Fact Sheet for NPDES Permit WA0002925

McKinley Paper Company

August 27, 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 McKinley Paper Company (McKinley).

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 McKinley Paper Company, NPDES permit WA0002925, are available for public review and comment from September 3, 2019 until October 4, 2019. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement Information**.

McKinley Paper Company 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

McKinley discharges treated wastewater and stormwater and filtered backwash water to the Strait of Juan de Fuca. Ecology issued the previous permit for this facility on October 10, 2013 and the modified permit on November 1, 2017. Ownership was transferred between Nippon Paper Industries USA Co. to McKinley Paper Company in March 2017. A few months later, mill operations were temporarily curtailed. The facility is in the process of converting their operations to produce paperboard from wastepaper and expect to resume operations in the winter of 2019.

The proposed permit consists of the following amendments and requirements:

- Amends the biochemical oxygen demand (BOD) and total suspended solid (TSS) limits as a result of the change in papermaking process.
- Requires nutrient and enterococci monitoring, sediment monitoring, stormwater pollution prevention plan, and mixing zone study.
- Adds corrective actions when turbidity discharge at Outfall 002 is greater than 2000 NTU.
- Retains all other requirements from previous permit.

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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:	McKinley Paper Company Washington Mill
Facility Name and Address	McKinley Paper Company Washington Mill 1815 Marine Drive, Port Angeles, WA 98363
Contact at Facility	Name: Terry Nishimoto Title: Environmental Manager Telephone #: 360-565-7045
Responsible Official	Name: Edward Bortz Title: General Manager Address: 1815 Marine Drive, Port Angeles, WA 98363 Telephone #: 360-565-7076
Industry Type	Secondary fiber non-deink where paperboard from wastepaper is produced - non-corrugating and corrugating medium finish
Categorical Industry	40 CFR Part 430 Subpart J
Type of Treatment	Primary clarification followed by activated sludge treatment
SIC Codes	2621
NAIC Codes	322122
Facility Location (NAD83/WGS84 reference datum)	Latitude: 48.135 Longitude: 123.466
Discharge Waterbody Name and Location (NAD83/WGS84 reference datum)	Strait of Juan de Fuca (WA-18-0010) Outfall 001: Latitude: 48.13694444 Longitude: 123.47444444 Outfall 002: Latitude: 48.13777778 Longitude: 123.47027778

Permit Status	
Renewal Date of Previous Permit	Issued on October 10, 2013. Effective on November 1, 2013
Application for Permit Renewal Submittal Date	April 12, 2018
Date of Ecology Acceptance of Application	April 27, 2018

Inspection Status	
Date of Last Sampling Inspection	May 12, 2017
Date of Last Non-sampling Inspection Date	April 11, 2019

Figure 1 Facility Location Map

A. Facility Description

History

McKinley Paper Company Washington Mill was built in 1920 at the base of Ediz Hook in Port Angeles, Washington and was owned and operated by Crown Zellerbach Corp for many years. Daishowa American Co. (subsequently Nippon Paper Industries) purchased the facility in 1988 and owned and operated the facility until McKinley purchased the facility in March 2017. Until recently, the facility produced newsprint and telephone directory paper, from thermo-mechanical pulping, deinking pulping, and non-integrated semi-bleach kraft pulping systems. The facility has been curtailed since January 21, 2017. The facility currently employs approximately 44 employees and plans to have about 120 employees at full production.

Cooling Water Intakes

CWA § 316(b) requires the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. Since July 2013, Ecology has required a supplemental application for all applicants using EPA Form 2-C. McKinley selected "No" on this form when asked if a cooling water intake is associated with the facility.

Industrial Processes

From December 2013 through January 2017, the facility produced an average of 295 tons/day of telephone directory paper off-of-the-machine from the thermo-mechanical pulping, deinking pulping, and non-integrated semi bleach kraft pulping systems. The permit renewal application proposes to produce 840 tons/day of linerboard, medium and bag grades using recycled old corrugated containers (OCC) and mixed paper (non-corrugated).

Water Treatment

The facility treats raw water from the Elwha River prior to using it in its industrial processes. As part of the water treatment process it produces filter plant backwash, which discharges through Outfall 002 (further information below).

Wastewater Treatment processes

The facility collects stormwater runoff on site including the stormwater runoff on the public roads adjacent to the facility and stormwater runoff on site of the Andeavor petroleum bulk terminal in the sump and pumps it to the primary treatment system. The stormwater runoff on site of the Andeavor petroleum bulk terminal is routed to Andeavor's oil water separator before being pumped to McKinley's collection sump.

The facility treats its wastewater and stormwater runoff on site with primary settling followed by a secondary activated sludge treatment system and then secondary clarification prior to discharge. The wastewater treatment system historically removed about 90 percent of the solids and biochemical oxygen demand (BOD) from the raw wastewater. Treated wastewater is discharged through **Outfall 001** at an average of 6.6 MGD.

Biomass Cogeneration Facility

The cogeneration facility was built in 2013 to produce both steam and electricity.

Cooling water is required for the power generating process and is supplied from the existing Elwha River water supply. The river water is filtered to remove particulates and then used throughout the mill. Heat reuse, water reuse, and thermal dissipation treatment technologies are applied in the mill, thereby minimizing thermal water discharges to Outfall 001. A two-cell cooling tower has been selected for dissipating the heat load from the surface condenser of the steam turbine generator for the vast majority of operating conditions throughout the year. This configuration allows warm water from the surface condenser to be reused within the mill, thus avoiding a 2.0 MGD increase in raw water use that would otherwise be needed for cooling.

The water filter plant (WFP) will continue to produce approximately 6.5 MGD of filtered water for use in the paper mill, but will first be circulated through the cogeneration facility. Approximately 6.3 MGD will be used as non-contact cooling water for the cogeneration steam turbine generator (STG) surface condenser. Non-contact cooling water will flow through a cooling tower that uses variable-speed fans to dissipate the heat load as necessary for normal operating conditions throughout the year. This water will then be used as process water within the mill.

Solid Wastes

The facility generates and manages various solid waste streams including: boiler ash, industrial wastes, sewage sludge, demolition and construction wastes, and recycle materials. The facility has a current solid waste plan that is reviewed and approved by the facility's environmental manager every five years.

Discharge Outfalls 001 and 002

The facility's water balance is expected to improve with the tooling to 100% recycled paper manufacturing from changing the previous batch-style refining operations to a continuous recycle pulping process aligned with paper machine operations. The existing condensing turbine in the cogeneration plant also will be replaced with a back pressure turbine. These modifications are anticipated to reduce the mill water needs by approximately 50% which further results in the following: reduce backwashing frequency in the filter plant with less water use; and possibly eliminate use of the surface condenser and cooling towers for the cogen facility, thus no intermittent non-contact cooling water discharge.

Outfall 001 - Consists of a 1,200-foot long concrete-coated steel pipe that terminates in a 300-foot long multiport diffuser section. The 300-foot long outfall diffuser has a total of 32 ports discharging secondary effluent into the Strait of Juan de Fuca at an average depth of 30 feet below Mean Lower Low Water (MLLW). The outfall diffuser has twenty (20) 5-inch diameter ports and ten (10) 6-inch diameter ports situated along the outfall flanks and two (2) 8-inch diameter ports located on the top of the pipe. The 30 lateral diffuser ports discharge at an angle of 45 degrees toward the surface and the ports are spaced at 10 feet apart on opposite sides of the diffuser. Adjacent ports on the same side of the diffuser are 20 feet apart.

