



STATE OF WASHINGTON  
**DEPARTMENT OF ECOLOGY**

PO Box 47600, Olympia, WA 98504-7600 • 360-407-6000

August 01, 2022

Craig McKinney, Environmental Engineer  
Emerald Kalama Chemical, LLC  
1296 Third Street NW  
Kalama, Washington 98625

**Re: Class 1 Water Quality Inspection on July 22, 2022**

Dear Craig McKinney:

Enclosed is a copy of the report for the non-sampling water quality inspection I conducted at Emerald Kalama Chemical, LLC (Emerald) on July 22, 2022. The purpose of the inspection was to determine Emerald's level of compliance with NPDES permit number WA0000281.

The inspection included a visual examination of the anaerobic treatment system (ANTS); biological treatment (BIOX) plant; other wastewater treatment system units; Outfalls 001, 002 and 003; intake cooling water structure and filter backwash water filters; and portions of the main process area. Emerald appeared to comply with their NPDES permit at the time of the inspection.

Thank you for your time during the inspection. If you have any questions, please contact me at (360) 819-6426 or [greg.gould@ecy.wa.gov](mailto:greg.gould@ecy.wa.gov).

Sincerely,

Gregory Gould, P.E.  
Industrial Section  
Solid Waste Management Program





## Water Quality Compliance Inspection Report Industrial Section

**Facility Name & Address:** Emerald Kalama Chemical, LLC  
1296 Third Street NW  
Kalama, Washington 98625

**NPDES Permit Number:** WA0000281

**Dates of Inspection:** July 22, 2022

**Type of Inspection:** Unannounced Compliance Inspection-Without Sampling

**Time On Site:** 9:47 AM to 11:47 AM

**Areas Evaluated:** Permit, Facility Site Review, Effluent/Receiving Waters, Flow Measurement, Sludge Handling/Disposal, Pretreatment, Pollution Prevention, Stormwater

**Photographs Taken:** No

**Ecology Representatives:** Greg Gould (Lead Inspector), Sarah Penfield

**Facility Representatives:** Phil Oyer, Environmental Manager, (360) 673-0305  
Craig McKinney, Environmental Engineer, (360) 673-0285  
Mitch Louis, IPW Supervisor, (360) 673-2550  
Chris Culp, HS&E Manager, (360) 673-0203  
Galen Hathcock, Site Director, (360) 673-0304

**Report by:** Greg Gould

**Supervisor Approval by:** Shingo Yamazaki

**Report Date:** August 01, 2022

Sarah Penfield and I arrived at Emerald Kalama Chemical, LLC (Emerald) at 9:47 AM on July 22, 2022 for an unannounced Class 1 (non-sampling) water quality inspection and site visit. We met with Phil Oyer, Craig McKinney, and Mitch Louis who accompanied us during the inspection, which included a visual examination of the anaerobic treatment system (ANTS); biological treatment (BIOX) plant; other wastewater treatment system units; Outfalls 001, 002 and 003; intake cooling water structure and filter backwash water filters; and portions of the main process area. I discussed the findings of the inspection with Phil Oyer, Craig McKinney, Chris Culp, and Galen Hathcock exited the facility at 11:47 AM.

## Site Background

Emerald owns a 155-acre property on the Columbia River near the town of Kalama, Washington. The facility is on the northern end of the Kalama Industrial Park, bounded at the north by a man-made wetland, west by the river, and east by Interstate 5. Emerald is a manufacturer of organic chemicals. The chemical plant operates 24 hours a day, 7 days a week. Using toluene as the raw material, the plant produces an estimated 170,000 tons of chemicals per year. The products include benzoic acid, benzaldehyde, benzyl alcohol, benzyl amine, sodium and potassium benzoate, cinnamic aldehyde, dibenzyl amine, benzyl acetate, benzyl salicyclate, and Lilience®. The products are used in food preservatives, fragrances, perfumes, adhesives, resins, coatings, dyes, detergents, sunscreens, and solvents.

The facility has a National Pollutant Discharge Elimination System (NPDES) permit, number WA0000281, for the discharge of treated wastewater and non-contact cooling water into the Columbia River. The NPDES permit became effective on March 1, 2021 and expires on February 28, 2026.

