

FACT SHEET FOR NPDES PERMIT WA0052272

Milne Fruit Products Inc.

Date of Public Notice: 11/13/24-12/13/24

Permit Effective Date: xx/xx/xxxx

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 Milne Fruit Products Inc. (Milne).

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 Milne NPDES permit WA0052272, are available for public review and comment from November 13, 2024 until December 13, 2024. For more details on preparing and filing comments about these documents, please see Appendix A - Public Involvement.

Milne 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

Milne operates a fruit processing plant that discharges a large volume of fruit processing wastewater to the City of Prosser's Publicly Owned Treatment Works (POTW). Milne also discharges a small volume of non-contact cooling water and stormwater to the Yakima River.

Effluent limits for the conventional pollutants, temperature, and pH, discharged to the river are unchanged from the previous permit limits in 2010. The previous technology based limits for wastewater flow to the river has also remained the same.

Milne added Reverse Osmosis (RO) Units and clean water capture in 2008 in response to noncompliance problems with the pretreatment limits in the 2004 permit for discharges to the POTW.

Effluent limits for the conventional pollutants Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), and flow discharged to the City have been increased from the permit issued in 2010 to reflect the current Industrial Wastewater User Agreement with the City of Prosser. Additionally, pH sent to the POTW is limited to a range of 5.0 to 11.0 standard units, in accordance with the Industrial Wastewater User Agreement.

The proposed permit requires Milne to report its wastewater analysis to Ecology on a monthly basis. The facility may accomplish this by reporting the City of Prosser's wastewater analysis or split composited wastewater samples with the City of Prosser and reporting the analytical results to Ecology. Milne received an increased allocation from the City of Prosser Wastewater Treatment facility in anticipation of an expansion of their business. The expanded allocation is reflected in the new permit limits. The Industrial Wastewater User Contract with Milne and the City of Prosser establishes allowable wastewater discharges to the POTW.

TABLE OF CONTENTS

Fact Sheet for NPDES Permit WA0052272	1
I. Introduction.....	5
II. Background Information.....	6
II.A. Facility description	8
II.B. Description of the receiving water.....	14
II.C. Wastewater characterization.....	14
II.D. Summary of compliance with previous permit Issued.....	15
II.E. State environmental policy act (SEPA) compliance	17
III. Proposed Permit Limits	18
III.A. Design criteria	18
III.B. Technology-based effluent limits	19
III.C. Surface water quality-based effluent limits.....	19
III.D. Designated uses and surface water quality criteria	25
III.E. Water quality impairments	26
III.F. Evaluation of surface water quality-based effluent limits for narrative criteria	26
III.G. Evaluation of surface water quality-based effluent limits for numeric criteria	27
III.H. Human health	30
III.I. Sediment quality	30
III.J. Groundwater quality limits	31
III.K. Whole effluent toxicity.....	31
III.L. Comparison of effluent limits with the previous permit issued on August 31, 2010....	31
IV. Monitoring Requirements	32
IV.A. Wastewater monitoring.....	32
IV.B. Lab accreditation	32
V. Other Permit Conditions.....	32
V.A. Reporting and record keeping.....	32
V.B. Non routine and unanticipated wastewater.....	32
V.C. Spill and Slug discharge Control plan	33
V.D. Solid waste control plan	33
V.E. Operation and maintenance manual	33

V.F. General conditions	33
VI. Permit Issuance Procedures.....	34
VI.A. Permit modifications.....	34
VI.B. Proposed permit Issuance	34
VII. References for Text and Appendices.....	34
Appendix A – Public Involvement Information	36
Appendix B – Your Right to Appeal.....	37
Appendix D – Technical Calculations.....	47
Appendix E – Response to Comments	59
 Table 1 - Facility Information	6
Table 10 - Dilution Factors (DF)	28
Table 11 - Comparison of Previous and Proposed Effluent Limits – Outfall 1 to the Yakima River	31
 Figure 1 - Facility Location and Prosser Overview Map.....	7