The two 8-inch ports on the top of the end structure of the outfall discharge effluent at 90 degrees toward the surface of the water, and these ports are 4 feet apart. Outfall 001 discharges approximately 6.6 MGD of the final effluent into the Strait of Juan de Fuca.

Outfall 002 - The Elwha River Ecosystem and Fisheries Restoration Act of 1992 caused the removal of Elwha and Glines Canyon dams.

The demolition of the dams is expected to impact the water quality of the untreated water delivered to the water treatment plant at the facility. In the NPDES permit that was issued in 2007, Ecology required the facility to conduct an AKART study, submit an engineering and specification report, and conduct an effluent mixing study for the anticipated filter backwash discharge.

The initial AKART study was conducted by URS in April 2007. The AKART study was updated in October 2011 to reflect the addition of the cooling towers to the overall cogeneration project. Ecology's review concurred that the deep outfall in combination with engineering report and design specifications and the discharge mixing study met the AKART requirements and the water quality standards, Chapter 173-201A WAC. The facility implemented the AKART and completed construction of the new Outfall 002 in 2011.

Originally, Outfall 002 consisted of an above-grade 12-inch steel pipe that discharged onto the riprap shoreline adjacent to the water filter plant (WFP). Additional solids were anticipated to be entrained in the source (river) water with the removal of the dams. Filtration plant improvements, as well as replacement of Outfall 002 with a deep water outfall with a multiport diffuser, were implemented to address the potential long-term changes in the source water quality to the facility. The deep water outfall consists of a 24-inch fused HDPE SDR 17 pipe extending roughly 1,000 feet into the Strait of Juan de Fuca and ending in a 375 foot diffuser. The diffuser consists of 25, 3-inch flanged diffuser ports located at 15-feet on-center, on alternating sides of the pipe. The diffuser lies at an average depth of 28 feet. Outfall 002 discharges approximately 0.6 MGD (of filter plant backwash from six sand filter beds, settled solids from the sedimentation basin, and valve leakage) into the Strait of Juan de Fuca.

B. Description of the Receiving Water

McKinley discharges treated wastewaters to the Strait of Juan de Fuca. Other nearby point source outfalls include the City of Port Angeles.

The ambient background data used for this permit includes the following from Ecology's Long-Term Marine Water Quality Database for Dungeness Bay Station DUN001 and Nippon Paper's "Water Treatment Plant Outfall Effluent Mixing Report" completed by URS in September 2009. The data for the metals as total recoverable comes from an Ecology sampling event which included sampling in the Strait of Juan de Fuca done in 2009 (Publication No. 09-03-051).

Table 2 Ambient Background Data

Parameter	Value Used
Temperature (lowest)	7.7 °C
Temperature (highest)	11.4 °C
pH (Minimum / Maximum)	7.6 – 7.9 standard units
Dissolved Oxygen	5.3mg/L at 18 meters; 9.2mg/L at 0.5 meters
Fecal Coliform	1 colony / 100 ml
Turbidity (secchi disc)	3.9 meters in August; 8 meters in February
Hardness	5790 mg/L as CaCO3
Salinity	31.99 psu as CaCO3
Lead	0.009 µg/L
Copper	0.27 µg/L
Zinc	0.37 µg/L

C. Wastewater Characterization

McKinley reported the concentration of pollutants in the discharge in the permit application and in discharge monitoring reports. The tabulated data from Table 3 represents the quality of the wastewater effluent discharged from January 2015 through December 2016 for both outfalls before the facility's curtailment. The characteristics are not really representative of the future discharge. McKinley is required to characterize its wastewater effluent on an annual basis for common potential pollutants of concern for this type of discharge and biannually for others once operations resume. If the characteristics of the effluent indicate that the concentration of any pollutant exceeds or has the potential to exceed the state water quality standards, Ecology may issue an administrative order to require a reduction of pollutants or modify the permit to impose effluent limits to meet the water quality standards.

Table 3 Wastewater Characterization at Outfall 001

Parameter	Units	# of Samples	Long Term Average Value	Maximum Daily Value
Biochemical Oxygen Demand (BOD5)	mg/L	733	7	192
Total Suspended Solids (TSS)	mg/L	757	15	225
Oil and Grease	mg/L	1	--	<0.7
Flow	MGD	759	7.3	12.9
Temperature (winter)	°C	181	23.7	27.4
Temperature (summer)	°C	184	26.2	29.7
Cadmium	µg/L	1	--	0.707
Chromium	µg/L	1	--	1.28
Copper, Total	µg/L	1	--	4.5
Lead, Total	µg/L	1	--	0.468
Mercury	µg/L	1	--	0.00392
Nickel	µg/L	1	--	4.11
Zinc	µg/L	1	--	32.8
pH	SU	757	6.0 minimum	8.0 maximum

Table 4 Wastewater Characterization at Outfall 002 (DMR Data from November 2013 – August 2017)

Parameter	Units	# of Samples	Long Term Average Value	Maximum Daily Value
Turbidity	NTU	46	77	9999

D. Summary of Compliance with Previous Permit Issued

McKinley has complied with the effluent limits and permit conditions throughout the duration of the permit term except on two events. Ecology assessed compliance based on its review of the facility's information in the Ecology Permitting and Reporting Information System (PARIS), discharge monitoring reports (DMRs), and on inspections.

The following table summarizes the violations that occurred during the permit term. Ecology issued a civil penalty (Docket #13098) for the violations of TSS on 11/30/15 and 12/2/15. During the mill shutdown, the clarifiers behaved like natural ponds. The algae activities during the sunny weather contributed to the elevated pH in the clarifiers. The elevated pH did not appear to be related to the industrial activities at the mill. Therefore, Ecology determined to take no formal enforcement action on these pH violations.

Table 5 Violations

Date	Parameter	Max. Daily Limit	Discharge	Discharge Duration limit (min/month)	Discharge Duration (min/month)	Action Taken
11/30/2015	TSS	14003 lbs/day	14386 lbs/day			Docket 13098
12/2/2015	TSS	14003 lbs/day	15053 lbs/day			Docket 13098
7/31/2017	pH			450	1401	No Enforcement
8/1/2017	pH	9 SU	10.16 SU			No Enforcement
8/15/2017	pH	9 SU	10.03 SU			No Enforcement
8/16/2017	pH	9 SU	10.0 SU			No Enforcement
8/21/2017	pH	9 SU	10.04 SU			No Enforcement
8/31/2017	pH			450	7056	No Enforcement

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

Table 6 Permit Submittals

Submittals	Permit Condition	Due Date	Received Date
Spill Prevention Plan	S8	4/1/2014	3/27/2014
Solid Waste Control Plan	S5.C	4/1/2014	3/31/2014
O&M Treatment System Operating Plan	S4.A	4/1/2014	3/27/2014
Outfall Evaluation Inspection Report	S10	4/30/2018	6/27/2018 *
Application for Permit Renewal	S6	4/30/2018	4/12/2018

*Ecology extended the due date to July 31, 2018.

