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December 21, 2022

Mr. Eric Gustafson
Environmental Program Manager
Air Quality Program
PADEP – Northwest Regional Office
230 Chesnut Street
Meadville, PA 16335

RE: GrafTech USA, LLC
St. Marys Facility
St. Marys, Elk County, PA
RACT III Initial Notification – 25 Pa. Code 129.115(a)

Dear Mr. Gustafson:

GrafTech USA, LLC (GrafTech) operates a facility in St. Marys, Pennsylvania (St. Marys Facility) that manufactures carbon products and electrodes. The St. Marys facility operates under federally enforceable Title V Operating Permit No. 24-00012 and is a major source of emissions of volatile organic compounds (VOC) per 25 Pa Code §121.1. This package is being submitted to meet both the requirement to submit a written notification of compliance status per §129.115(a) and the requirement to propose alternative RACT requirements/limits per §129.114(d).

As discussed in the report, Graftech has completed alternative RACT proposals per 25 Pa. Code 129.114. Pursuant to 25 Pa Code §129.114(i), GrafTech has evaluated whether any new pollutant-specific air pollution control technologies have become available since the RACT II analysis. The results of this evaluation are detailed in the report. Per 25 Pa. Code 129.114(i), I certify the analysis within the report which demonstrates compliance with RACT II alternative limits assures compliance with RACT III.

If further information is required, please contact Travis Reed at (814) 781-2393 or travis.reed@graftech.com.

Sincerely,

Robert Quinn
General Manager

NOTIFICATION OF COMPLIANCE STATUS & ALTERNATIVE RACT PROPOSAL

PA RACT III

GrafTech / St. Marys Facility

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December 2022

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1. INTRODUCTION

GrafTech USA, LLC (GrafTech) operates a facility in St. Marys, Pennsylvania (St. Marys Facility) that manufactures carbon products and electrodes. The St. Marys facility operates under federally enforceable Title V Operating Permit No. 24-00012 and is a major source of emissions of volatile organic compounds (VOC) per 25 Pa Code §121.1.

On November 12, 2022, the Pennsylvania Department of Environmental Protection (PADEP), published new additional Reasonably Available Control Technology (RACT) regulations, including RACT III requirements and limits for major sources of NO_X and VOC under 25 Pa Code 129.111 – 129.115. The St. Marys Facility is subject to certain provisions of this regulation including the requirement to provide written notification of compliance status required under §129.115(a). In addition, sources for which presumptive RACT requirements are not established or for which presumptive limits cannot be met must submit an alternative RACT proposal. This document is intended to meet both the requirement to submit a written notification of compliance status per §129.115(a) and the requirement to propose alternative RACT requirements/limits per §129.114(d).

Based on potential emissions, the St. Marys facility is considered a major stationary source of VOC under the RACT program (i.e., greater than 50 tons per year of VOC). The site is not considered a major stationary source for NO_X (i.e., greater than 100 tons per year of NO_X). Therefore, the site must satisfy the requirements under 25 Pa Code §129.112-129.115 for each applicable source of VOC.

Per 25 Pa Code §129.111(c), RACT requirements only apply to NO_X and/or VOC sources that have the potential to emit more than one (1) ton per year (tpy) of NO_X or VOC. There are three (3) sources of VOC at the St. Marys facility that have the potential to emit more than one tpy of VOC: (1) the burn-off oven (Source 151); (2) the carbottom furnaces (Source 186); and (3) the longitudinal graphitizers (Source 187). In addition, the St. Marys facility operates several other emission sources that emit VOC. However, each of these sources has the potential to emit less than one (1) tpy VOC and as such is exempt from RACT III. A complete list of all applicable sources, and each source's potential to emit, is available in Appendix A.

1.1 Facility Information

GrafTech St. Marys facility produces graphite electrodes from carbon-based raw material. Production activities include milling, extrusion, baking, and graphitization. Coke is first milled and mixed with tar pitch, then extruded into the cylinder-shaped electrode. The extruded electrodes are baked to carbonize the pitch. After carbonization, the electrodes undergo a pitch impregnation (PI) step where coal tar pitch is impregnated into the porous electrode, followed by a second baking step. Following PI, the electrodes undergo a graphitization step to convert the baked carbon to graphite. The graphite electrode products are used in electric arc furnaces (EAFs) used in steel manufacturing.

The main sources of VOC emissions at the St. Marys facility are sixteen (16) carbottom (carbottom) furnaces and twenty (20) longitudinal graphitizing (LG) furnaces. Each carbottom furnace is a direct-fired, natural gas-fueled unit rated at 10 MMscf/hr. Emissions from the carbottom furnaces are vented to a common stack which is controlled by one (1) of two (2) thermal oxidizers. Controlled emissions of VOC from the carbottom furnaces are limited to 1.49 lb VOC per ton of carbon produced and 89.6 tpy total. The LG furnaces are direct-fired, electric-powered units with VOC emissions limited to 19.73 tpy. Emissions from the LG furnaces are vented to a common stack which is controlled by a venturi scrubber.

1.2 Summary of RACT Requirements

RACT is defined in 25 Pa Code §121.1 as "the lowest emission limit for VOC or NO_X that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."

For sources subject to RACT, there are three options for compliance with the RACT III Rule:

1. Compliance Option 1: Presumptive RACT;
2. Compliance Option 2: System-wide averaging (applicable for NO_X only); and
3. Compliance Option 3: Case-by-case RACT determination.

The proposed RACT III compliance strategy for each VOC emission unit at the St. Marys facility is provided in Table 1-1 below. Additional details for these sources as required by §129.115 are included in Appendix A.

Table 1-1. RACT III Compliance Strategy

Emission Source ID	Source Description	VOC RACT Status
108	Pitch Impregnation	Exempt
128	Cummins Natural Gas Emergency Generator	Exempt
130	Diesel Emergency Generator	Exempt
151	PI Basket Burners/Burn-off Oven	Presumptive
162	Liquid Pitch Storage (PI) & Dist.	Exempt
163	Air/Vegetable Oil Quench System	Exempt
186	Carbottom (carbottom) Furnaces	Case-by-case
187	Longitudinal Graphitizing (LG) Furnaces	Case-by-case
203	Parts Cleaners	Exempt
---	Miscellaneous Heaters	Exempt

1.2.1 Exemptions

As specified in 25 PA Code 129.111(c), sources with a potential to emit of 1.0 tpy or less of VOC are exempt from RACT III. The St. Marys Facility operates several small sources with potential emissions of VOC less than 1.0 tpy, which are identified in the table above. Appendix A provides supporting calculations demonstrating potential to emit less than 1.0 tpy for each of the sources noted as exempt in the table above as required under §129.115(a)(7)(ii).

1.2.2 Presumptive RACT

Under the first RACT III compliance option, sources can comply with presumptive RACT limits as outlined in §129.112. These limits are included in the regulations for several source categories and apply to all emission units in those source categories at major VOC facilities. The St. Marys Facility operations include one source of VOC that falls under a presumptive category. Source 151 is not regulated elsewhere in 25 Pa Code 129 and has potential emissions less than 2.7 tpy of VOC and is therefore covered under §129.112(c)(2). The presumptive RACT III requirement for this source is to install, maintain and operate in accordance with the manufacturer's specifications and with good operating practices.

1.2.3 System-Wide Averaging – Not Applicable

The owner or operator of a major NO_X emitting facility may elect to comply with RACT using facility-wide or system-wide emissions averaging. Since the St. Marys Facility is not a major NO_X emitting facility, this compliance option is not applicable to the facility.

