

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

Purpose: Pretreatment Industrial User (IU) Inspection

Facility: Dynomax, Inc.
230 W. Palatine Road
Wheeling, Illinois 60090

Date of Inspection: February 13, 2024

U.S. EPA Representatives: Jennifer Bush, Environmental Scientist, (312) 886-0879
E-Mail Address: Bush.Jennifer@epa.gov
Valerie Dooling, Environmental Engineer/Scientist, (312) 886-7167
E-Mail Address: Dooling.Valerie@epa.gov

Illinois EPA Representatives: Jeff Lienemann, Environmental Engineer
E-Mail Address: Jeffrey.Lienemann@illinois.gov
Malik Carroll, Environmental Engineer
E-Mail Address: Malik.Carroll@illinois.gov

Facility Representatives: Edward Lee, Operations Manager
Dylan Medlock, Laboratory Technician
Atul Mehte, Industrial Chemist
Andrea Wachter, Laboratory Technician

Report Prepared by: Jennifer Bush, Environmental Scientist, 312-886-0879
Water Enforcement and Compliance Assurance Branch, Section 1
Bush.Jennifer@epa.gov

Inspector Signature: JENNIFER BUSH Digitally signed by JENNIFER BUSH
Date: 2024.04.10 16:02:44 -05'00'

Report Date: 4/10/2024

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

Approver Signature: MOLLY SMITH Digitally signed by MOLLY SMITH
Date: 2024.04.10 15:57:10 -05'00'

Approval Date: 4/10/2024

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Purpose of Inspection:

The purpose of the inspection performed by the U.S. Environmental Protection Agency (EPA) was to investigate elements of the Clean Water Act (CWA) and associated pretreatment regulations with respect to Dynomax, Inc. ("Dynomax" or "Facility"), located at 230 West Palatine Road Wheeling, Illinois 60090.

Background:

Dynomax, Inc. is a metal finishing and machining facility, predominately for the aerospace industry, located in Wheeling, Illinois. Dynomax discharges process wastewater to the Metropolitan Water Reclamation District of Greater Chicago (MWRD) via the Wheeling Wastewater Treatment Plant (WWTP). The MWRD runs a federally approved pretreatment program. In addition, the Illinois Environmental Protection Agency (IEPA) does not run an approved pretreatment program. Therefore, the EPA is the Approval Authority, and the MWRD is the Control Authority for the Dynomax Facility, as defined in 40 C.F.R. § 403.3(c) and (f).

Dynomax submits periodic monitoring reports to the EPA Region 5 office on a semi-annual basis.

Dynomax provided EPA with the most recent Industrial User Discharge Authorization Permit issued from the Metropolitan Water Reclamation District of Greater Chicago for the discharge of the Facility's wastewater (Discharge Authorization No. 27824-2, which has an effective date of January 1, 2022, and an expiration date of December 31, 2025).

Inspection:

Opening Conference

Jennifer Bush and Valerie Dooling of EPA and Jeff Lienemann and Malik Carroll of IEPA arrived at the Facility on February 13, 2024, at 9:40 a.m. CST and met Edward Lee (Operations Manager), Dylan Medlock (Laboratory Technician), and Atul Mehte (Industrial Chemist). Jennifer Bush and Valerie Dooling showed their credentials and began the Opening Conference at 10:02 a.m. CST. The Opening Conference ended at 10:55 a.m. CST. The following information was provided to EPA by Dynomax, Inc. staff:

- **General Plant Information:**
 - The Dynomax, Inc. in Wheeling, Illinois opened in 2016.
 - Prior to 2016, Dynomax was a Chicagoland area company, which began operations in 1984 as a machining facility. Before moving to Wheeling, Dynomax was located in Buffalo Grove, Illinois beginning in 2014. Dynomax now has 5 locations in the Chicagoland area, and expanded to include metal finishing once operations shifted to the aerospace industry. When Dynomax expanded, three

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(3) buildings were purchased for the Wheeling location, one used for metal finishing, and two for machining. The EPA inspection was conducted in the Metal Finishing building at the Wheeling, Illinois location.