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.

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 131.36).
- 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

Under WAC 173-220-150 (1) (g), flows and waste loadings must not exceed approved design criteria. McKinley's wastewater treatment system construction predates the current interpretation of the above referenced citation. However, historical treatment system performance reflects that the treatment system was sized and designed to accommodate the current waste loading, both in terms of volume and characteristics. The following design criteria have been included in the proposed permit requiring notification to Ecology to ensure the system continues to be operated as intended and to ensure that any additional capacity will be added to the system, if needed.

Table 7 Design Criteria for McKinley Secondary Wastewater Treatment System

Parameter	Design Quantity
Maximum Month Design Flow (MMDF)	12 MGD
BOD_5 Loading for Maximum Month	18,000 lb/day
TSS Loading for Maximum Month	20,000 lb/day

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.

Outfall 001

Technology-based limitations are set by regulations or developed on a case by case basis. The federal effluent guidelines for best practicable control technically available (BPT) is defined in 40 CFR Part 430 Subpart J for Secondary Fiber Non-Deink subcategory.

These guidelines were published in the Code of Federal Regulations, 40 CFR Part 430 Edition July 1, 2002. The federal effluent guidelines for best conventional pollutants control technology (BCT) for these categories were defined on December 17, 1986 to be the same as BPT previously defined in March 1983. The BCT and BPT applicable to McKinley were defined more than ten years ago. With BCT and BPT being defined longer than ten years, it is Ecology policy to determine if they are still valid and if they can still be considered equivalent to all known and reasonable treatment (AKART) for these categories of paper making.

On April 15, 1998, the Environmental Protection Agency made changes to the Pulp, Paper, and Paperboard Effluent Guidelines to address toxic pollutants, which included the promulgation of new effluent guidelines for the Bleached Kraft Papergrade and Soda subcategories and Papergrade Sulfite subcategory. The 1998 allowances for BOD and TSS in pound per 1000 pound of pulp produced for the above categories were set at the same values as the allowances in the effluent guidelines published in 1982. The 1998 effluent guidelines took both emissions to air and water into consideration and included chlorinated organic compounds. Secondary treatment was the required type of treatment.

The company treats their wastewater with primary treatment followed by a secondary activated sludge treatment system. The wastewater treatment system removes approximately 90% solids and BOD5 from the raw wastewater.

Throughout the history of the effluent guidelines, a combination of primary and secondary treatment has been the accepted standard for BOD and TSS removal. It is determined that the 1982 effluent guidelines for the secondary fiber non-deink paper production allowances are equivalent to AKART for the following reasons:

- The mill has historically generated wastewater flow from three processes, TMP pulp production, deinked pulp production, and use of nonintegrated Kraft pulp.
- EPA did not make any changes for BOD and TSS for the type of paper making conducted at McKinley in the federal effluent guidelines promulgated on April 15, 1998.
- Ecology expects that secondary treatment will remain the level of treatment on which EPA bases the effluent guidelines.
- Ecology has determined that the 1982 effluent guidelines are equivalent to AKART in the other permits issued for pulp mills.

The 2002 guidelines allowances from 40 CFR 430 Subpart J were used for the Secondary Fiber Non-deink production. The allowances are the same as the ones in the 1986 guidelines since they were only reorganized and not re-promulgated in the 1998 changes to the guidelines.

Oil and Grease (O & G) is not included in the Effluent Guidelines for the Secondary Fiber Non-Deink facilities. O & G sources are from the stormwater runoff onsite and Endeavor's tank farm. The existing O & G limit is a technology based limit that was required during the last two permit terms.

The permittee has been able to comply with the limit and has had detectable amounts in their effluent. As such, the permit will continue to require the oil and grease limit as a best professional judgement technology based limit.

Production Basis: Discharge limits in this permit for the conventional pollutants of BOD5 and TSS are based on the proposed average continuous production rate in the renewal application. Effluent guidelines allowances for these types of production are given below:

Table 8 Technology-based Limits (BPT and BPJ) for Conventional Pollutants for Outfall 001

Parameter	Production (ton/day)	Ave. Monthly Limit Allowance (lbs/1000 lbs product)	Ave. Monthly Limit (lbs/day)	Max. Daily Limit Allowance (lbs/1000 lbs product)	Max. Daily Limit (lbs/day)
BOD5 (10% Non-corrugating)	84	1.5	252	3.0	504
BOD5 (90% Corrugating)	756	2.8	4234	5.7	8618
Total BOD5			**4486**		**9122**
TSS (10% Non-corrugating)	84	2.5	420	5.0	840
TSS (90% Corrugating)	756	4.6	6955	9.2	13910
Total TSS			**7359**		**14750**
Oil & Grease			--		**15 mg/L**

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

Outfall 002

As discussed in II.A above, an initial AKART study for Outfall 002 was conducted by URS in April 2007. The AKART study was updated in October 2011 to reflect the addition of the cooling towers to the overall cogeneration project. The update evaluated the potential increase in thermal load to the Outfall 002 discharge.

C. Surface Water Quality-Based Effluent Limits

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 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 (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 131.36) 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--This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.

Ecology’s analysis described in this section of the fact sheet demonstrates that the proposed permit conditions will protect existing and designated uses of the receiving water.

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 authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

1. Ecology must specify both the allowed size and location in a permit.

The proposed permit specifies the size and location of the allowed mixing zone (as specified below).

2. The facility must fully apply "all known, available, and reasonable methods of prevention, control and treatment" (AKART) to its discharge.

Ecology has determined that the treatment provided at McKinley meets the requirements of AKART (see "Technology-based Limits").

3. Ecology must consider critical discharge conditions.

Surface water quality-based limits are derived for the water body's critical condition (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated waterbody uses). The critical discharge condition is often pollutant-specific or waterbody-specific.

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology uses the water depth at mean lower low water (MLLW) for marine waters. Ecology's *Permit Writer's Manual* describes additional guidance on criteria/design conditions for determining dilution factors. The manual can be obtained from Ecology's website at: *https://fortress.wa.gov/ecy/publications/documents/92109.pdf*

Table 9 Critical Conditions Used to the Outfall 001 Discharge (Previous operating scenario)

Critical Condition	Value
Water depth at MLLW of 30 feet	30 feet
Density profile between 30 feet and the surface	Min. Density Stratification (0.03 sigma t) & Max. Density Stratification (0.99 sigma t)
10^{th} and 90^{th} percentile current speeds for acute mixing zone	4 cm/sec and 22 cm/sec
50th percentile current speeds for chronic and human health mixing zones	13 cm/sec
Manning roughness coefficient	0.012
Slope	1.7 degrees
Channel width	Unconfined
Maximum average monthly effluent flow for chronic and human health non-carcinogen	9.53 MGD
Annual average flow for human health carcinogen	9.14 MGD
Maximum daily flow for acute mixing zone	13 MGD
1 DAD MAX effluent temperature or 95% of data.	30.5 degrees C (winter) and 31.5 degrees C (summer)

Ecology obtained ambient data from ambient station DUN001 located Dungeness Bay.

