DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

N795952171

FACILITY: PENINSULA POWDER COATING INC		**SRN / ID:** N7959
LOCATION: 128 HEMLOCK, BARAGA		**DISTRICT:** Upper Peninsula
CITY: BARAGA		**COUNTY:** BARAGA
CONTACT: Bill Kunick , Operations Manager		**ACTIVITY DATE:** 01/10/2020
STAFF: Michael Conklin	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MINOR
SUBJECT: Targeted inspection for FY 20.		
RESOLVED COMPLAINTS:		

Facility: Peninsula Powder Coating (SRN: N7959)
Location: 128 Hemlock St, Baraga, MI 49908
Contact(s): Bill Kunick, Operations Manager, 906-353-7234

Regulatory Authority

Under the Authority of Section 5526 of Part 55 of NREPA, the Department of Environment, Great Lakes, and Energy may upon the presentation of their card, and stating the authority and purpose of the investigation, enter and inspect any property at reasonable times for the purpose of investigating either an actual or suspected source of air pollution or ascertaining compliance or noncompliance with NREPA, Rules promulgated thereunder, and the federal Clean Air Act.

Facility Description

Peninsula Powder Coating, located in Baraga, MI, provides powder coating services to commercial, municipal, and residential customers. The company was founded in 2004 and currently employs 35-40 employees within their 34,000 square foot facility. Powder coating is a process that provides a protective and decorative finish to both metallic and non-metallic products. It is often used in a variety of industry such as automotive, agriculture, electronics, furniture, fitness and medical equipment.

Peninsula Powder Coating provides a range of decorative colors and finishes to any electrically conductive metal or material that can endure 400 degrees Fahrenheit. They primarily work with steel, sheet metal, and foundry castings of ductile iron and aluminum. The facility works with parts ranging from 2 inches long up to a maximum of 26 feet long, 12 feet wide and 10 feet high. The company provides surface preparation, finishing, assembly, and delivery services.

Emission units at this source include 4 powder coating booths, 4 natural gas-fired curing ovens, 2 sand blasting booths, 1 natural gas-fired wastewater evaporator, 1 natural gas-fired water heater, and natural gas-fired space heaters. The source is currently not subject to any state air permits or federal regulations. From prior inspections, Peninsula Powder Coating has been considered exempt from the need for a Permit to Install (PTI).

Process Description

The powder coating process begins with sandblasting parts to a dry and bare surface or by using another surface preparation technique when sandblasting cannot be done. The surface preparation stage removes contaminants, oil, rust, and other substances that interfere with coating adhesion. Next, the parts are moved into the powder coating spray booth where parts are coated. The coating material is a dry powder consisting of resins, pigments, leveling agents, flow modifiers, and other additives. Inside the booths, the powder is applied using a spray gun that electrostatically charges the powder. The powder is applied using a process called electrostatic spray deposition (ESD) where the charged powder particles (typically positive) are attracted to the grounded part (negative) causing them to adhere. After the parts have been coated, they are moved into the natural gas-fired batch curing ovens that bake the parts at 400 degrees Fahrenheit. The thermosetting powder begins to melt and produce long polymers that cross-link. These long molecular chains within the coating provide a durable, uniform, and aesthetic finish on the part.

Emissions

Abrasive blasting, such as sandblasting, causes the emissions of particulate matter (PM). Fabric filter collectors can be used to control emissions from sandblast enclosures that use air recirculation systems.

Particulate emissions from the powder coating process are very little. The process also contains very little VOCs as compared to solvent-based paints. The process occurs in an enclosed booth and typically

has a coating transfer efficiency of 93%. Many booths use cartridge filters that collect excess material from overspray and exhaust to the general in-plant environment.