- There are approximately 150 employees in the Metal Finishing Building, but 300 employees total at the Wheeling location.
- The Facility operates five days a week, Monday through Friday. Metal finishing occurs from 6:00 a.m. – 6:30 p.m. (12.5 hours per day), and machining operates 8 hours per day. Dynomax is open on Saturdays as needed.
- There are no scheduled shutdowns or maintenance throughout the year.
- Besides domestic waste, the Metal Finishing Building is the only building at this location that discharges wastewater.
- Edward Lee stated the Facility began discharging more wastewater as new metal finishing processes have been added, with the most recent process coming online in 2022.
- There are three staff members who work in the onsite laboratory, which is managed by Atul Mehte.
- Dylan Medlock, a laboratory technician, is a Class K Operator.
- Final products are shipped to other Dynomax locations, which are eventually shipped internationally.
- Manufacturing Process:
 - Dynomax is predominately a metal finishing and machining facility for the aerospace industry, but also finishes medical, transportation, defense, and energy products.
 - Dynomax receives raw materials daily from customers, including aluminum, stainless steel, and copper. Because the Dynomax in Wheeling is the only location with metal finishing, machined parts are also received from other Dynomax locations to be finished, with products/processes dependent on customer needs.
 - There are multiple process lines in the Metal Finishing building, including anodizing, conversion coating class 1 and 3, passivation, electropolish, gold plating, and electroless nickel plating. There is also a wet paint area within the Facility as well. The anodizing process switched from chromic acid to sulfuric acid in June 2023.
 - Dynomax staff told EPA the main substrate is aluminum and stainless steel. For the gold plating line, gold is plated over copper products.
 - There is chemical storage onsite, with all chemicals on containment in one area in the Metal Finishing Building. Dynomax told EPA they are not aware of any floor drains in this area.
 - Spills kits are kept throughout the building in specific locations. If spills kits are used, material would be hauled offsite for disposal. Dynomax staff told EPA this is due to cyanide use in the building. Additionally, if spills occur onsite, staff are trained to notify Atul Mehte, the Industrial Chemist.

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- All process lines are in the same area of the building, except gold plating and electroless nickel plating.
- At the time of the Inspection, EPA was given a hard copy of the Process Flow Diagram for Dynomax, Inc. This document is referenced throughout the Inspection as “Process Flow Diagram”.
- Waste Generation:
 - Dynomax uses water from the City of Wheeling, which goes through five (5) resins to produce deionized (DI) water. The DI water is split through one pump, which is then dispersed through valves at each process line.
 - All process lines onsite use water and discharge to a sump pit which are pumped through one of three (3) different treatment processes prior to discharging to the sanitary line. The three treatments onsite are Chrome Treatment, Acid Alkaline Treatment, and Cyanide Treatment.
 - The anodizing line has 18 tanks, with two rinses between each process tank and an overflow system for rinses to back flow into each other. The first five tanks in the anodizing line don’t use chrome but are still discharged to Sump Pit 4 (As seen on Process Flow Diagram), which discharges to Chrome Treatment.
 - The Stainless Steel (Line 2 on Process Flow Diagram), Ultrasonic (Line 3 on Process Flow Diagram) and Electroless Nickel (Line 5 on Process Flow Diagram) discharge to Acid Alkaline Treatment.
 - Gold plating (Line 4 on Process Flow Diagram) has two pits. The first half of the line discharges to Acid Alkaline Treatment, and the second half discharges to the Cyanide Treatment.
 - The onsite laboratory sink discharges to a holding tank which goes through Chrome Treatment and Cyanide Treatment.
 - All processes and flow directions can be seen on the Process Flow Diagram.
- Pretreatment:
 - Process wastewater is generated by the Facility’s process lines in the Metal Finishing building, which include anodizing, conversion coating class 1 and 3, passivation, electropolish, gold plating, and electroless nickel plating.
 - Acid Alkaline Treatment:
 - The Acid Alkaline Treatment begins with a holding tank, which is then pumped to Neutralization 1, which Dynomax staff told EPA typically has a pH around 4. The pH is maintained at 4 by sulfuric acid and sodium hydroxide. Water is then pumped to Neutralization 2, which raises pH to about 10. There are coagulants in both neutralization tanks. Neutralization 2 overflows to a lamella, floc is introduced to the lamella plates at an angle, metals sink to the bottom, and the process splits. An automatic pump will discharge based on the amount of metals that are sinking (i.e., if solids are on top (not sinking), before the pump discharges to Neutralization 3, the automatic process will slow down the discharge Neutralization 3). As the lamella overflows, it discharges to Neutralization 3, where sulfuric acid is added. The pH in Neutralization 3 is set to a pH

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range of 5-9. As a final pH check, Neutralization 3 overflows to Final pH, which sets off a sensor, goes through a filter, and is discharged to "2C" on the Process Flow Diagram. This is the last location prior to discharge to the City.