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 - Facility Information

Applicant:	
Facility Name and Address	Milne Fruit Products, Inc. 804 Bennett Ave Prosser, WA 99350
Contact at Facility	Name: Bruce DeJong Title: Plant Engineer Telephone #:509-786-2611
Responsible Official	Name: Michael Sorenson Title: President and CEO Address: 804 Bennett Ave Prosser, WA 99350 Telephone #: 509-786-2611
Industry Type	Frozen Fruit, Fruit Juice, and Vegetable Manufacturing
Categorical industry	40 CFR Part 407 – Canned and Preserved Fruits and Vegetables Processing Point Source Category
Type of Treatment	Solids removal, clarification, pH adjustment
SIC Codes	2037- Frozen Fruits, Fruit Juices, and Vegetables
NAIC Codes	311411 – Frozen Fruit, Juice, and Vegetables Manufacturing
Facility Location (NAD83/WGS84 reference datum)	Latitude: 46.202224 Longitude: -119.776106
Discharge Waterbody Name and Location (NAD83/WGS84 reference datum)	Yakima River Latitude: 46.202750 Longitude: -119.777535
Treatment Plant Receiving Discharge City of Prosser POTW	Latitude: 46.213987 Longitude: -119.764021
Discharge Location to POTW	Latitude: 46.204290 Longitude: -119.773181

Permit Status

Issuance Date of Previous Permit: August 31, 2010

Application for Permit Renewal Submittal Date: September 29, 2014, July 19, 2024

Date of Ecology Acceptance of Application: November 25, 2014, July 31, 2024

Inspection Status

Date of Last Sampling Inspection: N/A

Date of Last Non-sampling Inspection: June 18, 2024



Figure 1 - Facility Location and Prosser Overview Map



Figure 2 -Milne Fruit Products Plant

II.A. Facility description

1. History

The company was started in 1956 as Prosser Packers, then sold to Kraft Foods in the early 1960's as a source for juices and purees. By 1975, the company was acquired by a local business group and took the name Milne Fruit Products, Inc.

In 1985, Milne Fruit Products Inc. was sold to Ocean Spray Cranberries, Inc. and became a wholly owned subsidiary of this grower cooperative. The facility expanded in the 1990's with additional equipment and buildings that doubled the capacity of the facility. In October 2004, Milne Holdings Inc. assumed ownership of the Milne Fruit Products Inc. from Ocean Spray.

Reverse Osmosis units were added in November 2008 to remove sugars and other material from the evaporator condensate water for reuse. However, this system ended up being removed as it did not perform as the facility had hoped. Milne Fruit Products Inc. also constructed a clean water recapture system during 2008.

2. 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. Milne indicated that no cooling water intake is associated with the facility.

3. Industrial Processes

Milne produces fresh and frozen raw fruit into concentrated juices and purees. The facility operates 24 hours per day, five and a half days per week, 51 weeks per year. Milne discharges process water to the City of Prosser POTW and cooling water to the Yakima River. Cooling water is discharged to the POTW when the daily flow limit to the river is reached or when the temperature or pH limits are exceeded.

The Milne facility processes about 105,000 tons per year of fresh fruit into 3,000,000 gallons of concentrated juice and puree, and 6,000 tons of juice blends and pre-mixes. The facility processes a greater amount of fruit during the September to October grape season than during the rest of the year.

Chemicals used and stored include:

- Anhydrous ammonia and propylene glycol for refrigeration
- Paint
- Gear, refrigeration & motor oils
- Sulfuric Acid – Wastewater – 76%
- Sodium Hydroxide – 25 % Wastewater, 50% Cleaning
- Magnesium Hydroxide – Wastewater
- Chloroclean Plus – Chlorinated Alkaline Cleaner 155 Potassium Hydroxide 3% Sodium Hypochlorite
- Phos Brite – Acid Cleaner 35% Phosphoric Acid
- Pro Add – Cleaner Additive 5% Sodium Amino
- Stericlean – Sanitizer 12.5% Sodium Hypochlorite
- PerOxy Cleaner – Fruit Stain Remover 45% Sodium Met silicate, 55% Sodium Percarbonate
- Ultrasil 01 – Surfactant

