REGION 1
BOSTON, MA 02109

Clean Air Act Inspection Report

Report Date: October 31, 2024

I. Background

Inspection Date: September 26, 2024

Inspection Type: Partial Compliance Evaluation

EPA Inspector: Karen Peltier, Environmental Engineer, Enforcement and Compliance Assurance Division, Air Compliance Section

KAREN PELTIER Digitally signed by KAREN PELTIER
Date: 2024.10.31 15:20:16 -04'00'

EPA Reviewer: Jack Melcher, Senior Enforcement Coordinator, Enforcement and Compliance Division, Air Compliance Section

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Date: 2024.10.31 14:23:41 -04'00'

Facility Name: Bostik Inc.

ICIS Air ID#: MA0000002511900159

Facility Location: 211 Boston Street
Middleton, MA 01949-2128

Mailing Address: Same

Disclaimer:

Unless otherwise noted, this report describes conditions at the facility/property as observed by EPA inspector(s), and/or through records provided to and/or information reported to EPA inspector(s) by facility representatives and as understood by the inspector(s). This report may not capture all operations or activities ongoing at the time of the inspection. This report does not make final

determinations on potential areas of concern. Nothing in this report affects EPA's authorities under federal statutes and regulations to pursue further investigation or action.

Inspection Attendees:

Name	Title	Organization
Karen Peltier	Environmental Engineer	EPA-R1, ECAD, ACS
Darren Fortescue	Manager, Air Compliance Section, ECAD	EPA-R1, ECAD, ACS
Dana Donovan	Environmental Engineer	EPA-R1, ECAD, ACS
Mun Wong	AQ Permit Engineer	MassDEP Northeast Regional Office
Ruben Garcia	EHS Manager	Bostik, Inc.
Daniel Welch (via telephone)	Sr. Principal Environmental Leader	Bostik, Inc.
Christopher Lindley	Process Engineering Lead	Bostik, Inc.
Christopher Tryfonos	Production Manager	Bostik, Inc.
Timothy Malone	Operator Film	Bostik, Inc.
Jhon Perez	Sr. Operator S/C	Bostik, Inc.

Facility/Process Description:

Facility representatives provided the following information about the facility during the inspection:

The facility, located at 211 Boston Street, Middleton, Massachusetts, is owned and operated by Bostik Inc. ("Bostik"). The facility manufactures polyester and polyurethane resins that are used in:

- Industrial Grade Adhesives
- Solid Web Adhesives
- Solvent based liquid Adhesives

End use applications include, but are not limited to, aerospace industry, automotive interiors and food packaging.

A detailed facility report regarding the facility's compliance with federally enforceable environmental regulations can be obtained from EPA's Enforcement and Compliance History Online website, "ECHO", via the following link:

ECHO Detailed Facility Report.

Potentially Applicable Federal Clean Air Act Regulations:

The following Federal Clean Air Act Regulations may be applicable to the facility:

- 40 CFR 63, Subpart VVVVVV, National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources.

State Permits:

Non-Major Comprehensive Plan Approval (CPA): NE-22-011, issued February 27, 2013 by the Massachusetts Department of Environmental Protection ("MassDEP").

The primary air emissions of the facility are Hazardous Air Pollutants ("HAPs") and Volatile Organic Compounds ("VOCs") generated by the reactors for both the polyester and polyurethane manufacturing lines, the solvent adhesive mixer, and the adhesive film coating line. A regenerative thermal oxidizer ("RTO") controls VOC and HAP emissions from these processes.

This permit regulates VOC and HAP emissions from the polyurethane and polypropylene resin manufacturing processes, adhesive film coating line and associated air pollution control equipment. The permit also restricts the facility wide emissions for VOCs, HAPs and acetone.

Previous Clean Air Act Federal Enforcement Actions:

On November 15, 2011, EPA issued as administrative order ("AO") and testing order ("TO") to Bostik for failure to demonstrate compliance with the Hazardous Waste Combustion NESHAP, 40 CFR 63, Subpart EEE. This AO/TO ordered Bostik to conduct a comprehensive performance test of the hazardous waste boiler. This was issued after Bostik had failed to pass performance testing conducted in 2008, 2009 and 2010.

