



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

## Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Charles D. Baker  
Governor

Karyn E. Polito  
Lieutenant Governor

Matthew A. Beaton  
Secretary

Martin Suuberg  
Commissioner

November 4, 2016

Mr. Joseph Dufresne  
Saint-Gobain Abrasives, Inc.  
One New Bond Street  
Worcester, MA 01606

**RE: Worcester**  
Transmittal No.: X271660  
Application No.: CE-16-015  
Class: OP  
FMF No.: 130510  
**FINAL AIR QUALITY PLAN APPROVAL**

Dear Mr. Dufresne:

The Massachusetts Department of Environmental Protection (“MassDEP”), Bureau of Air and Waste, has reviewed your Limited Plan Application (“Application”) listed above. This Application concerns the proposed installation and operation of a steam condenser for the Powerhouse located at your Worcester facility located at 1 New Bond Street in Worcester, Massachusetts (“Facility”).

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 “Air Pollution Control” regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-O, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP’s review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator (“Permittee”) must comply in order for the Facility to be operated in compliance with this Plan Approval.

## **1. DESCRIPTION OF FACILITY AND APPLICATION**

Saint-Gobain Abrasives, Inc. (“Saint-Gobain”) operates a manufacturing facility located at 1 New Bond Street in Worcester, Massachusetts (the “site” or “Facility”). Products manufactured at this site include abrasive products (Organic Wheels, Super Abrasives, and Vitrified Products), high performance refractories (Refractory), and grains and powders. The manufacturing operations occur at multiple plants throughout the manufacturing complex. To support its manufacturing operations and provide building heat, Saint-Gobain operates an on-site Powerhouse with four boilers totaling 427 million British thermal units per hour (MMBtu/hour).

The four boilers are Riley water tube dual-fuel boilers with heat inputs of 226 MMBtu/hour (Boiler 6) and 67 MMBtu/hour for the other three boilers (Boilers 1, 2, and 5). The boilers previously fired a combination of coal, fuel oil, and natural gas. Fuel oil combustion in all four boilers was permitted as an emergency back-up fuel. In recent years, the boilers have operated on natural gas only.

The Company utilizes two (2) General Electric Generators to generate electricity for the Facility and to receive a credit from the electric utility. One is rated at 4,600 kilowatts (kW) and the second is rated at 3,125 kW.

The boilers operate under a Reasonably Available Control Technology for Oxides of Nitrogen, Emissions Control Plan (NO<sub>x</sub> RACT ECP#138828) pursuant to 310 CMR 7.19, approved and issued in 1997. To comply with the NO<sub>x</sub> RACT ECP requirements, boiler 6 (EU523-01), boilers 1 (EU523-02a), 2 (EU523-02b), and 5 (523-02c) were equipped with low NO<sub>x</sub>, high pressure steam atomizing dual fuel burners. NO<sub>x</sub> emission limits, monitoring, recordkeeping and reporting requirements were established for each boiler within the ECP.

Plan Approval, CM-84-C-004 issued on November 30, 1984 and amended on August 29, 2000, established emission limits for the boilers while combusting coal and oil. Those Plan Approvals were voluntarily relinquished by Saint-Gobain and are no longer in effect.

A particulate matter (filterable) emission limit of 0.10 lb/MMBtu pursuant to 310 CMR 7.02(8) Table 4, applies to all four existing emission units at this fuel utilization Facility (not a BACT emission limit).

### **Condenser Project**

Over the past several years, Saint-Gobain has downsized operations in Worcester and has consolidated many of their operations to improve operational efficiency. To address the reduced need for steam, Saint-Gobain is proposing to install a steam condenser to remove and reuse excess steam no longer needed for process operations and building heat. Part of the excess steam will go through the condenser and be reused for boiler feed water. Boiler feed water from the condensed steam will allow the boilers to operate more efficiently since the boiler feed water

will be heated to 120<sup>0</sup>F, significantly reducing the energy required to heat the feed water. The remaining excess steam will be used to generate electricity using the existing Powerhouse steam turbines. The condenser will be located outside and adjacent to the Powerhouse (Building 523). The condenser will primarily be used in conjunction with boiler 6, the Facility's primary boiler. During the annual maintenance outage of boiler 6, the condenser will also be used in conjunction with boilers 1, 2, and 5.

The Condenser Project will reduce current powerhouse potential NOx emissions from 840 tons per year (tpy) to 290 tpy by limiting the boilers to natural gas firing and by optimizing boiler operations.

