

**CLEAN WATER ACT COMPLIANCE EVALUATION INSPECTION REPORT
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 5**

Purpose: Pretreatment Industrial User (IU) Inspection

Facility: Cardinal Plating Solutions
802 SE 19th Avenue
Aledo, Illinois 61231

Date of Inspection: March 29, 2023

EPA Representatives: Newton Ellens, Pretreatment Program Manager, 312-353-0724
Kenneth Gunter, Chemist, 312-353-9096

Facility Representatives: Chris Schull, President
Tony Schadel, Plant Manager

SCL Representative: Jeff Zak

Report Prepared by: Newton Ellens, Pretreatment Program Manager
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Inspector Signature: Ellens, Newton
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Date: 2023.05.10 11:16:03 -05'00'

Report Date: _____

Approver Name and Title: Smith Molly, Supervisor, Section 1, Water Enforcement and Compliance Assurance Branch

Approver Signature: MOLLY SMITH
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Approval Date: _____

Purpose of Inspection:

The purpose of this inspection was to inform the terms of a proposed Administrative Consent Order issued to Cardinal Plating Solutions (Cardinal Plating).

Background:

Cardinal Plating is a job shop plating facility, located in Aledo, Illinois. The U.S. Environmental Protection Agency (EPA) reviewed four of Cardinal Plating's self-monitoring reports (dated October 6, 2020, September 24, 2019, August 30, 2019, and August 22, 2019) for compliance with the requirements of 40 C.F.R. Part 403 (General Pretreatment Regulations for Existing and New Sources of Pollution) and 40 C.F.R. Part 433 (Metal Finishing Point Source Category, or "Metal Finishing Category"). Based on that review, EPA issued a May 26, 2021, Compliance Assistance Letter to Cardinal Plating. The letter cited Cardinal Plating for failure to:

1. Include analytical results for total toxic organics (TTO);
2. Obtain 24-hour, flow-proportioned composite samples for metals;
3. Certify self-monitoring reports; and
4. Account for sample custody from the time of collection to the time of delivery to the analytical laboratory.

While working with Cardinal Plating to address the deficiencies identified in the Compliance Assistance Letter, EPA also identified deficiencies related to sensitivity of analytical methods for certain TTO parameters; suitability of quality assurance/quality control procedures when conducting analysis of certain TTO parameters utilizing methods approved in 40 CFR Part 136; and documentation of all required sampling information, such as name of sampler. On October 19, 2022, U.S. EPA issued a proposed Administrative Order to Cardinal Plating to address the deficiencies. Subsequently, Cardinal Plating changed or has proposed to change its flow-monitoring procedures, composite sample collection procedures, and sample documentation procedures. The purpose of this inspection was to observe and evaluate the sufficiency of the new/proposed procedures.

Opening Conference

Messrs. Ellens and Gunter (EPA inspectors) entered the Cardinal Plating facility at 9:20 a.m. They were greeted by Messrs. Schull, Schadel, and Zak (Cardinal Plating staff). Mr. Ellens showed his credentials to Mr. Schull. Cardinal Plating staff told EPA staff the following:

- **Facility Description**
 - The Cardinal Plating facility was constructed either in 2007 or 2009.
 - Mr. Schull purchased Cardinal Plating from Bruce Memminger in 2016. Before Mr. Schull's purchase, the facility was called MMF2.
 - The company has five full-time employees, and two part-time employees.
 - The Cardinal Plating facility operates five days a week, eight hours a day.
 - The company conducts electroless nickel plating, electrolytic nickel plating, and hard chrome plating.

- According to a facility diagram (submitted as part of a proposed toxic organic management plan (TOMP)), there are three plating lines. One of the lines, a trivalent chrome plating line, is not used. According to the facility, there is not a demand for trivalent chrome plated parts.
- Cardinal Plating's operations are seasonal. The slowest time of the year is from July to September.
- The facility includes a polishing operation. The polishing operation does not produce wastewater.
- Cardinal Plating receives parts for plating every day, via truck.
- The facility can take anywhere from four hours to two weeks to plate parts. Sometimes parts must be plated multiple times, and certain areas of each must be masked in between each plating round. Cardinal Plating takes longer to plate those types of parts.
- The facility does not conduct solvent degreasing. Instead, Cardinal Plating uses an alkaline soak cleaner.
- Cardinal Plating has US Ecology haul wastewater from spent plating baths for disposal.¹
- Pretreatment
 - Process wastewater is generated by the facility's rinse water tanks, among other sources.
 - Cardinal Plating uses the following pretreatment units:
 - Chrome reduction;
 - pH adjustment;
 - Flocculation;
 - Inclined plate clarifier;
 - Cone bottoms (for sludge storage); and
 - Filter press.
 - The flocculation, clarification, and filter press processes generate F006 waste. It is subject to 90-day storage requirements.

