Fact Sheet for NPDES Permit WA0991024

Solvay Chemicals, Inc.

August, 23, 2019

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for Solvay Chemicals, Inc. (Solvay).

This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for Solvay, NPDES permit WA0991024, are available for public review and comment from August 27, 2019 until September 27, 2019. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement Information**.

Solvay reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility's location, history, discharges, or receiving water prior to publishing this draft fact sheet for public notice.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as **Appendix E - Response to Comments**, and publish it when issuing the final NPDES permit. Ecology generally will not revise the rest of the fact sheet. The full document will become part of the legal history contained in the facility's permit file.

Summary

Solvay operates a hydrogen peroxide manufacturing plant in Longview, Washington near the northern shore of the Columbia River. Historically Solvay received raw treated water and wastewater treatment services from the Kraft pulp and paper mill (Nippon Dynawave Packaging Company, LLC) located south of Solvay. The discharge of process wastewater to the Nippon Dynawave Packaging Company, LLC (Nippon Dynawave) Industrial Wastewater Treatment Plant was permitted under State Waste Discharge (SWD) Permit ST0006070.

Solvay proposes to discharge process wastewater to the Three Rivers Regional Wastewater Authority (TRRWWA) Wastewater Treatment Plant. Solvay also proposes to discharge reverse osmosis reject water, cooling tower blowdown water, and filter backwash to the Consolidated Diking Improvement District (CDID) Number 1's Ditch Number 5.

Ecology is proposing to issue a NPDES Permit to Solvay for the discharges described above. This NPDES Permit includes the SWD permit requirements for discharges to publicly owned treatment works (POTWs). This permit will include an allowance for Solvay to discharge to Nippon Dynawave's Industrial Wastewater Treatment Plant. The NPDES Permit includes discharge limits, monitoring, and reporting requirements for the discharge of process wastewater to the receiving treatment plant (TRRWA or Nippon Dynawave) and for the discharge to CDID Ditch #5.

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I. Introduction

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the state of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The Legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations apply to industrial NPDES permits:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC)
- Water quality criteria for surface waters (chapter 173-201A WAC)
- Water quality criteria for ground waters (chapter 173-200 WAC)
- Whole effluent toxicity testing and limits (chapter 173-205 WAC)
- Sediment management standards (chapter 173-204 WAC)
- Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC)

These rules require any industrial facility owner/operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for performance requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050). (See **Appendix A-Public Involvement Information** for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in **Appendix E**.

II. Background Information

Table 1 General Facility Information

Facility Information	
Applicant	Solvay Chemicals, Inc.
Facility Name and Address	Solvay Chemicals, Inc. 3500 Industrial Way Longview, Washington 98632
Contact at Facility	Name: Duke Spencer Telephone #: 360-636-7797
Responsible Official	Name: Robert May Title: Vice President
Industrial User Type	Other Significant Industrial User
Industry Type	Hydrogen Peroxide Manufacturing
Type of Treatment	Settling, oil-water separator, pH adjustment
SIC Codes	2819
NAIC Codes	325180
Facility Location (NAD83/WGS84 reference datum)	Latitude: 46.1369 Longitude: -122.9808
Treatment Plant(s) Receiving Discharge	Three Rivers Regional Wastewater Authority (TRRWA) Wastewater Treatment Plant Nippon Dynawave Packaging Company, LLC (Nippon Dynawave) Industrial Wastewater Treatment Plant
Discharge Waterbody Name and Location (NAD83/WGS84 reference datum)	Consolidated Diking Improvement District (CDID) Number 1, Ditch Number 5, Outfall 002 Latitude: 46.1354 Longitude: -122.983 TRRWA Wastewater Treatment Plant, Outfall 001A

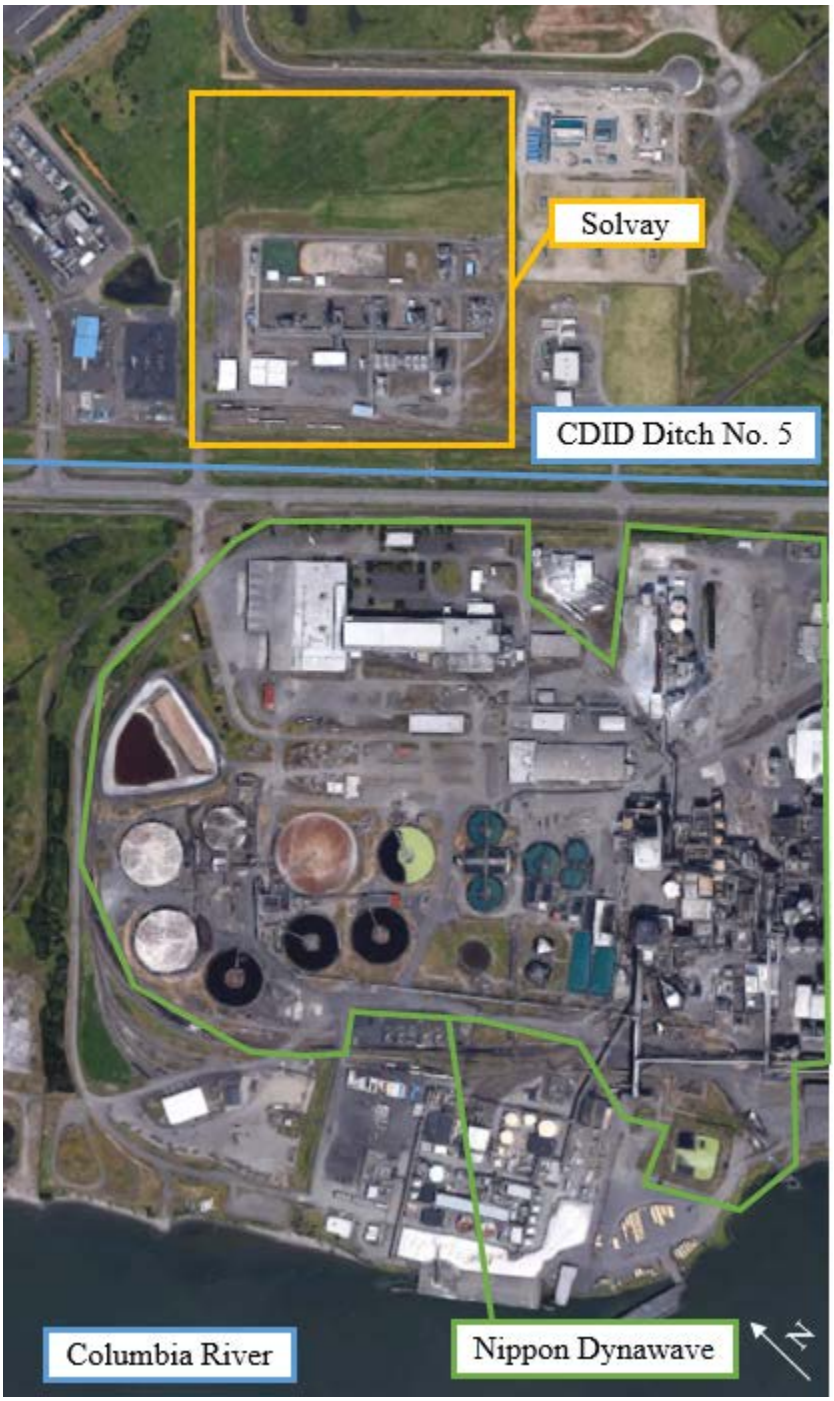
Facility Information	
	Latitude: 46.139482 Longitude: -122.981183 Nippon Dynawave Industrial Wastewater Treatment Plant, Outfall 001B Latitude: 46.135739 Longitude: -122.982717

Permit Status	
Renewal Date of Previous Permit	September 11, 2014
Application for Permit Renewal Submittal Date	April 4, 2019 June 28, 2019 (revision)
Date of Ecology Acceptance of Application	July 10, 2019

Inspection Status	
Date of Last Non-sampling Inspection	March 7, 2019

Figure 1 Facility and Receiving Treatment Plants Map

Figure 2 Facility Location Map



A. Facility Description

History

Solvay Chemicals, Inc. (Solvay) operates a hydrogen peroxide manufacturing plant in Longview, Washington. The facility was constructed in 1988 and began operations in 1989. Expansions of the facility occurred in 1991 and 1995. In 1993 a steam methane reformer was installed to produce hydrogen for the manufacturing process. In 2016 Solvay completed the Titan Project, which included the installation of a second steam methane reformer. Historically Solvay purchased treated raw water from the Kraft pulp and paper mill (Nippon Dynawave Packaging Company, LLC, formerly and Weyerhaeuser NR Company) located on the southern side of Industrial Way. Nippon Dynawave Packaging Company, LLC (Nippon Dynawave) also accepted Solvay's process and sanitary wastewaters for treatment at the industrial wastewater treatment plant and sanitary wastewater treatment plant.

Solvay has constructed a reverse osmosis (RO) system to treat groundwater for use in the manufacturing process rather than purchase treated raw water from Nippon Dynawave. Solvay is proposing to send process wastewater to the Three Rivers Regional Wastewater Authority (TRRWA) wastewater treatment plant in addition to Nippon Dynawave's industrial and sanitary wastewater treatment plants.

TRRWWA has agreed to accept a portion of the process wastewater from Solvay. Solvay proposes to discharge RO reject water and cooling tower blowdown water to the Consolidated Diking Improvement District (CDID) Number 1's Ditch Number 5. The discharge to CDID Ditch #5 classifies Solvay as a minor discharger.

Industrial Processes

Solvay operates approximately 24 hours a day, 7 days a week, for 51 weeks a year. The hydrogen peroxide manufacturing process is a continuous closed loop process. In the process, an organic working solution is hydrogenated in the presence of a metal catalyst and then oxidized. The result is hydrogen peroxide, which is soluble in water and removed from the working solution. Following the hydrogen peroxide extraction, the working solution returns to the hydrogenation reactor and the process is repeated. The hydrogen used in the process is produced on-site by two steam-methane reformers with supplemental hydrogen being supplied from a local chemical facility. Much of the hydrogen peroxide product is distilled to produce higher product strengths. The hydrogen peroxide is stored onsite and loaded into trailers, railcars, or shipped by pipeline to customers in concentrations ranging from 35% to 70%. Process wastewater generated during the production of hydrogen peroxide, including stormwater from process areas, will be discharged to a treatment plant (TRRWA or Nippon Dynawave) for further treatment prior to discharging to the Columbia River.

Solvay has installed and will operate a RO system to treat groundwater onsite for use in the manufacturing process. The RO system consists of two groundwater pumps, a filtration system, chemical addition, and the RO treatment unit. RO reject water, filter backwash, and cooling tower blowdown will be discharged directly to CDID Ditch #5.

Wastewater Treatment Processes

Process wastewater, boiler blowdown wastewater, wash water, and stormwater from process areas are treated prior to being discharged to the receiving treatment plant (TRRWA or Nippon Dynawave). Treatment includes a settling tank, an oil-water separator, and continuous pH adjustment.

RO reject water will continuously flow to a holding tank. Filter backwash water will intermittently flow to the holding tank. The combined RO reject water and filter backwash will be pumped and combined with cooling tower blowdown water prior to discharging via Outfall 002 to CDID Ditch #5.

Solid Wastes

The effluent settling tank is used to separate the organic working solution from the waste stream. Solids are not settled in the effluent settling tank. The stormwater pond, which is used for stormwater from process areas, does not typically accumulate solids due to a low level of solids entering the pond. Solids in the stormwater pond are monitored visually and removed as needed.

Discharge Outfalls

Solvay proposes to continuously discharge effluent from the RO system and the cooling tower blowdown into CDID Ditch #5 through a 3-inch pipe with a 6-inch nozzle which will terminate approximately 1 foot above the high water line. This proposed discharge outfall utilizes the current demineralized water line which brings process water to Solvay from Nippon Dynawave's raw water filter plant.

Solvay proposes to install a new discharge line to connect to the City of Longview's sewer collection system. The discharge line will run northeast on Solvay's property and connect to the City of Longview's collection system at Weber Avenue.

Figure 3 Outfall Location Map

B. Description of the Receiving Water

Solvay proposes to discharge to CDID Ditch #5. Other nearby point source outfalls include stormwater discharges from Solvay's non-process areas, along with stormwater discharges from the following industrial facilities: Puget Sound Energy Mint Farm Generating Station, Nippon Dynawave, Weyerhaeuser NR Company, Flexible Foam Products, Inc., Longview Auto Wrecking, All Out Industrial & Environmental Services, and Millennium Bulk Terminals Longview, LLC. Significant nearby non-point sources of pollutants include urban stormwater runoff.