- Ultrasil OP – Bleach >50% sodium perborate, monohydrate
- Ultrasil 84 – Cleaner Additive >50% Dipropylene glycol methyl ester
- Ultrasil 75 – Acid Cleaner 50% Nitric Acid, 25% Propanoic Acid
- Ultrasil MP – Preservative
- Onoxia Active – Sanitizer
- BWT 2109 – Boiler Water Treatment 99% Sodium Sulfite
- SCT 7207 – Resin Cleaner >50% Sodium Metabisulfite
- CRT 3030 Boiler condensate treatment >50% Morpholine
- CWT 5212 Cooling Water Treatment
- BWT 2478 – Boiler Treatment
- Contrac All Weather Blox
- Advion Ant Gell

4. Wastewater Treatment processes

Milne has made changes to reduce water usage and lower the amount of BOD (BOD) and TSS (TSS) in its effluent. The changes include:

- Installation of a “clean water capture” system to separate high concentration BOD and TSS water from low concentration water. This allows the clarifier to run more efficiently [see details below].
- A polymer addition system was added to the clarifier. This improvement allows the clarifier to more effectively remove TSS.
- Installation of catch pans under fruit processing equipment to reduce BOD.
- Addition of recirculation loops on seals and pumps to reduce the water used and discharged.
- Addition of four 20,000 gallon tanks intended to serve as flow equalization for more effective wastewater pretreatment. However, later these tanks were removed and accommodate a new juice storage tank room.

The facility maintains three wastewater systems: 1) Most of the facility’s wastewater is discharged to the City’s municipal wastewater sewer and POTW; 2) Cooling wastewater mixed with stormwater with an integrated “first flush” system that

directs flow to either the river or the City's municipal wastewater sewer and; 3)
Simple storm water sewers:

1) Discharge to POTW

Process water and "first flush" stormwater is collected in a wastewater sump. The wastewater is pumped up to a rotary screen which removes solids prior to discharge into a treatment clarifier. Three 6,000 gallon storage tanks receive process water that cannot be processed immediately by the clarifier system and therefore function as flow-equalization for the clarifier.

The wastewater's pH is monitored as it enters the clarifier and sulfuric acid or sodium hydroxide are added as needed; a second pH monitor is near the clarifier's discharge port and serves to adjust the chemical feed rate; a third monitor detects "out of spec" pH in discharged wastewater and activates a valve which diverts the wastewater back into the sump. Clarified and pH adjusted wastewater flows by gravity to a City-owned lift station that pumps to the POTW.

The facility has a cooling tower on each of the four juice concentrators. Milne constantly monitors cooling water conductivity in these four cooling towers. When an action level is exceeded, a bleed-off discharge is activated. Concurrently, the discharged cooling water's pH and temperature are monitored. If the pH and temperature are not within permit limits, it is sent to the "clean water capture" sump. This sump also receives "clean" operating, blow-down, and seal wastewater. Wastewater from the "clean-water system" is pH neutralized and discharged directly to the City's sanitary sewer lift station, bypassing the clarifier.

A stormwater "first flush" sump has an integrated pump and valve designed to keep protect the Yakima River. First flushes of stormwater from the facility's roofs and paved surfaces (frequently carrying higher pollutant loads) are prevented from entering the Yakima River. The first flush water and cooling water is pumped to Milne's clarifier pretreatment system and then to a municipal wastewater sewer. The system also prevents accidental spills from entering the Yakima River.

2) Discharge to River

If the cooling tower wastewater pH and temperature are within permit limits, up to 29,000 gallons per day is discharged to the river. Also, during higher flow precipitation events, water in the sump can be manually switched and sent through the storm sewer pipe.

3) Stormwater Discharges

The facility has stormwater drains separate from the first flush stormwater sump. Ecology has issued an Industrial Stormwater General Permit WAR001443 to the facility.

Discharge, Outfall 1 Yakima River

The stormwater pipe conveying waste cooling water runs about 200 feet from the plant to the river. The outfall is elevated five to eight feet above the river and discharges about five feet from the shore at low flow river conditions.

Discharge, Outfall 2 Prosser POTW

The industrial process wastewater enters the City's collection system at Lift Station No. 2 located approximately ¼ mile east of the Milne plant along Bennett Avenue. A composite wastewater sampler and magnetic flow meter are located at the lift station. The City of Prosser monitors Milne wastewater Lift Station No. 2 wet well for compliance with the terms of the Industrial Wastewater User Contract.