Plant Walk Through

Cardinal Plating staff told EPA inspectors the following:

- Sample collection procedure:
 - Cardinal Plating uses a wastewater control panel to help staff collect a sample aliquot every time 200 gallons of process wastewater is discharged. Cardinal Plating demonstrated its sample collection procedure for metal analysis:²
 - A buzzer on a control panel (located by the pretreatment process and discharge point) went off. Cardinal Plating staff said that the buzzer is triggered after 40 minutes of wastewater discharge. The control panel also

¹ According to Toxic Release Inventory data, Cardinal Plating disposed of 4,241 pounds of lead and nickel compounds in 2021.

² Cardinal Plating staff told EPA inspectors that their procedure was for demonstration purposes only. Cardinal Plating staff was not actually collecting compliance samples. Cardinal Plating did not demonstrate its sample collection procedure for cyanide or total toxic organics analysis.

- shut off the flow from the pretreatment process into the First Stage Equalization tank;³
 - Mr. Schadel collected a grab sample (into a one-pint sample bottle) from the pretreatment process (Attachment 1, Photo 1);
 - Using the control panel, Mr. Schadel re-started the discharge pump and timer;
 - Mr. Schadel took the sample bottle to the lab, where the sample refrigerator was located. There was a half-gallon bottle inside the refrigerator, called a compositing bottle (Attachment 1, Photo 3). Cardinal Plating staff poured the sample from its sample bottle into the compositing bottle. Cardinal Plating staff said that they may need one or more compositing bottles, depending on the number of samples collected. There was no thermometer inside the refrigerator.
- Cardinal Plating staff described the other sample collection steps:
 - Compositing bottles are shaken, then stored in the refrigerator;
 - After all the samples are collected, the compositing bottles are poured into a five-gallon bucket.
 - A portion from the bucket is poured into a “metals” bottle, which contains nitric acid for preservative;
 - The “metals” bottle is labeled and prepared for shipment.
 - Mr. Schadel fills out chain of custody forms for metals and cyanide sample analysis; Mr. Schull fills out chain of custody for total toxic organics sample analysis.
- In addition to sampling for metals analysis, Cardinal Plating staff stated that they collect a grab sample for cyanide analysis.
- Currently, the 200-gallon flow interval is determined by the discharge pump rate (five gallons per minute) and a timer in the control panel (that triggers every 40 minutes). Mr. Schull said that he will replace the timer with a flow meter. Cardinal Plating staff said that they will then program the control panel to shut off discharge flow more accurately. The flow meter will record discharge volume.⁴
- Cardinal Plating has an atomic absorption machine (Attachment 1, Photo 4). Staff stated that it uses the machine for wastewater testing and process quality control.
- Generation of Process Water:
 - The rinse tanks in Chrome Plating’s metal finishing lines are stagnant. Chrome Plating staff discharge a rinse tank for pretreatment each day, from Monday to Thursday, on a rotating schedule.
 - The process water flow rate is not consistent. The metal finishing tanks are heated, so a significant amount of the process water in the tanks evaporates.
 - Process water from the rinse tanks discharge to an adjacent sump (Attachment 1, Photo 14) , then pumped to one of two 800-gallon equalization tanks (Tanks E1 and E2--Attachment 1, Photos 5 and 6).

³ Although Cardinal Plating staff said that the discharge flow was shut off, EPA inspectors noticed that there was a small discharge from the pretreatment process into the first stage equalization tank. EPA inspectors asked Cardinal Plating staff about this. The facility responded that the discharge was a residual flow.

⁴ EPA inspectors stated that, after the flow meter is installed, future discharge monitoring reports should include flow data from the meter.

