

Inspection Report: Reichhold LLC 2, Clean Air Act Stationary Source

Facility Name: Reichhold LLC 2

Inspection Date: July 13, 2023

Facility Address: 249 St. Louis Avenue, Valley Park, MO, 63088

ICIS-Air #: MO0000002918901097

Federal Facility: No

NCI: Creating Clean Air for Communities

Facility size: Synthetic Minor

Activity: Partial Compliance Evaluation

State Referral: No

EJ: Yes

NAICS code: 325211 Plastics Material and Resin Manufacturing

Lead Inspector: Steve Rapp, Eastern Research Group, Inc., ("ERG") Inspector, 339-364-4264

Asst. Inspector: Elizabeth Hubbard, ERG Inspector Trainee, 919-468-7894

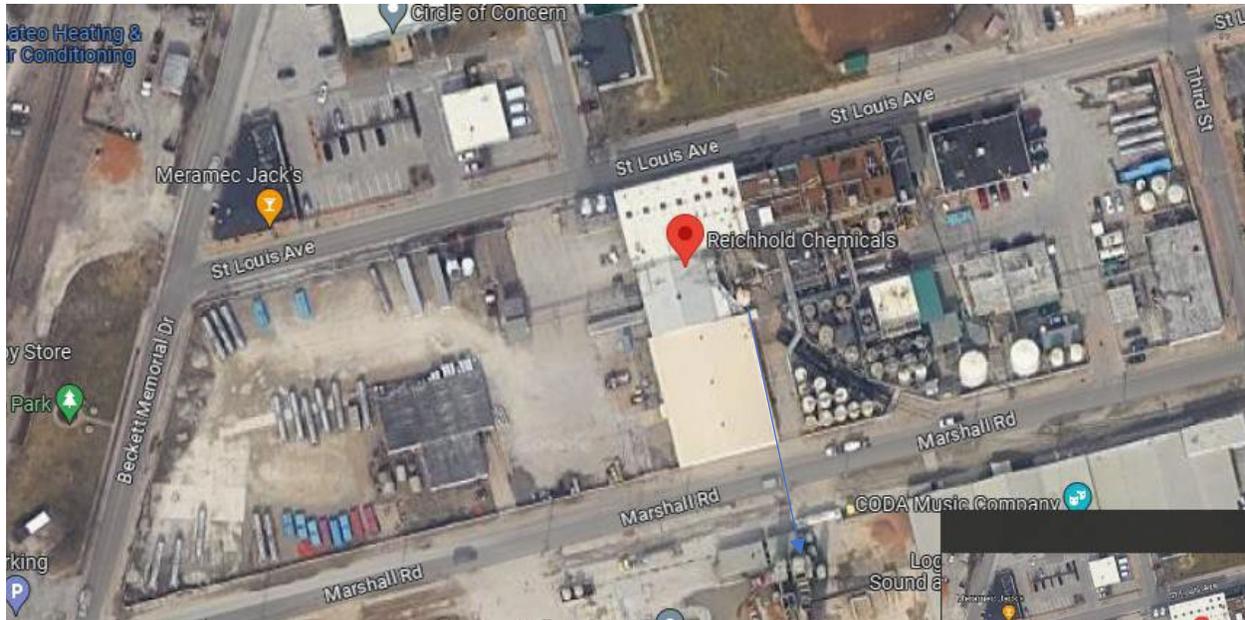
State Inspectors: John McCormick, St. Louis County Department of Public Health

Facility Contact: Michael McCormick, Environmental Health and Safety ("EHS") Manager

1. Plant Description:

Reichhold LLC 2 facility manufactures coating resins for the paint production industry. The resin production operations include mixing, blending, and reacting solid and liquid chemicals. The facility is a major source for volatile organic compounds (“VOCs”) and hazardous air pollutants (“HAPs”) but is limited below the major source thresholds in construction permit #3876 issued by the St. Louis County Air Pollution Control Program. The facility includes 59 storage tanks, six reactor tanks, eight thinning tanks, and 12 mixing tanks devoted to resin production. The facility uses a thermal oxidizer (“TO”) to control odors from the reactor and thinning tanks. There are three boilers, two heaters, a diesel-powered emergency generator and a diesel fire pump on site. All the boilers and heaters operate on natural gas or #2 fuel oil. Two of the boilers are used at any one time. The heaters are used to warm some of the storage tanks, as their contents would solidify at room temperature (both raw materials and finished goods).