Pollutants emitted from the combustion of natural gas-fired curing ovens include nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), particulate matter (PM), carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and trace amounts of sulfur dioxide. NOx is formed and emitted primarily through one of three mechanisms: thermal, fuel, and prompt. Thermal NOx formation occurs in the high temperature zone, near the burners, by the reaction of nitrogen (N2) and oxygen (O2) molecules in the combustion air. Fuel NOx formation occurs through the reaction of nitrogen molecules in the fuel and the oxygen molecules in the combustion air. This form of NOx formation is low when burning natural gas since there is a low nitrogen content in the fuel. Prompt NOx is formed through the reaction of nitrogen molecules in the combustion air and hydrocarbon radicals from the natural gas. Higher temperatures of burning and longer residence time results in higher NOx emissions. CO and VOC emissions are directly related to combustion efficiency. Higher combustion temperatures, longer residence times, and well mixing of fuel and combustion air results in greater combustion efficiency and lower emissions of CO and VOCs. Emissions of sulfur oxides are low since processed natural gas contains a very low sulfur content. PM emissions are also low since natural gas is a gaseous fuel. Nitrous oxide and methane emissions are related to the combustion temperature and amount of excess oxygen.

Emissions Reporting

The source is not a fee-subject facility and does not have to report its annual emissions to the Michigan Air Emissions Reporting System (MAERS). There are no current state air permits or federal regulations associated with this source.

Compliance History

The facility has not received any violation notices in the past five years. The facility was last inspected in 2014 and was found to be in compliance with all applicable air quality rules and federal regulations at that time.

Inspection

On January 10, 2020, I conducted an unannounced inspection on Peninsula Powder Coating. I arrived at the office building and met with Operations Manager, Bill Kunick. I explained to Mr. Kunick that the purpose of the inspection was to ensure compliance with state air pollution control rules and federal regulations. Jane Kahkonen, Air Quality Specialist for the Keweenaw Bay Indian Community, accompanied me on the inspection. The inspection began with a tour of the facility and associated emission units.

Shot Blasting

The facility operates two completely enclosed sandblasting booths for surface preparation. Parts are brought in and cleaned with 80 grit shot media. A large air filter vent at the end of the booth is used to draw in air during sand blasting operations. Each booth has an air recirculation system that goes through a common fabric filter collector. Air is drawn out of the booths, filtered, and a portion is vented back into booths while the other portion is exhausted to the atmosphere.

After inspecting the sandblast booths, we went outside to inspect the baghouse. The baghouse was in operation and filtering air from one of the sandblast booths being used. No visible emissions were observed. The baghouse is equipped with a magnehelic gauge for monitoring the static pressure drop. The gauge was reading 7" WC. This is a higher differential pressure reading compared to other fabric filter collectors operating under normal conditions. Most fabric filter designs typically operate within a pressure drop of 4-6" WC. A high pressure drop reading could mean excessive build-up of material on the filters leading to bleed-through and pore collapse that decreases the particulate matter removal efficiency. This also leads to higher energy costs and excessive stress on the system fan since a higher speed is needed to maintain the airflow at a consistent rate with there being high flow resistance. It is necessary to clean the filters when the static pressure drop exceeds the manufacturer recommended value, which is typically in the 5 to 6" WC range.

It was also observed during the baghouse inspection that waste shot media collected in the hoppers was becoming a source of fugitive dust when being emptied into the bins. Currently, the emptying of the baghouse hoppers into the bins is not enclosed and wind is picking up some of the material and blowing it around the area of the baghouse. This was brought to Mr. Kunick's attention and he stated that the company plans to install an enclosed system for emptying/disposal of waste material collected in the

baghouse.

Equipment for shot blasting that has externally vented emissions controlled by a fabric filter collector can be considered exempt from the need for a PTI per R 336.1285(2)(l)(vi)(C).

Powder Coating
The facility operates 4 powder coating booths, each with a cartridge filter collection system that exhausts to the general in-plant environment. The collection system has a backflow pulse generator to drop excess material off the cartridges. After every shift, the cartridges are "popped", and excess material is deposited onto slide-out trays beneath the filters. No emissions were observed from the powder coating booths.