The ambient background data used for this permit includes the following from Longview Ditches Study (1992):

Table 2 Ambient Background Data

Parameter	**Value Used**
pH (Maximum / Minimum)	6.9 standard units 6.6 standard units
Temperature	15.5 °C
Total Ammonia-N	0.55 mg/L
Turbidity (50^{th} Percentile, 75^{th} Percentile)	61.5 NTU 70 NTU
Hardness	106 mg/L as $CaCO_3$
Chloride	10.9 mg/L
Iron	17,100 µg/L
Nitrate/Nitrite	0.021 mg/L
Conductivity	320 µmhos/cm
Total Suspended Solids (TSS)	60 mg/L
Zinc	41.7 µg/L

C. Wastewater Characterization

Solvay reported the concentration of pollutants in the discharge in the permit application for the discharge from Outfall 001 (Outfall 001B in the proposed permit) and in discharge monitoring reports. The tabulated data represents the quality of the wastewater effluent discharged from October 2014 through May 2019. The discharge from proposed Outfall 001A is expected to have the same quality as the discharge from historical Outfall 001, with the exception of pH and flow rate. The pH from Outfall 001A is expected to be in the range of 6.0 to 9.0 standard units. Solvay reported in the permit application a maximum average monthly wastewater discharge flow of 142,555 gallons per day from Outfall 001A. The permit application also specified a typical daily flow rate of approximately 76,250 gallons per day from Outfall 001A.

The wastewater effluent for Outfall 001 is characterized as follows:

Table 3 Wastewater Characterization – Outfall 001

Parameter	Units	# of Samples	Average Value	Maximum Value
Antimony, Total	µg/L	1	0.219	0.219
Arsenic, Total	µg/L	1	1.04	1.04
Cadmium, Total	µg/L	1	0.28	0.28
Chromium, Hexavalent, Total	µg/L	1	59.0	59.0
Chromium, Total	µg/L	1	40.4	40.4
Copper, Total	µg/L	1	3.96	3.96
Lead, Total	µg/L	1	0.189	0.189
Nickel, Total	µg/L	1	12.7	12.7
Zinc, Total	µg/L	1	33.7	33.7
Cyanide, Total	µg/L	1	6.3	6.3
Total Phenols	µg/L	1	658	658
Flow Rate	Gallons per Day	Continuous	96,106	236,183

Parameter	Units	# of Samples	Minimum Value	Maximum Value
pH	standard units	Continuous	5.2	11.7

Solvay reported the expected concentration of pollutants in the discharge in the permit application for the proposed discharge from Outfall 002. The typical average flow rate is expected to be 173,040 gallons per day, with an estimated projected average flow rate of 210,190 gallons per day. The wastewater effluent from Outfall 002 is characterized as follows:

Table 4 Wastewater Characterization – Outfall 002

Parameter	Units	Estimated Typical Value
Barium, Total	mg/L	0.06
Calcium, Total	mg/L	161
Iron, Total	mg/L	3.4
Magnesium, Total	mg/L	46.0
Manganese, Total	mg/L	1.6
Nickel, Total	mg/L	0.03
Phosphorus, Total	mg/L	1.4
Potassium, Total	mg/L	19
Silicon, Total	mg/L	79
Silica, Total	mg/L	193
Sodium, Total	mg/L	49
Strontium, Total	mg/L	0.46
Total Hardness as $CaCO_3$	mg/L	592
Fluoride, Total Soluble	mg/L	0.69
Chloride, Total	mg/L	243
Bromide, Total	mg/L	0.14

Parameter	Units	Estimated Typical Value
Sulfate, Total	mg/L	4.6
Total Dissolved Solids (TDS)	mg/L	881
Arsenic, Total	mg/L	0.018
Total Organic Carbon (TOC)	mg/L	1.7
Ammonia, Total (as Nitrogen)	mg/L	1.3
Phosphate, Total	mg/L	2.3
Alkalinity, Total as $CaCO_3$	mg/L	365
Beta, Total	pCi/L	5.5

Parameter	Units	Estimated Minimum Value	Estimated Maximum Value
pH	standard units	6.4	7.6

D. Summary of Compliance with Previous Permit Issued

The previous permit placed effluent limits on pH. Solvay has consistently complied with the effluent limits. Solvay has consistently complied with the permit conditions throughout the duration of the permit issued on September 11, 2014, with a few exceptions noted below. Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on inspections.

The following table summarizes the violations that occurred during the permit term.

Table 5 Violations

Date	Parameter	Violation
12/31/2015	Effluent Characterization: Cyanide, Total Phenolic Compounds, Priority Pollutants (PP) – Total Metals, PP – Volatile Organic Compounds, PP – Acid-Extractable Compounds, PP – Base-Neutral Compounds, PP – Dioxin, PP – Pesticides/PCBs	Analysis Conducted Late
4/1/2019	Permit Renewal Application	Late Submittal

The following table summarizes compliance with report submittal requirements over the permit term.

Table 6 Permit Submittals

Submittal Name	Due Date	Received Date
Non-Routine Discharge	n/a	11/6/2014
Non-Routine Discharge	n/a	11/13/2014
Notice of Change in Authorization	n/a	3/10/2015
Spill Control Plan	4/1/2015	4/1/2015
Slug Discharge Control Plan Update or Certification	4/1/2015	4/1/2015
Notice of Change in Authorization	n/a	7/19/2016
Non-Routine Discharge	n/a	8/3/2016
Application for Permit Renewal	4/1/2019	4/5/2019

E. State Environmental Policy Act (SEPA) Compliance

State law exempts the issuance, reissuance or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions that are no less stringent than federal and state rules and regulations (RCW 43.21C.0383). The exemption applies only to existing discharges, not to new discharges.

To meet the intent of SEPA, new discharges must undergo SEPA review during the permitting process. The facility filed a SEPA checklist with Ecology on April 5, 2019 for the new discharge from Outfall 002. Ecology issued a determination of non-significance for the project on August 27, 2019.

III. Proposed Permit Limits

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).

Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the National Toxics Rule (40 CFR 131.45).

Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Ecology does not usually develop limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent [40 CFR 122.42(a)]. Until Ecology modifies the permit to reflect additional discharge of pollutants, a permitted facility could be violating its permit.

A. Design Criteria

According to WAC 173-220-150 (1) (g), neither flows nor waste loadings may exceed approved design criteria. However, Ecology does not have an engineering report that specifies the design criteria for the wastewater pretreatment system or the RO reject and cooling tower blowdown systems at this facility.

B. Technology-Based Effluent Limits

Ecology must ensure that facilities provide all known, available, and reasonable methods of prevention, control, and treatment (AKART) when it issues a permit for discharges to waters of the state. Technology-based limits and AKART requirements for each outfall are described further in the sections below.

Process Wastewater Discharge to TRRWA (Outfall 001A)

Federal and state effluent guidelines apply to discharges to publicly owned treatment works (POTWs). TRRWA is a POTW, as defined in 40 CFR Part 403 and Chapter 173-216 WAC. The federal categorical limits for hydrogen peroxide manufacturing are included in 40 CFR Part 415, Subpart I. No pretreatment standards have been established for this subpart. Therefore, only the general pretreatment standards apply to the discharge from Solvay to TRRWA wastewater treatment plant. The general pretreatment standards, included in 40 CFR Part 403 and Chapter 173-216 WAC, include pH limitations of 5.0 – 11.0 standard units. These pH limits have not been included in the proposed permit because TRRWA has developed more stringent local limits which are discussed further in the next section. AKART for this discharge has been determined to be continuous chemical treatment to meet the local limits for pH and the use of a settling tank for high solids waste streams and an oil-water separator.

Process Wastewater Discharge to Nippon Dynawave (Outfall 001B)

Federal effluent guidelines do not apply to facilities discharging to a privately-owned industrial wastewater treatment facility. AKART for this discharge has been determined to be chemical treatment to neutralize pH within the permitted range, the use of a settling tank for high solids waste streams, and an oil-water separator. The following permit limits are necessary to meet the AKART requirements and were established based on historical performance and the ability of the receiving treatment plant to treat wastewaters within the permitted range:

Table 7 Technology-Based Limits – Outfall 001B

Parameter	Daily Minimum	Daily Maximum
pH	4.0 standard units	12.2 standard units

Cooling Tower Blowdown and RO Reject Water Discharge (Outfall 002)

The proposed discharge from Outfall 002 includes continuous streams of RO reject water and cooling tower blowdown, and intermittent discharges from filter backwash. The waste streams will combine prior to discharge, with 78.8% of the total waste stream from RO reject water, 11.5% from cooling tower blowdown, and 9.7% from filter backwash. Solvay uses chemicals in the RO system and the cooling tower to prevent bacterial growth and fouling of the RO membrane. Ecology has determined that AKART for the discharge is optimized use of treatment chemicals to prevent significant amounts of treatment chemicals in the discharge and the use of a holding tank for RO reject water and filter backwash water.

Ecology's NPDES General Permit for Water Treatment Plant discharges (2019) was developed for discharges primarily from municipal water treatment plants that utilize filter systems. One of the main sources of discharge is filter backwash. The General Permit developed technology-based limits for total suspended solids (TSS).

Cooling tower blowdown discharges at other industrial facilities were reviewed to determine typical levels of total residual chlorine (TRC). Many of the reviewed facilities have water quality-based effluent limits for TRC. The facilities reviewed which have technology-based effluent limits for TRC were electric power generation facilities. These facilities have federal effluent limitation guidelines developed for free available chlorine specifically for the discharge of cooling tower blowdown. Due to the similar discharge characteristics, technology-based limits for TRC were developed based on the technology-based limits for the reviewed facilities. Water quality-based limits were also developed for the discharge. The water quality-based limits are more stringent than the technology-based limits. The technology-based limits have been included in the proposed permit as interim limits, which will be in effect for the first two years of the permit.

Technology-based limits for pH were developed based on Ecology's NPDES General Permit for Water Treatment Plant Discharges (2019) and the technology-based limits included in NPDES permits for facilities with cooling tower blowdown discharges. The discharge from Outfall 002 will consist primarily of cooling tower blowdown and RO reject water, with an intermittent portion resulting from filter backwash.

The following technology-based effluent limits were developed to ensure the discharge meets the AKART requirements:

Table 8 Technology-Based Limits – Outfall 002

Parameter	Average Monthly Limit	Maximum Daily Limit
Total Suspended Solids (TSS)	30 milligrams per liter (mg/L)	45 milligrams per liter (mg/L)
Chlorine, Total Residual	0.2 mg/L	0.5 mg/L

Table 9 Technology-Based Limits – Outfall 002

Parameter	Daily Minimum	Daily Maximum
pH	6.0 standard units	9.0 standard units

C. Effluent Limits Based on Local Limits – Outfall 001A

To protect TRRWA wastewater treatment plant and the City of Longview's sewer collection system from pass-through, interference, concentrations of toxic chemicals that would impair beneficial or designated uses of sludge, or potentially hazardous exposure levels, Ecology believes it necessary to impose limits for certain parameters. Ecology based these limits on local limits established by TRRWA and the City of Longview and codified in ordinance. Ecology's pretreatment program delegation agreement with EPA includes language in which Ecology agreed to enforce limits adopted by non-delegated programs (local limits).

Ecology reviewed the expected hydraulic loading rates from Solvay to TRRWA wastewater treatment plant (Appendix D). In order to protect the hydraulic capacity of TRRWA wastewater treatment plant, Ecology has developed local limits for daily maximum flow rate. The daily maximum flow rate limit is based on the expected maximum discharge rate from Outfall 002 (210,190 gallons per day) and the expected typical daily flow rate from Outfall 001A (76,250 gallons per day). This combined flow rate was used because the proposed permit allows Solvay to divert flows from Outfall 002 during specified periods.

Applicable limits for this discharge include the following:

Table 10 Limits Based on Local Limits – Outfall 001A

Parameter	Maximum Daily Limit
Flow Rate	287,000 gallons per day

Table 11 Limits Based on Local Limits – Outfall 001A

Parameter	Daily Minimum	Daily Maximum
pH	6.0 standard units	9.0 standard units

Ecology reviewed the expected organic and solids loading rates from Solvay to TRRWA wastewater treatment plant. Based on the expected maximum loading rates included in the application and DMR data for TRRWA, Ecology has determined that additional limits for biochemical oxygen demand and total suspended solids are not necessary at this time to protect the receiving treatment plant (Appendix D). Technology-based limits for flow were developed and are included in the previous section.

D. Surface Water Quality-Based Effluent Limits – Outfall 002

The Washington State surface water quality standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

Numerical Criteria for the Protection of Aquatic Life and Recreation

Numerical water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in a receiving water to protect aquatic life and recreation in and on the water.

Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

Numerical Criteria for the Protection of Human Health

In 1992, U.S. EPA published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State in its National Toxics Rule (40 CFR 131.45 EPA, 1992). Ecology submitted a standards revision for 192 new human health criteria for 97 pollutants to EPA on August 1, 2016. In accordance with requirements of CWA section 303(c)(2)(B), EPA finalized 144 new and revised Washington specific human health criteria for priority pollutants, to apply to waters under Washington's jurisdiction. EPA approved 45 human health criteria as submitted by Washington. The EPA took no action on Ecology submitted criteria for arsenic, dioxin, and thallium. The existing criteria for these three pollutants as adopted in the National Toxics Rule (40 CFR 131.45) remain in effect.