4. **Supporting information must clearly indicate the mixing zone would not:**
    - Have a reasonable potential to cause the loss of sensitive or important habitat.
    - Substantially interfere with the existing or characteristic uses.
    - Result in damage to the ecosystem.
    - Adversely affect public health.

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms and set the criteria to generally protect the species tested and to fully protect all commercially and recreationally important species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criteria concentration for one hour. They set chronic standards assuming organisms are exposed to the pollutant at the criteria concentration for four days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of discharge.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column.

Ecology has additionally determined that the effluent will not exceed 33 degrees C for more than two seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics and the discharge location.

Based on this review, Ecology concluded that the discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem, or adversely affect public health if the permit limits are met.

5. The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.

Ecology conducted a reasonable potential analysis, using procedures established by the EPA and by Ecology, for each pollutant and concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone if permit limits are met.

6. The size of the mixing zone and the concentrations of the pollutants must be minimized.

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. Because tidal currents change direction, the plume orientation within the mixing zone changes. The plume mixes as it rises through the water column therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge.

Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving waterbody. When a diffuser is installed, the discharge is more completely mixed with the receiving water in a shorter time. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

Because of the above reasons, Ecology has effectively minimized the size of the mixing zone authorized in the proposed permit.

7. Maximum size of mixing zone.

The authorized mixing zone does not exceed the maximum size restriction.

8. Acute mixing zone.

- **The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.**

Ecology determined the acute criteria will be met at 10% of the distance of the chronic mixing zone at the ten year low flow.

- **The pollutant concentration, duration, and frequency of exposure to the discharge will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.**

As described above, the toxicity of any pollutant depends upon the exposure, the pollutant concentration, and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organisms near the point of discharge (below the rising effluent).

- **Comply with size restrictions.**

The mixing zone authorized for this discharge complies with the size restrictions published in chapter 173-201A WAC.

9. Overlap of mixing zones.

This mixing zone does not overlap another mixing zone.

D. 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 using the following general categories. All indigenous fish and non-fish aquatic species must be protected in waters of the state.
  a. Extraordinary quality salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
  b. Excellent quality salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
  c. Good quality salmonid migration and rearing; other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.
  d. Fair quality salmonid and other fish migration.

The Aquatic Life Uses and the associated criteria for this receiving water are identified below.

Table 10 Marine Aquatic Life Uses and Associated Criteria

Extraordinary Quality	
Temperature Criteria – Highest 1D MAX	13°C (55.4°F)
Dissolved Oxygen Criteria – Lowest 1-Day Minimum	7.0 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.
pH Criteria	pH must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.2 units.

- To protect shellfish harvesting, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL.
- The recreational uses for this receiving water are identified below.

Table 11 Recreational Uses

Recreational Use	Criteria
Primary Contact Recreation	Enterococci organism levels within an averaging period must not exceed a geometric mean value of 30 colony forming units (CFU) or most probable number (MPN) per 100 mL, with not more than 10 percent of all sample (or any single sample when less than ten sample values exist) obtained within the averaging period exceeding 110 CFU or MPN per 100 mL.

- The *miscellaneous marine water uses* are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

E. Water Quality Impairments

Ecology has not documented any water quality impairments in the receiving water in the vicinity of the outfalls. The area in the vicinity of Outfalls 001 and 002 is covered by the Strait of Juan de Fuca Dioxin TMDL published in July 1992. This TMDL does not pertain to McKinley Paper as McKinley will not be bleaching any of their products. Dioxin was not detected in the process effluent samples that were analyzed for dioxin under their previous operating scenario in 03/08, 03/10, and 06/11. The method reporting limit was 2.00 picograms per liter (pg/L).

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

Ecology must consider the narrative criteria described in WAC 173-201A-160 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.

Ecology considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements all known, available, and reasonable methods of treatment and prevention (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.

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

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field).

Toxic pollutants, for example, are near-field pollutants; their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biological oxygen demand (BOD) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

With technology-based controls (AKART), predicted pollutant concentrations in the discharge exceed water quality criteria. Ecology therefore authorizes a mixing zone in accordance with the geometric configuration, flow restriction, and other restrictions imposed on mixing zones by chapter 173-201A WAC.

The diffuser at Outfall 001 is 300 feet long with a diameter of 30 inches. The outfall diffuser has twenty (20) 5-inch diameter ports, ten (10) 6-inch diameter ports situated along the outfall flanks, and two (2) 8-inch diameter ports located on the top of the pipe. The 30 lateral diffuser ports discharge at an angle of 45 degrees toward the surface and the ports are spaced at 10 feet apart on opposite sides of the diffuser. Adjacent ports on the same side of the diffuser are 20 feet apart. The two 8-inch ports on the top of the end structure of the outfall discharge effluent at 90 degrees toward the surface of the water, and these ports are 4 feet apart. The diffuser depth is 30 feet. The mean lower low water (MLLW) depth is 30 feet.

The diffuser at Outfall 002 is 375 feet long with a diameter of 24 inches. The diffuser has a total of twenty five (25) 3-inch diameter ports. The distance between ports is 15 feet. The diffuser depth is 28 feet. The mean lower low water (MLLW) depth is 28 feet.

Ecology obtained this information from the Water Treatment Plant Outfall Engineering Report submitted in January 2010.

The mixing zones described below relates to the previous operating scenario. Ecology feels this scenario is sufficiently conservative to assess the proposed operating scenario.

The draft permit includes a requirement for the facility to conduct an updated mixing zone study. As stated in the permit, if the results of the mixing study indicate that the concentration of any pollutant exceeds or has the potential to exceed the state water quality standards, Ecology may issue an administrative order to require a reduction of pollutants or modify the permit to impose effluent limits to meet the water quality standards.

Chronic Mixing Zone--WAC 173-201A-400(7)(c) specifies that mixing zones must not extend in any horizontal direction from the discharge ports for a distance greater than 300 feet plus the depth of water over the discharge ports as measured during MLLW.

The horizontal distance of the chronic mixing zone is 330 feet. The mixing zone extends from the bottom to the top of the water column.

Acute Mixing Zone--WAC 173-201A-400(8)(b) specifies that in oceanic waters a zone where acute criteria may be exceeded must not extend beyond 10% of the distance established for the chronic zone. The horizontal distance of the acute mixing zone is 33 feet. The mixing zone extends from the bottom to the top of the water column.

Ecology determined the dilution factors that occur within these zones at the critical condition. The dilution factors are listed below.

Table 12 Dilution Factors (DF) for Outfalls 001 and 002

Criteria	Acute	Chronic
Outfall 001		
Aquatic Life	95	343
Human Health, Carcinogen		343
Human Health, Non-carcinogen		343
Outfall 002		
Aquatic Life	101	294
Human Health, Carcinogen		294
Human Health, Non-carcinogen		294

Ecology determined the impacts of turbidity, BOD_5, pH, temperature, dissolved oxygen, and toxics as described below, using the dilution factors in the above table.

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.

With technology-based limits, this discharge results in a small amount of BOD_5 loading relative to the large amount of dilution in the receiving water at critical conditions. Technology-based limits will ensure that dissolved oxygen criteria are met in the receiving water.