- There are two pH probes in all neutralization tanks, with sound alarms. Dylan Medlock said these tanks are also checked visually by himself and one additional staff member. There is also an onsite laboratory pH probe that is used to check the probes used in the neutralization tanks.
- When the sludge tower is filled, sludge is sent through a filter press. The decant from the filter press is sent back to the beginning of the Acid Alkaline Treatment.
- Sludge is hauled offsite as needed by Environmental Waste Services.
- Chrome Treatment:
 - The Chrome Treatment process begins with the Chrome EQ Equalization tank. Once wastewater is in the Chrome Treatment process, there is a 716 reducer. This has 2 pH probes and two ORP probes with specific levels to measure the wastewater prior to pumping to Acid Alkaline Treatment. There is a meter in this treatment process to analyze for hexavalent chromium, and ICP that monitors total chrome before discharging to Acid Alkaline Treatment.
 - The wastewater then proceeds through the Acid Alkaline Treatment series prior to being discharged to the City.
- Cyanide Treatment:
 - Cyanide Treatment is the only treatment process that is not staged in the same area as the others. Cyanide Treatment is located behind the gold plating line.
 - There are two stages in Cyanide Treatment. The first stage uses sodium hydroxide and industrial grade sodium hypochlorite to hit certain target ranges, and stay in the target range for 15 minutes before the wastewater will automatically pump to Stage 2.
 - In Stage 2, sodium hypochlorite and sulfuric acid are used to lower the pH. Once the target pH range is met, the wastewater will stay in this stage for 12 – 16 hours before discharging. The holding times can change as needed.
 - Following Stage 2, wastewater is then pumped to Neutralization Tank 1 or Neutralization Tank 2 in Acid Alkaline Treatment, depending on pH range/levels. The wastewater then proceeds through the remaining Acid Alkaline Treatment series prior to being discharged to the City.
- All treatment processes onsite lead to one discharge point, located at the end of the Acid Alkaline Treatment.
- Dylan Medlock told EPA sometimes the Facility will have nitric acid cleaning, which will be discharged through the Acid Alkaline Treatment process.

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Additionally, rinse tank dumps only happen one tank at a time, instead of a full cleaning of the entire system.

- Domestic waste and process wastewater at the Facility is combined prior to connecting to the City sanitary line.
- The wastewater is discharged to the MWRD via the Wheeling Wastewater Treatment Plant.
- **Wastewater Sampling:**
 - Dynomax is required by MWRD to sample the effluent monthly, however, Dynomax chooses to sample internally once a week. If needed, the staff will collect samples more frequently. For each internal sample collected, Dynomax analyzes for zinc, lead, chrome, cadmium, silver, nickel, and copper.
 - Flow at the Facility is measured throughout the process using four (4) water meters.
 - All internal sampling is conducted at 2C (as labeled on Process Flow Diagram), and final pH (before 2C). Dynomax staff told EPA the only difference between the two sampling points is a filter used to remove any remaining floating solids.
 - The weekly samples are collected by onsite staff at Dynomax. The monthly samples are collected by a third party, Admiral Consultants.
 - In addition to the weekly and monthly samples, MWRD collects samples at Dynomax on a quarterly basis. For the quarterly samples, an automatic sampler (owned by MWRD) is brought to Dynomax, and used at the two sampling locations (2C and 1A on the Process Flow Diagram).

Plant Walk Through

Dynomax staff showed EPA and IEPA inspectors the following during the plant walkthrough:

- **Resins for DI Water**
 - DI tanks hold approximately 2,000 gallons of water. (Photo 1).
- **Metal Finishing Area**
 - Spent acid tanks are pumped into the Chrome EQ tank at a rate of 1-2 gallons per minute.
 - Treated cyanide holding tank is a sampling location for internal use.
 - There are three (3) scrubbers, Chrome scrubber, Cyanide Scrubber, and EN scrubber. These discharge to the respective treatment lines.
- **Chrome Treatment**
 - 2 pH probes in Tank 1 and only the holding tank gets agitated.
 - 716 reducer and sulfuric acid pumps.
 - All sump pumps that lead to the Chrome Treatment start at the Chrome Equalization tank (Photo 3).
- **Acid Alkaline Treatment**
 - Once Neutralization 1 overflows, discharges to Neutralization 2, which overflows to Neutralization 3 and final pH.