On November 16, 2012, MassDEP issued a Consent Order, with a penalty, to Bostik for failure to operate its RTO at the required temperature and failure to operate the hazardous waste boiler ("BIF") at the required temperature. This action was based upon Bostik's self-reporting that the RTO operated 14 hours below 1550 degrees Fahrenheit, and the BIF operated 395 hours below the minimum required temperature of 1400 degrees Fahrenheit between the period 11/13/11 through 1/27/12.

II. Inspection

A. Opening Conference:

Karen Peltier contacted the facility via telephone on September 23, 2024, and notified Daniel Welch and Ruben Garcia of EPA's upcoming inspection to be conducted on September 26, 2024.

The EPA inspectors, Ms. Peltier, Darren Fortescue and Dana Donovan, and MassDEP representative, Mun Wong, arrived on site at approximately 10:00 a.m. Mr. Fortescue presented his credentials to Mr.

Garcia, the EHS Manager for the facility. Daniel Welch, Bostik Senior Principal Environmental Leader, joined the opening conference by phone. Ms. Peltier explained that the purpose of the visit was to conduct a partial compliance evaluation under the Clean Air Act. Ms. Peltier provided a copy of the Small Business Resource Information Sheet to Mr. Garcia and explained the facility's right to claim Confidential Business Information. Mr. Garcia provided a safety orientation to the EPA and MassDEP representatives and explained the restrictions on taking photographs in the facility, due to electrical classification safety requirements.

Mr. Garcia provided the following information regarding the facility:

- Parent Company: Arkema Delaware, Inc. (since 2015)
- NAICS Code: 325520
- Mailing address: 211 Boston Street, Middleton, MA
- Number of full-time employees: approximately 78
- Hours of operation: Normal operation is 3 shifts/day, 24 hrs./day, 5 days/week. The Polyester Department has historically run 24 hrs./day, 7 days/week, but has not done so for approximately 1.5 yrs. There are two planned shutdowns that take place annually. This year, one of the shutdowns occurred in April and another one is planned for October.
- Preventative and unscheduled maintenance is tracked in an SAP based program, as well as contractor reports.

Mr. Garcia and Mr. Welch said the site consists of 200 acres, 50 of which are developed, and there are five manufacturing areas located at the facility. Mr. Garcia and Mr. Welch said all the processes run at the facility are considered to be batch processes. Mr. Garcia and Mr. Welch said the only liquid discharge to the sewer is sanitary waste. Mr. Garcia provided the EPA and MassDEP inspectors a map of the facility and reviewed the operations that take place in the various buildings. An annotated facility map is provided in Attachment 1 of this report.

Polyurethane resin process:

Mr. Garcia and Mr. Welch provided the following information describing the polyurethane resin process:

- This resin is manufactured in Building 37.
- The polyurethane process flow includes: Hotbox preheat, loading of solids and liquid components into a reactor followed by the reaction, then the product can be washed in an MEK wash tank (EU-WT1) or a M-Pyrol wash tank (EU-WT2). Waste liquid from the process is collected in a liquid waste receiver tank.
- The facility has three reactors installed: a 1,000-gallon reactor (EU-R1000, operational), a 500-gallon reactor (EU-R500, operational), and a 100-gallon reactor (EU-R100, not currently operational).
- The facility also operates a V-3 adhesive mixer (EU-V3) in the same area as the polyurethane process.

- The VOC/HAP emissions from the reactors, adhesives mixer, wash tanks and liquid waste receiver are vented to a process vapor header pipe that feeds emissions to the RTO (PCD-RTO), for control, prior to discharge to atmosphere.
- The particulate emissions, generated during the loading of the reactors and mixer, are vented via localized exhaust ventilation collection systems and fed to and controlled by a dust collector (PCD-DC2) prior to discharge to the atmosphere.
- The polyurethane processes operate under a small vacuum to pull out small bubbles from the products.