It is noted that Outfall 002 is located in an area that has been listed as being impaired for dissolved oxygen. The water discharged from Outfall 002 is not expected to contribute to the lack of dissolved oxygen in the area. Outfall 001 is located in the area adjacent to the listed area and could potentially contribute to a decrease in dissolved oxygen. The permit includes additional nutrient monitoring during the next permit cycle to allow Ecology to better assess potential impacts from Outfall 001, if any.

pH--Compliance with the technology-based limits of 6.0 to 9.0 will assure compliance with the water quality standards of surface waters because of the high buffering capacity of marine water.

Fecal Coliform and Enterococci— As discussed in the fact sheet for the permit issued in October 2013, the commercial shellfish area within 600 meters of McKinley's Outfall 001 is currently prohibited by the Department of Health (DOH) and there does not appear to be any recreational shellfish beaches in the vicinity. Additionally, the analysis provided in that fact sheet demonstrated that the discharge did not have the potential to cause a water quality criteria exceedance at the mixing zone boundary of 330 feet or the DOH shellfish closure zone boundary approximately 2,000 feet from the diffuser.

Ecology is not currently proposing monitoring for fecal coliform based on the margin of compliance predicted by the evaluation from the previous permit. It is also worth noting that the previous data meets the criteria established by the State regulations and that the margin of compliance is considered to be both reasonable and conservative based on studies confirming that substantial bacteria die-off occurs when wood-waste bacteria and fecal bacteria are discharged to cold saltwater. Ecology will determine if additional assessment is needed based on the results of the mixing zone study required by the proposed permit and/or results of any bacteria monitoring.

As specified in the recently adopted amendments to Chapter 173-201A WAC, the water quality standard for bacteria in marine water has been changed to an enterococci standard. The permit includes monitoring for enterococci to characterize the effluent to determine if there is a potential to cause an exceedance of the new water quality standard.

Turbidity--Ecology evaluated the impact of turbidity based on the range of turbidity in the effluent and turbidity of the receiving water. Based on visual observation of the facility's effluent, Ecology expects no violations of the turbidity criteria outside the designated mixing zone.

Outfall 002: The proposed permit requires the facility to continue to monitor turbidity and implement Best Management Practices to mitigate elevated turbidity discharges.

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 previous operations contributed a number of toxic pollutants to the wastewater effluent discharged through Outfall 001. (See Appendix **D**). Ecology conducted a reasonable potential analysis on these parameters to determine whether it would have a reasonable potential to cause or contribute to an exceedance of the water quality criteria. Based on a similar facility regulated by the Industrial Section, it is expected that the modified operations will have some of the same toxic pollutants, such as heavy metals, but a number of other toxic pollutants will no longer be present. The heavy metals are expected to be present at similar or lower concentrations.

When valid ambient background data were not available, Ecology used zero for background.

Valid ambient background data were available for copper, lead, and zinc. Ecology used all applicable data to evaluate reasonable potential for this discharge to cause a violation of water quality standards.

Ecology determined that the toxic pollutants present in the previous discharge did not pose a reasonable potential to exceed the water quality criteria at the critical condition using procedures given in EPA, 1991 (**Appendix D**) and as described above. As such, Ecology does not anticipate that the modified operations at the facility will have a reasonable potential to exceed water quality standards. Ecology's determination assumes that this facility meets the other effluent limits of this permit.

Outfall 002 is not expected to consist of or contribute to a significant increase of toxic pollution. The permit includes additional monitoring of metals in the discharge to verify this assumption during the next permit renewal.

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

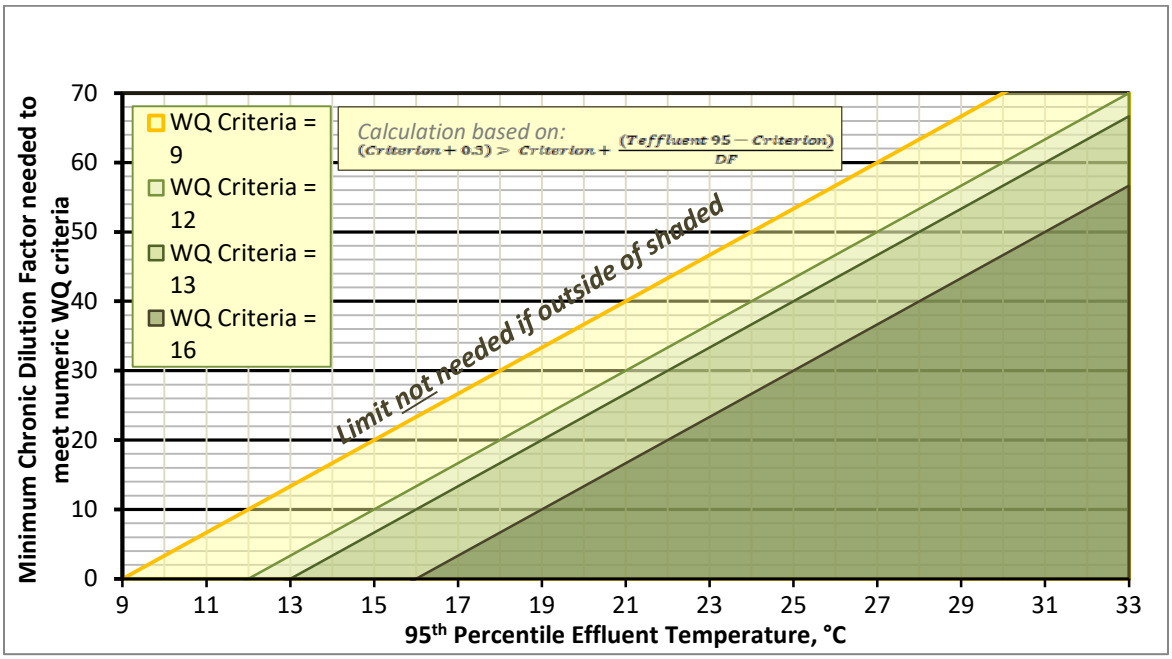
Outfall 001:

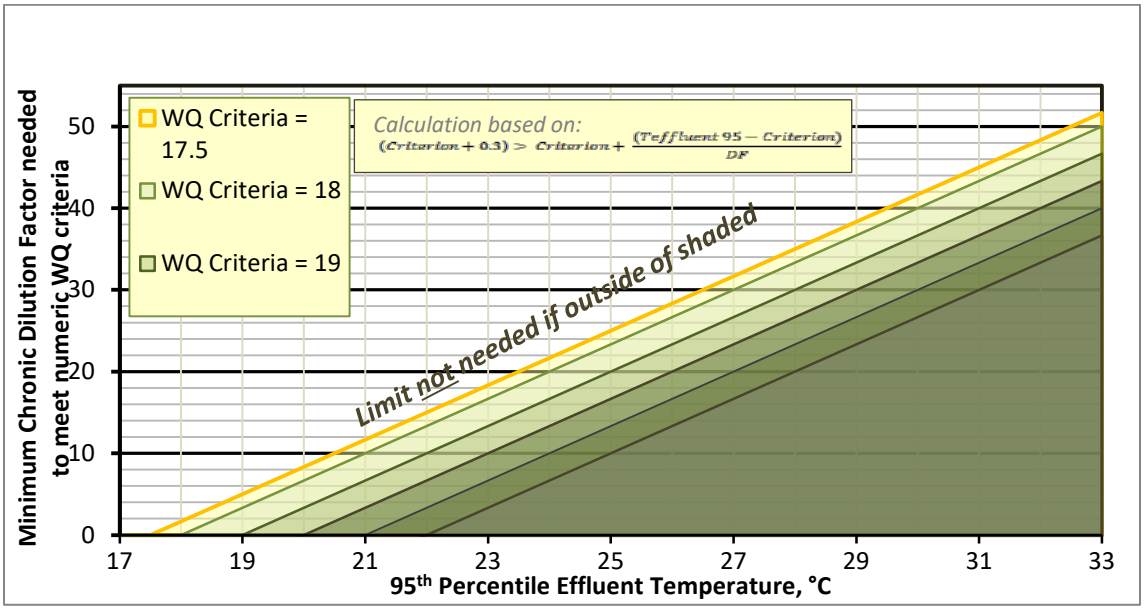
Annual summer maximum, supplementary spawning criterion, and incremental warming criteria: Ecology calculated the reasonable potential for the discharge to exceed the annual summer maximum, the supplementary spawning criterion, and the incremental warming criteria at the edge of the chronic mixing zone during critical condition(s). No reasonable potential exists to exceed the temperature criterion (See Appendix E) where:

(Criterion + 0.3) > [Criterion + (Teffluent95 – Criterion)/DF].

The figure below graphically portrays the above equation and shows the conditions when a permit limit will apply.

Figure 2 Dilution Necessary to Meet Criteria at Edge of Mixing Zone





Note: show calculation above with your specific discharge data filled in below.

(13.0+ 0.3) > (13+ (29.7–13)/343)

The modified process is not expected to result in an increase in the effluent temperature. Therefore, the proposed permit does not include a temperature limit for Outfall 001. The permit requires additional monitoring of effluent temperatures. Ecology will reevaluate the reasonable potential during the next permit renewal.

Outfall 002: Outfall 002 must meet the same criteria as Outfall 001. An evaluation was developed for Outfall 002 which has intermittent temperature discharges. McKinley contracted with CH2MHILL to evaluate the dilution and the resulting ambient water quality impact. The results of the evaluation were presented to Ecology in the document titled, "*Engineering Report, Biomass Cogeneration Cooling Water Discharge to Outfall 002, Nippon Paper Industries USA, Port Angeles, WA, October 2011*".

The worst-case scenario (one paper machine out of service, highest ambient temperatures during summer, and the cogeneration facility producing power at maximum rated capacity), consists of a projected discharge of heated cooling water via Outfall 002 up to 6 days per year in addition to the normal discharge of water filter plant waste streams.

The results of the CH2MHILL evaluation show that under all thermal discharge scenarios for Outfall 002, the discharge of cogeneration non-contact cooling water will meet water quality standards. The mixed discharge temperatures within two seconds (approximately 2.3 feet from port) of discharge from the Outfall 002 diffuser ports are predicted to be less than 20 degrees C with the maximum discharge temperature of 47.8 degrees. Discharge temperatures within four seconds (approximately 4 feet from port) of discharge from Outfall 002 are predicted to be less than 17 degrees C with the maximum discharge temperature of 47.8 degrees C. The maximum predicted temperature at the edge of the mixing zone under this scenario is 13.10 degrees C.

H. 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 contains 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 associated with the previous operations did not have a reasonable potential to cause a violation of water quality standards. Based on a similar facility regulated by the Industrial Section, it is expected that the modified operations will not result in an effluent that has a reasonable potential to exceed the human health criteria. As such, no water quality based effluent limits are not needed at this time.

I. 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

McKinley conducted their last sediment monitoring study in July 2010. The data from the previous study exceeded the time criteria required for accurate sediment evaluation. The proposed permit requires a toxicity analysis of sediment samples collected in the vicinity of Outfalls 001 and 002. A sediment sampling and analysis plan is required to be submitted **by December 31, 2021**.

J. 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).

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

K. 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.

- *Acute toxicity tests measure mortality as the significant response* to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.
- *Chronic toxicity tests measure various sublethal toxic responses*, such as reduced growth or reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure survival.

Laboratories accredited by Ecology for WET testing know how to use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff know how to calculate an NOEC, LC50, EC50, IC25, etc. Ecology gives all accredited labs the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (*https://fortress.wa.gov/ecy/publications/documents/9580.pdf*) which is referenced in the permit. Ecology recommends that each regulated facility send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

During the previous permit term, the facility was unable to conduct effluent characterization for acute and chronic toxicity due to the curtailment. Additionally, flow and wastewater characteristics have the potential to change with the new process.

The proposed permit requires McKinley to conduct quarterly effluent characterization at Outfall 001 for acute and chronic toxicity. This characterization will depend on the results of the Updated Mixing Zone Study and will not be required until after the mixing zone study is submitted to Ecology.

L. Comparison of Effluent Limits with the Previous Permit Issued on 10/10/2013

Table 13 Comparison of Previous and Proposed Effluent Limits

		Previous Effluent Limits: Outfall # 001		Proposed Effluent Limits: Outfall # 001	
Parameter	**Basis of Limit**	**Average Monthly (lbs/day)**	**Maximum Daily (lbs/day)**	**Average Monthly (lbs/day)**	**Maximum Daily (lbs/day)**
Biochemical Oxygen Demand (5-day)	Technology-based	4499	8547	4486	9122
Total Suspended Solids	Technology-based	7447	14003	7375	14750
Oil and Grease	Technology-based	--	15 mg/L	--	15 mg/L
pH	Technology-based	6.0 minimum	9.0 maximum	6.0 minimum	9.0 maximum

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 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.

The proposed permit includes monitoring of nutrients (particulate organic carbon, total organic carbon, dissolved organic carbon, ammonia as N, nitrate as N, nitrite as N, total Kjeldahl nitrogen filtered and unfiltered, total phosphorus filtered and unfiltered, soluble reactive phosphorus, carbonaceous biochemical oxygen demand five-day, and alkalinity) at Outfall 001 to accurately quantify the nutrients in the discharge for this facility. This data supports the work of the Puget Sound Nutrient Reduction Project to evaluate dissolved oxygen impacts in the receiving water. Excess nutrients in the form of nitrogen and carbon can lead to low dissolved oxygen in Puget Sound which negatively affect aquatic life. Monitoring data is necessary to evaluate individual sources of anthropogenic nutrients for both near field and far field effects. Ecology intends to use this discharge data in both the Salish Sea Model and in future reasonable potential evaluations.