The wastewater produced by each processing source is as follow in Table 2:

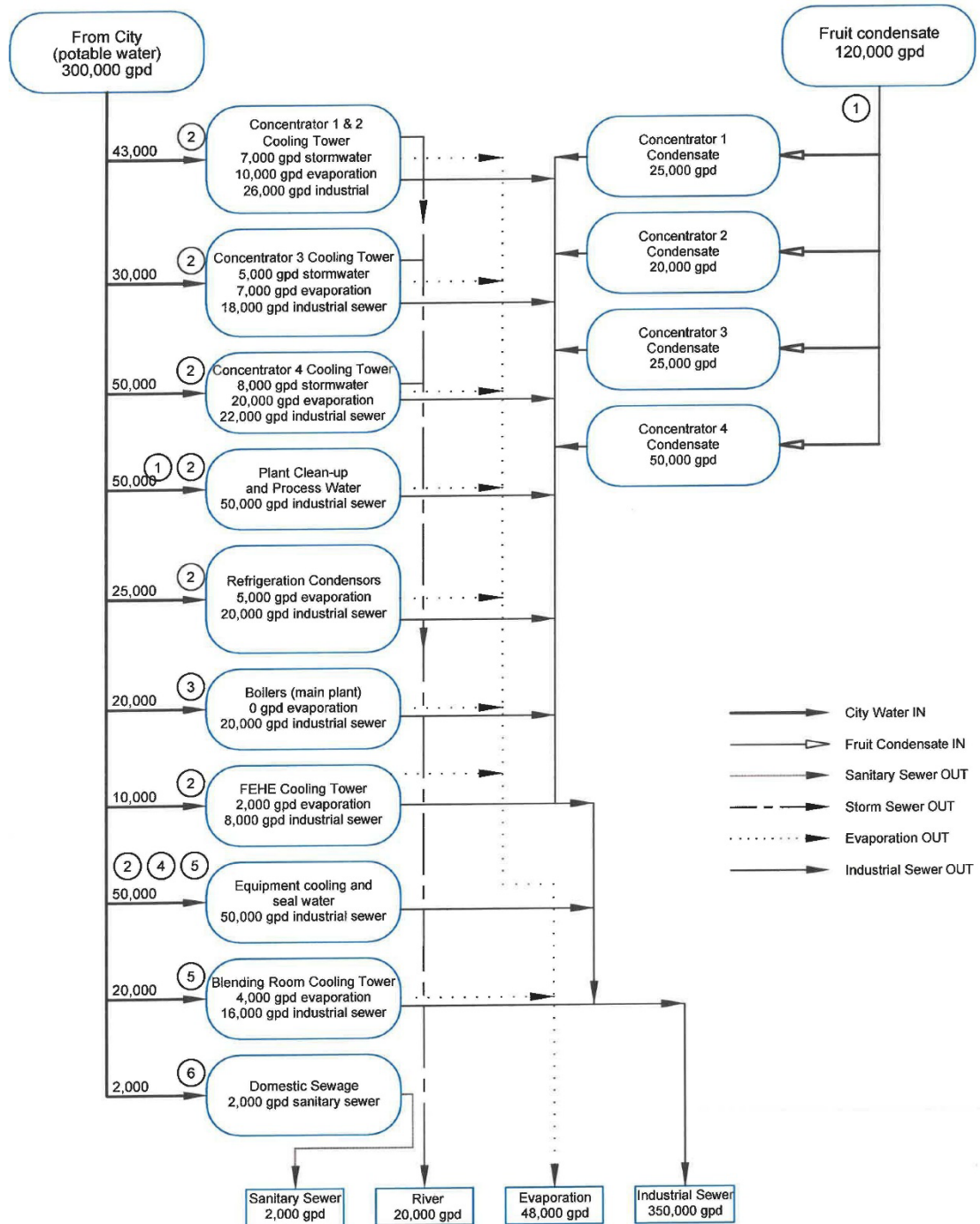
Table 2 - Waste Streams

Process	Wastewater Name	Batch or Continuous	Wastewater Production/Month estimated
Concentrating	Condensate	C	79,166 gals
Cooling	Tower Blowdown	C	54,166 gals
Boiler	Boiler Blowdown	C	26,666 gals
Plant Cleanup	Plant Clean	B/C	156,666 gals
Blend Cleanup	Blend Clean	B/C	54,166 gals
Sanitary Waste	Domestic	C	60,000 gals