Polyester resin process:

Mr. Garcia and Mr. Welch provided the following information describing the polyester resin process:

- This resin is manufactured in Buildings 36 and 39.
- The facility operates four polyester resin trains, identified as A, B, C and D.
- The trains each have stage 1 (EU-R1, EU-R3, EU-R11 and EU-R13) and stage 2 (EU-R2, EU-R4, EU-R10 and EU-R14) reactors, and may be followed by other process that can include pelletization, crystallization, water wash, dry blending, and/or tray formation.
- The trains each have a condensate collection tank, and then accumulated condensate is collected in the V13 receiver tank, before being pumped to the temporary day storage tank.
- Remaining liquid is transferred to one of two bulk hazardous waste storage tanks.
- The VOC/HAP emissions from the first and second stage reactors, distillate day tank, and liquid hazardous waste tanks are vented to a process vapor header pipe that feeds emissions to the RTO, for control, prior to discharge to atmosphere.
- Particulate emissions generated by the polyester process are controlled via local exhaust ventilation that discharges through a dust collector (PCD-DC1) prior to discharge to the atmosphere.
- The polyester resin processes operate under a vacuum to pull out excess glycols from the products. This part of the process occurs in the second stage reactors.

Mr. Garcia and Mr. Welch said the process equipment mentioned above for both the polyurethane and polyester resin manufacturing processes are hard piped to the RTO, via the process vapor header pipe. Mr. Wong explained that this is considered to meet EPA Method 204 requirements for 100% capture of emissions, as required by the permit. Mr. Garcia and Mr. Welch said that the VOC and HAP emissions from the polyurethane and polyester processes were vented to the RTO after the “2011 incident.”

Film adhesive coating line:

Mr. Garcia provided the following information describing the film adhesive coating line:

- Pressure sensitive adhesive coatings are not applied on this line.
- The coating line is utilized to apply polyester adhesive resins to substrate.

- There is an enclosure built around the coater's head to capture fugitive emissions and meet the permit's requirement for 100% capture via a Method 204 enclosure.
- The enclosure has less than 5% openings and a face velocity of greater than 200 feet per minute, and this is confirmed during each stack test.
- The enclosure is vented to the process vapor header pipe, through an RTO for VOC and HAP emission control prior to discharge to the atmosphere.
- The coating line speed data is captured in the "Citect" system.

RTO:

Mr. Garcia stated that there have not been any changes to the RTO, except for the addition of heat recovery unit installed to recover heat from the exhaust stack of the RTO for building heat. Mr. Garcia said the heat recovery unit is normally off except during winter months. According to Mr. Welch, the operation of this unit should not have any impact to the results of the stack testing required to demonstrate compliance with the emission limits.

Mr. Garcia and Mr. Welch said the RTO has a 4,000,000 BTU/hr. burner, and that the minimum operating temperature established during the most recent compliance test conducted in July 2024 was 1678 degrees Fahrenheit.[1] Mr. Garcia stated that changes to the set point for the operating temperature of the RTO are documented through the management of change process "Citect" system.

Mr. Garcia and Mr. Welch said data for the operating temperature of the RTO is captured every 15 seconds in a Citect Wonderware system. Mr. Garcia and Mr. Welch said data is downloaded from the RTO Programmable Logic Controller every week in an Excel style data file. Mr. Garcia and Mr. Welch said there are interlocks in place that isolate the process emission vents from the RTO, in the event there is a malfunction of the RTO, or the temperature goes below the minimum operating temperature. Mr. Garcia and Mr. Welch said the interlocks will shut down the blowers to the film coating line at a minimum threshold temperature.

Mr. Garcia stated the last time the RTO was shut down for unscheduled maintenance was in May 2024. Mr. Garcia and Mr. Welch said that most of the events in which the RTO was shutdown/bypassed that required notification to MassDEP was attributed to interlocks related to lower flammable limits ("LFL") and power glitches. There are lower explosive limit ("LEL") sensors in the film coating line vapor header that will "cut-off" the exhaust gas from entering the RTO. Ms. Peltier asked Mr. Garcia and Mr. Welch if the RTO has ever shut down due to the temperature exceeding 1900 degrees Fahrenheit, as required by the permit and Mr. Garcia said this has "never happened." Mr. Garcia stated that there had been an NOV issued years ago as a result of a contractor changing the setpoint in the RTO, and that the issued had been resolved.