Figure 1: Satellite image of the Reichhold facility in Valley Park, MO.



2. Facility Entry

The representatives of the United States Environmental Protection Agency (“EPA”), Steve Rapp and Elizabeth Hubbard from Eastern Research Group, Inc. (“ERG”), arrived at the Reichhold LLC 2 facility at: 249 St. Louis Avenue, Valley Park, MO, (“Reichhold”, or “the facility”), at approximately 8:45 am. Shortly after, the representative from Saint Louis County Department of Public Health, John McCormick, arrived. The ERG and St. Louis County representatives (“the inspectors”) signed in at the security guard station and were directed to the administration building where they were greeted by: Michael McCormick, EHS Manager, and Doug Reed, site manager, for the facility (the “facility representatives”). At approximately 9:00 am, the inspectors and facility representatives met in a conference room for the opening conference. The inspectors presented their identification credentials and provided an overview and scope of the inspection. The inspectors explained that ERG worked as contractors to conduct facility inspections for the EPA. They provided a copy of EPA’s “Small Business Resources Information Sheet.”

3. Opening Conference/Technical Discussion:

The inspectors explained that they were at the facility to conduct a routine Clean Air Act (“CAA”) inspection, including a focus on VOCs and HAPs. The inspectors explained that during the facility walkthrough, they would like to take digital images of the facility’s processes and emission points using a digital point and shoot camera, as well as an optical gas imaging, forward looking infrared (“FLIR”) video camera, model GF320, that were not intrinsically safe. Mr. McCormick explained that there were several areas in the facility areas where there could be a potentially explosive atmosphere and therefore, the inspectors needed a “hot work permit” to take the cameras on the facility tour. He prepared the permit and picked up a gas meter to monitor concentrations in each section of the facility.

The inspectors asked for background information about Reichhold and the facility. The facility representatives explained that the facility currently has approximately 48 employees and operates 24 hours a day, seven days per week. They said that the facility was originally built in 1927 for truck bed manufacturing. Reichhold purchased the site in 1989. The facility makes various types of products, such as urethanes, polyesters, and paint additives and components. The facility receives chemicals by rail, tanker truck, and drums. Some raw materials, including solvents and finished products, are stored in fixed roof tanks. The facility mixes chemicals and uses batch reactor vessels to make products which are then thinned with solvents. Recently, Reichhold was purchased by Polynt Group and the company was in the process of changing names.

The inspectors explained they had questions related to the facility’s 2018 operating permit, the associated Statement of Basis (“SOB”), Emission Inventory Questionnaire (“EIQ”), and related calculations used in compliance reports. The following is a summary of the discussion.

The inspectors noted that the SOB of the 2018 permit does not discuss 40 C.F.R. Part 63, Subparts VVVVVV, the National Emission Standards for Hazardous Air Pollutants (“NESHAPs”) for chemical manufacturing at area sources, BBBB BBB, the NESHAP for area sources in the chemical preparations industry, or CCCCCC, the NESHAP for area sources in paints and allied products manufacturing, as potentially applicable federal standards. They asked if the facility used any raw materials, intermediates, or final products containing any of the HAPs targeted by those regulations¹, such as (but not limited to): 1,3-butadiene; 1,3-dichloropropene; Acetaldehyde; Chloroform; Ethylene dichloride; Hexachlorobenzene; Methylene chloride; Quinoline; Arsenic compounds; Cadmium compounds; Chromium compounds; Lead compounds; Manganese compounds; Nickel compounds; Hydrazine; or Benzene. The facility representatives did not believe that the facility used raw materials or manufactured intermediates or products containing any of the HAPs targeted by those NESHAPs.