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- At the time of the Inspection, the wastewater discharging from Cyanide Treatment was pumped to Neutralization Tank 2.
- After Neutralization 2, the floc process begins.
- An HMI system near the Acid Alkaline Treatment controls pumps, readings, limits needed for pH, alarms, etc. This HMI system used is for all treatment processes.
- Dynomax recently received an iPad that has access to the HMI system, allowing the system to be portable. This also allows staff to stop systems if needed from a different location. The system requires a specific login to change settings. (Photo 11).
- At the time of the Inspection, Dynomax staff were refilling chemicals used in the treatment processes. Dynomax staff told EPA the chemicals are not typically stored near the process, but staff were in the middle of refilling the process when EPA arrived for the Inspection. (Photo 12).
- There is clear piping on the top of the Filter Press area for staff to have the ability to check for water flow in case of clogs from solids.
- All sumps are underground pipes within the process line which are piped into the backside of process tanks. Sumps are on the ground which are pumped to applicable treatment process. (Photo 15).
- Dynomax staff said if there is a spill onsite, the spill would flow to the sumps.
- The first rinse tanks are replenished by backflow of the second rinse tanks. The second rinse tanks are replenished by DI water.
- All DI water is controlled by the DI valve. Whenever the DI valve is turned on, there is a constant flow of DI water to the treatment lines.
- Monitoring/recording is kept on a clipboard at the end of AA Treatment. (Photo 16).
- All process lines in the Alkaline Acid Treatment and Chrome Treatment area are surrounded by a cement berm.
- Water Intake Area
- Sampling Location
 - Dynomax showed EPA a sink, which leads to the 1A Manhole (as seen on Process Flow Diagram). 1A is where the process water connects to the domestic discharge. (Photo 19).
- Onsite Laboratory
 - Laboratory sink is discharged to treatment areas.
- Plating Room
 - This room includes gold plating and electroless nickel plating.
 - Cyanide Treatment is located behind the gold plating line.
 - Dynomax staff told EPA that anything discharging to Cyanide Treatment goes through Sump Pit 7 (as seen on Process Flow Diagram). (Photo 23).
 - There is one pit for the electroless nickel plating line, which discharges to Acid Alkaline Treatment. This process is the newest line at the Facility.
- Chemical Storage Area (Photo 24).

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The site walk through ends at 12:08 p.m. CST.

Closing Conference

EPA and Dynomax staff discussed the following:

- At the time of the Inspection, EPA observed the pH buffers in the onsite laboratory. The pH buffers being used were not expired; however, the 7 pH buffer had an expiration date of the following day, February 14, 2024. (Photo 20).
- During the site walk through, there was a floor drain near the water intake meters that was uncapped. At the time of the Inspection, Dynomax staff were not aware of where the floor drain discharged.
- EPA requested these documents to be provided by Dynomax, Inc. following the Inspection:
 - Effective Metropolitan Water Reclamation District of Greater Chicago discharge permit;
 - The last monthly, quarterly, and weekly set of samples (January 2023, Quarter Four of 2024, and most recent weekly internal sample collected by Dynomax); and
 - Flow monitoring documentation.

EPA staff completed the Closing Conference and left the Facility at 12:27 p.m. CST.

Post-Inspection Activities

Atul Mehte provided the following documents to EPA via email on March 13, 2023, and March 14, 2024:

1. Dynomax – Feb 2024 RD-115: *(Monthly Sample)*;
2. Dynomax CU24010558: *(Copper Sample)*;
3. Copy of Wastewater Feb 2024 (002);
4. Xerox Scan_03132024131353 Jan 1: *(Flow Meter Log)*;
5. Xerox Scan_03132024131348 Jan 2: *(Flow Meter Log)*; and
6. Discharge Authorization #27824-15 Dec 2021: *(Industrial User Discharge Permit from MWRD)*.

Records Review

After the Inspection, EPA staff reviewed all documents provided by Dynomax staff. Observations by EPA staff on the provided documents are listed below:

1. Report Date: February 2024 Compliance Report Form, Form RD-115

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- a. There are four sampling locations listed in the report, including 1A, 2A, 3A, and 2C. At the time of the Inspection, EPA was made aware of sampling locations at final pH, 1A, and 2C. It is not clear to EPA where samples are collected for 2A or 3A.
- b. The certified statement at the end of the Continued Compliance Report, Form RD-115 does not include a signature.
- c. February 2024 Compliance Report Form includes Attachment 1: TTO Certification. However, the TTO Certification does not include a signature.