These newly adopted criteria, located in WAC 173-201A-240, are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

Narrative Criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200, 2006) and of all marine waters (WAC 173-201A-210, 2006) in the state of Washington.

Antidegradation

Description--The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

Facility Specific Requirements--Ecology determined that this facility must meet Tier II requirements for the discharge from Outfall 002. A Tier II analysis focuses on evaluating feasible alternatives that would eliminate or significantly reduce the level of degradation.

The analysis also includes a review of the benefits and costs associated with the lowering of water quality. New discharges and facility expansions are prohibited from lowering water quality without providing overriding public benefits.

Solvay submitted a Tier II analysis for the proposed discharge from Outfall 002. Alternatives reviewed in the Tier II analysis includes the following:

- Obtaining process water from the City of Longview
- Installing the RO system and discharging RO reject water, cooling tower blowdown, and filter backwash to TRRWA
- Installing the RO system and discharging RO reject water, cooling tower blowdown, and filter backwash to CDID Ditch #5

The City of Longview's drinking water system does not have adequate infrastructure to reliably supply process water to Solvay. The City recently upgraded its drinking water treatment system and adding additional infrastructure is not currently planned.

According to Solvay and TRRWA, the named waste streams are expected to have low concentrations of pollutants that are treatable in conventional treatment systems like the system at TRRWA. Additionally, the waste stream is expected to unnecessarily add to the hydraulic loading at the facility, reducing the total capacity of the treatment system.

Based on the reasons above, Ecology's denial of the discharge from Outfall 002 would either mean that the facility would not be able to continue operations at the site or the City would be required to give up treatment capacity at their wastewater treatment plan without a significant reduction in pollution. Ecology has therefore determined that there is overriding public interest in allowing the discharge to CDID Ditch #5.

Mixing Zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric standards, so long as the discharge doesn't interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control, and treatment (AKART). Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and must not use more than 25% of the available width of the water body for dilution [WAC 173-201A-400 (7)(a)(ii-iii)].

Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology's *Permit Writer's Manual*). Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 4 means the effluent is 25% and the receiving water is 75% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Each aquatic life *acute* criterion is based on the assumption that organisms are not exposed to that concentration for more than one hour and more often than one exposure in three years. Each aquatic life *chronic* criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two and four tenths (2.4) liters/day for drinking water (increased from two liters/day in the 2016 Water Quality Standards update).
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit does not authorize a mixing zone. The Permittee may submit a Mixing Zone Study, for Ecology's consideration, to evaluate whether or not a mixing zone is warranted for the discharge. If considering conducting and submitting a study the Permittee should discuss the applicable requirements with Ecology.

E. Designated Uses and Surface Water Quality Criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC.

In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). The table included below summarizes the criteria applicable to this facility's discharge.

- Aquatic Life Uses are designated based on the presence of, or the intent to provide protection for the key uses. All indigenous fish and non-fish aquatic species must be protected in waters of the state in addition to the key species. The Aquatic Life Uses for this receiving water are identified below.

Table 12 Freshwater Aquatic Life Uses and Associated Criteria

Salmonid Spawning, Rearing, and Migration	
Temperature Criteria – Highest 7-DAD MAX	17.5°C (63.5°F)
Dissolved Oxygen Criteria – Lowest 1-Day Minimum	8.0 mg/L
Turbidity Criteria	• 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
Total Dissolved Gas Criteria	Total dissolved gas must not exceed 110 percent of saturation at any point of sample collection.
pH Criteria	The pH must measure within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

- The *recreational uses* for this receiving water are identified below.

Table 13 Recreational Uses and Associated Criteria

Recreational Use	**Criteria**
Primary Contact Recreation	*E. Coli* organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN /100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN /100 mL.

- The *water supply uses* are domestic, agricultural, industrial, and stock watering.
- The *miscellaneous freshwater uses* are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

F. Water Quality Impairments

CDID Ditch #5 is listed on the current 303(d) list and is impaired for Dissolved Oxygen (DO). Ecology has not developed a Total Maximum Daily Load (TMDL) to date for CDID Ditch #5. Solvay's proposed discharge to CDID Ditch #5 is not expected to contribute to oxygen depletion in CDID Ditch #5. The draft permit requires Solvay to conduct a receiving water study to determine the current conditions in CDID Ditch #5 and to determine if there is a potential that the proposed discharge is adding to the DO impairment in the ditch.

G. Evaluation of Surface Water Quality-Based Effluent Limits for Narrative Criteria

Ecology must consider the narrative criteria described in WAC 173-201A-260 when it determines permit limits and conditions. Narrative water quality criteria limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Analysis of the numerical criteria for toxic and radioactive materials is described in the following section.

Ecology considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements AKART as described above in the technology-based limits section. When Ecology determines if a facility is meeting AKART it considers the pollutants in the wastewater and the adequacy of the treatment to prevent the violation of narrative criteria.

In addition, Ecology considers the toxicity of the wastewater discharge by requiring whole effluent toxicity (WET) testing when there is a reasonable potential for the discharge to contain toxics. Ecology's analysis of the need for WET testing for this discharge is described later in the fact sheet.

H. Evaluation of Surface Water Quality-Based Effluent Limits for Numeric Criteria

Ecology has not authorized a mixing zone in the permit.

Ecology determined the impacts of pH, chlorine, ammonia, metals, temperature, radionuclides, and other toxics as described below. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

Dissolved Oxygen--BOD_5 and Ammonia Effects--Natural decomposition of organic material in wastewater effluent impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. The 5-day Biochemical Oxygen Demand (BOD_5) of an effluent sample indicates the amount of biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water. The amount of ammonia-based nitrogen in the wastewater also provides an indication of oxygen demand in the receiving water. Solvay's discharge to CDID Ditch #5 is not expected to have significant concentrations of organic material. However, the CDID Ditch #5 is currently listed as impaired for DO. Ecology has limited background data for CDID Ditch #5. Modeling of the impacts of the proposed discharge on CDID Ditch #5 DO requires valid background data to determine the impacts during critical periods. The draft permit requires Solvay to complete a receiving water study for CDID Ditch #5.

Following completion of the receiving water study Ecology will determine if Solvay's discharge has the potential to add to the existing impairment of the DO standard, and will modify the permit if necessary to ensure the discharge is not contributing to a violation of the water quality standards.

pH--Ecology modeled the impact of the effluent pH on the receiving water using the calculations from EPA, 1988. Ecology has limited background data for CDID Ditch #5. Modeling the impact of the effluent pH on CDID Ditch #5 requires valid background data to determine the impacts during critical periods. The draft permit requires Solvay to complete a receiving water study for CDID Ditch #5.

The proposed permit includes technology-based pH limits. Following completion of the receiving water study Ecology will model the impact of the effluent pH using the information in the receiving water study to determine if the discharge is causing or contributing to a violation of the water quality standards for pH. The permit will be modified if the updated modeling shows that the pH limits in the draft permit are not protective of the water quality standards.

Turbidity--Ecology evaluated the impact of turbidity based on the source of discharges in the effluent, anticipated ranges of total suspended solids, and turbidity of the receiving water. Based on the anticipated concentration of total suspended solids in the discharge, Ecology expects no violations of the turbidity criteria. However, CDID Ditch #5 is currently listed as a water of concern for turbidity and Solvay proposes to discharge filter backwash water intermittently through Outfall 002. Based on the 'waters of concern' designation for the receiving water and the type of discharge Ecology has included weekly monitoring requirements for Outfall 002 for turbidity.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are expected to be present in the discharge: chlorine, ammonia, chloride, arsenic, manganese, and nickel. Ecology conducted a reasonable potential analysis (see **Appendix D**) on these parameters to determine whether it would require effluent limits in this permit.

Iron is naturally occurring in relatively high concentrations in the groundwater and CDID Ditch #5. WAC 173-201A-240 does not include criteria for iron; however, WAC 173-201A-240 states that standards for toxic substances which are not included in Table 240 shall be determined in consideration of USEPA *Quality Criteria for Water* (1986) and other relevant information as appropriate. The *Quality Criteria for Water* (1986) includes criteria for iron for freshwater aquatic life and domestic water supplies: 1.0 and 0.3 mg/L, respectively. Based on the 1992 study of the CDID Ditches, Ditch #3 and #5 had concentrations of iron ranging from 7.0 to 17.1 mg/L.

The iron concentration in the groundwater is approximately 0.7 mg/L, based on test results from Solvay's groundwater test wells conducted in the fall of 2018. The *Quality Criteria for Water* (1986) states, in part, "…waters may contain iron concentrations of several mg/L in the presence or absence of dissolved oxygen, but this iron form has little effect on aquatic life." Based on the naturally occurring nature of iron in the Ditch system and the groundwater, Ecology has not developed water quality-based limits for iron for the discharge. The proposed permit requires Solvay to monitor the discharge from Outfall 002 for iron. The receiving water study, required in Special Condition S12, also includes monitoring requirements for iron to determine the concentration of iron in the ditch. If the receiving water study or monitoring data shows that the concentration of iron in the discharge is causing or contributing to a violation of the narrative or numeric water quality standards Ecology may modify the permit, issue an Administrative Order, or address it during the permit renewal process.

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature and pH in the receiving freshwater. To evaluate ammonia toxicity, Ecology used the available receiving water information, included in Table 2, and Ecology spreadsheet tools. The proposed permit requires Solvay to collect background concentrations for various parameters near the point of discharge (Special Condition S12). This information may result in a permit modification or additional limits in the next permit renewal.

Ecology derived effluent limits for the toxic pollutants determined to have a reasonable potential to cause a violation of the water quality standards.

These pollutants include total residual chlorine, chloride, and ammonia. Ecology calculated effluent limits using methods from EPA, 1991 as shown in **Appendix D**.

The proposed permit contains interim limits for total residual chlorine, chloride, and ammonia as required by chapter 173-201A WAC. Solvay provided estimated concentrations of pollutants in the discharge from Outfall 002 based on concentrations in the groundwater, anticipated treatment capability of the RO system, and historical cooling tower blowdown data. Because the actual characteristics of the discharge from Outfall 002 are unknown and the estimated concentrations are largely based on a single analysis from groundwater test wells, Ecology determined that interim limits were appropriate for the discharge. Typically interim limits would be developed based on historical performance. Because this discharge is proposed no historical data is available. The interim limits for chloride and ammonia are twice the value of the final effluent limits included in the proposed permit. The interim limits for total residual chlorine are the technology-based limits. The interim limits are effective for two years following the effective date of the permit. Solvay is required to complete a receiving water study during this time. Ecology will review the data submitted in the receiving water study and the monitoring data submitted in the discharge monitoring reports (DMRs) to determine if the final effluent limits are protective of water quality standards or if additional treatment is necessary prior to discharging to CDID Ditch #5. Ecology will modify the permit if changes to the permit limits are necessary.

Ecology may modify the permit or issue an Administrative Order if a compliance schedule is necessary in order for Solvay to comply with the final effluent limits.

The resultant interim and final effluent limits are as follows:

- Total Residual Chlorine: interim average monthly limit and maximum daily limit are the technology-based limits, final average monthly limit of 12.4 µg/L, final maximum daily limit of 18.1 µg/L
- Chloride: interim average monthly limit of 518 milligrams per liter (mg/L), final average monthly limit of 259 mg/L, interim maximum daily limit of 756 mg/L, final maximum daily limit of 378 mg/L
- Ammonia: interim average monthly limit of 4.6 mg/L, final average monthly limit of 2.3 mg/L, interim maximum daily limit of 6.8 mg/L, final maximum daily limit of 3.4 mg/L

Temperature--The state temperature standards (WAC 173-201A-200-210 and 600-612) include multiple elements:

- Annual summer maximum threshold criteria (June 15 to September 15)
- Supplemental spawning and rearing season criteria (September 15 to June 15)
- Incremental warming restrictions
- Protections against acute effects

Ecology evaluates each criterion independently to determine reasonable potential and derive permit limits.

- Annual summer maximum and supplementary spawning/rearing criteria

Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), 210(1)(c), and Table 602]. These threshold criteria (e.g., 12, 16, 17.5, 20°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures.

Some waters have an additional threshold criterion to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-602, Table 602]. These criteria apply during specific date-windows.

The threshold criteria apply at the edge of the chronic mixing zone. Criteria for most fresh waters are expressed as the highest 7-Day average of daily maximum temperature (7-DADMax). The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. Criteria for marine waters and some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

- Incremental warming criteria

The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-200(1)(c)(i)-(ii), 210(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone.

At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment.

These increments are permitted only to the extent doing so does not cause temperatures to exceed either the annual maximum or supplemental spawning criteria.

At locations and times when a threshold criterion is being exceeded due to natural conditions, all human sources, considered cumulatively, must not warm the water more than 0.3°C above the naturally warm condition.

When Ecology has not yet completed a TMDL, our policy allows each point source to warm water at the edge of the chronic mixing zone by 0.3°C. This is true regardless of the background temperature and even if doing so would cause the temperature at the edge of a standard mixing zone to exceed the numeric threshold criteria. Allowing a 0.3°C warming for each point source is reasonable and protective where the dilution factor is based on 25% or less of the critical flow. This is because the fully mixed effect on temperature will only be a fraction of the 0.3°C cumulative allowance (0.075°C or less) for all human sources combined.