[1] The Mass DEP permit (NE-22-011) requires the setpoint of the thermal oxidizer be set at an additional 30 degrees Fahrenheit above this value (for this test it would be 1708 degrees Fahrenheit).

Mr. Garcia and Mr. Welch said the damper positions, for the dampers used to bypass the RTO, are captured in the Citect system.

Mr. Garcia and Mr. Welch said that preventative maintenance and unscheduled maintenance is documented and recorded in "SAP" based application referred to as "EAM."

Process Vapor Header Pipe:

Mr. Garcia and Mr. Welch provided the following information describing the process vapor header pipe:

- The process header vapor pipe collects VOC/HAP emissions from the following:
    1. The polyester process equipment and tanks located in buildings 36 and 39,
    2. The polyurethane process equipment and tanks located in building 37, and
    3. The film coating line located in building 23.
- There are three pressure transducers that monitor the pressure/vacuum across the process vapor header pipe.
- The process vapor header pipe is always kept under a slight negative pressure.
- The data for these transducers is captured in the Citect data acquisition system. Mr. Garcia stated he would need to verify what actions take place if these transducers hit a setpoint out of normal operating range.
- There is a vortex flow meter that monitors flow rate in the process header.
- There is also an LFL meter that results in "cut-off events" in the event the concentration exceeds the setpoint. Mr. Garcia stated this happens multiple times per year and recalled the last time this occurred was in May of 2024. Mr. Garcia stated that most of the outages of the RTO were attributed to electrical outages. Mr. Fortescue asked if the emergency generators kicked on during this time. Mr. Garcia stated the generators do not produce energy fast enough to prevent outages.
- The emergency bypass stack on the RTO is used during restart for safety reasons. Mr. Garcia stated he believed the indicator for the bypass valve position is captured in the Citect system.

Mr. Wong said that, starting approximately two years ago, RTO bypasses are now reported to MassDEP via an electronic reporting system. Mr. Wong said that prior to this time, bypasses would be reported to MassDEP via telephone and electronic mail notification.

Stack Testing:

Ms. Peltier asked about the rationale used to choose the operating conditions selected during the compliance stack testing that is conducted on the coating line and RTO every three years as required by the permit. Ms. Peltier said the emissions measured before control during the 2024 test were twice as high as what was measured during the 2021 test, additionally, the coating line speed for both of these tests, is approximately 20% of the permitted maximum line speed of 100 feet per minute. Bostik representatives said that the stack testing is conducted running standard products. Bostik

representatives said the emissions from the coating line vary based on production runs which are based on campaigns of products. Bostik representatives said the tests are conducted at normal operating line speed, 16-20 feet per minute. Bostik representatives said the line speed is much less than the 100 feet per minute allowed in the permit due to impacts on the quality of the product at higher line speeds.

Mr. Garcia and Mr. Welch said that even though different reactors and processes can run simultaneously, the biggest contributor to emissions by far is the film adhesive coating line.

Mr. Garcia and Mr. Welch said the last stack test was conducted when producing the film product 554, which they said was a product that generates high emissions, relative to other products.

Tank Farm:

Mr. Garcia and Mr. Welch provided the following information describing the Tank Farm:

- The bulk storage tank farm is located underground.
- The tanks are equipped with conservation vents that discharge directly to the atmosphere.
- There is no vapor return system during delivery of the chemicals into each of the storage tanks.

The following information was provided by facility representatives describing the inventory of the storage tanks located in the tank farm:

Chemical	**Storage Capacity**
Acetone	5,000 gallons
Toluene (2)	5,000 gallons 10,000 gallons
Xylene	5,000 gallons
Tetrahydrofuran	5,000 gallons
Methyl ethyl ketone (2)	10,000 gallons 10,000 gallons
Hexane	10,000 gallons
Textile Spirits	5,000 gallons
Solvasol 3	5,000 gallons
Rubber Solvent	5,000 gallons
Methyl cyclohexane	10,000 gallons
Ethyl acetate	5,000 gallons

B. Facility Tour

The facility tour, led by Mr. Garcia, commenced at approximately 12:45 p.m. Other Bostik participants at various points of the tour included:

Christopher Lindley	Process Engineering Lead
Christopher Tryfonos	Production Manager
Timothy Malone	Operator Film
Jhon Perez	Sr. Operator S/C