***This Plan Approval supersedes Plan Approval TR CM-84-C-004, issued on November 30, 1984 and as amended on August 29, 2000 in its entirety.*** The Emission Control Plan (ECP) Tr 138828 issued on October 3, 1997, will be revised once the Facility submits an application and written approval is given by MassDEP. The submittal of the ECP application is a requirement of this Plan Approval.

### **New Source Performance Standards (NSPS)**

The boilers are currently not subject to 40 CFR 60, New Source Performance Standards ("NSPS") Subparts Db (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) or Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) due to the age of the boilers (1 and 2 installed 1939, 5 installed 1947, 6 installed 1958). However, the existing boilers were evaluated to determine whether the Condenser Project would be considered a modification or reconstruction under the NSPS.

The definition of a modification under 40 CFR §60.14 is:

Any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act. Emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable.

There will be no physical change to the boilers, but the installation of the condenser is considered an operational change. However, there will be no increase in NSPS emissions as a result of the Condenser Project and it is expected that there will be a decrease in emissions on a like for like basis. Therefore, the project will not be a modification under the NSPS. In addition, the Condenser Project will not replace any existing components. Therefore, based on §60.15, the project is not considered reconstruction as defined under the NSPS.

### **National Emissions Standards for Hazardous Air Pollutants (NESHAPS)**

All of the Powerhouse boilers are subject to the National Emissions Standards for Hazardous Air Pollutants (“NESHAPS”) for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters. As natural gas-fired boilers, the existing boilers are subject to work practice standards under 40 CFR 63 Subpart DDDDD.

### **Prevention of Significant Deterioration PSD Review and Applicability Analysis**

The MassDEP has been delegated authority to implement the federal Prevention of Significant Deterioration (“PSD”) permitting program codified in 40 CFR 52.21. A source is subject to a PSD review if the potential to emit is 250 tons per year of any criteria pollutant for which the area is designated as attainment, or 100 tons per year if the project is one of the 28 source categories listed in 40 CFR 52.21.

The Saint-Gobain Worcester, MA facility is an existing major stationary source of air pollutants under the PSD program and is one of the 28 listed source categories: fossil fuel-fired boiler (or combination thereof) totaling to more than 250 MMBtu per hour heat input. The Condenser Project requires an applicability analysis under the PSD program to determine if the net emissions increase resulting from the proposed change in operation is significant.

PSD permitting requirements apply to any regulated NSR pollutant (any pollutant for which a national ambient air quality standard has been promulgated) such as sulfur dioxide (SO<sub>2</sub>), Nitrogen oxides (NO<sub>x</sub>), total suspended particulate (TSP), particulate matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>), particulate matter with an aerodynamic diameter of 2.5 microns or less (PM<sub>2.5</sub>), carbon monoxide (CO), volatile organic compound (VOC), lead and other NSR Pollutants such as sulfuric acid mist (SAM). Hazardous air pollutants (HAPs) are not regulated NSR pollutants.

In accordance with 40 CFR 52.21(a)(2)(iv)(a), a project is a major modification for a regulated PSD pollutant if it causes two types of emissions increases:

- A significant emissions increase (as defined in 40 CFR 52.21(b)(40)), and
- A significant net emissions increase (as defined in 40 CFR 52.21(b)(3) and (b)(23)).

The method used to evaluate the proposed project’s emissions increase is the “Actual to - Projected Actual Test” where the project’s emissions increase is calculated by subtracting Baseline actual emissions from the Projected actual emission.

### **Baseline Actual Emissions**

Baseline actual emissions for the condenser project are defined in §52.21(b) (48)(ii) as:

“the average rate, in tons per year, at which the emission unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator with

the 10 year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Administrator for a permit required under this section or by the reviewing authority for a permit required by a plan, whichever is earlier, except that the 10-year period shall not include any period earlier than November 15, 1990.”

§52.21(b)(48)(ii)(c) further specifies that the average emission rate should be adjusted downward to exclude emissions that would have exceeded an emission limitation which a source must currently comply. As a result, the Permittee adjusted the NO<sub>x</sub> emissions for boilers 1, 2, and 5 downward from 0.2 lb/MMBtu (pounds per million British thermal units) to reflect the NO<sub>x</sub> RACT limit of 0.1 lb/MMBtu for medium sized boilers, firing natural gas only. The baseline actual NO<sub>x</sub> emissions for boiler 6 were based on 0.09 lb/MMBtu obtained from an annual stack test conducted on 3/17/2009. MassDEP determine that this is a conservative approach to calculate the baseline actual NO<sub>x</sub> emissions.

The emission factor for CO was based on boiler stack test data: (0.020, 0.001, 0.001, and 0.002 lb/MMBtu for boilers 1, 2, 5 and, 6, respectively). All other pollutants were calculated based on AP-42 section 1.4 (i.e. emission factor (lb/MMBtu) x (MMBtu/yr)/2000 lbs/ton = Actual Emission tons/yr).