The inspectors noted that the SOB to the 2018 operating permit indicated that the actual reported emissions of VOCs were 36.46 tons per year (“TPY”) and 40.56 TPY for 2016 and 2015. Yet, for HAPs, there were no reported values for emissions for the years 2013 – 2017. They noted that the footnote to the table on page SB-2 of the permit stated that, “Although the reported emissions include no values for Hazardous Air Pollutants, the installation did emit Hazardous Air Pollutants during the years 2013 – 2017. The HAPs emissions were reported as VOCs on Form 2T pages of the Emission Inventory Questionnaires

¹ See § 63.11494, § 63.11588, and § 63.11607.

in the applicable years.” Given the table values and footnote, the inspectors asked how Reichhold was calculating the HAP emissions from the facility. The facility representatives said that they were not sure and noted the company filled out the EIQ in-house but that the lead person involved in the calculations historically was not at the facility that day. The inspectors explained that because the total VOCs reported for 2013 - 2017 were all above 25 TPY, depending on the proportion of HAPs in the total VOCs, it appeared possible that HAP emissions could have been greater than the 10 TPY single HAP or 25 TPY total HAPs limits.

The inspectors noted that the SOB of the 2018 permit indicates that for various products, including those involving VOCs and HAPs, some of the settings on conservation vents were “none” or very low, such as 0.5 ounces per square inch (“OSI”). They asked if the facility representatives knew the settings of the conservation vents on the fixed roof tanks and whether there was a leak detection program to check that relief valves were operating correctly. The facility representatives explained that several tanks at the facility were not vented to the TO, including the solvent storage tanks, the finished product storage tanks, and a heated raw material tank, C5. They said the reactors and thinning tanks in the production building were vented to the TO. They explained that for tanks with conservation vents, they measured the pressure in the headspace of each tank and that if the pressure fluctuated outside normal range, they would check and likely replace the valve.

The inspectors noted that the 2018 operating permit did not appear to include any operating parameter limits to ensure that the TO achieves the expected level of control, which Reichhold indicated was 90% reduction of VOCs and HAPs in its permit application submitted to Saint Louis County Department of Public Health on February 21, 2014. The facility representatives said that the TO was designed to control odors from the facility. The inspectors asked if a performance test had been done recently on the scrubber and TO and if the testing included a measurement of capture efficiency. The inspectors explained that control efficiency is the product of both destruction and capture efficiency so it is necessary to measure both to get an accurate assessment of the emissions being treated. The facility representatives were not sure if an emissions or performance test had been performed on the control devices but thought that a performance test might have been done by the vendor after the equipment was installed.

The inspectors asked how the facility was estimating emissions from the outdoor and indoor fixed roof storage tanks that were not vented to the scrubber and TO. The facility representatives indicated that they estimate VOC and HAP emissions using emission factors from EPA’s “Compilation of Air Pollutant Emission Factors” (“AP-42”) and the “Tanks” emissions estimation computer model, as was explained in detail in the facility’s initial Title V operating permit application. The inspectors asked to see a copy of the EIQ for 2022 or the most recent year when the full form was filled out. The inspectors noted that AP-42 emission factors generally represented averages across an industry or equipment category and therefore, were not recommended for compliance calculations because, if tested, actual emissions from approximately half of the sources in the category would be higher than the factor.

The inspectors noted that information found in the National Emissions Inventory, found on EPA’s website, estimates the facility’s HAPs and VOCs for some categories using “engineering judgment.” They asked if the basis for engineering judgment included testing or site-specific emission factors for chemical storage, particularly for the breathing and working losses from fixed roof tanks that stored VOCs and/or

HAPs, such as aromatics, xylenes, and toluene diisocyanate (“TDI”). Similarly, they noted that emissions from other processes appeared to be estimated using engineering judgment, such as alkyd resin product finishing, solvent processing, and thinning. Additionally, they noted that several reported HAP emissions appeared to be based on a ratio (approximately 10%) of VOC, e.g., finished resin storage, microwave solvent recovery, resin thinning tank, resin production reactors, and filtering fugitive emissions. The facility representatives explained that they were not sure of the origin of each factor or what was meant by engineering judgment.

The inspectors asked if the loading of finished goods into trucks was controlled and whether the loading was to the top or bottom of the trucks. The facility representatives explained that the trucks are loaded from the top and the emissions are not controlled. They believed that they used an AP-42 factor to estimate emissions. The inspectors noted that loading from the top of tanks, i.e., “splash loading,” generally resulted in higher emissions than bottom loading.

The inspectors asked how Reichhold estimated VOC and HAP emissions from the wastewater processes at the facility. They noted that they could smell a solvent odor when they parked on the street adjacent to the facility next to two aboveground wastewater tanks.