Equipment used for metal surface treatment with process emissions released into the general in-plant environment can be considered exempt from the need for a PTI per R 336.1285(2)(r)(i).

Curing Ovens
In addition to the 4 powder coating booths, there are 4 natural gas-fired curing ovens. Theses ovens work in a batch process that bake coated parts at 400 degrees Fahrenheit for about 10 minutes. Two of the ovens have a rated heat input capacity of 2 MMBtu/hr, one oven is rated at 1.5 MMBtu/hr, and the fourth oven is rated at 950,000 Btu/hr.

Powder coating booths and associated ovens, where the booths are equipped with fabric filter controls can be considered exempt from the need for a PTI per R 336.1287(2)(d).

Miscellaneous Equipment
Behind the wash bay for parts and equipment is a natural gas-fired water heater and wastewater evaporator. The wastewater evaporator is used to minimize the amount of wastewater requiring disposal. A drain at the bottom of the wash bay collects wastewater containing metal contaminants, alkaline cleaners, phosphate coating treatments, and other metal preparation chemicals. The wastewater is then pumped into the evaporator where water is evaporated and concentrate remains behind for disposal. Emissions from wastewater evaporators can include VOCs from chemicals contained in the wastewater. Wastewater evaporators do not explicitly meet a state air permit exemption rule and have been previously permitted in the past. This emission unit will require a PTI and a Rule 201 violation notice will be sent.

Natural gas-fired space heaters and water heater can be considered exempt from the need for a PTI per R 336.1282(2)(b)(i).

<u>Compliance</u>
Based on this inspection, Peninsula Powder Coating is not in compliance with all state air quality rules and federal regulations. A PTI application will need to be submitted for the wastewater evaporator.