The Permittee calculated emissions based on the actual annual natural gas consumption for the powerhouse as reported on the annual source emission statements submitted for the years 2011 through 2015.

In 2012, Saint-Gobain ceased firing coal and oil in boiler 6. Powerhouse emissions prior to 2012 were significantly higher due to firing primarily coal. The Permittee proposed using emissions from 2012 and 2013 as the baseline years for the PSD applicability analysis because they are considered to be representative of the historical operation of the powerhouse. MassDEP agreed with the proposal. The average emissions from years 2102 and 2013 are shown in Table A.

### **Projected Actual Emissions**

The Permittee calculated the projected actual emissions using projected total fuel consumption for all four boilers of 950,000,000 cubic feet (ft<sup>3</sup>) of natural gas/year. Boilers 1, 2, 5 will operate approximately 95,000 MMBtu per year total, or account for 10% of total powerhouse operation. Boiler 6 will operate approximately 855,000 MMBtu per year total, or account for 90% of total powerhouse operation

The Permittee used NO<sub>x</sub> emission factors based on stack test data. Projected actual NO<sub>x</sub> emissions for boiler 6 were based on 0.115 lb/MMBtu (2016 stack test results). Projected actual NO<sub>x</sub> emissions for boilers 1, 2, and 5 were based on 0.2 lb/MMBtu<sup>1</sup>. The Permittee proposed a

---

<sup>1</sup> This emission rate was not adjusted downward to 0.1 lb/MMBtu as the NO<sub>x</sub> RACT compliance method for these boilers has not yet been determined.

weighted average emission factor for all four boilers of 0.124 lb/MMBtu (see Table A notes). MassDEP concurs with this methodology.

The emission factor for CO was based on boiler stack test data: (0.020, 0.001, 0.001, and 0.002 lb/MMBtu for boilers 1, 2, 5 and, 6, respectively). All other pollutants were calculated based on AP-42 section 1.4 (i.e. emission factor (lb/MMBtu) x (MMBtu/yr)/2000 lbs/ton = projected Actual Emission tons/yr).

For TSP, PM<sub>10</sub>, PM<sub>2.5</sub>, VOC and SO<sub>2</sub>, and lead, the Permittee used EPA’s AP-42 section 1.4 to calculate emissions. Sulfuric acid mist (SAM) emissions were calculated by assuming a 70% conversion from SO<sub>2</sub> to SAM.

A project that does not cause a significant emissions increase (Step 1) is not a major modification. If the project does cause a significant emissions increase, but does not cause a significant net emissions increase (Step 2), then it likewise is not a major modification. A project must cause both a significant emissions increase and a significant net emissions increase to be deemed a major modification.

Projected actual emissions increases from the Condenser Project alone (Step 1) will be less than the PSD pollutant specific significant emission rate (SER) for CO, TSP, PM<sub>10</sub>, PM<sub>2.5</sub>, VOC, SAM, and Lead. Therefore, the net emissions increase evaluation (Step 2), defined in §52.21(b)(3), will not be required for these pollutants. Projected actual NO<sub>x</sub> emissions are greater than the PSD significant emission rate prior to netting. However, the project will not result in a significant **net** emissions increase in NO<sub>x</sub> emissions. The NO<sub>x</sub> netting analysis is discussed in more detail under the Appendix A applicability discussion below. MassDEP has determined the project is not a major modification under PSD.

<b>Table A</b>					
<b>Condenser Project-PSD Applicability (in TPY) <sup>1</sup></b>					
Pollutant	Projected Actual Emissions	Existing Actual Emissions	Projected Actual Emissions Increase	Significant Emission Rate	Major Modification Yes/No
NO <sub>x</sub>	58.90 <sup>2</sup>	37.84	21.06	40	No
CO	1.19	6.58	-5.40	100	No
TSP	3.61	2.15	1.46	25	No
PM <sub>10</sub>	3.61	1.65	1.96	15	No
PM <sub>2.5</sub>	3.61	1.65	1.96	10	No
SO <sub>2</sub>	0.29	52.12	-51.84	40	No
VOC	2.61	1.23	1.38	40	No
SAM	0.31	39.91	-39.60	7	No
lead	0.00024	0.03	-0.0298	0.6	No
CO <sub>2</sub>	55,623	NA	55,623	NA	NA