1.2.4 Alternative (Case-by-Case) RACT Proposal

For sources of VOC which are unable to meet presumptive RACT limits and sources which do not qualify for one of the source categories that have presumptive RACT limits, the third option for RACT compliance applies. Under this third option, facilities must propose an alternative RACT emission limitation (i.e., a "case-by-case RACT limit"). For the St. Marys Facility, there are two such sources that fall into this category: Source 186 – Carbottom Furnaces and Source 187 – Longitudinal Graphitizers. These sources were previously assessed under RACT II with alternative case-by-case proposals.

Per 25 Pa Code 129.114, the case-by-case RACT proposal must include each of the elements required under 25 Pa Code 129.92(a)(1)-(5), (7)-(10) and (b). For those sources that were subject to alternative case-by-case requirements under RACT II per §129.99 and for which no new pollutant-specific air pollution control technology or technique is determined to be available, the facility may submit an analysis demonstrating that alternative RACT II requirements are sufficient to meet RACT III as long as the cost-effectiveness was previously calculated consistent with the EPA Air Pollution Control Cost Manual (6th Edition)[1] and remains equal to or greater than $12,000 per ton of VOC emissions reduced. For the RACT II assessment for Source 186 (Carbottom Furnaces), GrafTech determined that no additional controls were technically feasible since VOC emissions from this source are already controlled by thermal oxidation. For Source 187 (Longitudinal Graphitizers), GrafTech's RACT II assessment determined that one potential VOC control technology was technically feasible (thermal oxidation). However, the cost-effectiveness of that control strategy was determined to be $33,000 per ton of VOC removed.

Pursuant to 25 Pa Code §129.114(i), for sources subject to alternative case-by-case under RACT II that have not been modified or changed, the facility may submit an analysis that demonstrates that compliance with the RACT II alternative limits assures compliance with RACT III. GrafTech has evaluated whether any new pollutant-specific air pollution control technologies have become available since the RACT II analysis. The results of this evaluation are detailed in Section 2.

[1] EPA/452/B-02-001, January 2002, as amended.

2. ALTERNATIVE VOC RACT III ANALYSIS

As discussed previously, the St. Marys Facility operates two sources of VOC that do not have categorical presumptive requirements under RACT III and are not otherwise exempt. Sources 186 (Carbottom Furnaces) and 187 (Longitudinal Graphitizers) were previously evaluated for case-by-case RACT II. These sources have not been changed or modified since 2016.[2] GrafTech has conducted an evaluation of available VOC control techniques for these sources as required for RACT III. This section provides details on the methodology used and the conclusions resulting from this analysis.

2.1 Top-Down Methodology

Case-by-case RACT determinations are traditionally based on a top-down methodology. For the RACT III assessment, GrafTech has performed the five (5) basic steps of a top-down RACT review out described below.

2.1.1 Step 1: Identify All Control Technologies

Under Step 1, all available control technologies are identified for the emission unit in question. The following methods may be used to identify potential technologies:

- Researching the RACT/BACT/LAER Clearinghouse (RBLC) database;
- Surveying regulatory agencies;
- Drawing from previous engineering experience;
- Surveying air pollution control equipment vendors; and
- Surveying available literature.

Once identified, the control technologies are ranked in descending order of expected control efficiency/effectiveness.

2.1.2 Step 2: Eliminate Technically Infeasible Options

After control technologies are identified under Step 1, an analysis is conducted to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that prohibit the implementation of the control technology or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits, such as a New Source Performance Standard (NSPS) or National Emission Standard for Hazardous Air Pollutants (NESHAP).

2.1.3 Step 3: Rank Remaining Control Technologies by Effectiveness

In Step 3, remaining control technology options are ranked based on their control effectiveness, from highest to lowest control efficiency. This list must identify, at a minimum, the baseline emissions before implementation of each control option, the estimated reduction potential or control efficiency of each control option, and the estimated emissions after the application of each control option along with the economic impacts.

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[2] Note that a wet scrubber has been installed on Source 187, however, the primary purpose for this was for control of SO_2 emissions. As reflected in the corresponding Plan Approval (24-012K) for that project, there was no change in potential or allowable VOC from the source.

2.1.4 Step 4: Evaluate Most Effective Controls and Document Results

Beginning with the highest-ranked control technology option from Step 3, detailed economic, energy, and environmental impact evaluations are performed in Step 4. If a control option is determined to be economically feasible without adverse energy or environmental impacts, it is not necessary to evaluate the remaining options with lower control efficiencies. The economic evaluation centers on the cost-effectiveness of the control option. Costs of installing and operating control technologies are estimated and annualized following the methodologies outlined in the U.S. EPA's Office of Air Quality Planning and Standards (OAQPS) Control Cost Manual (CCM) and other industry resources.[3]

2.1.5 Step 5: Select RACT

Using the result of the prior steps to determine the appropriate control technology, the final step is to determine the source-specific pollution control technology and corresponding emission limit that represents RACT.

2.2 VOC RACT Assessment for Carbottom Furnaces

The St. Marys facility produces graphite electrodes in a multi-step batch-type manufacturing process that includes the operation of sixteen (16) carbottom kiln baking furnaces. Principal raw materials used in the manufacturing process include calcined petroleum coke and coal tar pitch binder, with minor amounts of other proprietary ingredients added to affect final product characteristics. Raw materials are sized, blended, and then formed into electrode shapes ("green" electrodes) by extrusion. Green electrodes are placed in large cans called saggers and baked to over 800 °C in specially designed, computer-controlled carbottom furnaces. It takes 1 to 2 weeks to carbonize the pitch depending upon the size of the electrodes being made. After cooling, the carbon electrodes are cleaned, inspected, and sample-tested. The electrodes are then impregnated with a special pitch to give them the higher density, mechanical strength, and electrical conductivity they will need to withstand the severe operating conditions inside our customers' electric arc furnaces. Following the PI operations, a second baking cycle or "rebake", is required to carbonize the pitch impregnation and to drive off any remaining volatiles at temperatures around 750 °C.

Carbottom baking is a batch process consisting of the following first bake basic operating steps:

1. Loading the "green" electrodes into saggers with sand pack
2. Loading saggers onto carbottom furnace car
3. Moving car to furnace and furnace kiln
4. Furnace cooling
5. Dumping electrodes and cleaning saggers
6. Preparing furnace car and furnace for next load

Rebake operating steps:

1. Loading pitch impregnated electrodes into "rebake" baskets
2. Load baskets onto carbottom furnace car
3. Move car to furnace and firing furnace
4. Furnace cooling
5. Unloading baskets
6. Prepare furnace car and furnace for next load

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[3] OAQPS, U.S. EPA Air Pollution Control Cost Manual, Sixth Edition, EPA 452-02-001 (https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution#cost%20manual) Mussatti & William M. Vatavuk, January 2002.

The source of VOCs from the carbottom furnaces (Source 186) include coal tar binder pitch used in Mill, Mix Forming (MMF) in the green electrodes driven off during first bake. The pitch impregnation coal tar pitch is the source of VOCs in rebake from the pitch impregnation process to increase the density, strength and conductivity of the product.

It should be noted that this source has been idle for the last several years. In 2021, GrafTech received a Plan Approval (24-012L) to restart the source in accordance with its approved reactivation plan. As part of the Plan Approval application, GrafTech provided a top-down technology review to demonstrate Best Available Technology (BAT), which was approved by the Department. As part of this RACT III assessment, GrafTech reviewed available resources to determine if any new technologies have since become available and found none. A list of all EPA RBLC database entries over the last 10 years has been attached in Appendix B.

