DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection

N004547162

FACILITY: Wolverine Plating Corporation		**SRN / ID:** N0045
LOCATION: 29456 Groesbeck Highway, ROSEVILLE		**DISTRICT:** Southeast Michigan
CITY: ROSEVILLE		**COUNTY:** MACOMB
CONTACT: Jake Keith , Regulatory Compliance Officer		**ACTIVITY DATE:** 11/30/2018
STAFF: Adam Bognar	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** Minor
SUBJECT: Self-initiated Inspection		
RESOLVED COMPLAINTS:		

On Friday, November 30, 2018, Michigan Department of Environmental Quality-Air Quality Division (MDEQ-AQD) staff, I, Adam Bognar, conducted an unannounced self-initiated inspection of Wolverine Plating Corporation (the "facility") located at 29456 Groesbeck Hwy, Roseville, MI 48066. The purpose of this inspection was to determine the facility's compliance status with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; and Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) rules.

I arrived at Wolverine Plating Corporation at around 9 am and met with Mr. Roger Dubay, Maintenance Supervisor, and Mr. Jake Keith, Regulatory Compliance Officer. I identified myself, provided credentials, and stated the purpose of the inspection. Mr. Dubay and Mr. Keith gave me a tour of the facility and explained the operations at Wolverine Plating Corporation.

Wolverine Plating Corporation performs both zinc electroplating and zinc/nickel electroplating on metal parts. There are three zinc electroplating and three zinc/nickel electroplating lines. All of the lines are automated barrel electroplating lines. In barrel electroplating, parts are loaded into a barrel before plating. The barrel replaces the rack system seen in other plating facilities. The barrel is permeable so that plating solution can get in, but parts do not fall out. This system works well for large quantities of small parts such as nuts, bolts, and fasteners. Barrels are moved from tank to tank using robotic actuators. The barrels spin when they are dipped into the tanks which ensures each part receives an even coating.

These lines are normally operated 24/7 including weekends by approximately 60 employees. In all lines, an automated rack system dips barrels of parts into a series of tanks containing different surface treatment materials. The series of tanks is described below.

Plating Process: Alkaline Cleaner (3% NaOH) → Aqueous Rinse→ Acid Wash (25% HCl) → Alkaline Electro-cleaner (6% NaOH) → Aqueous Rinse → Zinc or Zinc/Nickel Electroplating → Aqueous Rinse → Chromate Conversion Coating (Cr^{+3}) → Aqueous wash → Drying Oven

The first five tanks act to strip unwanted scale, dirt, oxides, and smut from the steel parts before plating. The alkaline cleaner and electrified-cleaner are both heated by the onsite boiler. The chrome conversion coating utilizes a trivalent chromium solution to apply a colored finish to the zinc plating. Chromate conversion bath chemistry is modified slightly to achieve several different colored finishes. No electric current is used in chrome conversion coating. Parts exit the plating tanks into a natural gas fired drying oven. After drying, the parts are loaded into bins and shipped to the customer.

90% of the parts plated at this facility are for the automotive industry. Zinc electroplating is commonly used on parts that do not need the decorative look of more expensive plating, but still need some extra protection against corrosion. Zinc electroplating is relatively cheap compared to other metal plating such as nickel and chrome. The zinc layer is used as a "sacrificial layer" (a sacrifice to atmospheric oxygen). As zinc oxide forms, it does not cause a breakdown of the underlying metal (in contrast to what iron oxide would do). So long as the zinc oxide layer remains relatively undisturbed it will create a barrier to oxidation of the underlying metal.

In each plating line, the hydrochloric acid wash tanks and the alkaline cleaner/electro-cleaner tanks are equipped with an exhaust system that is ventilated outdoors. Throughout all six plating lines, these are the only tanks with external ventilation.

These six plating lines are currently operated without an air Permit to Install. Since the cleaning/acid wash tanks are exhausted outdoors, they do not qualify for the Permit to Install exemption for cleaning/acid wash tanks used in metal surface treatment (Rule 285 (2)(r)). This issue was addressed by an AQD inspection on June 6, 2000 when an AQD inspector cited Wolverine Plating Company for operating these tanks without first obtaining a Permit to Install.