**Table A Notes:**

1. Actual heat input per boiler may vary, but projected actual emissions may not exceed thresholds that would exceed PSD or Appendix A applicability thresholds.
2. Projected actual NO<sub>x</sub> emissions based on the following assumptions:
  - boilers 1, 2, 5 will operate 95,000 MMBtu per year total = 10% of total powerhouse operation
  - boiler 6 will operate 855,000 MMBtu per year total = 90% of total powerhouse operation
  - boilers 1,2,5 operate at 0.2 lb/MMBtu (0.2 x 10% = 0.02 lb/MMBtu)
  - boiler 6 operates at 0.115 lb /MMBtu (0.115 x 90% = 0.1035 lb/MMBtu)
  - weighted average emission factor for all 4 boilers is 0.1035+0.02= 0.124 lb/MMBtu
  - 0.124 lb/MMBtu x 950,000 MMBtu/yr = 117,800/2000 lb/ton = 58.9

**Table A Key:**

CO = Carbon Monoxide

CO<sub>2</sub> = carbon dioxide

lb/MMBtu = pounds per million British thermal unit

NO<sub>x</sub> = nitrogen oxides

PM<sub>2.5</sub> = particulate matter with an aerodynamic diameter of 2.5 microns

PM<sub>10</sub>= particulate matter with an aerodynamic diameter of 10 microns

NA = not applicable

SAM = Sulfuric acid mist

SO<sub>2</sub> = sulfur dioxide

TSP = total suspended solids

TPY = tons per year

VOC = volatile organic compounds

% = percent

**310 CMR 7.00: Appendix A-Nonattainment New Source Review (NNSR) Applicability Analysis**

A modification is subject to review under 310 CMR 7:00 Appendix A if (1) the source or modification is located in a nonattainment area, (2) the existing source that is being modified is “major”, and (3) the net emissions increase of any pollutant emitted by the source, as a result of the modification, is “significant” as defined in 310 CMR 7:00 Appendix A(2). A modification at an existing major VOC or NO<sub>x</sub> source is subject to NNSR if there is a significant net emissions increase of 25 tpy of either pollutant.

To assess whether the Condenser Project would cause a significant net emissions increase, the Permittee conducted a netting analysis.

**Existing Actual Emissions**

As required by 310 CMR 7.00: Appendix A, the average actual emission used for netting should be adjusted downward to exclude emissions that would have exceeded an emission limitation which a source must currently comply with. Accordingly, the baseline actual emission for boilers 1, 2, and 5 were adjusted downward to reflect the NO<sub>x</sub> RACT limit of 0.1 lb/MMBtu for

firing natural gas. The baseline actual NO<sub>x</sub> emissions for boiler 6 were based on 0.09 lb/MMBtu obtained from an annual stack test conducted on 3/17/2009. MassDEP determine that this is a conservative approach to calculate the baseline actual NO<sub>x</sub> emissions.

VOC emissions were calculated using actual annual natural gas consumption for the powerhouse and AP-42 section 1.4 (5.5 lb/MMcf).

The Permittee calculated emissions based on the actual annual natural gas consumption for the powerhouse as reported on the annual source emission statements submitted for the years 2011 through 2015. In 2012, Saint-Gobain ceased firing coal and oil in boiler 6. Powerhouse emissions prior to 2012 were significantly higher due to firing primarily coal. The Permittee proposed using emissions from 2012 and 2013 as the baseline years for the Appendix A applicability analysis because they are considered to be representative of the historical operation of the powerhouse. MassDEP agreed with the proposal. The average emissions from years 2102 and 2013 are shown in Table B.

### **Contemporaneous Increases / Decreases**

A netting analysis includes any contemporaneous increases and decreases of NO<sub>x</sub> or VOC emissions if they occurred over a period of five consecutive calendar years prior to the startup of the condenser.

The contemporaneous NO<sub>x</sub> emission increase from the installation of the kiln TK-15 is 3.99 tpy (Plant 7, permitted in 2014). The contemporaneous VOC emission increases are from the installation of TK-15 (0.36 tpy) at Plant 7 and the 2016 permitted changes at Plant 8 (2.3 tpy) for a total of 2.66 tpy contemporaneous VOC increase.

Contemporaneous decreases in NO<sub>x</sub> and VOC emission resulted from the shutdown of equipment from calendar years 2011 through 2015 and the 2013 conversion of TK-9 from fuel oil to natural gas reducing NO<sub>x</sub> emissions. Equipment shutdowns included the removal of Plant 2 periodic kilns, SG&P kiln and the small boilers and incinerators in building 505.

The Permittee calculated the contemporaneous NO<sub>x</sub> emission decrease to be 4.67 tpy and the contemporaneous VOC emission decrease to be 0.26 tpy.