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). Ecology accredited the laboratory at this facility for:

Table 14 Accredited Parameters

Parameter Name	Category	Method Name	Matrix Description
Turbidity	General Chemistry	SM 2130 B-2011	Non-Potable Water
Total Suspended Solids (TSS)	General Chemistry	SM 2540 D-2011	Non-Potable Water
Biochemical Oxygen Demand (BOD)	General Chemistry	SM 5210 B-2011	Non-Potable Water
pH	General Chemistry	SM 4500-H+ B-2011	Non-Potable Water
Dissolved Oxygen	General Chemistry	SM 4500-O G-2011	Non-Potable Water

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. 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 implementation of the procedures in the Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the permit. The permittee has prepared a treatment system operation plan in previous permit. The proposed permit requires that the treatment system operation plan be updated and submitted to the department (Special Condition S4).

C. Solid Waste Control Plan

McKinley 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 update the approved solid waste control plan designed to prevent solid waste from causing pollution of waters of the state (Special Condition S5). The facility must submit the updated 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*

D. 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].

McKinley 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 S8).

E. Outfall Evaluation

The proposed permit requires McKinley to conduct inspections of Outfall 001 and 002 and submit a report detailing the findings of that inspection (Special Condition S10). The inspection must evaluate the physical condition of the discharge pipe and diffusers, and evaluate the extent of sediment accumulations in the vicinity of the outfalls.

F. Stormwater Pollution Prevention Plan

In accordance with 40 CFR 122.44(k) and 40 CFR 122.44 (s), the proposed permit includes requirements for the development and implementation of a SWPPP along with BMPs to minimize or prevent the discharge of pollutants to waters of the state. BMPs constitute Best Conventional Pollutant Control Technology (BCT) and Best Available Technology Economically Achievable (BAT) for stormwater discharges. Ecology has determined that McKinley must update their SWPPP and implement adequate BMPs in order to meet the requirements of "all known, available, and reasonable methods of prevention, control, and treatment" (AKART).

A SWPPP requires a facility to implement actions necessary to manage stormwater to comply with the state's requirement under chapter 90.48 RCW to protect the beneficial uses of waters of the state.

The SWPPP must identify potential sources of stormwater contamination from industrial activities and identify how it plans to manage those sources of contamination to prevent or minimize contamination of stormwater. McKinley must continuously review and revise the SWPPP as necessary to assure that stormwater discharges do not degrade water quality. It must retain the SWPPP on-site or within reasonable access to the site and available for review by Ecology.

G. Updated Mixing Zone Study

Ecology estimated the amount of mixing of the discharge with receiving water and the potential for the mixture to violate the water quality standards for surface waters at the edge of the mixing zone (chapter 173-201A WAC). The proposed permit requires McKinley to more accurately determine the mixing characteristics of the discharge (Special Condition S14). The effluent mixing study must measure or model the characteristics of the discharge under conditions specified in the permit to assess whether the receiving water quality is protected outside the mixing zone boundary.

H. 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.

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.

I. 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.

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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.)

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*

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.)

Appendix A--Public Involvement Information

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

Ecology will place a Public Notice of Draft on September 3, 2019 in The Peninsula Daily News 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) 407-6955, 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 Liem Nguyen.

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*.

Simple Mixing:

Ecology uses simple mixing calculations to assess the impacts of certain conservative pollutants, such as the expected increase in fecal coliform bacteria at the edge of the chronic mixing zone boundary. Simple mixing uses a mass balance approach to proportionally distribute a pollutant load from a discharge into the authorized mixing zone. The approach assumes no decay or generation of the pollutant of concern within the mixing zone. The predicted concentration at the edge of a mixing zone (C_{mz}) is based on the following calculation:

$$C_{mz} = Ca + \frac{(Ce - Ca)}{DF}$$

where: Ce = Effluent Concentration
Ca = Ambient Concentration
DF = Dilution Factor

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).

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

Figure 3 Reasonable Potential Calculations for Outfall 001

Reasonable Potential Calculation

Facility	McKinley
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	95.0	343.0
Human Health Carcinogenic		343.0
Human Health Non-Carcinogenic		343.0

Pollutant, CAS No. & NPDES Application Ref. No.				ARSENIC (dissolved) 7440382 2M	BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B	CADMIUM - 7440439 4M Hardness dependent	CHROMIUM(HEX) 18540299 - Dissolved	COPPER - 744058 6M Hardness dependent	DIETHYLPHTHALATE 84662 24E	DI-n-BUTYL PHTHALATE 84742 26B	ENDRIN 72208 14P	FLUORANTHENE 206440 31B	LEAD - 7439921 7M Dependent on hardness
Effluent Data	# of Samples (n)			1	1	1	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	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)			0.57	2.2	0.707	1.28	4.5	0.086	0.18	0.0026	0.037	0.468
	Calculated 50th percentile Effluent Conc. (when n>10)												
Receiving Water Data	90th Percentile Conc., ug/L							0.27					0.009
	Geo Mean, ug/L												
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute		69	-	42	1100	4.8	-	-	0.037	-	210
		Chronic		36	-	9.3	50	3.1	-	-	0.0023	-	8.1
	WQ Criteria for Protection of Human Health, ug/L			-	0.046	-	-	-	200	8	0.002	6	-
	Metal Criteria	Acute		1	-	0.994	-	0.83	-	-	-	-	0.951
	Translator, decimal	Chronic		-	-	0.994	-	0.83	-	-	-	-	0.951
	Carcinogen?			Y	Y	N	N	N	N	N	N	N	N

Aquatic Life Reasonable Potential

			ARSENIC (dissolved) 7440382 2M	BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B	CADMIUM - 7440439 4M Hardness dependent	CHROMIUM(HEX) 18540299 - Dissolved	COPPER - 744058 6M Hardness dependent	DIETHYLPHTHALATE 84662 24E	DI-n-BUTYL PHTHALATE 84742 26B	ENDRIN 72208 14P	FLUORANTHENE 206440 31B	LEAD - 7439921 7M Dependent on hardness
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-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	0.037		0.046	0.084	0.511			0.000		0.038
		Chronic	0.010		0.013	0.023	0.337			0.000		0.017
Reasonable Potential? Limit Required?			**NO**		**NO**	**NO**	**NO**			**NO**		**NO**

Human Health Reasonable Potential

		ARSENIC (dissolved) 7440382 2M	BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B	CADMIUM - 7440439 4M Hardness dependent	CHROMIUM(HEX) 18540299 - Dissolved	COPPER - 744058 6M Hardness dependent	DIETHYLPHTHALATE 84662 24E	DI-n-BUTYL PHTHALATE 84742 26B	ENDRIN 72208 14P	FLUORANTHENE 206440 31B	LEAD - 7439921 7M Dependent on hardness
s	$s^2=\ln(CV^2+1)$		0.5545			0.5545	0.5545	0.5545	0.5545	0.5545	
Pn	Pn=(1-confidence level)1/n		0.050			0.050	0.050	0.050	0.050	0.050	
Multiplier			2.4895			2.4895	2.4895	2.4895	2.4895	2.4895	
Dilution Factor			343			343	343	343	343	343	
Max Conc. at edge of Chronic Zone, ug/L			0.016			6.2E-04	0.0013	2E-05	0.0003		
Reasonable Potential? Limit Required?			**NO**			**NO**	**NO**	**NO**	**NO**		

Comments/Notes:

References: WAC 173-201A.