- Protections for temperature acute effects

Instantaneous lethality to passing fish: The upper 99th percentile daily maximum effluent temperature must not exceed 33°C, unless a dilution analysis indicates ambient temperatures will not exceed 33°C two seconds after discharge.

General lethality and migration blockage: Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.

Lethality to incubating fish: Human actions must not cause a measurable (0.3°C) warming above 17.5°C at locations where eggs are incubating.

Reasonable Potential Analysis

Data Collection Required: Ecology does not have sufficient information on the temperature of the effluent or the receiving water to determine compliance with water quality criteria for temperature. The proposed permit requires Solvay to monitor effluent and receiving water temperature and report the results to Ecology. The receiving water temperature will be monitored as part of the receiving water study.

Radionuclides--Solvay conducted sampling of test wells prior to submitting an application for the discharge of RO reject water. Total Alpha, Radium-228, and Radium-226 were not detected in the groundwater samples. Total Beta was detected at 5.5 picocuries per liter (pCi/L). Groundwater in the area has naturally occurring sources of beta radiation. Ecology conducted an analysis to determine if effluent limits for radionuclides were required for the discharge. Maximum allowable concentrations for radionuclides in a discharge is determined based on the following criteria, as specified in WAC 173-201A-250:

- 1/12.5th of the discharge allowances included in WAC 246-221-290 (Column 2, Table II, effluent concentrations, rules and regulations for radiation protection), or
- USEPA Drinking Water Regulations for radionuclides (Safe Drinking Water Act, SDWA).

The SDWA regulations specify that the average annual concentration of beta particles must be less than an annual dose equivalent exposure of 4 millirem (mrem) per year (40 CFR 141.66). Radionuclides produce varying levels of radiation and therefore have different concentrations at which 4 mrem per year exposure occurs. EPA's *Implementation Guidance for Radionuclides* (March 2002) includes derived concentrations for 179 specific radionuclides which yields a dose of 4 mrem/year. These derived concentrations are determined assuming 2 liters of water are consumed per day.

The values included in WAC 246-221-290 (Column 2, Table II) are equivalent to the radionuclide concentrations that would produce a total effective dose equivalent of 0.05 rem (50 mrem) per year. These values are determined assuming continuous ingestion for a year. Using $1/12.5^{th}$ of these values, as specified in WAC 173-201A-250, provides the concentration at which the total effective dose equivalent would be 4 mrem per year. WAC 246-221-290 includes standards for 736 radionuclides. Many of these radionuclides are not naturally occurring elements.

The source of beta radiation in the groundwater samples is unknown. Ecology determined the approximate concentrations for 43 radionuclides based on the estimated concentration of the parameter in the proposed discharge (derived from the concentration in the groundwater), the half-life of each specific radionuclide, and the atomic weight of each specific radionuclide (see **Appendix D** for calculations).

Based on this analysis Ecology estimates that the proposed discharge will have an approximate dose equivalent of 0.14 microrem (µrem) per year (0.00014 mrem/year). This is approximately 0.004% of the SDWA standard. No limits or monitoring requirements for total beta have been included in the proposed permit.

I. Human Health

Washington's water quality standards include numeric human health-based criteria for 97 priority pollutants that Ecology must consider when writing NPDES permits.

Ecology determined the effluent may contain chemicals of concern for human health, based on data or information indicating the discharge may contain regulated chemicals.

Ecology evaluated the discharge's potential to violate the water quality standards as required by 40 CFR 122.44(d) by following the procedures published in the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) and Ecology's *Permit Writer's Manual* to make a reasonable potential determination. The evaluation showed that the discharge has no reasonable potential to cause a violation of water quality standards for human health criteria.

Groundwater test data submitted to Ecology by Solvay shows that arsenic is present in the source water for the RO system. Ecology submitted newly adopted state Human Health Water Quality Criteria to the EPA for Clean Water Act review and approval in August 2016. Parts of that submittal to EPA were new total arsenic criteria of 10 µg/L for both marine and freshwaters. Additional requirements in the new state rule included pollutant minimization requirements for anthropogenic inputs of arsenic from both indirect and direct discharges.

The state's new total arsenic criteria match the EPA's Safe Drinking Water Act maximum contaminant level (MCL) used in Washington State for drinking water protection. The state's new arsenic criteria took into account existing scientific data, high concentrations of naturally occurring arsenic in the State of Washington, and EPA's CWA approval of 10 µg/L total arsenic criteria in almost all other western states.

Ecology intended the new total arsenic criteria to supersede the inorganic arsenic human health criteria adopted for the State of Washington by the EPA in the 1992 National Toxics Rule (NTR; 40 CFR 131.45). The EPA's 1992 risk based human health criterion for marine waters is 0.14 µg/L inorganic arsenic, and is based on exposure from fish and shellfish tissue ingestion. The freshwater criterion is 0.018 µg/L, and is based on exposure from fish and shellfish tissue and surface water ingestion. The 2016 arsenic criteria adopted by Ecology eliminated uncertainties associated with the cancer potency factor used by the EPA in the 1992 NTR arsenic standards. However, the EPA disapproved Ecology's proposed total arsenic criteria in November 2016 and retained the inorganic arsenic human health criteria set in the 1992 NTR. The EPA's Technical Support Document for the approval/disapproval of Washington's Human Health Water Quality Criteria states that the federal agency intends to conduct a toxicological review of inorganic arsenic in 2017. The work has not yet been completed. This toxicological review could lead to an opportunity for Ecology to participate in a national dialogue associated with the update of the arsenic criteria in section 304(a) of the Clean Water Act. Until the EPA inorganic arsenic review is completed, scientific information is updated, and Washington State adopts into rule EPA CWA-approvable new total or inorganic arsenic criteria, the EPA's existing marine and freshwater inorganic arsenic criteria remain in effect at 0.14 and 0.018 µg/L.

The EPA's disapproval of Washington's new total arsenic criteria continues to create several difficulties in the wastewater discharge permitting process. One issue, as mentioned above, involves natural background concentrations of both marine and freshwaters that exceed the criteria. This can be particularly problematic for groundwater-sourced drinking waters with arsenic concentrations above 0.018 µg/L, which then pass through wastewater treatment plants after initial use. In this situation, no implementation tool exists to account for the naturally occurring element in the drinking water source. Intake credits do not apply in this situation because the source water and the receiving water must be the same body of water or proven to be hydraulically connected. Another issue is the lack of a 40 CFR 136-approved analytical method for inorganic arsenic that can be used for compliance assessment. Evaluation of point source discharges for effluent limit compliance must use 40 CFR 136 methods. The current 40 CFR 136-approved method for arsenic measures the total recoverable portion of the metal, and does not differentiate the inorganic portion. The lack of federally approved translators for inorganic-to-total recoverable arsenic in discharges increases the difficulty in assigning an effluent limitation for discharges to surface waters.

Attainment of Washington's inorganic arsenic criteria remains challenging if not improbable. At best, current treatment technologies may be capable of arsenic removal to approximate concentrations ranging from 0.5- 1 µg/L. The difference between the best available treatment technology and numeric effluent limits based on the criteria creates difficulty for both existing and proposed discharges.

Ecology intends to continue to pursue a solution to the regulatory issue of groundwater sources with high arsenic concentrations that would cause treatment plant effluent to exceed effluent limits based on the numeric criteria.

Where numeric effluent limits are infeasible, 40 CFR 122.44(k) provides for the use of best management practices (BMPs) to control or abate the discharge of pollutants. This provision in the federal regulations provides the basis for Ecology's permitting strategy for inorganic arsenic until the EPA revisits their criteria development procedures and develops site specific total-to-inorganic arsenic translators for individual dischargers. Components of Ecology's permitting strategy include permit requirements to monitor for total recoverable arsenic, implementation of source control BMPs, and an adaptive management process to refine BMPs for continuous pollutant minimization. While numeric effluent limits based on the human health inorganic arsenic criteria remain infeasible, Washington NPDES permits will continue to contain numeric effluent limits for arsenic based on best available treatment technology and aquatic life-based criteria as appropriate.

This permit requires Solvay to monitor the discharge from Outfall 002 for arsenic within the first year of operating to determine the actual concentration of arsenic in the discharge. Ecology may modify the permit or issue and Administrative Order following submittal of the priority pollutant scan for Outfall 002 to include more frequent monitoring, source minimization best management practices (BMPs), or other requirements, as appropriate, to address the discharge of arsenic.

J. Sediment Quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website. *https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Sediment-cleanups*

Through a review of the discharger characteristics and of the effluent characteristics, Ecology determined that this discharge has no reasonable potential to violate the sediment management standards.

If in the future if Ecology determines a potential for violation of the sediment quality standards, Ecology may issue an order requiring Solvay to demonstrate either:

- The point of discharge is not an area of deposition, or
- Toxics do not accumulate in the sediments even though the point of discharge is a depositional area.

K. Groundwater Quality Limits

The groundwater quality standards (chapter 173-200 WAC) protect beneficial uses of groundwater. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

Solvay does not discharge wastewater to the ground. No permit limits are required to protect groundwater.

L. Whole Effluent Toxicity

The water quality standards for surface waters forbid discharge of effluent that has the potential to cause toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

The screening criteria included in WAC 173-205-040 specifies that discharges from facilities which use, store, produce, or transfer any hazardous substance listed in 40 CFR 302.4 with a statutory code of 1 or 2 is required to complete an effluent characterization for acute and chronic WET. Ecology reviewed the hazardous substances which have the potential to be present in the discharge from Outfall 002. These hazardous substances primarily include the chemicals which are used in the RO system or in the cooling tower. The following hazardous substances were identified and have a statutory code of 1 or 2: potassium hydroxide, sodium hypochlorite, sodium hydroxide, and sodium bisulfite. WAC 173-205-040(1)(a)(ii) states that if the amount of any hazardous substance at the facility is never more than the statutory reportable quantity listed in 40 CFR 302.4 the effluent characterization is not required.

Solvay reported to Ecology via email on May 14, 2019 that the following hazardous substances will not be stored onsite above the respective reportable quantities: potassium hydroxide, sodium hydroxide, and sodium bisulfite. Sodium hypochlorite (bleach) will be stored onsite above the reportable quantity of 100 pounds. The main constituent of concern for bleach is chlorine. The proposed permit includes water quality-based limits for total residual chlorine. Using the screening criteria Ecology determined that toxic effects caused by unidentified pollutants in the effluent are unlikely. Therefore, this permit does not require WET testing. Ecology may require WET testing in the future if it receives information indicating that toxicity may be present in this effluent.

M. Comparison of Effluent Limits with the Previous Permit Issued on September 11, 2014

Table 14 Comparison of Previous and Proposed Effluent Limits for Outfall 001B

Parameter	Basis of Limit	Previous Limit	Proposed Limit
pH, Daily Maximum	Technology	12.2 standard units	12.2 standard units
pH, Daily Minimum	Technology	4.0 standard units	4.0 standard units

The previous permit did not authorize discharges from Outfalls 001A or 002. Therefore, the proposed discharge limits for Outfalls 001A and 002 are not included in this section.

IV. Monitoring Requirements

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits.

If a facility uses a contract laboratory to monitor wastewater, it must ensure that the laboratory uses the methods and meets or exceeds the method detection levels required by the permit. The permit describes when facilities may use alternative methods. It also describes what to do in certain situations when the laboratory encounters matrix effects. When a facility uses an alternative method as allowed by the permit, it must report the test method, detection level (DL), and quantitation level (QL) on the discharge monitoring report or in the required report.

A. Wastewater Monitoring

The proposed permit requires Solvay to monitor for pH, iron, chloride, ammonia, temperature, total residual chlorine, turbidity, total suspended solids, and priority pollutants to further characterize the discharges. These pollutants could have a significant impact on the quality of the surface water or on the receiving treatment plant.

The monitoring schedule is detailed in the proposed permit under Special Condition S2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

B. Lab Accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters). Solvay's previous permit did not include monitoring requirements for parameters which require laboratory accreditation. Solvay is required to obtain laboratory accreditation or use a laboratory which is already accredited for the following parameters: iron, chloride, ammonia, total residual chlorine, turbidity, total suspended solids, and priority pollutants. The permit requires Solvay to obtain accreditation for pH if the onsite laboratory is accredited for other parameters.

C. Effluent Limits Which Are Near Detection or Quantitation Levels

The water quality-based effluent concentration limits for total residual chlorine are near the limits of current analytical methods to detect or accurately quantify. The method detection level (MDL) also known as detection level (DL) is the minimum concentration of a pollutant that a laboratory can measure and report with a 99 percent confidence that its concentration is greater than zero (as determined by a specific laboratory method). The quantitation level (QL) is the level at which a laboratory can reliably report concentrations with a specified level of error. Estimated concentrations are the values between the DL and QL. Ecology requires permitted facilities to report estimated concentrations.