### **Projected Actual Emissions**

The Permittee used NO<sub>x</sub> emission factors based on 2016 stack test data. Projected actual NO<sub>x</sub> emissions for boiler 6 were based on 0.115 lb/MMBtu. Projected actual NO<sub>x</sub> emissions for boilers 1, 2, and 5 were based on 0.2 lb/MMBtu<sup>2</sup>. The Permittee proposed a weighted average

---

<sup>2</sup> This emission rate was not adjusted downward to 0.1 lb/MMBtu as the NO<sub>x</sub> RACT compliance method for these boilers has not yet been determined. If Boilers 1, 2, and 5 comply with the 0.1 lb/MMBtu NO<sub>x</sub> RACT limit by reducing boiler emissions to meet that limit, future actual emissions may account for the lower emission rate.



emission factor for all four boilers of 0.124 lb/MMBtu (see Table A Notes). MassDEP concurs with this methodology.

The projected actual VOC emissions of 2.61 tpy for boilers 1, 2, 5 and 6 are based on EPA AP-42 Section 1.4 and the projected fuel consumption of 950,000,000 ft<sup>3</sup> per year.

The Permittee calculated the net emission increase for the Condenser Project by subtracting the existing actual emissions from the projected actual emissions and then subtracting the contemporaneous emission decrease and adding the contemporaneous emissions increase.

Table B below shows that projected net emissions increase will be less than the 310 CMR 7.00: Appendix A, significant net emission thresholds for NOx and VOC. MassDEP has determined the Condenser Project is not a major modification pursuant to 310 CMR 7.00: Appendix A.

<b>Table B</b>		
<b>Net Emissions for Appendix A Applicability TPY</b>		
<b>Type of Emissions</b>	<b>NOx</b>	<b>VOC</b>
Existing actual emission 2012-2013	37.84	1.23
Projected actual emissions	58.90	2.61
Contemporaneous Emission decreases	4.67	0.26
Contemporaneous Emission increases	3.99	2.66
Net emissions increase	20.38	3.79
Significant Net Emission Threshold	25	25
Major Modification (Yes/No)	No	No

**Table B Key:**

NOx = nitrogen oxides  
 TPY = tons per year  
 VOC = volatile organic compounds

**2. EMISSION UNIT (EU) IDENTIFICATION**

Each Emission Unit (EU) identified in Table 1 is subject to and regulated by this Plan Approval:

<b>Table 1</b>			
<b>EU</b>	<b>Description</b>	<b>Design Capacity(MMBtu/hr)</b>	<b>Pollution Control Device (PCD)</b>
523-01	Boiler 6 - Riley Water Tube	226	Low NO <sub>x</sub> Burners
523-02a	Boiler 1 - Riley Water Tube	67	Low NO <sub>x</sub> Burners
523-02b	Boiler 2 - Riley Water Tube	67	Low NO <sub>x</sub> Burners
523-02c	Boiler 5 - Riley Water Tube	67	Low NO <sub>x</sub> Burners

**Table 1 Key:**

EU = Emission Unit Number  
 PCD = Pollution Control Device

MMBtu/hr = million British Thermal Units per Hour  
 NO<sub>x</sub> = Nitrogen Oxides

### **3. APPLICABLE REQUIREMENTS**

#### **A. OPERATIONAL, PRODUCTION and EMISSION LIMITS**

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2. Compliance with the current and future NO<sub>x</sub> emission limits will be achieved through the conditions that will be established within the revised ECP. The requirement to submit a revised ECP is a condition of Table 6 in this Plan Approval.

<b>Table 2</b>			
<b>EU</b>	<b>Operational / Production Limit</b>	<b>Air Contaminant</b>	<b>Emission Limit</b>
523-01	None	NO <sub>x</sub>	0.2 lb/MMBtu
523-02a, 523-02b, 523-02c	None	NO <sub>x</sub>	0.1 lb/MMBtu <sup>1</sup>
523-01, 523-02a, 523-02b, 523-02c	None	VOC	5.5 lb/MMBtu <sup>2</sup>
	None	CO	200 ppmvd, corrected to 3% oxygen <sup>3</sup>
	None	PM	0.10 lb/MMBtu <sup>4</sup>

**Table 2 Key:**

CO = carbon monoxide  
EU = Emission Unit Number  
lb/MMBtu = pounds per million British thermal unit  
NO<sub>x</sub> = Nitrogen Oxides  
ppmvd = parts per million volume dry  
VOC = volatile organic compound

**Table 2 Notes:**

1. Current NO<sub>x</sub> RACT limit
2. VOC emission factor 5.5 lb/MMcf from AP-42 section 1.4
3. CO emissions are based on a one hour averaging time.
4. PM emission limit is not Best Available Control Technology but a regulatory requirement pursuant to 310 CMR 7.02(8)