2.2.1 Step 1: Identify Potential Control Technologies

Step 1 in a top-down analysis is to identify all available control technologies. The evaluation of potential controls for VOC emissions from Source 186 includes an investigation of pre-combustion and post-combustion methods. Table 2-1 contains a list of the various technologies that have been identified for the control of VOC emissions from Source 186.

Table 2-1. Potential VOC Control Technologies

Potentially Applicable VOC Control Technologies
Thermal Oxidizer / Incinerator
Catalytic Oxidizer / Incinerator
Raw Material Substitution

2.2.2 Review of Potentially Applicable VOC Control Technologies

2.2.2.1 Thermal Oxidizer/Incinerator

Incineration removes VOCs from a vapor stream after being collected by a fume exhaust hood. Through combustion, the VOCs are converted into carbon dioxide, water vapor and small quantities of other compounds. In thermal incineration, the emission stream passes through a combustion chamber where a natural gas-fueled flame ignites the VOCs in the vapor stream. The thermal oxidizer may require supplemental fuel in order to continuously operate when the vent stream is not being sent to the incinerator or when the vapor stream VOC concentration is too variable for self-sustained ignition. Thermal oxidizers/incinerators can achieve VOC control efficiencies greater than 99%.

2.2.2.2 Catalytic Oxidizer/Incinerator

Incineration removes VOCs from a vapor stream after being collected by a fume exhaust hood. Through combustion, the VOCs are converted into carbon dioxide, water vapor and small quantities of other compounds. Catalytic incinerators use a catalyst, such as platinum or copper, to lower the ignition temperature of the VOC stream. The catalyst allows the VOC stream to be ignited at a lower temperature and therefore requires less fuel and auxiliary heat than thermal incineration to maintain VOC ignition. Catalytic devices are most suited to systems with lower exhaust volumes, where there is little variation in the type and concentration of VOC, and where catalyst poisons or other fouling contaminants (e.g., silicone, sulfur, heavy hydrocarbons, and particulates) are not present. Catalytic oxidizers/incinerators can achieve VOC control efficiencies greater than 99%.

2.2.2.3 Raw Material Substitution

VOC-containing raw materials for the baking process include coal tar binder pitch and pitch impregnation coal tar. Raw materials with lower VOC contents have the potential to result in reduced overall VOC emissions from the process.

2.2.3 Step 2: Eliminate Technically Infeasible Control Strategies

Step 2 in a top-down analysis is to eliminate the control options identified in Step 1 which are technically infeasible. The remaining technologies are then carried into Step 3.

2.2.3.1 Thermal Oxidizer/Incinerator

Thermal oxidization is the VOC control technique currently utilized for the carbottom furnaces at the St. Marys Facility. Thermal incinerators require high VOC concentrations to sustain combustion reactions; therefore, the exhaust stream of the carbottom furnaces is appropriate for the use of this technology. For those reasons, this control strategy is considered to be **technically feasible** for Source 186.

2.2.3.2 Catalytic Oxidizer/Incinerator

The optimal working temperature range for oxidation catalysts is approximately 850-1,100 °F with a minimum exhaust gas stream temperature of 500 °F for minimally acceptable control. The exhaust stream of the carbottom furnaces is well above this range (typically ~1,500 °F). In addition, the carbottom furnace exhaust gases contain sulfur compounds, which would present risk of poisoning/fouling of the catalyst. This type of control device is not listed in the RBLC or found in permits for similar sources. Therefore, catalytic incineration is **not technically feasible** for VOC emissions control from Source 186.

2.2.3.3 Raw Material Substitution

The coal tar binder pitch and the coal tar impregnating pitch are directly related to the quality of the Ultra High Powered (UHP) electrodes produced at the St. Marys facility. Any substitution of these raw materials would compromise the quality of GrafTech's product and consumption rates of the products as they are used in customer applications (Electric Arc Furnaces). GrafTech has explored the potential production of lower VOC products, including a petroleum/coal tar pitch mixture. Unfortunately, these lower VOC products have not yielded the same quality results as standard raw materials and are in short supply. Therefore, raw material substitution is **not technically feasible** at this time as a means of reducing VOC emissions from Source 186 and therefore is not RACT.

2.2.4 Step 3: Rank Remaining Controls by Effectiveness

In Step 3, the remaining control technology options are ranked based on their control effectiveness, from highest to lowest control efficiency. However, the only control technology that is technically feasible for the carbottom furnaces is the use of thermal oxidization/incineration.

2.2.5 Step 4: Evaluate Most Effective Controls and Document Results

Only one control technology for the carbottom furnaces remained after the technical feasibility analysis of Step 2. Since GrafTech already utilizes thermal oxidizers to control VOC emissions from the carbottom furnaces, no further cost analysis is required.

2.2.6 Step 5: Select RACT

For Step 5, GrafTech will continue to use the existing thermal oxidizers as RACT for the carbottom furnaces. For the purposes of RACT III, GrafTech proposes continued compliance with the RACT II requirements that are outlined in the facility's permits. Further, a table provided by the PADEP central office regarding the compliance with RACT II assuring compliance with RACT III is included in Appendix C.

2.3 VOC RACT Assessment for Longitudinal Graphitizers

The St. Marys Facility produces graphite electrodes in a multi-step batch-type manufacturing process that includes the operation of twenty (20) longitudinal graphitizing (LG) furnaces. Principal raw materials used in the manufacturing process include calcined petroleum coke and pitch binder, with minor amounts of other proprietary ingredients added to effect final product characteristics. Raw materials are sized, blended, and then formed into electrode shapes ("green" electrodes) by extrusion. The "green" electrodes are baked to form amorphous carbon electrodes which are then graphitized in the LG furnaces. The graphitized electrodes undergo several finishing steps to become the final product.

Graphitizing is a batch process consisting of the following basic operating steps:

1. Loading the payload (electrodes) into the furnace;
2. Covering the payload with metallurgical coke insulation;
3. "On-fire" schedule for graphitizing the payload;
4. Furnace cooling;
5. Unloading the electrodes;
6. Removal of coke insulation ("gulping"); and
7. Preparing the furnace bed for the next payload.

The furnace "on-fire" schedule is pre-determined based on the payload. The payload is aligned end-to-end (longitudinally) and an electric current is applied at the end of the furnace, thereby heating the payload by direct resistance. The payload can reach temperatures of approximately 3,000 °C at its peak. After the on-fire cycle is concluded, the electrodes and metallurgical coke insulation are allowed to cool for up to 60 to 72 hours. A water spray is used to assist cooling during a portion of this period. At the end of the cooling period, the metallurgical coke insulation is removed by vacuum, or "gulping". During gulping, the insulation pack is collected for re-use. The vacuum exhaust is passed through a fabric filter for particulate emission control. The furnace is then prepared for the next run.

The furnaces are covered with removable hoods for the on-fire schedule and a portion of the subsequent cooling cycle. The hoods must be removed before the electrodes can be pulled and before the gulper can remove the insulation. Up to four (4) furnaces at a time can be covered by hoods. The hoods are connected to a central exhaust duct manifold located under the floor of the graphitizing building and discharge to atmosphere through wet scrubber (C187). Uncollected process emissions, including the gulper baghouse exhaust, discharge to atmosphere through a roof monitor extending the length of the graphitizing building. Emissions from an individual furnace are cyclical, increasing as power is applied and the payload is heated, peaking as the power is turned off, decreasing rapidly and then tailing off as the payload cools.

VOC is emitted from the metallurgical coke used for pack around the baked electrodes being graphitized in the furnace.[4] Emissions from an individual furnace are cyclical, increasing as power is applied and the payload is heated, peaking as the power is turned off, decreasing rapidly and then tailing off as the payload cools.