When reporting maximum daily effluent concentrations, Ecology requires the facility to report "less than X" where X is the required detection level if the measured effluent concentration falls below the detection level.

V. Other Permit Conditions

A. Reporting and Record Keeping

Ecology based Special Condition S3 on its authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

B. Non Routine and Unanticipated Wastewater

Occasionally, this facility may generate wastewater which was not characterized in the permit application because it is not a routine discharge and was not anticipated at the time of application. These wastes typically consist of waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems.

The permit authorizes the discharge of non-routine and unanticipated wastewater under certain conditions (Special Condition S9). The facility must characterize these waste waters for pollutants and examine the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and on any opportunities for reuse, Ecology may:

- Authorize the facility to discharge the wastewater.
- Require the facility to treat the wastewater.
- Require the facility to reuse the wastewater.

C. Spill Plan

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

Solvay developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the facility to update this plan and submit it to Ecology (Special Condition S10).

D. Solid Waste Control Plan

Solvay could cause pollution of the waters of the state through inappropriate disposal of solid waste or through the release of leachate from solid waste.

This proposed permit requires this facility to develop a solid waste control plan to prevent solid waste from causing pollution of waters of the state (Special Condition S5). The facility must submit the plan to Ecology for approval (RCW 90.48.080). You can obtain an Ecology guidance document, which describes how to develop a Solid Waste Control Plan, at: *https://fortress.wa.gov/ecy/publications/documents/0710024.pdf*

E. Operation and Maintenance Manual

Ecology requires industries to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state and federal regulations [40 CFR 122.41(e) and WAC 173-220-150 (1)(g)].

The facility will prepare and submit an operation and maintenance manual as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150) (Special Condition S4). Implementation of the procedures in the operation and maintenance manual ensures the facility's compliance with the terms and limits in the permit.

F. Prohibited Discharges to Receiving Treatment Plant

Ecology prohibits certain pollutants from being discharged to the receiving treatment plant. These include substances which cause pass-through or interference, pollutants which may cause damage to the receiving treatment plant or collection system, or harm the receiving treatment plant or collection system workers (chapter 173-216 WAC). The discharge of designated dangerous wastes is not authorized by this permit unless approved in accordance with Special Conditions S3.I. and S9 and General Condition G4 (Chapter 173-303 WAC) (Special Condition S6).

G. Dilution Prohibited

Ecology prohibits the facility from diluting its process wastewater effluent as a partial or complete substitute for adequate treatment to achieve compliance with permit limits for Outfalls 001A and 001B (Special Condition S7).

H. Slug Discharge Plan

Ecology determined that Solvay has the potential for a batch discharge or a spill that could adversely affect the treatment plant, therefore the proposed permit requires a slug discharge control plan [(40 CFR 403.8 (f)(l) (iii)(B)(6) and (f) (2)(vi)] (Special Condition S11).

I. Dangerous Wastes – Permit by Rule Requirements

The proposed permit authorizes Solvay to treat dangerous wastes, generated onsite, at the wastewater treatment facility under the permit by rule provisions of Chapter WAC 173-303-802(5). This authorization is limited to the onsite waste streams identified on the permit application and application amendments as approved by Ecology.

Effluent sampling and monitoring requirements established in the permit should adequately address the pollutants in the waste stream. Permit-by-rule provisions cover the identified waste streams as long as Solvay complies with the conditions of the NPDES permit, including but not limited to Special Condition S13 and with the following dangerous waste requirements in WAC 173-303, as required by WAC 173-303-802(5)(a), pertaining to:

- Notification and identification numbers
- Designation of dangerous wastes
- Performance standards
- General waste analysis
- Security
- Contingency plans and emergency procedures
- Emergencies

- Manifest system
- Operating record
- Facility reporting

K. Receiving Water Study

As discussed in Section III above, a reasonable potential analysis is conducted during the permit renewal process to determine whether the discharge has the potential to cause the water body to exceed the water quality standards at the edge of the mixing zones, when allowed. Details about the reasonable potential calculations are provided in Appendix D. In order to perform the analysis, ambient water quality data is necessary to determine if the water quality criteria will be exceeded. Limited ambient water quality data is currently available for CDID Ditch #5 where Solvay proposes to discharge some of their wastewater. The draft permit requires Solvay to submit a sampling and quality assurance plan for Ecology review and approval no later than one year after permit issuance (Special Condition S12). Solvay must then collect the samples in accordance with the approved plan and submit the results of the monitoring within 1 year after following approval of the sampling and quality assurance plan.

L. Stormwater Management Plan (SWMP)

The permit application indicated that all the stormwater generated from process areas of the site is directed to a wastewater treatment system. In accordance with 40 CFR 122.44(k) and 40 CFR 122.44 (s), the proposed permit includes a requirement to develop and implement a SWMP to ensure continued management of the stormwater in a manner that prevents or minimizes pollutants from entering the waters of the state (Special Condition S14). The SWMP must identify potential sources of stormwater contamination from industrial activities and identify how those sources of contamination are properly managed to prevent or minimize contamination of surface waters. Solvay must continuously review and revise the SWMP as necessary to assure that stormwater discharges do not degrade water quality. The SWMP must be kept on-site or within reasonable access to the site and available for review by Ecology. If Solvay has a stormwater pollution prevention plan (SWPPP) developed that addresses stormwater runoff from process areas, the permit allows Solvay to use the existing SWPPP to meet the SWMP requirement. The SWPPP must include all of the information that is required for the SWMP.

M. Permit Renewal Application

In accordance with WAC 173-220-180, any Permittee that wishes to continue the permitted activity after the expiration date of the permit must submit a complete application for replacement to an existing permit or continuation of a discharge beyond the expiration date at least one hundred eighty (180) days prior to its expiration.

Special Condition S8 requires the facility to submit their permit renewal application no later than twelve months prior to the expiration date of the permit.

Additionally, WAC 173-220-150 requires that the Permittee must submit a new application or supplement to an existing application at least one hundred eighty (180) days prior to commencement of discharges resulting from any facility expansions, production increases, or other planned changes, such as process modifications, which may result in permit violations.

N. General Conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual industrial NPDES permits issued by Ecology.

VI. Permit Issuance Procedures

A. Permit Modifications

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for groundwaters, after obtaining new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state or federal regulations.

B. Proposed Permit Issuance

This proposed permit includes all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of 5 years.

VII. References for Text and Appendices

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. *Technical Support Document for Water Quality-based Toxics Control*. EPA/505/2-90-001.

1988. *Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling*. USEPA Office of Water, Washington, D.C.

1985. *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water*. EPA/600/6-85/002a.

1983. *Water Quality Standards Handbook*. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. *Characterization of Stream Reaeration Capacity*. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

2002. *Implementation Guidance for Radionuclides*. USEPA Office of Ground Water and Drinking Water. EPA 816-F-00-002.

1986. *Quality Criteria for Water*. USEPA Office of Water, Washington, D.C. EPA 440/5-86-001.

Washington State Department of Ecology.

July 2018. *Permit Writer's Manual*. Publication Number 92-109 (https://fortress.wa.gov/ecy/publications/documents/92109.pdf)

September 2011. *Water Quality Program Guidance Manual – Supplemental Guidance on Implementing Tier II Antidegradation*. Publication Number 11-10-073 (https://fortress.wa.gov/ecy/publications/summarypages/1110073.html)

October 2010 (revised). *Water Quality Program Guidance Manual – Procedures to Implement the State's Temperature Standards through NPDES Permits*. Publication Number 06-10-100 (https://fortress.wa.gov/ecy/publications/summarypages/0610100.html)

Laws and Regulations (http://leg.wa.gov/LawsAndAgencyRules/Pages/default.aspx)

Permit and Wastewater Related Information (https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance)

February 2007. *Focus Sheet on Solid Waste Control Plan, Developing a Solid Waste Control Plan for Industrial Wastewater Discharge Permittees*, Publication Number 07-10-024. https://fortress.wa.gov/ecy/publications/documents/0710024.pdf

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Wright, R.M., and A.J. McDonnell.

1979. *In-stream Deoxygenation Rate Prediction*. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

Three Rivers Regional Wastewater Authority.

2012. Three Rivers Regional Wastewater Authority Discharge Pretreatment Policy. June 5, 2012.

Appendix A--Public Involvement Information

Ecology proposes to issue a permit to Solvay. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology placed a Public Notice of Application on July 12 and July 19, 2019 in The Daily News to inform the public about the submitted application and to invite comment on the issuance of this permit.

Ecology will place a Public Notice of Draft on August 27, 2019 in The Daily News (Longview) to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft Permit and Fact Sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Urges people to submit their comments, in writing, before the end of the Comment Period.
- Tells how to request a public hearing of comments about the proposed NPDES permit.
- Explains the next step(s) in the permitting process.

Ecology published a document titled *Frequently Asked Questions about Effective Public Commenting* which is available on our website at https://fortress.wa.gov/ecy/publications/SummaryPages/0307023.html

You may obtain further information from Ecology by telephone, (360) 407-6916, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Industrial Section
PO Box 47600
Olympia, WA 98504-7600

The primary author of this permit and fact sheet is Kelsey Holbrook.

Appendix B--Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Appendix C--Glossary

1-DMax or 1-day maximum temperature -- The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

7-DADMax or 7-day average of the daily maximum temperatures -- The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute toxicity --The lethal effect of a compound on an organism that occurs in a short time period, usually 48 to 96 hours.

AKART -- The acronym for "all known, available, and reasonable methods of prevention, control and treatment." AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance -- An alternative location in the groundwater from the point of compliance where compliance with the groundwater standards is measured. It may be established in the groundwater at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site specific basis following an AKART analysis. An "early warning value" must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

Ambient water quality -- The existing environmental condition of the water in a receiving water body.

Ammonia -- Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Annual average design flow (AADF) -- average of the daily flow volumes anticipated to occur over a calendar year.

Average monthly (intermittent) discharge limit-- The average of the measured values obtained over a calendar month's time taking into account zero discharge days.

Average monthly discharge limit -- The average of the measured values obtained over a calendar month's time.

Background water quality -- The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of groundwater at a particular point in time upgradient of an activity that has not been affected by that activity, [WAC 173-200-020(3)].

Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

Best management practices (BMPs) -- Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD5 -- Determining the five-day Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD5 is used in modeling to measure the reduction of dissolved oxygen in receiving waters after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD_5 is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass -- The intentional diversion of waste streams from any portion of a treatment facility.

Categorical pretreatment standards -- National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties, which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

Chlorine -- A chemical used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic toxicity -- The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean water act (CWA -- The federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance inspection-without sampling -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance inspection-with sampling -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

Composite sample -- A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples.

May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction activity -- Clearing, grading, excavation, and any other activity, which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous monitoring -- Uninterrupted, unless otherwise noted in the permit.

Critical condition -- The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Date of receipt – This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

Detection limit -- The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the pollutant concentration is above zero and is determined from analysis of a sample in a given matrix containing the pollutant.

Dilution factor (DF) -- A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Distribution uniformity -- The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Early warning value -- The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, groundwater, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

Enforcement limit -- The concentration assigned to a contaminant in the groundwater at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a groundwater criterion will not be exceeded and that background water quality will be protected.

Engineering report -- A document that thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal coliform bacteria -- Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab sample -- A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Groundwater -- Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

Industrial user -- A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial wastewater -- Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated stormwater and, also, leachate from solid waste facilities.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

- Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Local limits -- Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

Major facility -- A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum daily discharge limit -- The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Maximum day design flow (MDDF) -- The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum month design flow (MMDF) -- The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum week design flow (MWDF) -- The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

Method detection level (MDL) -- See Detection Limit.

Minor facility -- A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing zone -- An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The permit specifies the area of the authorized mixing zone that Ecology defines following procedures outlined in state regulations (chapter 173-201A WAC).

National pollutant discharge elimination system (NPDES) -- The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

pH -- The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

Pass-through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

Peak hour design flow (PHDF) -- The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

Peak instantaneous design flow (PIDF) -- The maximum anticipated instantaneous flow.

Point of compliance -- The location in the groundwater where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the groundwater as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

Potential significant industrial user (PSIU) --A potential significant industrial user is defined as an Industrial User that does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).
Ecology may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation level (QL) -- Also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1,2,or 5) x 10^n, where n is an integer. (64 FR 30417).
ALSO GIVEN AS:
The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).

Reasonable potential -- A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

Responsible corporate officer -- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sample Maximum -- No sample may exceed this value.

Significant industrial user (SIU) --

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

Slug discharge -- Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate that may cause interference or pass through with the POTW or in any way violate the permit conditions or the POTW's regulations and local limits.

Soil scientist -- An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

Solid waste -- All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

Soluble BOD_5 -- Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BOD_5 test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BOD_5 test is sufficient to remove the particulate organic fraction.

State waters -- Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based effluent limit -- A permit limit based on the ability of a treatment method to reduce the pollutant.

Total coliform bacteria--A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

Total dissolved solids--That portion of total solids in water or wastewater that passes through a specific filter.

Total maximum daily load (TMDL) --A determination of the amount of pollutant that a water body can receive and still meet water quality standards.