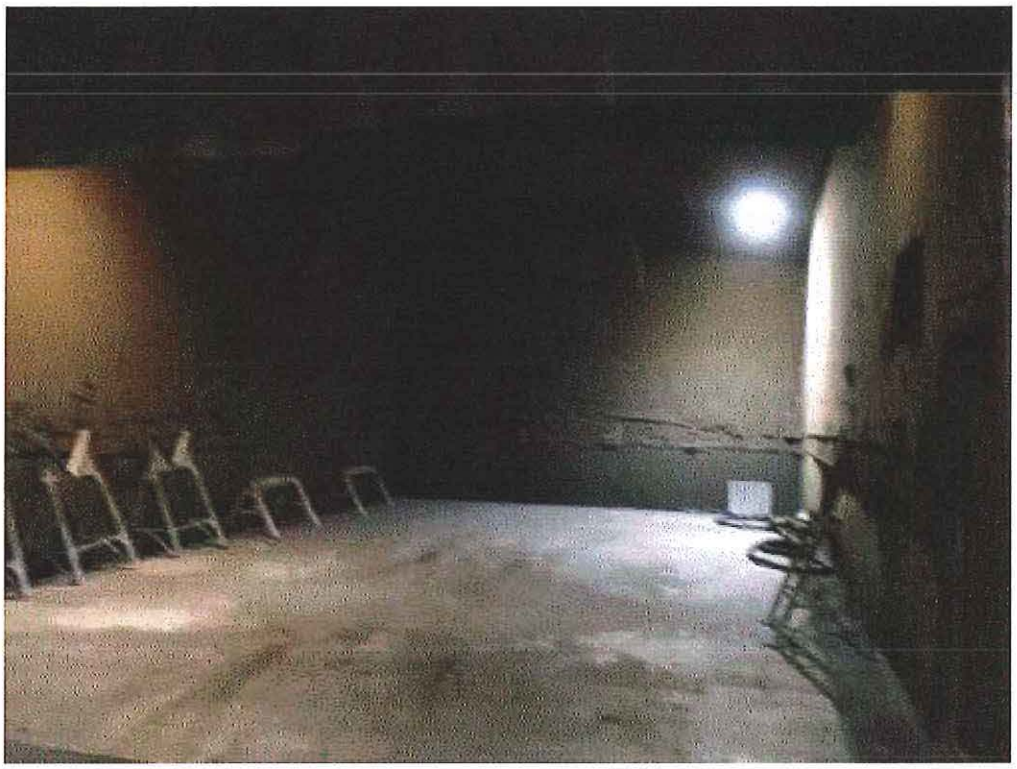
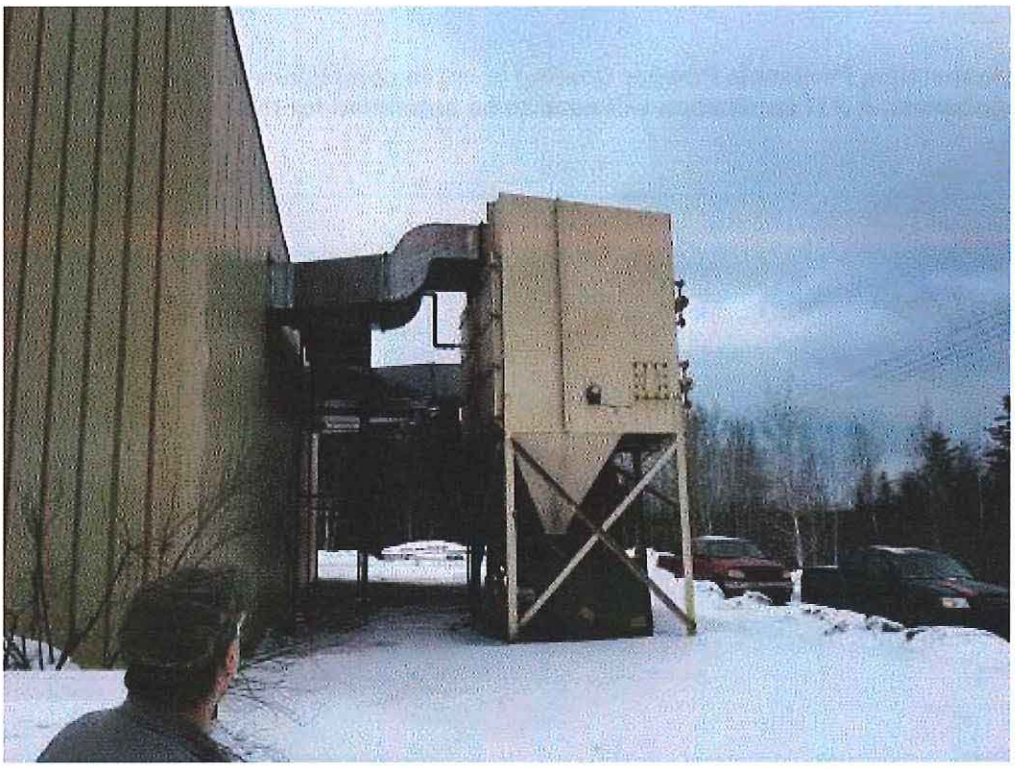


Image 1(Shot Blast) : Enclosed shot blast booth with air recirculation system.