The inspectors noted that the 2018 operating permit included Permit Condition (EU0030) - 001 that set emission limits for particulate matter of 12.88 pounds per hour from the powder/toner coatings cooling operations and 0.30 grain per standard cubic foot of exhaust gases from the Raw Material Handling System. Given the specific numeric limits, they asked whether the facility had conducted emissions testing to determine compliance with the numeric standards. The facility representatives explained that the processes vent to a scrubber but did not know of any emissions testing of the processes. They said that the powder/toner coatings process was being discontinued at the facility and the equipment was in the process of being dismantled and sent to another factory in Brazil.

The inspectors noted that the 2018 operating permit included Permit Condition (EU0080 and EU0090) - 002 that set an emission limit of 500 parts per million by volume of sulfur dioxide or more than 35 milligrams per cubic meter of sulfuric acid or sulfur trioxide or any combination of those gases averaged on any consecutive three-hour period from the Emergency Generators. Given the numeric limits, they asked whether the facility had conducted emissions testing to determine compliance with the numeric standards. The facility representatives did not know of any emissions testing of the equipment.

4. Facility Tour/Walkthrough:

At approximately 10:00 am, the facility representative led the inspectors on a walk through the facility. The group followed the basic production process, including: the raw materials receiving and storage areas, including the solvent offloading equipment and storage tanks; the production building, including raw material storage tanks, reactors and thinning tanks, filter pods, powder coating line, and product storage; as well as product shipping area. The facility representatives indicated tanks S5 and S6 were being loaded with mineral spirits that day. They also observed the scrubber and TO, however, the facility representatives indicated that the TO was not working that day and was being repaired.

During the facility walkthrough, the inspectors took photographs with a digital camera and videos using the FLIR camera. See the digital image log in Appendix A. Using the FLIR camera, they detected indications of VOC emissions at several locations, including:

- The wastewater storage tanks (see MOV_2725.mp4 and photo DSCN9693.JPG),
- The thermal oxidizer bypass stack (see videos MOV_2726.mp4 and MOV_2727.mp4 and photo DSCN9700.JPG),
- Tanks S5 and S6 storing mineral spirits (see videos MOV_2728.mp4 and MOV_2729.mp4 and photos DSCN9702.JPG and DSCN9703.JPG),
- An open filter pod and filter materials near the powder coatings production area (see videos MOV_2730.mp4 and MOV_2731.mp4 and photos DSCN9710.JPG and DSCN9711.JPG),
- Open-ended lines in the production building (see video MOV_2732.mp4 and photo DSCN9712.JPG),
- A valve on a line connected to thinning tank T7 (see video MOV_2733.mp4 and photo DSCN9720.JPG),
- The hatch on the top of reactor T-110 (see video MOV_2734.mp4 and photo DSCN9736.JPG), and
- A flange on a pipe from Tank T7 to the scrubber (see video MOV_2735.mp4).

At approximately 11:55 am, the group returned to the conference room. The inspectors noted their observations of sources of VOC emissions using the FLIR camera during the walkthrough of the facility.

As a follow-up to the discussion of emissions reporting during the opening conference, the facility representatives showed the inspectors the most recent EIQ and spreadsheet that contained the facility's emissions calculations. They explained that the emission factors used in the EIQ and reports were explained in the original operating permit application, which they showed to the inspectors. They explained that the facility tracks chemicals used at the facility and the usage of each solvent by weight using its "SAP" system. They then multiply the usage by an emission factor. For example, the inspectors looked at the spreadsheet cells used to calculate emissions for January 2022 for xylene storage. To calculate breathing losses (when the tanks are not being filled), it appeared that the facility used a factor of 3.365 pounds of xylene per 1,000 gallons, and to calculate working losses (when the tanks are not being filled), it appeared that the facility used a factor of 0.696 pounds of xylene per 1,000 gallons. The inspectors noted that the breathing loss factor appeared higher than the working loss factor and said they would need to review the calculations more closely to understand why that would be the case.

The inspectors asked what materials were stored in each of the solvent tanks they had observed outdoors. The facility representatives provided the following list:

- S-3: recovered xylene,
- S-4: xylene,
- S-5: mineral spirits,
- S-6: mineral spirits,
- S-8: sec butyl alcohol,
- S-9: toluene,
- B-3: "150 solvent," and
- Tanker rail car: styrene.