Total suspended solids (TSS) -- Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset -- An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water quality-based effluent limit -- A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

Appendix D--Technical Calculations

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found in the PermitCalc workbook on Ecology's webpage at: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance.

Reasonable Potential Analysis:

The spreadsheets Input 2 – Reasonable Potential, and LimitCalc in Ecology's PermitCalc Workbook determine reasonable potential (to violate the aquatic life and human health water quality standards) and calculate effluent limits. The process and formulas for determining reasonable potential and effluent limits in these spreadsheets are taken directly from the *Technical Support Document for Water Quality-based Toxics Control*, (EPA 505/2-90-001). The adjustment for autocorrelation is from EPA (1996a), and EPA (1996b).

Reasonable Potential Calculation

Facility	Solvay
Water Body Type	Freshwater
Rec. Water Hardness	106 mg/L

Dilution Factors:	Acute	Chronic
Aquatic Life	1.0	1.0
Human Health Carcinogenic		1.0
Human Health Non-Carcinogenic		1.0

Pollutant, CAS No. & NPDES Application Ref. No.		AMMONIA, Criteria as Total NH3	ARSENIC (dissolved) 7440382 2M	CHLORIDE (dissolved) in mg/L 16887006	CHLORINE (Total Residual) 7782505	IRON 7439896	MANGANESE 7439965	NICKEL - 7440020 9M - Dependent on hardness
Effluent Data	# of Samples (n)	1	1	1	1	1	1	1
	Coeff of Variation (Cv)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)	1,300	0.018	243	20	3400	1.6	0.03
	Calculated 50th percentile Effluent Conc. (when n>10)							
Receiving Water Data	90th Percentile Conc., ug/L	569	0	10.9	0	17100		0
	Geo Mean, ug/L					13475	0	0
Water Quality Criteria	Aquatic Life Criteria, ug/L Acute	26,150	360	860	19	-	-	1486.9
	Chronic	2,048	190	230	11	1000	-	165.14
	WQ Criteria for Protection of Human Health, ug/L	-	-	-	-	300	50	80
	Metal Criteria Translator, decimal Acute	-	1	-	-	-	-	0.998
	Chronic	-	1	-	-	-	-	0.997
	Carcinogen?	N	Y	N	N	N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950	0.950	0.950	0.950		0.950
s	$s^2=\ln(CV^2+1)$	0.555	0.555	0.555	0.555	0.555		0.555
Pn	$Pn=(1-\text{confidence level})^{1/n}$	0.050	0.050	0.050	0.050	0.050		0.050
Multiplier		6.20	6.20	6.20	6.20	6.20		6.20
Max concentration (ug/L) at edge of...	Acute	8,057	0.112	1506.052	123.955	21072.333		0.186
	Chronic	8,057	0.112	1,506.052	123.955	21,072.333		0.185
Reasonable Potential? Limit Required?		YES	NO	YES	YES	YES		NO

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.554513	0.5545	0.5545	
Pn	Pn=(1-confidence level)1/n	0.050	0.050	0.050	
Multiplier		2.4895271	2.4895	2.4895	
Dilution Factor		1	1	1	
Max Conc. at edge of Chronic Zone, ug/L		8464.3921	3.9832	0.0747	
Reasonable Potential? Limit Required?		YES	NO	NO	

Freshwater Un-ionized Ammonia Criteria Calculation
Based on Chapter 173-201A WAC, amended November 20, 2006

INPUT	
1. Receiving Water Temperature (deg C):	15.5
2. Receiving Water pH:	6.9
3. Is salmonid habitat an existing or designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Absent
OUTPUT	
Using mixed temp and pH at mixing zone boundaries?	
Ratio	30.697
FT	1.400
FPH	3.330
pKa	9.548
Unionized Fraction	0.002
Unionized ammonia NH3 criteria (mg/L as NH_3)	
Acute:	0.071
Chronic:	0.006
RESULTS	
Total ammonia nitrogen criteria (mg/L as N):	
Acute:	26.150
Chronic:	2.048

Calculation of Water Quality-Based Effluent Limits:

Water quality-based effluent limits are calculated by the two-value wasteload allocation process as described on page 100 of the TSD (EPA, 1991) and shown below.

1. Calculate the acute wasteload allocation WLA_a by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic wasteload allocation (WLA_c) by multiplying the chronic criteria by the chronic dilution factor and subtracting the background factor.

WLA_a = (acute criteria x DF_a) – [(background conc. x (DF_a - 1)]

WLA_c = (chronic criteria x DF_c) – [(background conc. x (DF_c -1)]

where: DF_a = Acute Dilution Factor

DF_c = Chronic Dilution Factor

2. Calculate the long term averages (LTA_a and LTA_c) which will comply with the wasteload allocations WLA_a and WLA_c.

$LTA_a = WLA_a \times e^{[0.5\sigma^2 - z\sigma]}$

where: $\sigma^2 = \ln[CV^2 + 1]$

$z = 2.326$

CV = coefficient of variation = std. dev/mean

$LTA_c = WLA_c \times e^{[0.5\sigma^2 - z\sigma]}$

where: $\sigma^2 = \ln[(CV^2 \div 4) + 1]$

$z = 2.326$

3. Use the smallest LTA of the LTA_a or LTA_c to calculate the maximum daily effluent limit and the monthly average effluent limit.

MDL = Maximum Daily Limit

$MDL = LTA \times e^{(Z\sigma - 0.5\sigma^2)}$

where: $\sigma^2 = \ln[CV^2 + 1]$

$z = 2.326$ (99th percentile occurrence)

LTA = Limiting long term average

AML = Average Monthly Limit

$AML = LTA \times e^{(Z\sigma_n - 0.5\sigma_n^2)}$

where: $\sigma^2 = \ln[(CV^2 \div n) + 1]$

n = number of samples/month

$z = 1.645$ (95^{th} % occurrence probability)

LTA = Limiting long term average

Pollutant, CAS No. & NPDES Application Ref. No.		AMMONIA, Criteria as Total NH3	ARSENIC (dissolved) 7440382 2M	CHLORIDE (dissolved) in mg/L 16887006	CHLORINE (Total Residual) 7782505	IRON 7439896	MANGANESE 7439965	NICKEL - 7440020 9M - Dependent on hardness
Aquatic Life Limit Calculation								
# of Compliance Samples Expected per month		1		1	1	1		
LTA Coeff. Var. (CV), decimal		0.6		0.6	0.6	0.6		
Permit Limit Coeff. Var. (CV), decimal		0.6		0.6	0.6	0.6		
Waste Load Allocations, ug/L	Acute	26150.5		860	19	-		
	Chronic	2047.65		230	11	1000		
Long Term Averages, ug/L	Acute	8396.47		276.132	6.1006	-		
	Chronic	1080		121.31	5.8018	527.43344		
Limiting LTA, ug/L		1080		121.31	5.8018	527.43344		
Metal Translator or 1?		1.00		1.00	1.00	1.00		
Average Monthly Limit (AML), ug/L		**2305.7**		**259.0**	**12.4**	**1126.0**		
Maximum Daily Limit (MDL), ug/L		**3363.6**		**377.8**	**18.1**	**1642.7**		
Human Health Limit Calculation								
# of Compliance Samples Expected per month						1		
Average Monthly Effluent Limit, ug/L						**300**		
Maximum Daily Effluent Limit, ug/L						**437.64402**		

Calculation of Interim Limits for Ammonia, Chloride, and Total Residual Chlorine
Interim limits were developed for ammonia and chloride by multiplying the limits developed above by 2. The results of these calculations are included in the table below.

Parameter	Limit Type	Final Limit (included in previous section)	Calculated Interim Limit
Ammonia	Average Monthly	2.3 mg/L	4.6 mg/L
Ammonia	Maximum Daily	3.4 mg/L	6.8 mg/L
Chloride	Average Monthly	259 mg/L	518 mg/L
Chloride	Maximum Daily	378 mg/L	756 mg/L

Radionuclides Calculations
Radioactive concentration is calculated by taking the number of atoms of the radionuclide times the decay constant for the radionuclide. The decay constant is specific for each radionuclide and is calculated based on the half-life of the isotope. The resulting radioactive concentration is in units of disintegration of atoms per second (dps), which is equivalent to a Becquerel (Bq). One Curie (Ci) is equal to 3.7×10^{10} Bq.

To determine the approximate radioactive concentration of each specific isotope in Solvay's discharge, the known concentration for each parameter was assumed to be present in the respective isotopic form. The concentration, in milligrams per liter (mg/L), was converted to atoms per liter using the atomic weight of the isotope and Avogadro's number (6.02×10^{23}). All radionuclides which have a specified dose equivalent concentration included in EPA's *Implementation Guidance for Radionuclides* were analyzed. However, only those radionuclides which are naturally occurring are included in the table below. Additionally, only those parameters which Solvay analyzed the groundwater for are included in the table below. The values in the column labeled "Approximate concentration = 4 mrem/yr (pCi/L)" were taken from Appendix I of EPA's *Implementation Guidance for Radionuclides*.

Radionuclide	Approximate concentration = 4 mrem/yr (pCi/L)	Bq/L (disintegrations per second per liter)	Half-Life	Units	Half-Life (Seconds)	Decay Constant (λ)	Atomic Mass	Expected Concentration in Discharge (mg/L)	Approximate Radioactive Concentration (pCi/L)
C-14	2,000	7.4×10^{26}	5730	years	1.8×10^{11}	3.8×10^{-12}	14.0	2.9	1.29×10^{-14}
F-18	2,000	7.4×10^{26}	109.8	min	6586.3	1.05×10^{-4}	18.0	0.69	6.56×10^{-8}
Na-22	400	1.48×10^{25}	2.602	years	8.2×10^{7}	8.44×10^{-9}	21.99	49	3.06×10^{-10}
Na-24	600	2.22×10^{25}	14.96	hours	53856	1.29×10^{-5}	23.99	49	4.28×10^{-7}
Si-31	3,000	1.11×10^{26}	2.62	hours	9432	7.35×10^{-5}	30.98	79	3.05×10^{-6}
P-32	30	1.11×10^{24}	14.268	days	1.2×10^{6}	5.62×10^{-7}	31.97	1.4	4.01×10^{-10}
Cl-36	700	2.59×10^{25}	3.01×10^{5}	years	9.5×10^{12}	7.3×10^{-14}	35.97	243	8.02×10^{-15}
Cl-38	1,000	3.7×10^{25}	37.24	min	2234.4	0.0003	37.97	243	3.23×10^{-5}
K-42	900	3.33×10^{25}	12.36	hours	44496	1.56×10^{-5}	41.96	19	1.15×10^{-7}
Ca-45	10	3.7×10^{23}	162.7	days	1.41×10^{7}	4.93×10^{-8}	44.96	161	2.87×10^{-9}
Ca-47	80	2.96×10^{24}	4.5	days	3.89×10^{5}	1.78×10^{-6}	46.95	161	9.95×10^{-8}
V-48	90	3.33×10^{24}	15.97	days	1.38×10^{6}	5.02×10^{-7}	47.95	0.03 (BD)	5.11×10^{-12}
Cr-51	6,000	2.22×10^{26}	27.7	days	2.39×10^{6}	2.90×10^{-7}	50.94	0.05 (BD)	4.62×10^{-12}
Mn-56	300	1.11×10^{25}	2.58	hours	9284.04	7.47×10^{-5}	55.94	1.6	3.47×10^{-8}
Ni-59	300	1.11×10^{25}	76,000	years	2.40×10^{12}	2.89×10^{-13}	58.93	0.03	2.39×10^{-18}
As-76	60	2.22×10^{21}	1.09	days	94539	7.33×10^{-6}	75.92	0.018	2.83×10^{-11}
As-77	200	7.4×10^{21}	38.83	hours	1.40×10^{5}	4.96×10^{-6}	76.92	0.018	1.89×10^{-11}
Br-82	100	3.7×10^{21}	35.28	hours	1.27×10^{5}	5.46×10^{-6}	81.92	0.14	1.52×10^{-10}
Sr-85m	20,000	7.4×10^{23}	67.63	min	4058	0.00017	84.91	0.46	1.51×10^{-8}
Sr-90	8	2.96×10^{20}	28.9	years	9.12×10^{8}	7.6×10^{-10}	89.91	0.46	6.33×10^{-14}
Sr-91	200	7.4×10^{21}	9.63	hours	34668	2.0×10^{-5}	90.91	0.46	1.65×10^{-9}
Sr-92	200	7.4×10^{21}	2.66	hours	9576	7.24×10^{-5}	91.91	0.46	5.89×10^{-9}
Cd-115m	90	3.33×10^{21}	44.56	days	3.85×10^{6}	1.80×10^{-7}	114.91	0.02 (BD)	5.1×10^{-13}
Ba-131	600	2.22×10^{22}	11.5	days	9.94×10^{5}	6.98×10^{-7}	130.91	0.06	5.20×10^{-12}

Radionuclide	Approximate concentration = 4 mrem/yr (pCi/L)	Bq/L (disintegrations per second per liter)	Half-Life	Units	Half-Life (Seconds)	Decay Constant (λ)	Atomic Mass	Expected Concentration in Discharge (mg/L)	Approximate Radioactive Concentration (pCi/L)
Ba-140	90	3.33×10^{21}	12.75	days	1.10×10^{6}	6.29×10^{-7}	139.91	0.06	4.39×10^{-12}
Pb-203	1000	3.7×10^{22}	51.87	hours	1.87×10^{5}	3.71×10^{-6}	202.97	0.33 (BD)	9.82×10^{-11}

The dose equivalent for each radionuclide was calculated by dividing the approximate radioactive concentration in the effluent by the approximate concentration equivalent to 4 millirem per year (mrem/yr). The resultant is the fraction of the total allowable dose (4 mrem). The total dose equivalent was determined by summing the calculated fractions and multiplying the total fraction by 4 millirem. The total dose equivalent was calculated to be approximately 1.44×10^{-7} mrem per year.