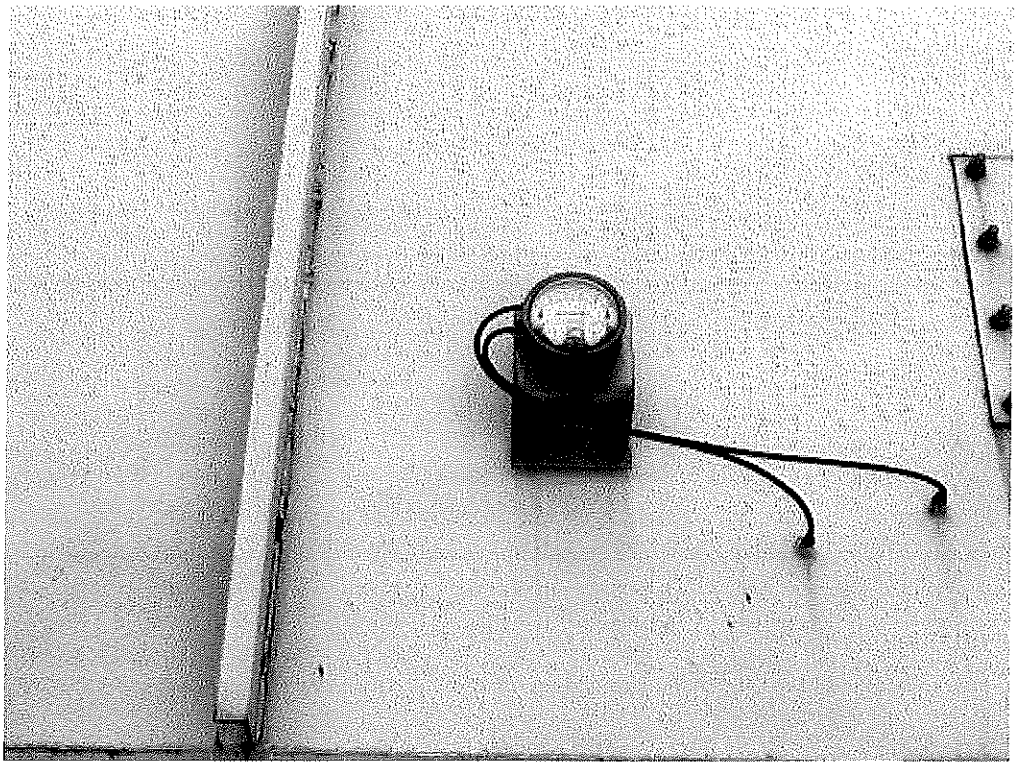


Image 3(Magnehelic) : Magnehelic pressure drop gauge reading 7" WC.

Image 4(Hopper) : Baghouse hopper with waste collection bin.