As part of this RACT III assessment, GrafTech reviewed available resources to determine if any new VOC control technologies have become available since the RACT II evaluation and found none. A list of all EPA RBLC database entries over the last 10 years has been attached in Appendix B.

2.3.1 Step 1: Identify Potential Control Technologies

Step 1 in a top-down analysis is to identify all available control technologies. Table 2-2 contains a list of the various technologies that have been identified for the control of VOC emissions from the LG furnaces.

Table 2-2. Potential VOC Control Technologies

Potentially Applicable VOC Control Technologies
Thermal Oxidizer or Afterburner
Catalytic Incinerator
Raw Material Substitution

2.3.2 Review of Potentially Applicable VOC Control Technologies

The following section provides a discussion of each potentially applicable technology identified above as it might be applied to the LG furnaces at the St. Marys facility.

2.3.2.1 Thermal Oxidizer or Afterburner

Incineration removes VOCs from a vapor stream after being collected by a fume exhaust hood. Through combustion, the VOCs are converted into carbon dioxide, water vapor and small quantities of other compounds. In thermal incineration, the emission stream passes through a combustion chamber where a natural gas-fueled flame ignites the VOCs in the vapor stream. The thermal oxidizer may require supplemental fuel in order to continuously operate when the vent stream is not being sent to the incinerator or when the vapor stream VOC concentration is too variable for self-sustained ignition. Thermal oxidizers/incinerators can achieve VOC control efficiencies greater than 99%.

2.3.2.2 Catalytic Incinerator

Incineration removes VOCs from a vapor stream after being collected by a fume exhaust hood. Through combustion, the VOCs are converted into carbon dioxide, water vapor and small quantities of other compounds. Catalytic incinerators use a catalyst, such as platinum or copper, to lower the ignition temperature of the VOC stream. The catalyst allows the VOC stream to be ignited at a lower temperature and therefore requires less fuel and auxiliary heat than thermal incineration to maintain VOC ignition. Catalytic devices are most suited to systems with lower exhaust volumes, where there is little variation in the type and concentration of VOC, and where catalyst poisons or other fouling contaminants (e.g., silicone,

[4] Based on small scale testing results, it is believed that not all of the VOCs in the metallurgical coke are emitted during the firing of the furnace due to the temperature gradient from the core of the electrode being graphitized to the surface of the met coke pack. Some of the volatiles condense on the pack material as it cools.

sulfur, heavy hydrocarbons, and particulates) are not present. Catalytic oxidizers/incinerators can achieve VOC control efficiencies greater than 99%.

2.3.2.3 Raw Material Substitution

VOC-containing raw materials for electrode manufacturing include coke and tar pitch. Raw materials with lower VOC contents may be available, however, the VOC content of commercially available materials does not appear to vary significantly. Each alternative raw material would need to be assessed for the manufacturing process on a case-by-case basis in order to determine if product specifications could be met with a change in raw materials. This evaluation would also need to carefully consider other air quality and environmental implications such as the sulfur content limits and SO_2 emission limits of the current permit for the LG furnaces.

2.3.3 Step 2: Eliminate Technically Infeasible Control Strategies

Step 2 in a top-down analysis is to eliminate the control options identified in Step 1 which are technically infeasible. The remaining technologies are then carried into Step 3.

2.3.3.1 Thermal Oxidizer or Afterburner

Thermal incinerators require high VOC concentrations (> 2,000 ppm) to sustain combustion reactions and can handle minor fluctuations in flow. The exhaust stream of the LG furnaces does have relatively high concentrations of VOC, but only for brief periods during the graphitizing process. The LG furnace exhaust flow is highly variable given the batch nature of the furnace operation and the inherent process cycling involved. The LG has a furnace peak every five hours running at capacity. Running at a slower production rate to accommodate thermal oxidizer operation would prove to be operationally difficult. Fuel consumption in thermal oxidizers is also high, making them best suited to smaller applications with moderate-to-high VOC loadings.

Further, packaged direct-fired thermal oxidizer units are typically available for waste streams with flow rates between 500 and 50,000 scfm, with regenerative thermal oxidizer units accommodating flows up to 100,000 scfm. The exhaust flow rate from the LG furnaces at St. Marys can be upwards of 90,000 scfm. Given the exhaust gas characteristics of the LG furnaces, custom designed, field-erected units would likely be necessary, which would incur higher engineering and installation costs as a result. Of additional concern in this case would be the burning of natural gas fuel in the thermal oxidizer to maintain constant operating temperatures (required to achieve continuous destruction efficiencies) given the frequency and duration of periods of low VOC concentration and/or low flow to the control device. The burning of excess fuel would coincidentally generate NO_X emissions, which is counter to the RACT III objective of reducing ozone precursors (NO_X and VOC). Lastly, since this source is now equipped with a wet scrubber, the moisture content of the exhaust stream is very high, which presents additional technical challenges. In order to incinerate streams with high water content, it would be necessary to install additional equipment such as a knock-out pot or disentrainment drum.

For the various reasons discussed above, GrafTech would anticipate significant technical challenges with design and operation of a thermal oxidizer for control of VOC emissions from the LG furnaces. The batch and cyclical operations of the furnaces, along with variability in VOC concentration and flow rates (which can reduce residence time and mixing, negatively affecting destruction efficiency), and the presence of water vapor, raise serious concerns regarding the technical feasibility of using a thermal oxidizer for control of VOCs on this source. Therefore, GrafTech believes incineration is not technically feasible for this source. This is supported by the fact that no longitudinal graphitizing furnaces are controlled by thermal oxidation. For these reasons, this control device is considered to be **not technically feasible** for the LG furnaces.

Despite this conclusion, GrafTech performed a cost-effectiveness analysis for this technology as part of the RACT II evaluation in the unlikely event that these technical challenges could be successfully navigated and despite evidence that they have not been demonstrated in practice on similar sources elsewhere.

2.3.3.2 Catalytic Incinerator

The optimal working temperature range for oxidation catalysts is approximately 850-1,100 °F with a minimum exhaust gas stream temperature of 500 °F for minimally acceptable control. The exhaust stream of the LG furnaces is well below this range (typically 100-350 °F at furnace j-trunk and 75-150 °F at dispersion stacks). In addition, the LG furnace exhaust gases contain sulfur compounds, which would present risk of poisoning/fouling of the catalyst. This type of control device is not listed in the RBLC or found in permits for similar sources. Therefore, catalytic incineration is **not technically feasible** for VOC emissions control from the LG furnaces.

2.3.3.3 Raw Material Substitution

The primary source of VOC emissions from the LG furnaces is the metallurgical coke used as insulating pack in the furnace. The vendor specification for VOC content in the met coke used by GrafTech is no greater than 3% (and Certificates of Analysis for received materials show that actual values are typically below 1%). A lower VOC substitution for met coke is not known to exist or be technically feasible without potentially serious impacts to product quality, such as potentially burning or splitting the electrodes being graphitized. Therefore, raw material substitution is **not technically feasible** for the LG furnaces.

2.3.4 Step 3: Rank Remaining Controls by Effectiveness

In this top-down review, no technically feasible controls for VOC emissions were identified. Nevertheless, GrafTech performed a cost-effectiveness analysis for thermal oxidation/incineration as part of the RACT II evaluation. For this exercise, GrafTech used EPA's Cost Estimation Spreadsheet Tool for Thermal and Catalytic Oxidizers (January 2018) to prepare a cost-effective analysis for the potential use of a thermal oxidizer for control of VOC from the LG furnaces. It should be noted that the cost calculation template is based on the average cost of a packaged thermal oxidizer unit. As such, the cost estimates predicted by the tool are expected to be very conservative (i.e., low) for GrafTech's case since a field-erected site-specific design would be needed. Furthermore, these estimates do not account for any knockout of water vapor in the waste gas stream which may be needed. Equipment life for an oxidizer is variable and depends on several factors, including the system design and materials used in its construction, composition of the waste gas stream, and the temperatures experienced by the oxidizer. As noted previously, oxidizers that handle corrosive waste gases or higher levels of particulates will generally have a shorter operational life and systems that undergo frequent fluctuations in temperature or more frequent startup-shutdown cycles will have a shorter operational life than systems where a steady temperature is maintained. However, to be conservative, GrafTech has not adjusted EPA's default life expectancy of 20 years to account for these conditions.