The tour began outdoors, starting at the outdoor underground storage tank area, and then generally followed the path of the main process vapor header starting in the polyester manufacturing buildings, then the polyurethane manufacturing buildings, the film coating line building and ended at the thermal oxidizer located outside of the building. Observations of other areas observed along the path are also noted:

1. **Outdoor Underground Solvent Storage Area:** The group observed the piping from the underground storage tanks travels overhead on pipe racks to the polyester and poly urethane production buildings. Mr. Garcia said stated GZA, an environmental contractor, inspects the piping monthly and yearly.

2. **Building 42:** Was observed from the exterior and Mr. Garcia said it contains bulk raw material and a wastewater tank that contains crystallization area wash water.

3. **Building 27:** Was observed from the exterior and Mr. Garcia said it contains natural gas boilers and a Paratherm hot oil heat exchanger system.

4. **Polyester Buildings 35, 36 and 39:** The reactors and associated equipment for manufacturing polyester product were observed in buildings 36 and 39. Mr. Garcia said the "H-Room" contains the receivers and day tanks associated with the polyester manufacturing process. Day tank 1, ("EU-DT1") was observed to have a valve locked out in the open position, though it was unclear what line this valve is associated with at the time of the inspection. According to Bostik representatives, there is a "high safety" interlock system that is set at 1800 degrees Fahrenheit that isolates all polyester process equipment from the RTO system. Bostik representatives said the reactors are automatically sent into a cooling stage if the interlock is activated. Bostik representatives said the C-train polyester manufacturing line was in operation at the time of the inspection. According to Bostik representatives "2700 B" product was being manufactured and vacuum was being pulled on EU-R14, a second stage reactor. Bostik representatives said the second stage reactors vacuum systems discharge into the day tank (EU-DT1).

Building 35 was also viewed and contains additional process equipment used in the polyester manufacturing process. Bostik representatives said that the equipment involved in this part of the process does not emit VOCs/HAPs and is not connected to the RTO system.

Exterior: There was an old cyclone observed on the exterior adjacent to these buildings. Bostik personnel said that this unit is no longer in service. Liquid hazardous waste tanks "EU-T1 and EU-T2" were observed to be located on the exterior of Building 39. Bostik representatives said that the tanks were equipped with conservation vents and there was no vapor return during transfer of the waste into the tank trucks.

5. **Polyurethane Building 37:** A freezer was observed in this area. According to Bostik personnel, it is used to store methyl di-isocyanate (MDI), a raw material utilized in the manufacture of some of the polyurethan resins. Bostik representatives said the polyurethane reactor, EU-R1000, was in use at the time of the inspection. Visual observation was made that reactor, EU-R100 is not in service, as evidenced by blind flanges and signage posted on the unit. Local exhaust ventilation was observed at each of the reactors, that discharges through a dust collector PCD-DC2. It appeared that the polyurethane EU-500 was also in operation during the inspection. All three of the reactor manways were observed to be sealed at the time of the inspection. According to Bostik personnel, the emissions from these reactors are vented through a knockout pot, through two flame arrestors, operated in parallel prior to discharging into the main process header. The group observed the solvent based liquid adhesives mixer, EU-V3, was empty. Bostik personnel stated that it was offline to replace gaskets.

   Exterior: A Caterpillar emergency generator was observed on the exterior of the building. Bostik representatives said the generator is used for emergencies only, no demand response. Bostik representatives said the generator is operated for monthly testing only. Bostik representatives said the engine is a diesel-fired unit. Mr. Garcia also stated that there is a diesel-fired fire pump located at the facility for emergency purposes only.

6. **Film Adhesive Coating Line and RTO Control System, Building 23:** The group observed the film coating line was not in operation at the time of the interior inspection of this building. Bostik representatives said that this was due to quality issues with the product on the coating line. Bostik representatives said that they had been making B23-24 film prior to shutting down. Bostik representatives said the film is added to the substrate and the line has four burners that heats the product to bake off the solvent. Bostik representatives said the speed of the application determines the amount of VOC generated.