Milne Fruit Products, Inc. Water Flow Diagram

Average Water Balance

Attachment C.2.2
Production schematic flow diagram
and average water balance



5. Solid wastes

Milne generates the following solid wastes:

Diatomaceous earth and fruit pomace, clarifier sludge, used oil, and parts washer sludge.

Table 3 - Waste Disposal

Waste Description	Disposal Method	Storage
Diatomaceous Earth and Fruit Pomace	Land Application Cattle Feed	Held in dump trucks
Clarifier Sludge	Landfill	Dumpsters
Used Oil	Recycle	Double walled tank
Parts Washer Sludge	Vendor Treatment	Parts washer in shop

6. Discharge outfall

Cooling tower wastewater, pH and temperature adjusted, flow approximately 200 feet from the plant to the Yakima River through an eight inch diameter pipe. The outfall is elevated five to eight feet above the river and discharges approximately five feet from the shore at low flow river conditions. Process wastewater is discharged to the City of Prosser POTW through a lift station located in the Northeast corner of the Milne property at Outfall 002.

II.B. Description of the receiving water

Milne discharges to the Yakima River, at River Mile 47. Other nearby point source outfalls include the Prosser POTW located approximately 1 mile downstream. Significant nearby non-point sources of pollutants include irrigation return drains.

The ambient background data used for this permit includes the following from an Ecology sampling station located downstream of Prosser at Kiona that includes data from 2014-2022:

Table 4 - Ambient Background Data

Parameter	Value Used
Temperature (Max recorded in data)	28.6 °C
pH (Maximum / Minimum)	9.3/7.4 standard units
Dissolved Oxygen 10 th percentile	9.6 mg/L
Total Ammonia-N 90 th percentile	0.031 mg/L
Fecal Coliform 90 th percentile	65.6 CFRs/100 mL
Turbidity 90 th percentile	21.3 NTU

II.C. Wastewater characterization

Milne reported the concentration of pollutants in the discharge in the permit application and in Discharge Monitoring Reports (DMRs). The tabulated data represents the quality of

the wastewater effluent discharged from Milne from 2017 to 2022. The wastewater effluent is characterized as follows:

Table 5A - Wastewater Characterization Discharge to Yakima River

Parameter	Units	# of Samples	Average Value	Maximum Value
Flow	Gallons per Day	2191	2844.71	29,000
Daily Maximum Temperature	° C	1075	22.13	29.4
Total Ammonia	mg/L	226	0.085	1.2
Chemical Oxygen Demand	mg/L	221	41.03	1900
pH	Standard Units	1052	7.5	8.86

Table 5B - Wastewater Characterization Discharge to Prosser POTW

Parameter	Units	# of Samples	Average Value	Maximum Value
Flow (November -August)	Million gallons per day	1791	0.18	0.48
Flow (September -October)	Million gallons per day	366	0.26	0.50
BOD ₅	mg/L	712	1078.64	3300
BOD ₅ (November -August)	lbs/day	592	2043.90	6979
BOD ₅ (September -October)	Lbs/day	120	3236.63	8714
TSS (TSS)	mg/L	1594	116.84	2300
TSS	lbs/day	1594	258.56	6595
Total Ammonia	mg/L	611	0.46	16.8
Total Ammonia	lbs/day	609	0.90	44.56
pH	Standard Units	1778	7.9	10.4

II.D. Summary of compliance with previous permit Issued

The previous permit placed effluent limits on flow, temperature, and pH for discharge of cooling water to the Yakima River. Effluent limits were placed on flow, pH, BOD, and TSS for process water discharge to the City of Prosser POTW. The City of Prosser established local limits through an Industrial User Contact (IUC) with Milne facility. Milne amended their IUC multiple times during the previous permit term. The previous permit issued on October 1, 2010, listed the IUC Schedule A allowable wastewater discharges in S1 of the permit.