- The first stage equalization tank discharges into the sewer through an adjacent standpipe. At the time of the inspection, there was a green garden hose inserted into the standpipe. Cardinal Plating staff took the hose out of the standpipe before we left the area (Attachment 1, Photo 2). It is not clear what the purpose of the hose was.
- Pretreatment:
 - Process water from a sump is transferred to one of two equalization tanks (Tanks E1 and E2).
 - A float in each equalization tank triggers a pump that transfers wastewater to the following pretreatment system:
 - Stage 1: Chrome reduction, using sodium bisulfite (Attachment 1, Photo 7);
 - Stage 2: pH adjustment, using caustic (Attachment 1, Photo 8) ;
 - Stage 3: Flocculation (Attachment 1, Photo 9);
 - Stage 4: Inclined plate clarifier (Attachment 1, Photo 10); and
 - Batch Tank (Attachment 1, Photo 11).
 - Wastewater in the Batch Tank is tested for metals concentration before discharge through the Final Effluent Tank. If test results show that the metals concentration in the Batch exceed limits, then the water in the Batch Tank is routed back to the pretreatment system.
 - Sludge from the Inclined plate clarifier is transferred to one of two Cone Bottom Tanks (Attachment 1, Photo 11). Then a filter press is used to dewater the sludge (Attachment 1, Photo 12). Water from the filter press is transferred to pretreatment, and the sludge is hauled for disposal.
- Chemical Storage:
 - Cardinal Plating keeps various chemicals stored onsite. Attachment 1, Photos 15 to 27 are photos of some of the chemical containers and labels. In addition, Mr. Schull downloaded a copy of SDS for chemicals stored onsite and provided Mr. Ellens with that copy.

Closing Conference

Cardinal Plating and EPA staff discussed the following:

- Cardinal Plating staff provided a copy of a chain-of-custody (COC), from an Iowa laboratory, for metals and cyanide analysis. The COC appeared to show no gaps in the chain of custody from sample collection to acquisition by the laboratory. Mr. Schull stated that he will switch from the present laboratory and send sample to the Iowa laboratory from now on.
- In response to EPA inspectors' comments about the need to monitor the temperature of the sample refrigerator (for cyanide samples), Cardinal Plating stated it will purchase a thermometer for the refrigerator.
- Sometime during the week of April 3, 2023, Cardinal Plating expected to receive a flow meter; staff plan to replace the timer in its control panel with the flow meter. Then, Cardinal Plating intends to use the flow meter in the control panel to stop flow and collect sample aliquots during each flow interval.

EPA inspectors left the facility at 12:30 p.m.

Areas of Concern

1. Under Table II of 40 C.F.R. § 136.3. (Required Containers, Preservation Techniques, and Holding Times):
 - a. Samples for the analysis of cyanide and organics must be maintained at a temperature $\leq 6^{\circ}\text{C}$. At the time of the inspection, Cardinal Plating did not have a thermometer inside its sample refrigerator.
 - b. Samples for metals analysis should be preserved within 15 minutes of collection. Cardinal Plating staff stated that they pour a portion of the day's composited samples from a bucket to a "metals" bottle (with preservative) at the end of the day.
2. One purpose of the inspection was to witness Cardinal Plating's sample collection techniques. However, Cardinal Plating did not actually collect samples for analysis.
3. After Cardinal Plating installs a flow meter into its control panel, Cardinal Plating should include a record of average and maximum daily flows for the reporting period in future self-monitoring reports, per 40 C.F.R. § 403.12(e)(1).

Documents Provided

1. Documents provided during the inspection:
 - a. Thumb drive of a copy of SDS sheets for chemicals stored at Cardinal Plating;⁵
 - b. Visual Work Instruction—Monthly Metals Sampling (December 22, 2022); and
 - c. QC Analytical Services—Chain of Custody report (for samples delivered on March 8, 2023).
2. Documents provided after the inspection (emailed on March 29, 2023):
 - a. Facility layout;
 - b. Pretreatment narrative; and
 - c. Seametrics FT520 Batch Flow Processor Instructions.

Attachments

1. Inspection Photos
2. Cardinal Plating Solutions Visual Work Instruction—Monthly Metals Sampling (December 22, 2022)
3. QC Analytical Services—Chain of Custody report (for samples delivered on March 8, 2023)

⁵ After downloading copies of SDS, Mr. Ellens mailed the thumb drive back to Mr. Schull, per Mr. Schull's request.