Using EPA's tool, GrafTech previously calculated the cost-effectiveness of a thermal oxidizer for control of VOC from the LG furnaces for RACT II at more than $33,000 per ton of VOC removed on a projected actuals basis. GrafTech has updated this cost-effectiveness calculation to reflect current costs and to be based on the full potential to emit from the source. Using these very conservative assumptions, GrafTech has calculated the cost-effectiveness to this technology to be **over $12,000 per ton of VOC removed** on a PTE basis. Based on this analysis, a thermal oxidizer is **not cost-effective** as RACT for this source. Further, a table provided by the PADEP central office regarding the compliance with RACT II assuring compliance with RACT III is included in Appendix C. Cost-effectiveness calculations of a thermal oxidizer are also available in Appendix D.

2.3.5 Step 4: Evaluate Most Effective Controls and Document Results

In this top-down review, no technically feasible controls for VOC emissions were identified. The control strategies reviewed above are not technically feasible for the various reasons described. One technology was evaluated for cost-effectiveness and was determined to be **economically infeasible**.

2.3.6 Step 5: Select RACT

For Step 5, GrafTech will continue to use the existing thermal oxidizers as RACT for the carbottom furnaces. For the purposes of RACT III, GrafTech proposes continued compliance with the RACT II requirements that are outlined in the facility's permits.

3. VOC RACT PROPOSAL

The St. Marys facility proposed RACT III and related monitoring, testing, recordkeeping and reporting are summarized in Table 3-1 below.

Table 3-1. St. Marys Facility Proposed RACT Summary

Emission Source ID(s):	186, Carbottom Furnaces
Source Description(s):	Sixteen (16) Natural gas-fired Carbottom Furnaces, 10 MMscf/hr
Description of RACT:	Case-by-case
	Thermal Oxidization
Proposed Limit: 1.49 lbs VOC per ton of carbon baked (89.6 tpy). Maintain and operate the source and control device in accordance with manufacturer's specifications and good air pollution control practices. **Monitoring:** Continuous Monitoring of TO Inlet and Outlet Temperature. Maintain inlet TO temperature of 1500 °F or greater. **Proposed Testing:** Calibrate and check the accuracy of temperature indicator annually. **Proposed Recordkeeping:** Keep TO temperature records for five (5) years. Maintain a record of all preventative maintenance inspections of the control device. Maintain a record of pounds of VOC emitted per tons of carbon baked. **Proposed Reporting:** Semi-annual Title V reporting and annual compliance certification	

Emission Source ID(s):	187, Longitudinal Graphitizers
Source Description(s):	Twenty (20) electric graphitizers
Description of RACT:	Case-by-case
	Good Air Pollution Control Practices
Proposed Limit: 24.49 lbs VOC per ton of carbon graphitized. Maintain and operate the source in accordance with manufacturer's specifications and good air pollution control practices. **Monitoring:** Monitor Certificates of Analysis (COA's) from raw material vendors to verify volatile material content remains below 3%. **Proposed Testing:** No additional testing proposed. **Proposed Recordkeeping:** Maintain a record of pounds of VOC emitted per tons of carbon graphitized. Maintain records of COA's from vendors. **Proposed Reporting:** Semi-annual Title V reporting and annual compliance certification	

APPENDIX A. RACT III COMPLIANCE STATUS TABLES

Client Name: **Graftech USA LLC**
Facility Name: **St. Marys Facility**
Project Name: **RACT III**
Date: **12/21/2022**

Table A-1. GrafTech St. Marys Facility - Source Information

Source ID	Source Name	Rated Capacity		Make	Model	Physical Location	RACT II Applicability Status
108	Pitch Impregnation	---	---	Unknown	Unknown	Pitch Impregnation Building	Exempt per §129.96(c)
128	Cummins Natural Gas Emergency Generator	153	HP	Cummins	Unknown	Main Office Building	Exempt per §129.96(c)
130	Diesel Emergency Fire Pump	67	HP	Unknown	Unknown	Pump House	Exempt per §129.96(c)
151	Burn-Off Oven	1.296	MCF/hr	Unknown	Unknown	Pitch Impregnation Building	Exempt per §129.96(c)
162	Liquid Pitch Storage (P.I.) & Dist.	---	---	Unknown	Unknown	Pitch Impregnation Building	Exempt per §129.96(c)
163	Air/Vegetable Oil Quench System	---	---	Unknown	Unknown	Pitch Impregnation Building	Exempt per §129.96(c)
186	Carbottom Furnaces	50	tons/hr	Unknown	Unknown	Carbottom Bake Area	Alternative per §129.99
187	Longitudinal Graphitizers	5	tons/hr	Unknown	Unknown	Longitudinal Graphitizing Building	Alternative per §129.99
203	Parts Cleaner - 1	240	gal/yr	Unknown	Unknown	Maintenance Shop #1	Exempt per §129.96(c)
203	Parts Cleaner - 2	240	gal/yr	Unknown	Unknown	Maintenance Shop #2	Exempt per §129.96(c)
203	Parts Cleaner - 3	240	gal/yr	Unknown	Unknown	Mobile Maintenance Shop	Exempt per §129.96(c)
Misc	Miscellaneous Gas Heaters	2.5	MMBtu/hr	Varies	Varies	Varies	Exempt per §129.96(c)

Notes:
1. Source Information list represents most recent information on the facility from the TVOP issued 9/10/2021 and Plan Approval 24-012K issued on 2/10/2021.
2. Source ID 203 was separated out into individual emission units for RACT III assessment.

Client Name: Graftech USA LLC
Facility Name: St. Marys Facility
Project Name: RACT III
Date: 12/21/2022

Table A-2. GrafTech St. Marys Facility - VOC RACT III

Source ID	Source Name	Rated Capacity		Max Operating Hours	VOC Emission Factor		VOC PTE (tpy)	VOC RACT III Applicability	VOC RACT III Compliance Demonstration
108	Pitch Impregnation	---	---	8,760	---	---	0.19	Exempt per §129.111(c)	Maintain documentation of PTE
128	Cummins Natural Gas Emergency Generator	153	HP	500	0.10	g/bhp-hr	0.01	Exempt per §129.111(c)	Maintain documentation of PTE
130	Diesel Emergency Fire Pump	67.000	HP	500	0.0025	lb/hp-hr	0.04	Exempt per §129.111(c)	Maintain documentation of PTE
151	Burn-Off Oven	1	MCF/hr	8,760	---	---	2.27	Presumptive per §129.112(c)(2)	Install, maintain, and operate in accordance with good practices
162	Liquid Pitch Storage (P.I.) & Dist.	---	---	8,760	---	---	0.85	Exempt per §129.111(c)	Maintain documentation of PTE
163	Air/Vegetable Oil Quench System	---	---	8,760	---	---	0.002	Exempt per §129.111(c)	Maintain documentation of PTE
186	Carbottom Furnaces	50	tons/hr	8,760	---	---	89.60	Alternative per §129.114	Case-by-Case Analysis of RACT
187	Longitudinal Graphitizers	5	tons/hr	8,760	---	---	19.73	Alternative per §129.114	Case-by-Case Analysis of RACT
203	Parts Cleaner - 1	240	gal/yr	8,760	6.70	lb/gal	0.80	Exempt per §129.111(c)	Maintain documentation of PTE
203	Parts Cleaner - 2	240	gal/yr	8,760	6.70	lb/gal	0.80	Exempt per §129.111(c)	Maintain documentation of PTE
203	Parts Cleaner - 3	240.00	gal/yr	8,760	6.70	lb/gal	0.80	Exempt per §129.111(c)	Maintain documentation of PTE
Misc	Miscellaneous Gas Heaters	2.50	MMBtu/hr	8,760	5.50	lb/MMscf	0.06	Exempt per §129.111(c)	Maintain documentation of PTE