**B. COMPLIANCE DEMONSTRATION**

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5:

<b>Table 3</b>	
<b>EU</b>	<b>Monitoring and Testing Requirements</b>
523-01	<ol style="list-style-type: none"> <li>1. The Permittee shall demonstrate compliance with the NO<sub>x</sub> and CO emission standards by performing an annual stack on the emission unit prior to October 1 of each year.–The compliance stack testing shall be conducted in accordance with procedures set forth in Appendix A of 40 CFR Part 60 or another method approved by the Department and EPA.</li> </ol>
523-01, 523-02a, 523-02b, 523-02c	<ol style="list-style-type: none"> <li>2. The Permittee shall conduct compliance stack testing for PM (filterable), VOC, NO<sub>x</sub> and CO within 180 days of continuous operation of the condenser in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13. The initial stack test for EU 523-01 for the condenser project may be used to comply with the annual NO<sub>x</sub> stack testing requirement under 310 CMR 7.19(13).</li> <li>3. The Permittee shall measure on a daily basis for each powerhouse boiler, the total heating input value of the fuel consumed for each day (MMBtu/day).</li> <li>4. The Permittee shall monitor all operations to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.</li> <li>5. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with USEPA Reference Test Methods and Regulation 310 CMR 7.13.</li> <li>6. In accordance with 310 CMR 7.19 (13)(a)3.b, the Permittee shall adjust the emission rate from the stack tested emission unit by a compliance assurance multiplier determined by the Department within the range of 1.1-1.25.</li> </ol>

<b>Table 3</b>	
<b>EU</b>	<b>Monitoring and Testing Requirements</b>
	7. The Permittee shall perform sound compliance testing as described in the MassDEP approved protocol within 30 days of the sound survey protocol approval.

**Table 3 Key:**

EU = Emission Unit Number  
 USEPA = United States Environmental Protection Agency  
 NOx = nitrogen oxides

<b>Table 4</b>	
<b>EU</b>	<b>Record Keeping Requirements</b>
523-01, 523-02a, 523-02b, 523-02c	<ol style="list-style-type: none"> <li>1. The Permittee shall record for each powerhouse boiler on a daily basis, the total heat input (MMBtu) of the natural gas combusted and the allowable emission rate. For units complying with 310 CMR 7.19 (14), daily records shall also include a summation of these values for all emission units included in the average, as well as any other data needed to demonstrate compliance with the revised Emissions Control Plan.</li> <li>2. The Permittee shall record for each powerhouse boiler for each calendar month the heat input (MMBtu/month) and the natural gas consumption (ft<sup>3</sup>/month).</li> <li>3. The Permittee shall record for each powerhouse boiler during a 12 month rolling period the heat input (MMBtu/year) and the natural gas consumption (ft<sup>3</sup>/year).</li> <li>4. The Permittee shall maintain all records required by 310 CMR 7.19 (13)(d) and this Plan Approval for a period of five (5) years in a permanently bound log book or any other form acceptable to the Department including computer retained and generated data. The Permittee shall submit compliance records within ten days of written request by the Department or EPA.</li> <li>5. The Permittee shall maintain adequate records on-site to demonstrate compliance with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve-month period (current month plus prior eleven months). These records shall be compiled no later than the 15<sup>th</sup> day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at <a href="http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping">http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping</a>.</li> </ol>

523-01 523-02a, 523-02b, 523-02c	6. As described in 40 CFR §52.21 (r)(6)(iii), the Permittee shall monitor the emissions of any regulated NSR pollutant that could increase as a result of this Condenser project and calculate and maintain a record of the annual tons per year emissions on a calendar year basis, for a period of 5 years following resumption of regular operations after the change, or for a period of 10 years following resumption of regular operations after the change if the Condenser project increases the design capacity or potential to emit that regulated NSR pollutant at such emissions unit.
	7. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EU(s) 523-01, 523-02a, 523-02b, and 523-02c approved herein on-site.
	8. The Permittee shall maintain a record of routine maintenance activities performed on the approved EU(s), the condenser and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.
	9. The Permittee shall maintain a record of all malfunctions affecting air contaminant emission rates on the approved EU(s) and monitoring equipment. At a minimum, the records shall include: date and time the malfunction occurred; description of the malfunction; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation.
	10. The Permittee shall maintain records to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.