Attachments

- A. Photo Log: Photos taken during U.S. Environmental Protection Agency Inspection of Dynomax, Inc. (February 13, 2024)
- B. Dynomax, Inc. Process Flow Diagram

Dynomax, Inc.
EPA Inspection February 13, 2024
All photos taken by Jennifer Bush, Environmental Scientist, U.S. EPA
Camera: Ricoh WG-4 SR Adventure Proof, Serial No. 3101181



1: RIMG0147

Description: DI water holding tank and resins

Location: Metal Finishing Area – Dynomax, Inc.

Date/Time: February 13, 2024



2: RIMG0148

Description: Treated cyanide waste in left tank, non-cyanide plating waste on right side

Location: Metal Finishing Area – Dynamax, Inc.

Date/Time: February 13, 2024



3: RIMG0149

Description: Chrome equalization tank on left (first tank of Chrome Treatment) and Chrome Treatment Tank, which is pumped to Acid Alkaline Treatment

Location: Chrome Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



4: RIMG0150

Description: Acid Alkaline Treatment tank, all sump pits and Chrome Treatment discharge to this tank

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



5: RIMG0151

Description: Neutralization 1 overview

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



6: RIMG0152

Description: Neutralization 2 in foreground with lamella in background.

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



7: RIMG0153

Description: Overview of floc process, left of Neutralization 2

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



8: RIMG0154

Description: pH readings from Neutralization 1 and Neutralization 2

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



9: RIMG0155

Description: Above final pH overview on left, Neutralization 3 on right

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024

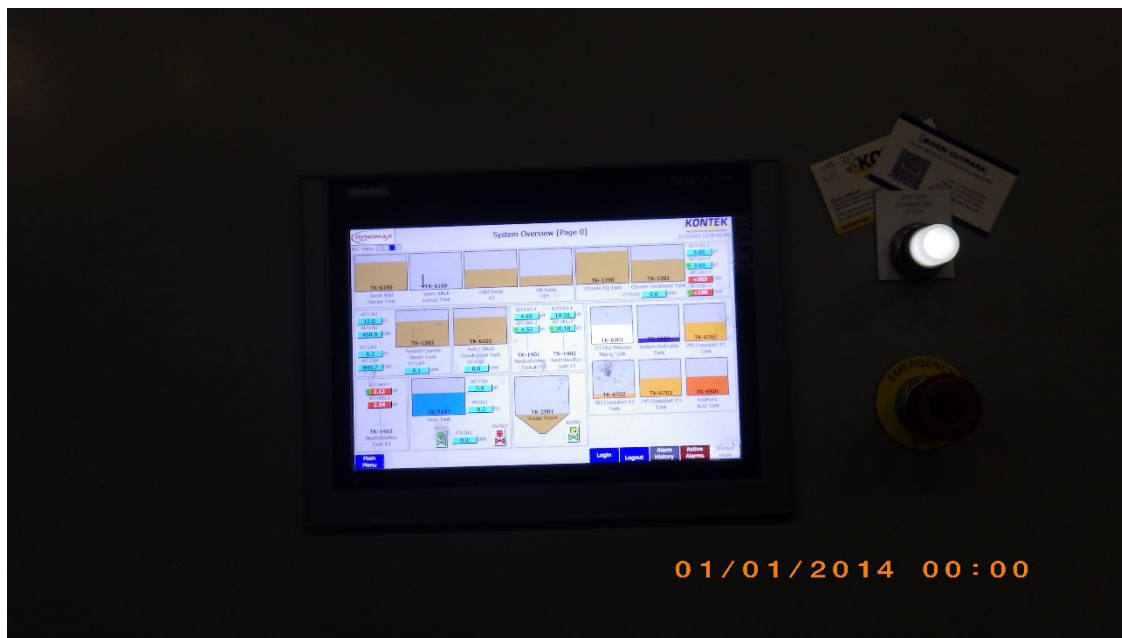


10: RIMG0156

Description: Above sludge tower on right, and Neutraliazation 3 on left

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



11: RIMG0157

Description: HMI system screen overview

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



12: RIMG0158

Description: Chemical refill to Acid Alkaline Treatment, all totes and containers labeled