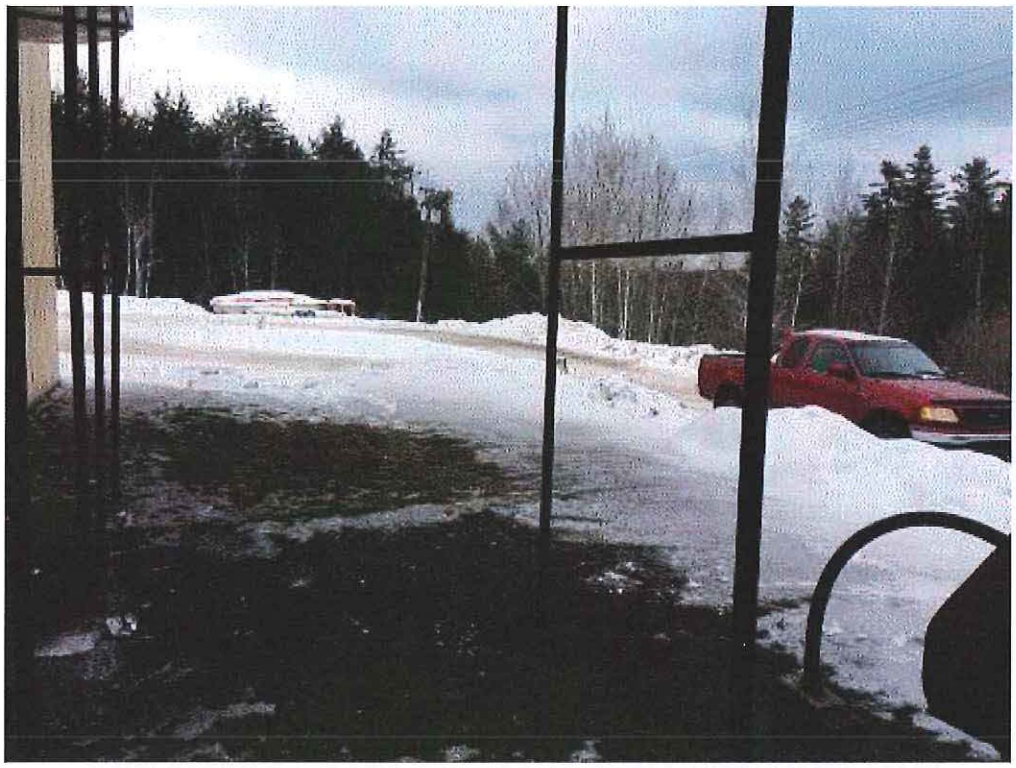


Image 5(Fugitive Dust) : Fugitive dust emissions observed around the surrounding area of the baghouse.

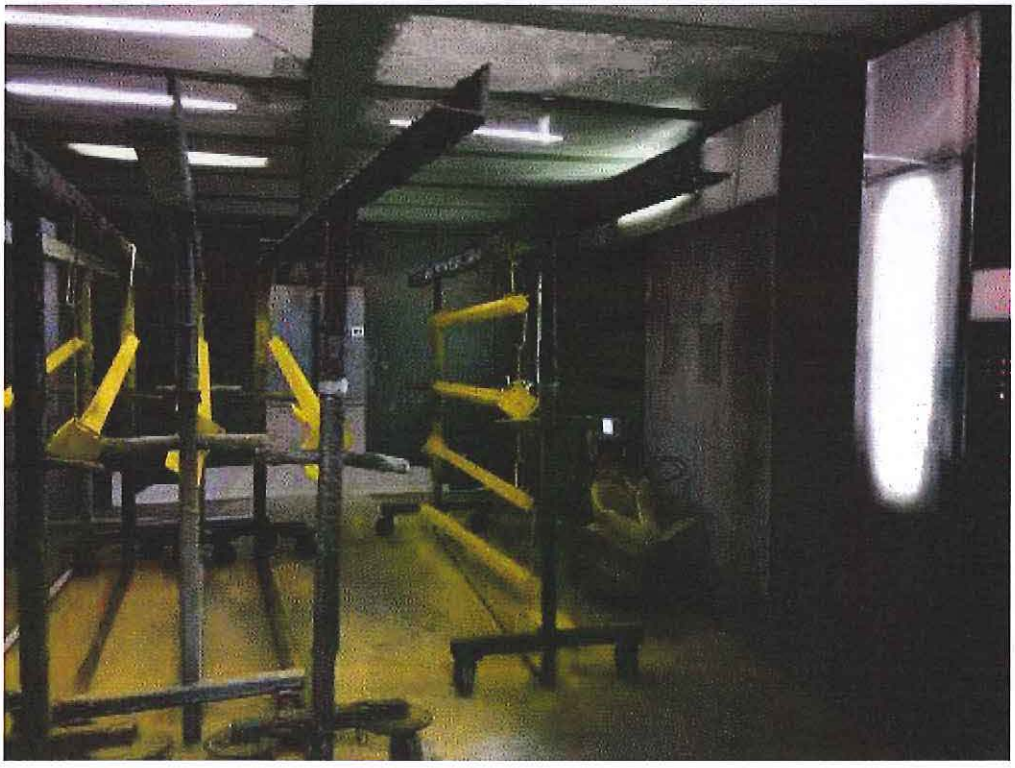


Image 6(Powder Coating) : Powder coating booth with cartridge filters.