The table below summarizes the limit based on WAC 173-201A-240 and the approximate radioactive concentrations expected in Solvay's discharge. All radionuclides are included in the table below which have specified limits in WAC 246-221-290. This includes radionuclides which are not naturally occurring and parameters which Solvay did not analyze the groundwater for.

Radionuclide	Approximate Radioactive Concentration = 4 mrem/year (pCi/L)	Approximate Radioactive Concentration from Total Estimated Effluent Concentration (pCi/L)	Discharge Allowance in WAC 246-221-290 (µCi/mL)	Limit based on WAC 173-201A-240 (pCi/L) *1/12.5 of WAC 246-221-290 allowance*
Hydrogen-3	20,000	Not tested	1×10^{-2}	800,000
Beryllium-7	6,000	Not tested	6×10^{-3}	48,000
Carbon-14	2,000	1.29×10^{-14} (calculated based on Total Organic Carbon result)	3×10^{-4}	2,400
Fluorine-18	2,000	6.56×10^{-8} (calculated using soluble fluoride concentration)	7×10^{-3}	56,000
Sodium-22	400	3.06×10^{-10}	6×10^{-5}	480
Sodium-24	600	4.28×10^{-7}	5×10^{-4}	4,000
Silicon-31	3,000	3.05×10^{-6}	1×10^{-4}	8,000
Phosphorus-32	30	4.01×10^{-10}	9×10^{-6}	720

Radionuclide	Approximate Radioactive Concentration = 4 mrem/year (pCi/L)	Approximate Radioactive Concentration from Total Estimated Effluent Concentration (pCi/L)	Discharge Allowance in WAC 246-221-290 (µCi/mL)	Limit based on WAC 173-201A-240 (pCi/L) *1/12.5 of WAC 246-221-290 allowance*
Sulfur-35 (inorganic)	500	Not tested	1×10^{-4}	8,000
Chlorine-36	700	8.02×10^{-15}	2×10^{-5}	1,600
Chlorine-38	1,000	3.23×10^{-5}	3×10^{-4}	24,000
Potassium-42	900	1.15×10^{-7}	6×10^{-5}	4,800
Calcium-45	10	2.87×10^{-9}	2×10^{-5}	1,600
Calcium-47	80	9.95×10^{-8}	1×10^{-5}	800
Vanadium-48	90	5.11×10^{-12}	9×10^{-6}	720
Chromium-51	6,000	4.62×10^{-12}	5×10^{-4}	40,000
Manganese-56	300	3.47×10^{-8}	7×10^{-5}	5,600
Nickel-59	300	2.39×10^{-18}	3×10^{-4}	24,000
Arsenic-76	60	2.83×10^{-11}	1×10^{-5}	800
Arsenic-77	200	1.89×10^{-11}	6×10^{-5}	4,800
Bromine-82	100	1.52×10^{-10}	4×10^{-5}	3,200
Rubidium-87	300	Not tested	1×10^{-5}	800
Strontium-85(m)	20,000	1.51×10^{-8}	3×10^{-3}	240,000
Strontium-90	8	6.33×10^{-14}	5×10^{-7}	40
Strontium-91	200	1.65×10^{-9}	2×10^{-5}	1,600
Strontium-92	200	5.89×10^{-9}	No limit	--
Yttrium-91(m)	9,000	Not tested	2×10^{-3}	160,000
Yttrium-92	200	Not tested	4×10^{-5}	3,200
Yttrium-93	90	Not tested	2×10^{-5}	1,600
Zirconium-93	2,000	Not tested	4×10^{-5}	3,200
Zirconium-95	200	Not tested	2×10^{-5}	1,600
Zirconium-97	60	Not tested	9×10^{-6}	720
Niobium-97	3,000	Not tested	3×10^{-4}	24,000
Technetium-96(m)	30,000	Not tested	2×10^{-3}	160,000

Radionuclide	Approximate Radioactive Concentration = 4 mrem/year (pCi/L)	Approximate Radioactive Concentration from Total Estimated Effluent Concentration (pCi/L)	Discharge Allowance in WAC 246-221-290 (µCi/mL)	Limit based on WAC 173-201A-240 (pCi/L) *1/12.5 of WAC 246-221-290 allowance*
Technetium-99	900	Not tested	6×10^{-5}	4,800
Ruthenium-105	200	Not tested	7×10^{-5}	5,600
Palladium-109	300	Not tested	3×10^{-5}	2,400
Cadmium-115(m)	90	5.10×10^{-13}	4×10^{-6}	320
Indium-113(m)	3,000	Not tested	7×10^{-4}	56,000
Indium-114(m)	60	Not tested	5×10^{-6}	400
Indium-115	300	Not tested	5×10^{-7}	40
Indium-115(m)	1,000	Not tested	2×10^{-4}	16,000
Tin-113	300	Not tested	3×10^{-5}	2,400
Tin-125	60	Not tested	6×10^{-6}	480
Antimony-122	90	Not tested	1×10^{-5}	800
Antimony-124	60	Not tested	7×10^{-6}	560
Tellurium-125(m)	600	Not tested	2×10^{-5}	1,600
Tellurium-127(m)	200	Not tested	9×10^{-6}	720
Tellurium-129(m)	90	Not tested	7×10^{-6}	560
Tellurium-131(m)	200	Not tested	8×10^{-6}	640
Tellurium-132	90	Not tested	9×10^{-6}	720
Iodine-126	3	Not tested	1×10^{-6}	80
Iodine-129	1	Not tested	2×10^{-7}	16
Iodine-132	90	Not tested	1×10^{-4}	8,000
Iodine-133	10	Not tested	7×10^{-6}	560
Iodine-134	100	Not tested	4×10^{-4}	32,000
Cesium-131	20,000	Not tested	3×10^{-4}	24,000
Cesium-134	80	Not tested	9×10^{-7}	72
Cesium-134(m)	20,000	Not tested	2×10^{-3}	160,000
Cesium-135	900	Not tested	1×10^{-5}	800

Radionuclide	Approximate Radioactive Concentration = 4 mrem/year (pCi/L)	Approximate Radioactive Concentration from Total Estimated Effluent Concentration (pCi/L)	Discharge Allowance in WAC 246-221-290 (µCi/mL)	Limit based on WAC 173-201A-240 (pCi/L) *1/12.5 of WAC 246-221-290 allowance*
Cesium-136	800	Not tested	6×10^{-6}	480
Cesium-137	200	Not tested	1×10^{-6}	80
Barium-131	600	5.20×10^{-12}	4×10^{-5}	3,200
Barium-140	90	4.39×10^{-12}	8×10^{-6}	640
Lanthanum-140	60	Not tested	9×10^{-6}	720
Neodymium-147	200	Not tested	2×10^{-5}	1,600
Neodymium-149	900	Not tested	1×10^{-4}	8,000
Promethium-147	600	Not tested	7×10^{-5}	5,600
Promethium-149	100	Not tested	2×10^{-5}	1,600
Gadolinium-153	600	Not tested	6×10^{-5}	4,800
Gadolinium-159	200	Not tested	4×10^{-5}	3,200
Terbium-160	100	Not tested	1×10^{-5}	800
Dysprosium-165	1,000	Not tested	2×10^{-4}	16,000
Dysprosium-166	100	Not tested	1×10^{-5}	800
Lutetium-177	300	Not tested	4×10^{-5}	3,200
Hafnium-181	200	Not tested	2×10^{-5}	1,600
Tungsten-187	200	Not tested	3×10^{-5}	2,400
Rhenium-186	300	Not tested	3×10^{-5}	2,400
Rhenium-187	9,000	Not tested	8×10^{-3}	640,000
Rhenium-188	200	Not tested	2×10^{-5}	1,600
Osmium-191(m)	9,000	Not tested	2×10^{-4}	16,000
Platinum-191	300	Not tested	5×10^{-5}	4,000
Platinum-193(m)	3,000	Not tested	4×10^{-5}	3,200
Platinum-197	300	Not tested	4×10^{-5}	3,200
Platinum-197(m)	3,000	Not tested	2×10^{-4}	16,000
Mercury-197(m)	600	Not tested	4×10^{-5}	3,200

Radionuclide	**Approximate Radioactive Concentration = 4 mrem/year (pCi/L)**	**Approximate Radioactive Concentration from Total Estimated Effluent Concentration (pCi/L)**	**Discharge Allowance in WAC 246-221-290 (µCi/mL)**	**Limit based on WAC 173-201A-240 (pCi/L)** *1/12.5 of WAC 246-221-290 allowance*
Thallium-200	1,000	Not tested	1×10^{-4}	8,000
Thallium-201	900	Not tested	2×10^{-4}	16,000
Thallium-202	300	Not tested	5×10^{-5}	4000
Lead-203	1,000	9.82×10^{-11}	7×10^{-5}	5,600
Bismuth-206	100	Not tested	9×10^{-6}	720
Protactinium-233	300	Not tested	2×10^{-5}	1,600
Neptunium-239	300	Not tested	2×10^{-5}	1,600

Loading Capacity Calculations at Three Rivers Regional Wastewater Authority WWTP

Three Rivers Regional Wastewater Authority (TRRWA) has specified design criteria for the treatment plant included in the NPDES discharge permit (WA003778). The design criteria are included below, for reference.

Parameter	Design Criteria
Average Flow for the Maximum Month	26.0 Million Gallons per Day (MGD)
5-day Biochemical Oxygen Demand (BOD_5) Loading for Maximum Month	31,200 pounds per day (lbs/day)
Total Suspended Solids (TSS) Loading for Maximum Month	32,100 lbs/day

Ecology must ensure that Solvay's discharge will not cause excessive loading to the treatment plant. TRRWA discharge data was reviewed for March 2017 through March 2019. Ecology calculated the approximate total loading to the facility based on Solvay's reported maximum discharge concentrations. The flow rate used is based on the maximum flow rate expected for the discharge to Outfall 002 (210,190 gallons per day) as well as the expected typical discharge from Outfall 001A (76,250 gallons per day). This combined flow rate was used because the permit allows Solvay to divert flows from Outfall 002 to Outfall 001A during specified periods. The expected combined loading to TRRWA is included in the tables below using the 99th, 95th, and 90th percentiles of TRRWA influent DMR data.

Percentile	TRRWA Flow (MGD)	TRRWA CBOD/BOD (lbs/day)	TRRWA TSS (lbs/day)
99th	21.8	15,810	31,502
95th	16.4	12,184	18,455
90th	14.1	11,032	15,704

Solvay Flow (MGD)	Solvay CBOD/BOD (lbs/day)	Solvay TSS (lbs/day)
0.29	307.16	105.21

Percentile	Combined Flow (MGD)	Combined CBOD/BOD (lbs/day)	Combined TSS (lbs/day)
99th	22.09	16,117	31,607
95th	16.69	12,491	18,560
90th	14.37	11,339	15,809

Appendix E--Response to Comments

Ecology published notice of an opportunity to comment on draft NPDES Permit No. WA0991024 in The Daily News on August 27, 2019. The proposed permit will allow Solvay Chemicals, Inc. to discharge process wastewater to the Consolidated Diking Improvement District No. 1's Ditch #5, Three Rivers Regional Wastewater Authority, or Nippon Dynawave Packaging Company, LLC. In the notice, Ecology invited public review of the proposed permit and provided a 31-day public comment period. The deadline for submittal of written comments was September 27, 2019. During the comment period, Ecology received written comments from two entities electronically.

The comments and Ecology's responses to comments are presented below. Comments appear in regular text, followed by Ecology's response in italicized text. One change was made to the permit based on the comments received, as discussed in the responses below.

Ecology will send a copy of this response to comments to each individual who provided comments. A copy of the final permit will be sent to all interested parties upon issuance and posted on the Industrial Section website at *https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Industrial-facilities-permits.*

Ecology has separated comments in two sections: City of Longview Comments and Consolidated Diking Improvement District No. 1 Comments.

City of Longview Comments

1. S1.D. Interim Effluent Limits for Outfall 002

   The City believes that Ecology should revisit the inclusion of interim effluent limits under this Permit. The proposed interim limits provide for much higher total residual chlorine, chloride and ammonia discharge concentrations than the final effluent limits for a period of two years.