   The EPA inspectors noted there was a slight to moderate solvent odor noted in this area. The enclosure constructed around the coater head of the film line was observed to be in place and all access doors appeared to be closed. Bostik representatives said the enclosure must be run to dilute the concentration of VOC in the header to keep it below the LEL.

The group observed the RTO controls and display are in this area. Per Ms. Peltier's request, Mr. Garcia took a photograph of the display screen for the RTO unit and provided the photograph to Ms. Peltier, post-inspection. The photograph of the RTO Control Screen is provided in Attachment 2 of this report. The RTO was observed to be in operation at the time of the inspection. The operating temperature for the two chambers of the RTO was observed to vary between 1743 to 1750 degrees Fahrenheit. The set point was noted to be 1678 degrees Fahrenheit. The rolling average RTO temperature displayed indicated a temperature of 1749.2 degrees Fahrenheit. Bostik representatives said at approximately 1:55 p.m. the film line went down and remained out of service for approximately 25 minutes. The pressure transmitter located prior to the blower for the RTO was noted to be -3.0 inches of water column.

7. **Churn Room: Building 24:** The operations inside the Churn Room were observed. There was a solvent odor noted in this building at the time of the inspection. The emissions from the churns and from the building exhaust ventilation are discharged to atmosphere. Bostik representatives said there are covers placed on each of the Churns. Conservation vents were also noted in this room that vented inside the building.

8. **RTO:** The RTO was observed on the exterior of Building 23. There was no odor noted at the time of the equipment was viewed. The blower on the unit did kick off and on while viewing the unit. The Bostik representatives stated that this was likely due to start-up of the adhesive film coating line.

C. Records Review

Mr. Garcia showed the inspectors the Excel spreadsheet utilized to demonstrate compliance with the monthly/twelve month rolling total air emissions VOC and HAP emission limits as required by the permit. Mr. Garcia said VOC and HAP emissions are calculated for each batch recipe by the in-house chemist and these records are maintained in SAP. Mr. Garcia said the emissions after control are calculated using the following information:

- The pounds of VOC and HAP emissions per batch,
- The number of batches produced per month,
- An assumed condenser efficiency for each reactor train (these condensers used chilled water as the cooling medium), and
- An assumed 99% removal across the RTO.

Mr. Garcia said the VOC emissions from the Churn Room are calculate using the VOC and HAP content and quantity of the ingredients utilized in this process and the coating film line assumes 100% of the VOCs and HAPs applied are emitted pre-control and assumes a 99% removal efficiency for RTO post control.

Mr. Garcia said facility-wide VOC and HAP emissions also include air emissions from the bulk storage tanks, fugitive emissions from valves, flanges and fittings using AP-42 emission factors and emissions from the boilers on-site. Mr. Garcia said the facility-wide emissions recorded on the Excel spreadsheet, through August of 2024, are 2.4 tons per year VOC and 0.69 tons per year of HAP. Mr. Garcia said the facility also has a leak detector and repair (LDAR) program that is required by 40 CFR 265, Subpart BB, Air Emission Standards for Equipment Leaks, for the equipment that comes into contact with organic hazardous waste.

Mr. Garcia said greenhouse gas emissions are calculated for the combustion of natural gas and are approximately six (6) metric tons of CO_2 equivalents per year.

D. Closing Conference

A closing conference was held with Bostik representatives Christopher Tryfonos, Mr. Welch and Mr. Garcia. Ms. Peltier thanked the Bostik representatives for their time.