Notes:
1. Source 108 VOC Emissions based on previously permitted VOC Limit of 0.19 tpy.
2. Source 151 VOC Emissions represent natural gas combustion emissions and process emissions, combined. See Table B-2 for detailed emission factors.
3. Source 162 and 163 VOC Emissions based on tank calculations completed in EPATanks.
2. Source 186 has a VOC limit of 89.6 tpy in any consecutive 12-month period per TVOP Condition #D.I. #002.
3. Source 187 has a VOC limit of 19.73 tpy in any consecutive 12-month period per Plan Approval 24-012K Condition #D.I. #001.
4. Source 203 emissions calculated per parts cleanear. Emissions assume four turnovers per year and all added cleaner is emitted as VOC emissions. See Table B-2 for detailed emission factors.

PTE Calculations:
Emission Rate (tpy) = EF (g/hp-hr) ÷ 453.592 (g/lb) * Operating Hours (hrs/yr) * Engine Horsepower (hp) ÷ 2,000 (lbs/ton)
Emission Rate (tpy) = EF (lb/hp-hr) * Operating Hours (hrs/yr) * Engine Horsepower (hp) ÷ 2,000 (lbs/ton)
Emission Rate (tpy) = EF (lb/MMscf) * Unit Heat Input (MMBtu/hr) ÷ Fuel HHV (Btu/scf) * Operating Hours (hrs/yr) ÷ 2000 (lbs/ton)
Emission Rate (tpy) = EF (lb/hr) * Operating Hours (hrs/yr) ÷ 2,000 (lbs/ton)
Emission Rate (tpy) = EF (lb/ton) * Rated Capacity (ton/hr) * Operating Hours (hrs/yr) ÷ 2,000 (lbs/ton)
Emission Rate (tpy) = EF (lb/gal) * Annual Throughput (gal/yr) ÷ 2,000 (lbs/ton)

Client Name: Graftech USA LLC
Facility Name: St. Marys Facility
Project Name: RACT III
Date: 12/21/2022

Table A-3. Detailed Emission Factors for Calculations

Emission Unit ID	Emission Unit Description	Pollutant	Emission Factor	Units	Source	Reference Emission Factor	Units	Source	Notes
108	Pitch Impregnation	VOC	380	lb/yr	2016 TVOP	0.19	ton/yr	2016 TVOP	Previously Accepted PTE value.
128	Cummins Natural Gas Emergency Generator	VOC	0.0002	lb/bhp-hr	Vendor Specs	0.1	g/bhp-hr	Vendor Specs	
130	Diesel Emergency Fire Pump	VOC	0.0025	lb/hp-hr	AP-42 Table 3.3-1 (10/96)				
151	Burn Off Oven - Nat. Gas	VOC	5.5	lb/MMscf	AP-42 Table 1.4-1 (07/98)				
151	Burn Off Oven - Process	VOC	0.51	lb/hr	Onex Emission Factor				Assume process runs continuously.
162	Liquid Pitch Storage (P.I.) & Dist.	VOC	1700	lb/yr	EPATanks/2022 Permit Application	0.85	ton/yr	EPATanks/2022 Permit Application	Combined estimated emissions for source 162 and 165. Captures three coal tar pitch storage tanks. Two (2) 100,000 gallon tanks, and one (1) 50,000 gallon tank.
163	Air/Vegetable Oil Quench System	VOC	3	lb/yr	2022 Permit Application	0.0015	ton/yr	2022 Permit Application	
186	Carbottom Furnaces	VOC	179200.0	lb/yr	TVOP Limit	89.6	ton/yr	TVOP Limit	
187	Longitudinal Graphitizers	VOC	0.900913242	lb/ton	lb/ton based on TPY Limit and rated capacity	19.73	ton/yr	Plan Approval Limit	
203	Parts Cleaner - 1	VOC	6.7	lb/gal	From Crystal Clean Premium 142+ Mineral Spirits SDS				
203	Parts Cleaner - 2	VOC	6.7	lb/gal	From Crystal Clean Premium 142+ Mineral Spirits SDS				
203	Parts Cleaner - 3	VOC	6.7	lb/gal	From Crystal Clean Premium 142+ Mineral Spirits SDS				
Misc	Miscellaneous Gas Heaters	VOC	5.5	lb/MMscf	AP-42 Table 1.4-1 (07/98)				

APPENDIX B. RACT/BACT/LAER CLEARINGHOUSE DATABASE RESULTS

COMPREHENSIVE REPORT
Report Date:12/19/2022

Facility Information

RBLC ID:	SC-0142 (final)	**Date Determination Last Updated:**	11/02/2017
Corporate/Company Name:	SHOWA DENKO CARBON, INC.	**Permit Number:**	0900-0025-CZ
Facility Name:	SHOWA DENKO CARBON, INC.	**Permit Date:**	06/08/2012 (actual)
Facility Contact:	SYSNULL	**FRS Number:**	110000353590
Facility Description:	GRAPHITE ELECTRODE MANUFACTURING FACILITY.	**SIC Code:**	3624
Permit Type:	A: New/Greenfield Facility	**NAICS Code:**	335991
Permit URL:			
EPA Region:	4	**COUNTRY:**	USA
Facility County:	DORCHESTER		
Facility State:	SC		
Facility ZIP Code:	29472		

Permit Issued By: SOUTH CAROLINA DEPT OF HEALTH & ENV CTRL, BUREAU OF AIR QUALITY (Agency Name)
MS. ALYSON HAYES(Agency Contact) (803)898-3836 camitdr@dhec.sc.gov

Other Agency Contact Info: SHEILA WATTS (803) 898-4123

Permit Notes:

Process/Pollutant Information

PROCESS NAME: MILL, MIX, AND EXTRUSION

Process Type: 70.290 (Other Grain Handling)

Primary Fuel:

Throughput: 0

Process Notes: THIS PROCESS INVOLVES GREEN SCRAP SERVICE BINS AND WEIGH SCALE, SERVICE BINS, BUCKET ELEVATORS, CRUSHER BINS, CRUSHERS, SCREENS, WEIGH SCALES, CONVEYORS, SCALE RETRACTABLE SPOUTS, PRE-HEATERS, HOPPERS, MILL FEED BIN, IRON OXIDE BIN AND SCALE, AND COKE SILOS AND CONVEYOR BELTS.

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission: 0.0050 GR/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission: 0.0050 GR/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission: 0.0050 GR/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: MILL, MIX AND EXTRUSION PROCESS INCLUDING MIXERS

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput: 0

Process Notes: PROCESS INCLUDES MIXERS, MIXER DISCHARGE BELT, SCREW SPREADER, COOLING BELTS, HOMOGENIZER, AND HOMOGENIZER DISCHARGE BELT.