## Description of Wastewater Treatment Plant

The wastewater treatment plant (WWTP) consists of a flow equalization system, ANTS plant, and BIOX plant. The system can treat up to 400 gallons per minute (gpm) of wastewater, including contaminated groundwater from the North and West Impacted Areas, stormwater from process and non-process areas, process wastewater, and laboratory wastewater.

### ***Flow Equalization System***

The flow equalization system is comprised of numerous collection and equalization tanks within each of the main process areas. Alarm systems are set up on many of the equalization tanks to ensure that the WWTP operates as designed. Emerald uses two Modu-tanks to store and equalize wastewater before treating the wastewater.

### ***Anaerobic Treatment System (ANTS)***

The ANTS provides pretreatment for acid wastewater from the benzoic acid processes and the wastewater generated during production of hexyl cinnamic aldehyde. The system consists of three digesters and two clarifiers. The system is designed for a chemical oxygen demand (COD) loading of 28,000 pounds per day and a maximum flow of 50 gpm. Emerald pumps the ANTS effluent to tank T-22 and surge tank T-90. T-22 and T-90 also hold wastewater from the American Petroleum Institute (API) oil/water separator. Wastewater from the tanks flows to the BIOX plant.

### ***Biological Treatment Plant (BIOX)***

The BIOX plant consists of two aeration tanks, three clarifiers, and a digester unit. Wastewater enters aeration tank T-91A and then aeration tank T-92. The tanks contain blowers for air sparging. The optimum temperature of wastewater in T-91A is from 24 to 26 degrees Celsius (°C).

Wastewater in T-92 overflows to two secondary clarifiers, T-96 and T-96A, which operate in parallel. Each clarifier has an apparatus to skim floating sludge and deposit it in a sump, where it is pumped back to T-91A. The clarifier bottoms are returned back to T-91A as recycled activated sludge. Flows from the top of the clarifiers enter the third “polishing” clarifier T-93. Operators can maintain constant hydraulics to the system by pumping T-93 bottoms back to aeration tank T-91A as needed. Employees monitor the depth to the sludge surface in the clarifiers daily to maintain an optimal depth of 10 to 12 feet.

The BIOX plant is designed to handle a COD loading of 5,000 pounds per day. Staff sample T-91A feed twice a day for COD. They also monitor for ammonia, phosphorus, and mixed liquor suspended solids. Emerald controls the COD and hydraulic loading to the plant through routine sampling and uses weir boxes to double-check flow rates to T-91A.

Emerald adds polymers to the clarifiers as a flocculant. A higher molecular weight polymer is added to the sludge in the SOMAT sludge press to improve de-watering. During the day and night shifts, staff take water samples from the aeration tanks, clarifiers, and the final effluent. Operators visually compare the sample jars and check for solids coagulation.

### ***Sludge Management***

Waste sludge (called industrial wastewater biological solids) from the BIOX plant clarifiers (T-96 and T-96A) flows to the sludge holding tank and then to a SOMAT unit. The SOMAT dewateres the waste sludge to about 7 to 10 percent solids. Water removed by the SOMAT returns to aeration tank T-91A. Ecology and the EPA recently approved a petition from Emerald to delist the industrial wastewater biological solids as hazardous waste. The approvals state that Emerald must send the delisted sludge to a solid waste landfill.

## Site inspection

### ***Wastewater Treatment System***

We inspected the API oil/water separator. Phil Oyer said Emerald cleans out the solids from the API oil/water separator approximately once per year and manages the solids as dangerous waste. I noted no issues with the API oil/water separator at the time of inspection.

We observed the ANTS and Phil Oyer described the wastewater process. Phil Oyer said that at the time of inspection, digester T-86 was offline for inspection. I noted no issues with the ANTS at the time of inspection.

We observed the BIOX and Phil Oyer described the wastewater process. We inspected aeration tank T-91A and the weir boxes. We viewed the following weir boxes (WB):

- WB T-103B - Untreated wastewater flow from Modu-tank T-103B
- WB T-22 – Main feed (includes ANTS plant effluent and API oil/water separator effluent)
- WB T-96 RAS - Bottoms from clarifier T-96
- WB T-96A RAS - Bottoms from clarifier T-96A
- WB T-93 - Bottoms from clarifier T-93.