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Reasonable Potential Calculation - Page 2

Facility	McKinley
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	95.0	343.0
Human Health Carcinogenic		343.0
Human Health Non-Carcinogenic		343.0

Pollutant, CAS No. & NPDES Application Ref. No.		MERCURY 7439976 8M	NICKEL - 7440020 9M - Dependent on hardness	PHENOL 108952 10A	PYRENE 129000 45B	SILVER - 7740224 11M dependent on hardness.	THALLIUM 7440280 12M	TOLUENE 108883 25V	ZINC- 7440666 13M hardness dependent			
Effluent Data	# of Samples (n)	1	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	0.6	0.6	0.6	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)	0.0039	4.11	0.11	0.04	0.012	0.017	0.12	32.8			
	Calculated 50th percentile Effluent Conc. (when n>10)											
Receiving Water Data	90th Percentile Conc., ug/L								0.37			
	Geo Mean, ug/L											
Water Quality Criteria	Aquatic Life Criteria, ug/L Acute	1.8	74	-	-	1.9	-	-	90			
	Aquatic Life Criteria, ug/L Chronic	0.025	8.2	-	-	-	-	-	81			
	WQ Criteria for Protection of Human Health, ug/L	0.15	100	70000	8	-	6.3	130	1000			
	Metal Criteria Translator, decimal Acute	0.85	0.99	-	-	0.85	-	-	0.946			
	Metal Criteria Translator, decimal Chronic	-	0.99	-	-	-	-	-	0.946			
	Carcinogen?	N	N	N	N	N	N	N	N			

Aquatic Life Reasonable Potential

Effluent percentile value		0.950	0.950			0.950			0.950			
s	$s^2=\ln(CV^2+1)$	0.555	0.555			0.555			0.555			
Pn	$Pn=(1\text{-confidence level})^{1/n}$	0.050	0.050			0.050			0.050			
Multiplier		6.20	6.20			6.20			6.20			
Max concentration (ug/L) at edge of...	Acute	0.000	0.265			0.001			2.390			
	Chronic	0.000	0.074			0.000			0.930			
Reasonable Potential? Limit Required?		**NO**	**NO**			**NO**			**NO**			

Human Health Reasonable Potential

s	$s^2=\ln(CV^2+1)$	0.5545	0.5545	0.5545	0.5545		0.5545	0.5545	0.5545			
Pn	Pn=(1-confidence level)1/n	0.050	0.050	0.050	0.050		0.050	0.050	0.050			
Multiplier		2.4895	2.4895	2.4895	2.4895		2.4895	2.4895	2.4895			
Dilution Factor		343	343	343	343		343	343	343			
Max Conc. at edge of Chronic Zone, ug/L		3E-05	0.0298	0.0008	0.0003		1.2E-04	8.7E-04	0.2381			
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**	**NO**		**NO**	**NO**	**NO**			

Comments/Notes:

References: WAC 173-201A.

Technical Support Document for Water Quality-based Toxics Control, US EPA, March 1991, EPA/505/2-90-001, pages 56/99

Appendix E--Response to Comments

Ecology published notice of an opportunity to comment on draft NPDES Permit No. WA0002925 in The Peninsula Daily News on September 3, 2019. The proposed permit will allow McKinley to discharge treated process wastewater and stormwater to the Strait of Juan de Fuca. In the notice, Ecology invited public review of the proposed permit and provided a 30-day public comment period. The deadline for submittal of written comments was October 4, 2019. During the comment period, Ecology received a written comment from one entity electronically via email.

No changes were made to the permit. The comment and Ecology's response to the comment is presented below. Comment appears in regular text, followed by Ecology's response in italicized text.

Ecology will send a copy of this response to comments to each individual who provided comment. 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.*

Comment from Darlene Schanfald, Olympic Environmental Council:

You mention very few contaminants, while there probably are more. The use of recycled paper, which is good, brings up the issue of PFAS, which paper can be coated with. PFAS, spoken of as a "forever contaminant" is not mentioned, yet it is the hot topic of the U.S. and other nations. It is in water ways and elsewhere. You must see how this will be tested for and tracked. Supposedly Ecology is drafting PFAS regulations. According to Laurie Davies, "we are working with the State Department of Health to develop a Chemical Action Plan (CAP) for PFAS. The plan will recommend actions to reduce the use, release and exposure to PFAS in Washington." How will this play into the permit?

A 24-hour test is so imperfect. There is buildup over time. There is a mix of chemicals that together make their own chemicals. The area is undergoing a MTCA cleanup from the Toxic Cleanup Program, yet this doesn't seem to be taken in to account. And emitting the toxins out into the Harbor does nothing for cleaning up the Harbor.

More attention has to be given to toxins that might be emitted into the Harbor and, as a result, the animals. Doesn't this need input from WDFW?

Response:

The Washington Departments of Ecology and Health released an Interim PFAS Chemical Action Plan in April 2018 (updated in January 2019) that includes protective actions from two new laws related to the use of PFAS-containing firefighting foam and an analysis of food packaging. See Ecology's website at ***https://fortress.wa.gov/ecy/publications/summarypages/1804005.html*** *for a copy of the interim action plan. Ecology and Health will continue to evaluate uses and impacts of PFAS chemicals and potentially release additional recommendations.*

The water quality rules currently do not have water quality criteria or standards for PFAS chemicals. If and when new aquatic life and/or human health criteria are developed for PFAS chemicals, Ecology will implement the new criteria.

With respect to concerns associated with 24-composite samples and the potential for chemicals to build-up over time, the objective of effluent sampling is to be representative of the treated effluent that is being discharged. A 24- hour composite sample is intended to be a representative sample of the discharge on a daily basis. Because the wastewater treatment system is not stagnant, we do not expect to see a buildup of chemicals within the system. However, if there were to be build up, we would see an increase in the concentration over time. The effluent is then discharged through diffusers which encourages thorough mixing within the receiving water. Additionally, the proposed permit requires the facility to conduct nutrient monitoring, whole effluent toxicity (WET) testing, and sediment monitoring to evaluate any potentially toxic effects in the receiving water. WET testing in particular is intended to evaluate any cumulative impacts that the discharge may have on aquatic life.

With respect to cleanup actions occurring in the area, MCTA generally requires that surface water cleanup levels, if applicable to a cleanup site, be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site conditions. As part of the permitting process, Ecology performed a reasonable potential analysis, to evaluate whether the discharge has the potential to cause or contribute to an exceedance of the water quality criteria, which are based in part on the beneficial use of the water body. The evaluation showed that the discharge associated with the previous operations did not have a reasonable potential to cause a violation of water quality standards or exceed the human health criteria. The new discharge is expected to be similar to the previous discharge and therefore is not expected to cause or contribute to an exceedance of the water quality criteria and standards or impact the cleanup efforts. However, the permit may be modified if monitoring during the permit cycle indicates a potential for an exceedance of the water quality standards.

As discussed above, Ecology's reasonable potential analysis and WET testing requirements ensure that the discharge will be protective of aquatic life. It is also noted that the Washington Department of Fish and Wildlife (WDFW) was provided notice of the draft permit. Ecology did not receive comments or recommendations from WDFW during the public comment period. Ecology would review and consider any recommendations from WDFW, if provided in the future.