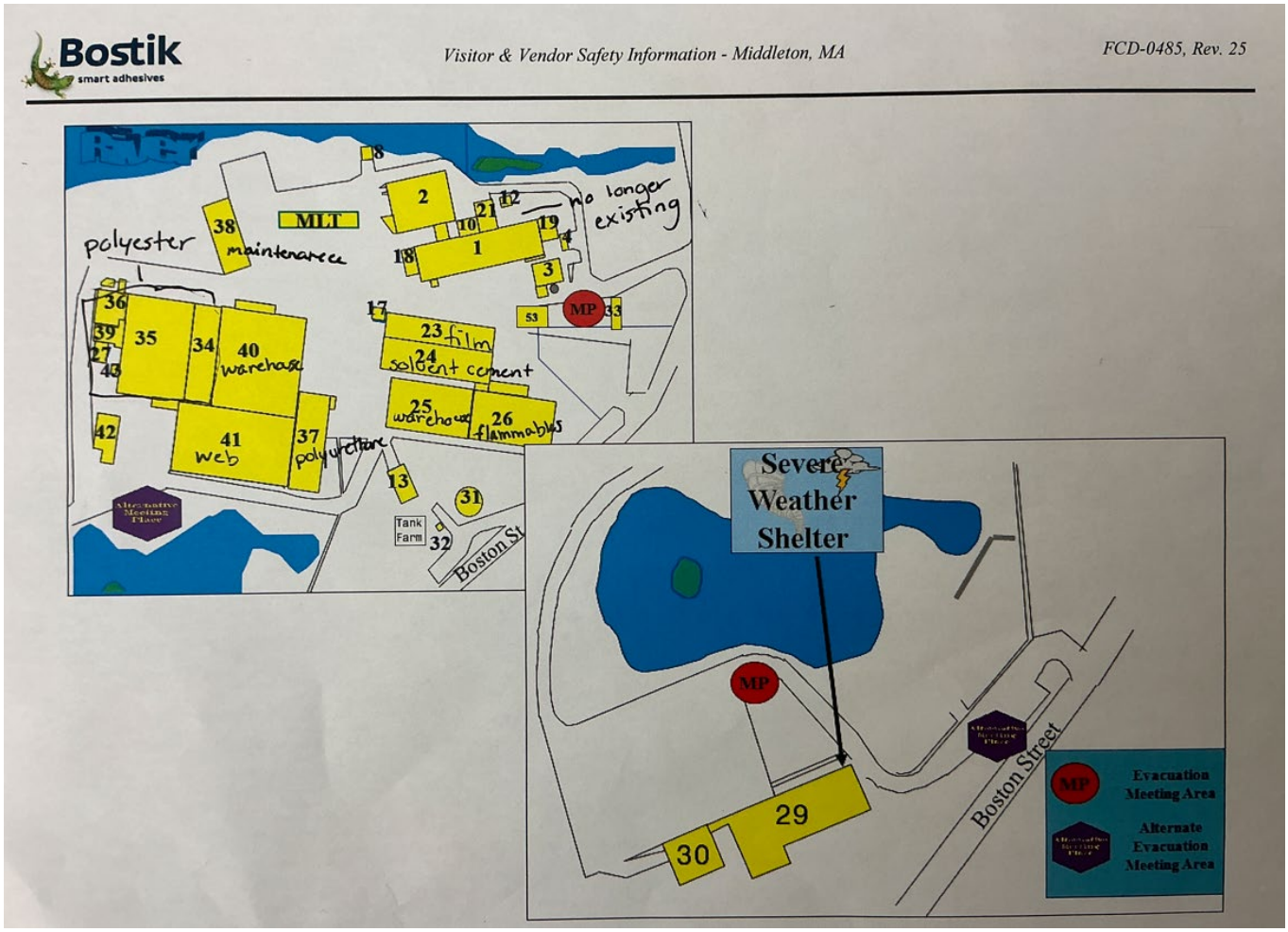
Ms. Peltier said that it is likely that EPA would send Bostik an information request to gather additional information that was not reviewed during the inspection.

Mr. Fortescue provided an overview of EPA's stack testing policy, in particular that the policy states that in the absence of a specific regulatory or permit requirement, stack tests should be conducted at maximum normal operating conditions. Mr. Fortescue said that for the previous two tests the pre-control VOC load had been 68 and 144 pounds per hour, and suggested that Bostik may want to think about operating scenarios that represent worse case emissions.

Mr. Wong stated that Bostik appears to be penalizing themselves by testing under conditions that result in an elevated operating temperature. This results in a higher operating setpoint and minimum temperature that they are required to maintain per the conditions of their permit. Mr. Wong suggested that they could submit another alternative for consideration to address this concern.

The inspectors proceeded to leave the facility at approximately 3:00 p.m.

ATTACHMENT 1: Bostik., Inc. Facility Plan (annotated)



ATTACHMENT 2: RTO CONTROL SCREEN