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



13: RIMG0159

Description: Final pH and flow level with cement berm surrounding area

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



14: RIMG0160

Description: Filter press with clear piping for staff to view water flow

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024

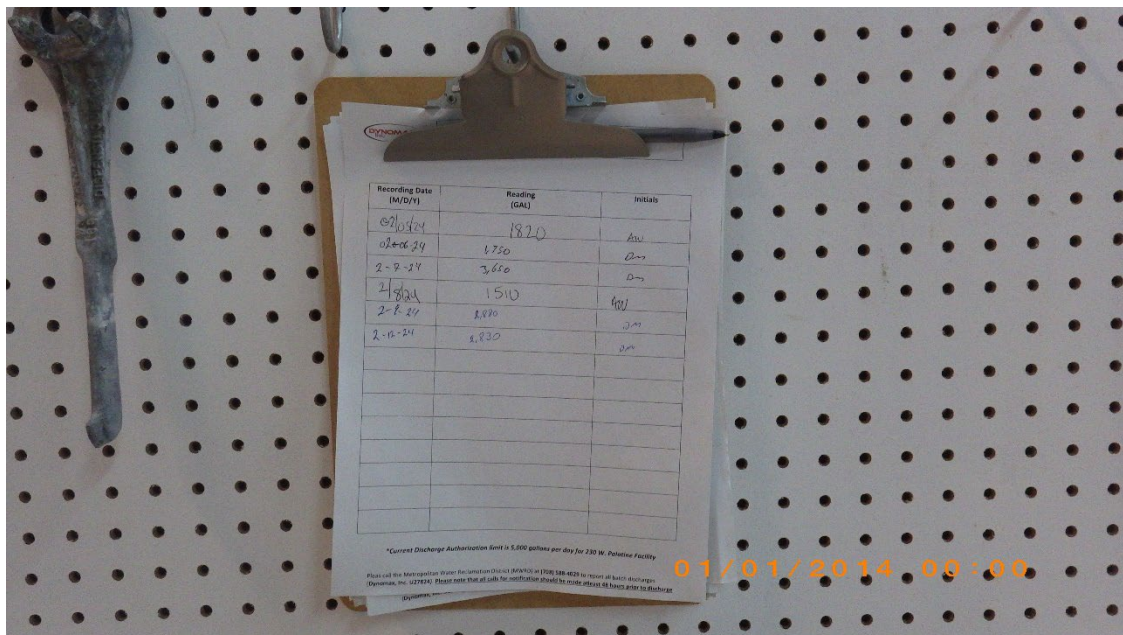


15: RIMG0161

Description: Pipes going to Acid Alkaline Sump Pit 2 (as seen on Process Flow Diagram)

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



16: RIMG0162

Description: Record keeping clipboard

Location: Acid Alkaline Treatment – Dynamax, Inc.

Date/Time: February 13, 2024



17: RIMG0163

Description: Water intake on left, floor drain under white pipe

Location: Water intake – Dynomax, Inc.

Date/Time: February 13, 2024



18: RIMG0164

Description: 2C Tank, after final pH. Sample collection location from grat pipe leading to sink

Location: Metal Finishing Area – Dynomax, Inc.

Date/Time: February 13, 2024



19: RIMG0165

Description: Overview of 2C flow to sink, leading to discharge. Gray pipe used for sample collection.

Location: Metal Finishing Area – Dynamax, Inc.

Date/Time: February 13, 2024



20: RIMG0166

Description: pH buffers in onsite laboratory, 1.68, 4, 7, 10.

Location: Onsite Laboratory – Dynamax, Inc.

Date/Time: February 13, 2024



21: RIMG0167

Description: Cyanide Treatment Stage 3 in foreground, Stage 1 in background

Location: Cyanide Treatment Area – Dynamax, Inc.

Date/Time: February 13, 2024



22: RIMG0168

Description: pH and ORP probes on Cyanide Treatment tank (Stage 2); sample access hole on left

Location: Cyanide Treatment Area – Dynamax, Inc.

Date/Time: February 13, 2024



23: RIMG0169

Description: Sump Pit 7, prior to discharging to Cyanide Treatment. Sump is in containment area under Gold Plating Line.

Location: Plating Room – Dynamax, Inc.

Date/Time: February 13, 2024



24: RIMG0170

Description: Storage area with labels

Location: Storage Area – Dynamax, Inc.

Date/Time: February 13, 2024

Process Flow Diagram for Dynamax Inc.
230 W. Palatine Road, Wheeling, IL 60090