**Table 4 Key:**

EU = Emission Unit Number

PCD = Pollution Control Device

SOMP = Standard Operating and Maintenance Procedure

USEPA = United States Environmental Protection Agency

<b>Table 5</b>	
<b>EU</b>	<b>Reporting Requirements</b>
523-01, 523-02a, 523-02b, 523-02c	1. In accordance with 310 CMR 7.19(13)(c), the Permittee shall submit a pretest protocol for the required emissions test for review and Department approval at least 60 days prior to the anticipated date of testing; include in the pretest protocol, a description of sampling point locations, sampling equipment, sampling and analytical procedures and the operating conditions for the required testing.
	2. In accordance with 310 CMR 7.19(13)(c), the Permittee shall submit the emission test report for the review and written Department approval within 60 days of the completion of the compliance stack testing.
	3. The Permittee shall submit to MassDEP a compliance sound survey protocol to verify compliance with MassDEP sound policies within 30 days of the installation of the condenser.

<b>Table 5</b>	
<b>EU</b>	<b>Reporting Requirements</b>
523-01, 523-02a, 523-02b, 523-02c	4. The Permittee shall submit to MassDEP a final test report confirming compliance of Project sound emissions within 45 days of completing the compliance sound survey. In the event that Project-related sound exceeds appropriate acoustic design goals, the Permittee shall implement additional mitigation until compliance is confirmed.
	5. As described in 40 CFR §52.21 (r)(6)(v), the Permittee shall submit a report to MassDEP if the annual tons per year emissions from this Condenser project exceed the baseline actual emissions documented in this Plan Approval, by a significant amount, as defined 40 CFR §52.21 (b)(23), for that regulated NSR pollutant, and if such emissions differ from the projected actual emissions documented in this Plan Approval. The Permittee shall submit this report to MassDEP within 60 days after the end of such year. The report shall contain the items listed in 40 CFR §52.21 (r)(6)(v).
	6. The Permittee shall provide written notification to MassDEP within 7 days of installing the condenser.
	7. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a “Responsible Official” as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	8. The Permittee shall notify the Central Regional Office of MassDEP, BAW Permit Chief by telephone: 508-767-2845, email: <a href="mailto:Roseanna.stanley@massmail.state.ma.us">Roseanna.stanley@massmail.state.ma.us</a> and <a href="mailto:CERO.Air@massmail.state.ma.us">CERO.Air@massmail.state.ma.us</a> , or fax : 508-792-7621, as soon as possible, but no later than three (3) business days after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to Permit Chief at MassDEP within ten (10) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	9. The Permittee shall report annually to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form.

**Table 5 Key:**

BAW = Bureau of Air and Waste  
 CMR = Code of Massachusetts Regulations  
 EU = Emission Unit Number

**4. SPECIAL TERMS AND CONDITIONS**

The Permittee is subject to, and shall comply with, the following special terms and conditions:

- A. The Permittee is subject to and shall comply with the Special Terms and Conditions as contained in Table 6:

**Table 6**

EU	Special Terms and Conditions
523-01, 523-02a, 523-02b, 523-02c	1. The Permittee shall submit a NO <sub>x</sub> RACT Emission Control Plan (ECP) application for Boilers 1, 2, 5 and 6 for review and written Department approval as required by 310 CMR 7.19(3), within 90 days after the installation of the condenser.
523-01, 523-02a, 523-02b, 523-02c	<p>2. The Permittee shall submit the ECP to the Department on a Department approved form and shall include, at a minimum, the following:</p> <ul style="list-style-type: none"> <li>a. A list and description of all the exempt and non-exempt emission units at the facility having potential to emit NO<sub>x</sub> including: <ul style="list-style-type: none"> <li>1) Any associated plan approvals, dates of installation, any subsequent alterations, etc.:</li> <li>2) The maximum energy input capacity, in millions of Btu per hour of each emission unit;</li> <li>3) For fuel utilization facilities, the type of fuel(s) permitted to be burned in each emission unit;</li> <li>4) The maximum NO<sub>x</sub> emission rate of each unit, in pounds per million Btu, for each fuel burned before and after the application of NO<sub>x</sub> RACT;</li> <li>5) The total actual fuel usage and energy input in million Btu for each fuel for each of the last two years for each emission unit.</li> </ul> </li> <li>b. A demonstration that the provision of 310 CMR 7.19 can be met by each emission unit included in the emission control plan, including the potential emissions after the implementation of RACT of all emission units emitting NO<sub>x</sub> for which the emission control plan is being submitted. A demonstration that combustion conditions will not significantly deteriorate shall be included for any emission unit for which a higher CO emission is being applied pursuant to 310 CMR 7.19(4)(f), (5)(d) or (7)(a)4.</li> <li>c. If applicable, the control efficiency, design, specifications and standard operating and maintenance procedure for any control equipment used to reduce NO<sub>x</sub> emissions to implement RACT;</li> <li>d. The testing, monitoring, recordkeeping and reporting procedures, as contained in 310 CMR 7.19(13), used to demonstrate compliance with 310 CMR 7.19;</li> <li>e. A schedule for the implementation of RACT at the facility, including provisions for demonstrating periodic increments of progress and demonstrating compliance;</li> <li>f. Any other information required by the Department; and</li> <li>g. The signature of the responsible official.</li> </ul>
	3. The Permittee shall describe within the ECP application how compliance with 310 CMR 7.19(14) will be achieved.
	4. The Permittee may be subject to additional requirements in the ECP Plan Approval to assure that emission from the emission unit(s) subject to RACT will not cause or contribute to a condition of air pollution or a violation of any other regulations. Such requirements include but are not limited to emission limits on other air contaminants, and additional stack test of or emission monitoring requirements.