In response to this citation, Wolverine Plating Company hired a consultant to perform a regulatory applicability study. The study was carried out by Environmental Consulting and Technology, Inc. A copy of this study is in the AQD Wolverine Plating Corporation file. The consultant provided calculations demonstrating that the acid wash tanks and alkaline cleaner/electro-cleaner tanks are exempt from Rule 201 requirements to obtain a Permit to Install pursuant to Rule 290 (2)(a)(ii)(A). These calculations were accepted by the AQD at that time.

A few things have changed since these calculations were performed. Two new electroplating lines have been installed since June 6, 2000. Both lines have acid wash and alkaline cleaning tanks. No emission calculations have been performed for the acid wash/alkaline cleaners on these two new lines. Additionally, the concentration of hydrochloric acid used in the all acid tanks has increased from 12% to 25% since the calculations were done. The main variables in the emission calculation are hydrochloric acid concentration, bath temperature, and surface area of tank. Temperature has remained the same at approximately room temperature (70 degrees Fahrenheit). Emissions from the alkaline cleaning tanks may not need to be evaluated since they will likely be small compared to the acid tank emissions.

Since the two new lines are essentially identical to the four older plating lines, I asked Mr. Keith to perform the identical calculation for the new lines. I also asked Mr. Keith to redo the calculations for the four older lines using the new hydrochloric acid concentration. I asked him to provide me this information by January 5, 2019. Compliance with Rule 201 will be evaluated after I receive this information.

The chemical storage area appeared to be kept in an organized manner. I did not see any open containers or spilled chemicals. I asked Mr. Keith to provide me with the SDS/EDS for the surfactant used in the alkaline cleaning tanks so I can determine if it contains PFAS.

There is a water treatment area used to pre-treat water before it is sent to the WWTP. Process wastewater is sent to a settling tank where it is treated with either acid or caustic depending on the type of waste. A coagulant is also used. The salts and aggregates formed during this process are allowed to settle. After settling, the water is pumped to the WWTP and the solid waste is run through a filter press.

In 2016, changes were made to the wastewater treatment process to allow Wolverine Plating to recover and reuse a portion of the wastewater. This new system consists of several additional treatment steps and finishes the treatment with a reverse osmosis unit. Mr. Dubay stated that approximately 70% of their wastewater is recovered and reused when the system is operating correctly. At the time of my inspection this recovery system was not working, meaning 100% of wastewater was sent to the WWTP after pre-treatment. Mr. Dubay stated that the recovery system was bypassed a couple months ago due to issues with the reverse osmosis unit. At the same time this recovery equipment was added, a sludge dryer was removed and replaced with a filter press.

There are three natural gas fired hydrogen bake ovens used for certain parts pre or post zinc plating. Mr. Stevens explained that this oven serves to remove hydrogen that is embedded in the piece. Each of these ovens has a heat input of approximately 1.5 MM Btu/hour. These ovens appear to be exempt from Rule 201 requirements pursuant to Rule 282 (2)(a)(i).

There is one natural gas fired 5MM Btu/hr boiler used to heat certain tanks in the plating lines. The alkaline cleaning tanks are among the heated tanks. This unit appears to be exempt from Rule 201 requirements pursuant to Rule 282 (2)(b)(i).

There is a pilot electroplating line located in the storage area. All tanks in this line are approximately 10-20 gallons and exhausted to the general in-plant environment. The pilot electroplating line appears to be exempt from Rule 201 requirements pursuant to Rule 285 (2)(r).

Compliance Determination

This facility appears to be in compliance with the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); and Michigan Department of Environmental Quality-Air Quality Division (MDEQ-AQD) Administrative Rules.

Compliance with Rule 201 will be evaluated after I receive emission calculations for the acid dip and alkaline cleaning tanks.

NAME Adam Borgert DATE 12/5/2018 SUPERVISOR SK