   Under the Western Washington Phase II Municipal Stormwater Permit, the City of Longview is required to address all illicit discharges to its stormwater system. According to the City's NPDES permit, planned discharges of potable water shall be "dechlorinated to a total residual chlorine concentration of 0.1 parts per million or less." In addition, discharges from swimming pools, spas and hot tubs are conditionally allowed only if they are dechlorinated to the same standard (0.1 ppm). The proposed interim average monthly total residual chlorine limit at 0.2 ppm is twice as high as the stormwater permit standard, while the maximum daily limit is five times higher (0.5 ppm). Further, the proposed limits are substantially higher than the limits permitted for the Three Rivers Regional Wastewater Treatment Plant discharge to similarly classified waters. The City feels that, at the minimum, the applicant should be required meet the same chlorine limits as the municipal stormwater permittees.

   Additionally, the chloride and ammonia concentrations under the proposed interim limits are twice the final limits.

The high ammonia concentrations in particular will have deleterious impacts to the receiving water of CDID #1 Ditch 5, including increased growth of aquatic vegetation.

The City believes that the applicant should implement all known, available and reasonable methods of prevention, control and treatment (AKART) at the time that the permit is issued and not be given an "interim" period in which to reach the expected effluent standards.

Ecology's Response to Comment 1. The Clean Water Act allows for interim discharge limits with a compliance schedule for discharges which cannot meet the final effluent limits. In this case it's unknown if the discharge will be able to meet the final effluent limits because the discharge is proposed and the exact characteristics of the discharge may vary from the predicted characteristics. 40 CFR 122.47(a)(2) states, in part, "The first NPDES permit issued to a new source or a new discharger shall contain a schedule of compliance only when necessary to allow a reasonable opportunity to attain compliance with requirements issued or revised after commencement of construction but less than three years before commencement of the relevant discharge." The proposed permit did not include a section specifically for a compliance schedule; however, the receiving water study and priority pollutant monitoring requirements were intended to be used as a compliance schedule. Ecology intends to monitor discharge data and use the receiving water study results to determine if additional treatment is necessary prior to discharging. If additional treatment is found to be necessary a compliance order will be issued requiring Solvay to install additional treatment. Ecology believes this approach meets the requirements of a compliance schedule; however, in order to clearly identify the steps required to ensure compliance with the final effluent limits a special condition has been added to the permit which outlines the compliance schedule (Special Condition S15).

Ecology's Permit Writer's Manual specifies that interim limits can be based on existing performance. For this discharge there is not historical discharge data, which prohibits Ecology from using existing performance to determine interim limits. Instead interim limits were developed on a pollutant-specific basis. For total residual chlorine (TRC), technology-based limits were used for the interim limits. These technology-based limits were determined to be AKART for this discharge, and were established from comparable discharges as described in the fact sheet (Section III.B).

The water quality standard for ammonia is based on the temperature and pH of the receiving water body and can vary greatly throughout the year. The water quality standards for ammonia for CDID Ditch #5 were calculated using the highest temperature and pH recorded in CDID Ditch #5 during the sampling event which occurred in 1992. The final discharge limit was calculated using the water quality standards and the maximum concentration of ammonia that was observed in CDID Ditch #5 during the 1992 sampling event. There's a limited number of samples that were collected during this sampling event in 1992 and this data is over 25 years old, which may not be representative of current conditions in CDID Ditch #5.

By using the maximum observed values in CDID Ditch #5 rather than the average value or a 90th percentile value Ecology has calculated conservative discharge limits to ensure the final discharge limits are protective of the receiving water's beneficial uses.

2. S1.D. Interim and Final Effluent Limits for Outfall 002

   CDID#1 Ditch 5 is historically and currently listed as a Category 5 for dissolved oxygen (DO) and was placed on the Federal 303(d) List. A Total Maximum Daily Load (TMDL) for this listing is in a pending status.

   Considering TSS and ammonia both contribute to turbidity and decreased DO, and that daily and monthly averaging is allowed, the City is concerned that the interim and final effluent limits for these two parameters may lead to violations of water quality standards for both turbidity and DO and be counterproductive in regards to future TMDL efforts.

   Ecology's Response to Comment 2. During the development of a TMDL, all sources which may be contributing to the impairment are reviewed and a load allocation is applied to the source. This load allocation is generally translated into a discharge limit that is incorporated into the discharge permit. In order to determine if the discharge of ammonia or TSS from Solvay's Outfall 002 has the potential to contribute to the dissolved oxygen (DO) impairment or to an exceedance of the TSS water quality standard, modeling of the discharge and the receiving water body is necessary. Ecology does not currently have sufficient data to complete this modeling exercise. Modeling requires an extensive amount of data for both the discharge and CDID Ditch #5. At this time, Ecology has included effluent limits for both ammonia and TSS based on the available information.

3. S2. Monitoring Requirements

   The City concurs with the requirement for comprehensive characterization monitoring of effluent of discharges to Outfall 002 and receiving water monitoring in CDID #1 Ditch 5. However, some of the parameters may be unnecessary given the industrial processes of the permittee.

   Ecology's Response to Comment 3. The presence of many of the priority pollutants in the discharge is not expected; however, there is not a guarantee that the pollutants will not be present in the discharge, which is why they are required to be monitored at least once during the permit term. If Solvay does not have a detection of specific pollutants in the discharge, monitoring may not be required during the next permit term.

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4. S1.D. Interim Effluent Limits for Outfall 002. The interim effluent limits should be revisited and/or deleted.

Chlorine: Solvay's flow diagram does not indicate a dechlorination process but RO membranes do not tolerate chlorine. Dechlorination will be necessary between the Green Sand Filters and the RO Units and, if necessary to their own treatment process, it is reasonable to also require the filter backwash to be dechlorinated. If public utilities, contractors and even homeowners are expected to comply with Ecology's source control BMP's 441 and 443 which limit chlorine residual to 0.1 ppm for flows which are comparatively low and infrequent, one can and should expect an industrial user to do the same or better. Limits of 0.2 mg/L (avg monthly) and 0.5 mg/L (max day) are not acceptable to CDID#1. And, CDID#1 is not comfortable relying on the possibility of a future administrative order to enforce more stringent conditions that are not written into the permit.

Ammonia: CDID#1 performs regular maintenance in Ditch No. 5 to control aquatic vegetation. Elevated levels of ammonia may promote additional weed growth which negatively impacts pumping operations at CDID#1's Industrial Way pump station.

Ecology's Response to Comment 4. See response to Comment 1 for the City of Longview for a discussion on interim discharge limits and information on the development of the TRC and ammonia interim limits.

The final discharge limits for TRC are 12.4 micrograms per liter (µg/L) as an average monthly limit and 18.1 µg/L as a daily maximum limit. These limits are significantly lower than 0.1 mg/L (100 µg/L). These limits are established in the permit and have an effective date of November 1, 2021. The interim limits are based on the discharge limits that power generation facilities are currently required to meet for cooling tower blowdown discharges, as discussed in this fact sheet (Section III.B).

5. S1.D. Final Effluent Limits. Add a parameter for a maximum daily flow rate equal to 210,000 gallons per day. This is the maximum volume which Solvay and CDID#1 have mutually accepted in our regional detention agreement.

   Ecology's Response to Comment 5. Ecology can establish limits which are water quality-based or technology-based. Water quality-based limits are generally based on potential impacts on the receiving water body. Technology-based limits can be based on EPA promulgated discharge limits, required treatment efficiencies for a treatment plant, or Washington's AKART requirements (all known, available, and reasonable methods of treatment). The agreed discharge rate from Outfall 002 between Solvay and CDID #1 would not be considered a water quality-based or technology-based limit.

6. S1.D. Final Effluent Limits. In addition to the permitted limits listed, define what water quality standard must be met for CDID Ditch #5. Provide specific reference to WAC 173-201A-240, Table 240 for Aquatic Life Freshwater Criteria (or other), as applicable.

   Ecology's Response to Comment 6. Ecology does not traditionally include the water quality standards in their permits.

As part of drafting the permit, Ecology must ensure that the water quality standards will not be exceeded as a result of the permitted discharge(s), based on the information available at the time. The fact sheet describes the process that is used to make that determination. Section III.D of the fact sheet describes the beneficial uses of CDID Ditch #5 and what water quality standards apply to the water body.

Additionally, General Condition G3 includes the conditions under which a permit can be modified, terminated, or revoked and reissued. One of the conditions includes the determination that the discharge contributes to water quality standards violations. If it is determined that the discharge causes or contributes to a violation of the water quality standards, the permit will be modified or revoked and reissued to include discharge limits for the pollutants of concern.

7. S2. Monitoring Requirements. Permittee is required to sample and test effluent for metals and other primary pollutants but the water quality standard is undefined. Refer to prior comment.

   Ecology's Response to Comment 7. The water quality standards for toxic pollutants (i.e., metals and many priority pollutants) are included in WAC 173-201A-240. This section also includes the human health standards.

8. S6. Prohibited Discharges. As written, this applies only to Outfalls 001A and 001B. Are there any prohibited discharges to Outfall 002?

   Ecology's Response to Comment 8. The prohibited discharges included in Special Condition S6 are specific to discharges to a receiving treatment works. These prohibited discharges are included in federal and state regulations specific to pretreatment permits and have been developed to prevent harm to the receiving treatment plant. The discharge from Outfall 002 is not a pretreatment discharge and therefore is not included in this Special Condition.

   There is not a single section in the permit which lists all of the prohibited discharges for Outfall 002; rather there are numerous sections that discuss prohibited discharges. The sections which include discharge prohibitions for Outfall 002 are included below with a brief description of the discharge prohibition.

   - *Special Condition S5 prohibits the discharge of solid waste material, including leachates, to surface waters.*

   - *Special Condition S9 requires Solvay to request approval from Ecology prior to discharging non-routine or unanticipated wastewater. Solvay is not authorized to discharge wastewater streams which were not identified in the permit application unless approved in accordance with this condition.*

- *Special Condition S10 requires Solvay to develop and follow a Spill Control Plan. The spill control plan must identify how Solvay will prevent, contain, or treat spills of all oil and petroleum products and any materials which would designate as dangerous waste if spilled. This condition indirectly prohibits discharges of these materials.*

- *Special Condition S14 prohibits the discharge of process area stormwater to surface waters. All stormwater from process areas must be discharged to a receiving treatment plant for further treatment.*

- *General Condition G9 prohibits the discharge of substances which are removed in the process of treating wastewater for discharge.*

- *General Condition G20 requires Solvay to notify Ecology if the discharge from Outfall 002 will exceed listed 'notification levels' for any toxic pollutant which does not have a limit in the permit. These 'notification levels' vary based on the specific pollutant.*

Any discharge which causes or contributes to a violation of the water quality standards in CDID Ditch #5 is prohibited.

9. S7. Dilution Prohibited. As written, this applies only to Outfalls 001A and 001B. Is dilution an acceptable practice to Outfall 002?

   Ecology's Response to Comment 9. Special Condition S7 is also specifically for pretreatment discharges to a receiving treatment facility and is derived from 40 CFR 403.6(d). Discharges from Outfall 002 are not regulated under the pretreatment rules. Solvay must properly operate and maintain the treatment and discharge systems for Outfall 002, as required by Special Condition S4. Dilution of the discharge stream for purposes of meeting the discharge limits would not be considered proper operation of the treatment system and is not authorized.

10. S12. Receiving Water Study.

    a. Paragraph 2c – Clarify what is meant by the "critical period". Does this relate to Solvay's max process flows or water quality changes within CDID's Ditch No. 5 due to environmental factors or both?

    Ecology's Response to Comment 10.a. The critical period is determined based on many different parameters and is pollutant and location specific. Some of the factors Solvay must consider when determining the critical period for the receiving water study sampling includes low-flow conditions in CDID Ditch #5, if pollutants could have different effects throughout the year, seasonal processes at Solvay that may have higher impacts on the discharge characteristics, etc.

Before Solvay completes sampling for the receiving water study a Sampling and Quality Assurance Plan must be submitted to Ecology for review and approval. The Sampling and Quality Assurance Plan must include the proposed timing of samples and justification for the proposed timing. Ecology will review the proposed timing to determine if the critical periods of concern are fully captured in the proposed sampling timeframe and may require additional sampling or a modified timeline, if necessary.

b. Paragraph 3 – Is the Permittee being required to conduct sediment sampling? All discussion relates to water quality sampling only.

Ecology's Response to Comment 10.b. Sediment sampling is not required in the receiving water study. Based on the sources of wastewater contributing to the discharge at Outfall 002 Ecology determined that sediment sampling was not necessary at this time.

c. Paragraph 4 – Permittee should also be required to submit a copy of the report to CDID#1.

Ecology's Response to Comment 10.c. Ecology's Water Quality Permitting and Reporting Information System (PARIS) is publicly available and includes all documents submitted to Ecology, as well as discharge monitoring reports (DMRs), inspection reports, and other formal correspondence between Ecology and the facility. When Solvay submits the Sampling and Quality Assurance Plan and the final report, CDID #1 will be able to access this report via the PARIS database.