We observed clarifier T-96A. I noted a few solids floating on the surface of the water, which Phil Oyer stated was normal. I observed the clarifier overflow water was clear. Mitch Louis stated that staff clean the algae along the outside of the clarifier about once per week in the summer. At the time of the inspection, the SOMAT was running. We observed the SOMAT screw press that dewateres the industrial wastewater biological solids. I noted no issues with the BIOX at the time of inspection.

We inspected the Modu-tanks T-103A and T-103B. Modu-tank T-103B had some water, Modu-tank T-103A was empty, and both tanks appeared to be operating properly. Mitch Louis said that staff check the leak detection ports in both Modu-tanks once every day. Phil Oyer said that Modu-tank T-103B is scheduled to be inspected in the next two years, and Modu-tanks are on a 5-year inspection cycle.

### ***Outfalls***

The outfalls and sampling stations are near the intake pump house by the Columbia River. Monitoring Point 002, which is BIOX effluent, flows through a weir box before entering a mixing basin. At the time of the inspection, the BIOX effluent was clear.

An automated composite sampler normally collects 500 mL/hour from the Monitoring Point 002 weir box. The compositor unit also has a refrigerator to cool the sample. The digital thermometer in the refrigerator was 5.2°C (below the required 6.0°C) and Emerald has the thermometer calibrated every year. The flow and pH at Monitoring Point 002 were 229 gpm and 8.24 standard units. There is no effluent limit on flow, but the design criteria limit is 400 gpm. Emerald's Monitoring Point 002 pH discharge limit is between 6.0 and 9.0 standard units.

The treated process wastewater from Monitoring Point 002 combines with non-contact cooling water in the mixing basin and Emerald discharges it through Outfall 001 to the Columbia River through a submerged diffuser port. At the time of the inspection, the mixing basin appeared clear, had no odor, and no debris. In addition, the temperature at Outfall 001 fluctuated around 32.5°C, which was below the permit limit of 40.7°C.

Outfall 003 is rarely used. Any discharge through Outfall 003 goes to the adjacent wetland. Discharge to this outfall only occurs in the situation where the holding capacity of the berm enclosing tanks T-70 and T-71 is exceeded during heavy rain. The last time Emerald discharged to Outfall 003 was in January 2002.

I noted no issues with the Monitoring Point 002, mixing basin, and Outfall 003 at the time of inspection.

### ***Intake Cooling Water Structure and Filter Backwash Water Filters***

We inspected the intake pump house, which includes the traveling screens and pumps, from a distance because Phil Oyer said staff were cleaning the traveling screens at the time of inspection. We also inspected the filter backwash water filters, which are located just north of the intake pump house. Phil Oyer described the sampling locations and flow measurement locations Emerald used for the NPDES permit required Filter Backwash Water Characterization Study. At the time of inspection, Emerald was discharging water through Outfalls 010 and 011 (filter backwash discharges). I noted no issues with the intake cooling water structure and filter backwash water filters at the time of inspection.

### ***Process Areas***

Phil Oyer explained that Emerald routes all stormwater that falls within the process area to the API oil/water separator. In addition, we inspected the dry well area in the product storage lot near the east gate. Phil Oyer described Emerald's process for sampling stormwater at one dry well. From the office, Phil Oyer and Mitch Louis showed me a screen listing out 15 heat exchangers and their corresponding pressure values. Mitch Louis explained that each heat exchanger has its own operating pressure and unique alarm pressure. Mitch Louis stated that if an alarm goes off, Emerald must take corrective action to right the issue. Phil Oyer explained that Emerald must test for toluene in the Outfall 001 effluent to evaluate if organics are leaking

into the non-contact cooling water system from the heat exchangers. Phil Oyer stated that if the pressure drops too low, organics will enter the non-contact cooling water and will discharge to the Columbia River. I noted no issues with the stormwater collection system in the process area, dry well area, and heat exchangers at the time of inspection.

## Conclusion

Emerald appeared to comply with their NPDES permit at the time of the inspection.