The inspectors asked if there were any HAPs in 150 solvent and asked to see a Safety Data Sheet (“SDS”). The SDS indicated the product is: 90 – 100% solvent naphtha (heavy); 5 – 10% naphthalene; 5 – 10% 1,2,3, trimethylbenzene; 5 – 10% 1,2,4 trimethylbenzene; 1 – 5% diethylbenzene; and 1 – 5% cumene. Reichhold’s records indicated that the facility had used approximately 15,000 pounds of the solvent in 2022. The inspectors noted that several of these compounds are HAPs, but the SDS only show ranges of material. They asked how Reichhold calculated the individual HAP emissions from such mixtures. The facility representatives were not sure.

Regarding the VOC emissions observed with the FLIR from the bypass stack of the TO, the inspectors asked to see a few months of downtime records for the TO. They reviewed records for December 2021, January 2022, and February 2022, and noted they showed numerous days when the TO was not functioning. For example, in December 2021, there were approximately 128,000 seconds (34 hours), and in January 2022, 75,000 seconds (20 hours) of downtime of the TO. The facility representatives noted that the downtime included periods when production had not occurred but added that once materials were mixed in the reactor vessels, production could not be stopped if the TO went down. In such cases, they said emissions were sent through the bypass directly to the atmosphere. The inspectors explained that without enforceable conditions in the operating permit for the proper operation of the TO, the facility was not technically required to operate the equipment. They explained that, generally, in these types of situations, if a permit did not include enforceable conditions to test and operate a TO in a manner demonstrated to reduce emissions, reduction from the device would not be considered in determining the facility’s potential emissions, or its compliance with conditions, such as Permit Condition PW001, the annual limits on VOCs and HAPs.

At approximately 12:45 pm, the inspectors took a break.

5. Closing Conference:

At approximately 2:00 pm, the inspectors returned to the facility. They met the facility representatives in the conference room for a closing conference. They thanked the facility representatives for their time and cooperation during the inspection. They explained that EPA would provide Reichhold with an inspection report in approximately 60 days. They explained that the report would be available to the public through the Freedom of Information Act, and therefore, if the company wanted to claim any notes or digital images as confidential business information (“CBI”), they could do so today or within 10 days following the inspection. They provided the facility representatives with EPA’s confidentiality notice form. Mr. Reed signed the form. See Appendix B.

The inspectors summarized the following areas of concern raised during the inspection:

- The inspectors made observations with the FLIR camera that indicated emissions of VOCs from several processes at the facility, including the TO bypass stack, the wastewater storage tanks, Tanks S5 and S6, a filter pod and filter materials near the powder coatings production area, open-ended lines in the production building, a valve on a line connected to thinning tank T7, the hatch on the top of reactor T-110, and a flange on a pipe from Tank T7 to the scrubber. They said that such observations raised questions about the assumptions Reichhold used regarding the degree of

capture of VOC and HAP emissions and the accuracy of emissions calculations reported to MoDNR and EPA. They also noted that leaks in the production areas raise health and safety concerns.

- The inspectors noted that the lack of enforceable conditions in the operating permit regarding the proper operation of the TO raised questions about the assumptions Reichhold uses to calculate the facility's potential to emit and annual emissions of VOCs and HAPs.
- The inspectors noted that they continued to have questions regarding the accuracy of the emission factors used to estimate HAP and VOC emissions from various processes and pieces of equipment at the facility.

The inspectors provided the facility representatives with a copy of a Notice of Preliminary Findings. See Appendix C.

The inspectors departed the facility at approximately 2:30 pm.

6. Appendices

- A. Digital Image Log
- B. Confidentiality Notice Form
- C. Notice of Preliminary Findings Form

Inspection Report Sign-Off

Lead Inspector's Name: Steven Rapp, ERG

X **Steve Rapp** Digitally signed by Steve Rapp
Date: 2023.08.28 14:04:47 -04'00'

Lead Inspector

Assisting Inspector's Name: Elizabeth Hubbard, ERG

X **Elizabeth Hubbard** Digitally signed by Elizabeth Hubbard
Date: 2023.08.28 14:15:33 -04'00'

Assisting Inspector

Supervisor's Name: Tracey Casburn, Air Branch Chief, ECAD

X _____

Supervisor