<b>Table 6</b>	
<b>EU</b>	<b>Special Terms and Conditions</b>
523-01, 523-02a, 523-02b, 523-02c	<p>5. The Permittee shall not exceed a CO exhaust concentration of 200 ppmvd, corrected to 3% oxygen. This shall be based on a one hour averaging time. If a continuous emission monitoring system is used for determining compliance, the averaging time shall be a calendar day. Notwithstanding this CO emission standard, the Department may approve a higher CO emission standard for a large boiler as part of the emission control plan if the Facility demonstrates that combustion conditions will not significantly deteriorate with the higher CO emission standard.</p> <p>6. The Permittee shall maintain and submit to MassDEP, on an annual basis for a period of five (5) years from the date the Facility resumes regular operation, information demonstrating that the physical and operational change(s) did not result in a significant net emissions increase of NO<sub>x</sub> or VOC emissions, and therefore does not constitute a major modification pursuant to 310 CMR Appendix A.</p> <p>7. In accordance with 310 CMR 7.00, Appendix C(4)(b)2., within 30 days from the date of this Plan Approval, the Permittee shall submit to MassDEP an update to the Operating Permit Renewal Application currently submitted to MassDEP that reflects this Plan Approval and any associated requirements that apply to the Facility, including but not limited to changes in fuel sulfur contents and emission limitations.</p> <p>8. This Plan Approval supersedes Plan Approval TR CM-84-C-004, issued on November 30, 1984 and as amended on August 29, 2000, in its entirety with the exception that all plan application materials submitted as part of the Plan Approval Tr. CM-84-C-004 become part of this Plan Approval, Tr. X271660.</p>

**Table 6 Key:**

EU = Emission Unit Number	% = percent
CMR = Code of Massachusetts Regulations	ppmvd = parts per million volume

- B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including but not limited to rain protection devices known as “shanty caps” and “egg beaters.”
- C. The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7, for the Emission Units that are regulated by this Plan Approval:



<b>Table 7</b>				
<b>EU</b>	<b>Stack Height Above Ground (feet)</b>	<b>Stack Inside Exit Dimensions (feet)</b>	<b>Stack Gas Exit Velocity Range (feet per second)</b>	<b>Stack Gas Exit Temperature Range (°F)</b>
523-01	210	9	6 - 22	350-400
523-02a, 523-02b, 523-02c	206	8	6 - 22	350-400

**Table 7 Key:**

EU = Emission Unit  
 °F = Degree Fahrenheit

**5. GENERAL CONDITIONS**

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.
- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local laws or regulations now or in the future.

- F. The Application is incorporated into this Plan Approval by reference. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

## **6. MASSACHUSETTS ENVIRONMENTAL POLICY ACT**

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain “Fail-Safe Provisions,” which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

## **7. APPEAL PROCESS**

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) and a completed Adjudicatory Hearing Fee Transmittal Form, a copy of which is attached hereto, must be mailed to:

Commonwealth of Massachusetts  
Department of Environmental Protection  
P.O. Box 4062  
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Enclosed is a stamped approved copy of the application submittal.

Should you have any questions concerning this Plan Approval, please contact Maria L'Annunziata by telephone at (508) 767-2748, or in writing at the letterhead address.

*This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.*

---

Roseanna E. Stanley  
Permit Chief  
Bureau of Air and Waste

Enclosures:

- Adjudicatory Hearing Fee Transmittal Form
- Stamped Plan Application

ecc: Worcester Office of Inspectional Services, 25 Meade Street, Worcester, MA 01610  
MassDEP/Boston - Yi Tian  
AMEC Massachusetts, Inc., 271 Mill Road, Chelmsford, MA