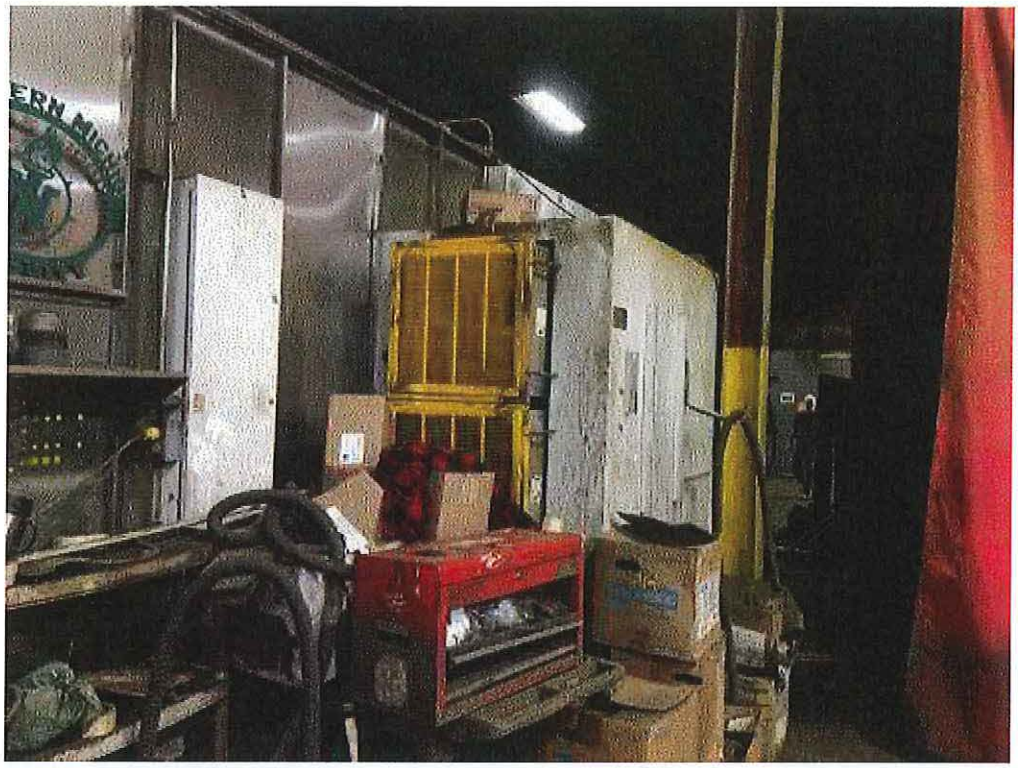


Image 7(Vent) : Powder coating exhaust vent to the general in-plant environment.