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0700 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:
Control Method: (A) BAGHOUSE/DRY FUME SCRUBBER
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE/DRY FUME SCRUBBER
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:
Control Method: (A) BAGHOUSE/DRY FUME SCRUBBER
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE/DRY FUME SCRUBBER
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: HOT OIL HEATER
Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)
Primary Fuel: NATURAL GAS
Throughput: 5.00 MMBTU/H
Process Notes: THERE WILL BE A HOT OIL HEATER FOR THE MILL, MIX, AND EXTRUSION PROCESS AND A HOT OIL HEATER FOR THE PITCH IMPREGNATION PROCESS (EACH SIZED AT 5 MMBTU/HR).

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0022 LB/MMBTU
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0022 LB/MMBTU
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0022 LB/MMBTU
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 0.0820 LB/MMBTU
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 0.1000 LB/MMBTU

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0120 LB/MMBTU

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 3093.0000 T/YR (CO2E)
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: MILL, MIX, EXTRUSION (BINDER PITCH TANK)

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput: 0

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.4000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:
Control Method: (A) VENT CONDENSER
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: CARBOTTOM FURNACES
Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)
Primary Fuel: NATURAL GAS
Throughput: 18.00 MMBTU/H
Process Notes: THERE ARE 15 CARBOTTOM FURNACES BEING INSTALLED THAT ARE RATED AT 18 MILLION BTU/HR EACH.

POLLUTANT NAME: Particulate matter, filterable (FPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 4.1400 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) THERMAL OXIDIZER, LOW NOX BURNERS, GOOD COMBUSTION PRACTICES, ANNUAL TUNE-UP, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 4.1400 LB/H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) THERMAL OXIDIZER, LOW NOX BURNERS, GOOD COMBUSTION PRACTICES, ANNUAL TUNE-UP, PROCESS OPTIMIZATION

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 4.1400 LB/H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) THERMAL OXIDIZER, LOW NOX BURNERS, GOOD COMBUSTION PRACTICES, ANNUAL TUNE-UP, PROCESS OPTIMIZATION

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 2.0000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) THERMAL OXIDIZER, LOW NOX BURNERS, GOOD COMBUSTION PRACTICES, ANNUAL TUNE-UP, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 75.2200 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) THERMAL OXIDIZER, LOW NOX BURNERS, GOOD COMBUSTION PRACTICES, ANNUAL TUNE-UP, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 17.3000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) THERMAL OXIDIZER, LOW NOX BURNERS, GOOD COMBUSTION PRACTICES, ANNUAL TUNE-UP, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 200009.0000 T/YR (CO2E)
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) THERMAL OXIDIZER, LOW NOX BURNERS, GOOD COMBUSTION PRACTICES, ANNUAL TUNE-UP, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: REBAKE LOAD AND UNLOAD/GRAPHITIZING PREPARATION
Process Type: 99.999 (Other Miscellaneous Sources)
Primary Fuel:
Throughput: 0
Process Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) BAGHOUSE

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0050 GR/DSCF

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) BAGHOUSE

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: BAKE LOAD AND UNLOAD AND BAKED ELECTRODE CLEANING PROCESS

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput: 0

Process Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: PITCH IMPREGNATION/PREHEATER
Process Type: 19.600 (Misc. Boilers, Furnaces, Heaters)
Primary Fuel: NATURAL GAS
Throughput: 12.00 MMBTU/H
Process Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0023 LB/MMBTU
Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0023 LB/MMBTU

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0023 LB/MMBTU

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide

CAS Number: 630-08-0

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds)

Emission Limit 1: 0.0830 LB/MMBTU

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 0.1000 LB/MMBTU

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 0.0110 LB/MMBTU

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9

Test Method: Unspecified

Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)

Emission Limit 1: 7424.0000 T/YR (CO2E)

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (P) GOOD COMBUSTION PRACTICES, ANNUAL TUNE UP, LOW NOX BURNERS

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: PITCH IMPREGNATION (AUTOCLAVE/SPRAY COOLER/COOLING BATH)

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput: 0

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 3.0830 LB/H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) THERMAL OXIDIZER

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide

CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 8973.0000 T/YR (CO2E)
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) THERMAL OXIDIZER ONLY CONTROLS VOCS
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: IMPREGNATION PITCH STORAGE TANKS

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput: 0

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.0550 T/YR (TOTAL)
Emission Limit 2:
Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) VENT CONDENSER
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: INSULATING MEDIA RECEIVING

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput: 0

Process Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: GRAPHITIZING FURNACES

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput: 0

Process Notes: 10 ELECTRICALLY POWERED GRAPHITIZING FURNACES

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 4.1900 LB/H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) WET SCRUBBER, PROCESS OPTIMIZATION

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 4.1500 LB/H

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) WET SCRUBBER, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 4.1200 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) WET SCRUBBER, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Monoxide
CAS Number: 630-08-0
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds)
Emission Limit 1: 1690.0000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) WET SCRUBBER, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 2.5000 LB/H
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) WET SCRUBBER, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide
CAS Number: 124-38-9
Test Method: Unspecified
Pollutant Group(s): (Acid Gasses/Mist , Greenhouse Gasses (GHG) , InOrganic Compounds)
Emission Limit 1: 32852.0000 T/YR (CO2E)
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) WET SCRUBBER, PROCESS OPTIMIZATION
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 3.3000 LBS/HR 96 HOUR BLOCK AVERAGE
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (N)
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: GRAPHITIZING PROCESS (GULPER SYSTEM, DUST BINS)
Process Type: 99.999 (Other Miscellaneous Sources)
Primary Fuel:
Throughput: 0
Process Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0050 GR/DSCF

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) BAGHOUSE

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 μ (FPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.0050 GR/DSCF

Emission Limit 2:

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:

Control Method: (A) BAGHOUSE

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: CLEANING AND INSPECTION

Process Type: 99.999 (Other Miscellaneous Sources)

Primary Fuel:

Throughput: 0

Process Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 10 μ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 μ (FPM2.5)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD

Other Applicable Requirements:	
Control Method:	(A) BAGHOUSE
Est. % Efficiency:	
Cost Effectiveness:	0 $/ton
Incremental Cost Effectiveness:	0 $/ton
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	

Process/Pollutant Information

PROCESS NAME:	MACHINING AND SHIPPING
Process Type:	99.999 (Other Miscellaneous Sources)
Primary Fuel:	
Throughput:	0
Process Notes:	

POLLUTANT NAME:	Particulate matter, filterable (FPM)
CAS Number:	PM
Test Method:	Unspecified
Pollutant Group(s):	(Particulate Matter (PM))
Emission Limit 1:	0.0050 GR/DSCF
Emission Limit 2:	
Standard Emission:	

Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown

Case-by-Case Basis:	BACT-PSD
Other Applicable Requirements:	
Control Method:	(A) BAGHOUSE
Est. % Efficiency:	
Cost Effectiveness:	0 $/ton
Incremental Cost Effectiveness:	0 $/ton
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	

POLLUTANT NAME: Particulate matter, filterable < 10 µ (FPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable < 2.5 µ (FPM2.5)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.0050 GR/DSCF
Emission Limit 2:
Standard Emission:
Did factors, other then air pollution technology considerations influence the BACT decisions: Unknown
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) BAGHOUSE
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

APPENDIX C. RACT II AS RACT III FORM

12/19/2022

Additional RACT Requirements for Major Sources of NO_x and VOCs

25 Pa Code § 129.114(i) - Demonstrating that compliance with § 129.99(e) assures compliance with § 129.114(a)-(c) and (e)-(h).

This form is intended to assist applicants in providing the information needed by the Department to evaluate whether a source or sources at a facility demonstrate that compliance with the alternative RACT requirement or alternative RACT emission limitation approved by the Department or the appropriate approved local air pollution control agency under § 129.99(e) (relating to alternative RACT proposal and petition for alternative compliance schedule) assures compliance with the provisions in subsections 25 Pa Code *§ 129.114(a)-(c) and (e)-(h)*, except for sources subject to § 129.112(c)(11) or (i)—(k).

This provision allows for RACT III compliance using an abbreviated analysis by providing the Department with the analysis done on the same source for RACT II.

This form must be submitted to the Department as soon as practicable, but no later than December 31st, 2022.

Please provide a list of sources that the owner or operator proposes to comply with RACT III through 129.114(i) in Table 1 using the instructions below.

The basic information requested here can be found in section A and H of the facility's operating permit.

If the source was evaluated for multiple control devices, please list the same source multiple times so that every source/control device combination is listed.

If one control device was evaluated to control multiple sources, please list all source ID's which the control device would control in the source ID section while skipping the source name, make, model, and location sections. Please treat the "source group" as a source for the purposes of the rest of this form.

Please choose one of the following provisions of 129.114(i) with which the source/evaluated control device combination will comply with:

a. 129.114(i)(1)(i) – Please choose this option if no new air pollution control device is available or if the cost analysis done for RACT II (129.99(e)) resulted in a cost-effectiveness equal to or greater than $7,500 for NOx or $12,000 per ton of VOC reduced. In addition, the owner or operator may choose this option if…

    i. A control option during RACT II evaluation was determined to be technically infeasible.

ii. No cost analysis was performed for another reason, such as a higher ranked control technology was installed.

b. 129.114(i)(1)(ii) – Please choose this option if the cost analysis done for RACT II (129.99(e)) resulted in a cost-effectiveness less than $7,500 for NOx emissions reduced or $12000 per ton of VOC emissions reduced.

c. 129.114(i)(2) – Please choose this option for any sources which have new or upgraded control device, beyond what was evaluated for RACT II (129.99(e)), which needs to be evaluated.

Table 1

Source ID	Source Name	NOx Control device evaluated	Cost per ton of NOx determined	VOC Control device evaluated	Cost per ton of VOC determined	Provision of 129.114(i) which the source/evaluated control device will comply with (a, b or c)
186	Carbottom Furnaces	N/A	N/A	TO/Incinerator	N/A	N/A – Technically Feasible/Currently Installed
186	Carbottom Furnaces	N/A	N/A	Catalytic Oxidizer/ Incinerator	N/A	N/A – Technically Infeasible
186	Carbottom Furnaces	N/A	N/A	Raw Material Substitution	N/A	N/A – Technically Infeasible
187	Longitudinal Graphitizers	N/A	N/A	TO/Afterburner	~$17,350	129.114(i)(1)(i)
187	Longitudinal Graphitizers	N/A	N/A	Catalytic Incinerator	N/A	N/A – Technically Infeasible
187	Longitudinal Graphitizers	N/A	N/A	Raw Material Substitution	N/A	N/A – Technically Infeasible

For all source/control device combinations listed in Table 1 subject to 129.114(i)(1)(i), please provide the following:

- A statement that explains how the owner or operator determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available.

- A copy of the final version of the cost analysis done for RACT II which was approved by the Department. If a copy of the final analysis is not available, you may submit a new cost analysis calculated consistent with the “EPA air pollution control cost manual” (sixth edition), EPA/452/b-02-001, January 2002, as amended.

- A statement that an evaluation of each economic feasibility analysis summarized as required above demonstrates that the cost effectiveness remains equal to or greater than $7,500 per ton of NO_x emissions reduced or $12,000 per ton of VOC emissions reduced.

- If the owner or operator feels that the Department should have any additional information to assist them in evaluating their application, please provide it.

For all source/control device combinations listed in Table 1 subject to 129.114(i)(1)(ii), please provide the following:

- A statement that explains how the owner or operator determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available.

- A copy of the final version of the cost analysis done for RACT II which was approved by the Department. If a copy of the final analysis is not available, the owner or operator may submit a new cost analysis calculated consistent with the “EPA air pollution control cost manual” (sixth edition), EPA/452/b-02-001, January 2002, as amended.

- A new economic feasibility analysis for each source/control device combination.

- A statement that an evaluation of each economic feasibility analysis summarized as required above demonstrates that the cost effectiveness remains less than $7,500 per ton of NO_x emissions reduced or $12,000 per ton of VOC emissions reduced.

- If the owner or operator feels that the Department should have any additional information to assist them in evaluating your application, please provide it.

For all source/control device combinations listed in Table 1 subject to 129.114(i)(2), please provide the following:

- A technical feasibility analysis and an economic feasibility analysis in accordance with § 129.92(b) (this is a standard RACT analysis).

- Submit the RACT analyses to the department or appropriate approved local air pollution control agency for review.

- If the owner or operator feels that the Department should have any additional information to assist them in evaluating your application, please provide it below.

APPENDIX D. COST-EFFECTIVENESS CALCULATIONS

Cost Estimate

Direct Costs

Total Purchased equipment costs (in 2021 dollars)

Incinerator + auxiliary equipment[a] (A) =			
Equipment Costs (EC) for Regenerative Oxidizer	=[2.664 x 100,000 + (13.98 x Qtot)] x (2021 CEPI/2016 CEPCI) =	$1,460,636	in 2021 dollars
Instrumentation[b] =	0.10 × A =	$146,064	
Sales taxes =	0.03 × A =	$43,819	
Freight =	0.05 × A =	$73,032	
	Total Purchased equipment costs (B) =	$1,723,550	in 2021 dollars

Footnotes

a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.

b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2021 dollars)

Foundations and Supports =	0.08 × B =	$137,884	
Handlong and Errection =	0.14 × B =	$241,297	
Electrical =	0.04 × B =	$68,942	
Piping =	0.02 × B =	$34,471	
Insulation for Ductwork =	0.01 × B =	$17,236	
Painting =	0.01 × B =	$17,236	
Site Preparation (SP) =		$0	
Buildings (Bldg) =		$0	
	Total Direct Installaton Costs =	$517,065	
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$2,240,615	in 2021 dollars

Total Indirect Installation Costs (in 2021 dollars)

Engineering =	0.10 × B =	$172,355	
Construction and field expenses =	0.05 × B =	$86,178	
Contractor fees =	0.10 × B =	$172,355	
Start-up =	0.02 × B =	$34,471	
Performance test =	0.01 × B =	$17,236	
	Total Indirect Costs (IC) =	$482,594	
Contínency Cost (C) =	CF(IC+DC)=	$272,321	
Total Capital Investment =	**DC + IC +C =**	**$2,995,530**	**in 2021 dollars**

Direct Annual Costs

Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$324,124	
Annual Fuel Costs for Natural Gas	= $Cost_{fuel}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$794,628	
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$14,569	
	Supervisor = 15% of Operator	$2,185	
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,002	
	Materials = 100% of maintenance labor	$15,002	
Direct Annual Costs (DC) =		**$1,165,509**	**in 2021 dollars**

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$28,054	
Administrative Charges	= 2% of TCI	$59,911	
Property Taxes	= 1% of TCI	$29,955	
Insurance	= 1% of TCI	$29,955	
Capital Recovery	= CRF[TCI-1.08(cat. Cost)]	$225,323	
Indirect Annual Costs (IC) =		**$373,199**	**in 2021 dollars**
Total Annual Cost =	**DC + IC =**	**$1,538,708**	**in 2021 dollars**

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$1,538,708 per year in 2021 dollars
VOC/HAP Pollutants Destroyed =	88.7 tons/year
Cost Effectiveness =	$17,347 per ton of pollutants removed in 2021 dollars