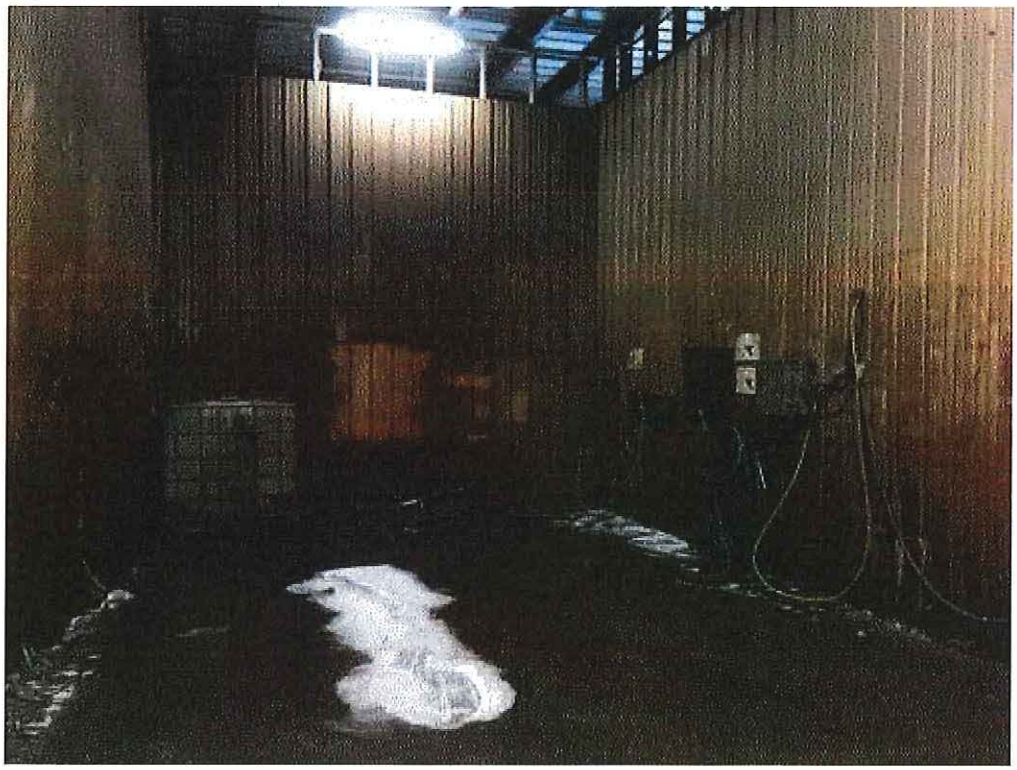


Image 8(Wash Bay) : Wash bay for parts and equipment.

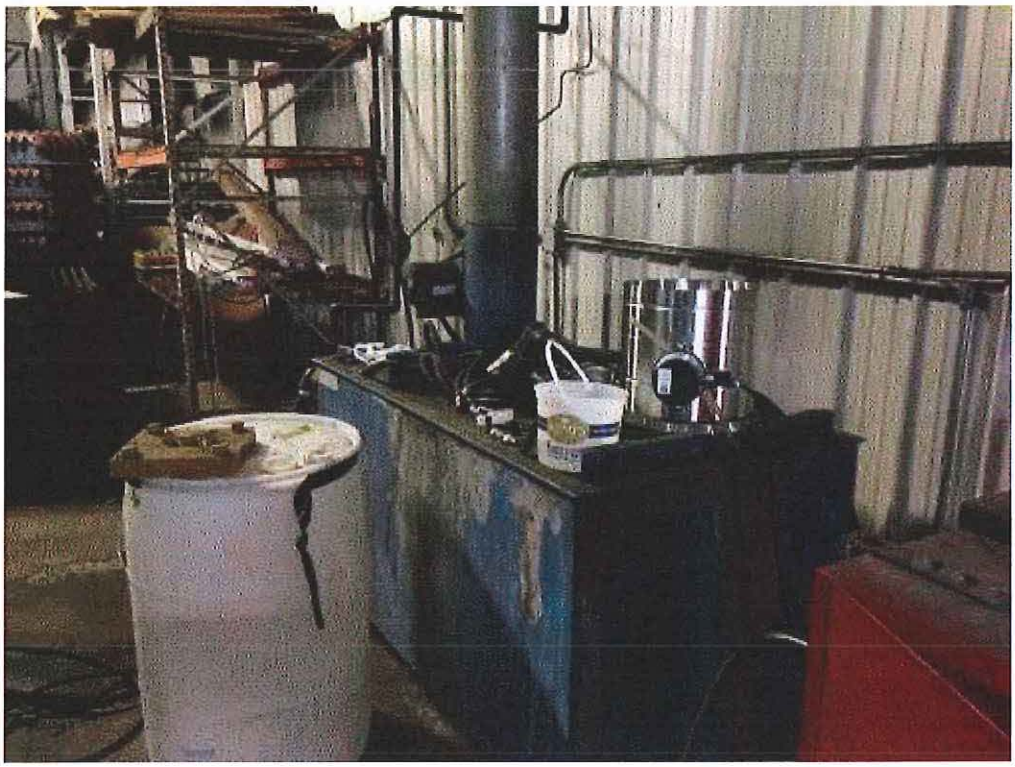


Image 9(Evaporator) : Natural gas-fired wastewater evaporator for wash bay.

NAME Michael Nelson DATE 1/17/20 SUPERVISOR EJL