Ecology was not able to incorporate updates to the IUC due to the age of the permit. The new proposed permit will require Milne to submit a signed and dated IUC within one week of a signed modification. The IUC will be placed in Appendix B of the permit. In the event the IUC is amended or updated, Ecology can modify the permit to include an updated copy in Appendix B of the permit.

Milne has complied with the effluent limits and permit conditions throughout the duration of the permit issued on October 1, 2010 with the exceptions listed below. Ecology assessed compliance based on its review of the facility DMRs and on inspection.

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

Table 6 - Violations, 2017-2022

Violation Date	Parameter Type	Unit Type	Max Limit	Measurement Value	Quantity	Statistical Base Type	Violation
3/1/2017	BOD5	Lbs/day	1800	2241		Average	Numeric effluent violation
4/1/2017	BOD5	Lbs/day	1800	2366		Average	Numeric effluent violation
5/1/2017	BOD5	Lbs/day	1800	2488		Average	Numeric effluent violation
6/1/2017	BOD5	Lbs/day	1800	1908		Average	Numeric effluent violation
7/1/2017	BOD5	Lbs/day	1800	2295		Average	Numeric effluent violation
8/1/2017	BOD5	Lbs/day	1800	2453		Average	Numeric effluent violation
9/1/2017	BOD5	Lbs/day	2500	2516		Average	Numeric effluent violation
10/1/2017	BOD5	Lbs/day	2500	5538.36		Average	Numeric effluent violation
10/1/2017	Flow	MGD	0.385	0.40		Average	Frequency of Sampling Violation
11/1/2017	BOD5	Lbs/day	1800	2627		Average	Numeric effluent violation
3/1/2018	BOD5	Lbs/day	1800	1822		Average	Numeric effluent violation
5/1/2018	BOD5	Lbs/day	1800	1982		Average	Numeric effluent violation
9/1/2018	BOD5	Lbs/day	2500	2582		Average	Numeric effluent violation
10/1/2018	BOD5	Lbs/day	2500	4806		Average	Numeric effluent violation
11/1/2018	BOD5	Lbs/day	1800	2045		Average	Numeric effluent violation
9/1/2019	BOD5	Lbs/day	2500	3519		Average	Numeric effluent violation
10/1/2019	BOD5	Lbs/day	2500	3394		Average	Numeric effluent violation
11/1/2019	Flow	MGD	0.32	-		-	Frequency of Sampling Violation

Violation Date	Parameter Type	Unit Type	Max Limit	Measurement Value	Quantity	Statistical Base Type	Violation
1/1/2020	BOD5	Lbs/day	1800	2068		Average	Numeric effluent violation
8/1/2020	BOD5	Lbs/day	1800	2193		Average	Numeric effluent violation
10/1/2020	BOD5	Lbs/day	2500	2682		Average	Numeric effluent violation
10/1/2021	BOD5	Lbs/day	2500	2750		Average	Numeric effluent violation
10/1/2022	BOD5	Lbs/day	2500	3086		Average	Numeric effluent violation
11/1/2022	BOD5	Lbs/day	1800	2010		Average	Numeric effluent violation

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

Table 7 - Permit Submittals

Water Quality Name	Submittal Name	Submittal Status	Due Date	Received Date	Permit Section	Submittal Notes
Milne Fruit Products	O&M - Operation And Maintenance Manual	Received	10/1/2011	12/16/2011	S4A1	comments sent
Milne Fruit Products	O&M - Operation And Maintenance Manual	Received	10/1/2011	1/9/2013	S4A1	response to 2011 comments
Milne Fruit Products	Solid Waste Control Plan	Received	10/1/2011	1/9/2013	S7C1	
Milne Fruit Products	Spill Prevention Plan	Received	10/1/2011	12/16/2011	S81	
Milne Fruit Products	Spill Prevention Plan	Received	10/1/2011	1/9/2013	S81	
Milne Fruit Products	Application For Permit Renewal	Accepted	9/30/2014	9/29/2014	S9	State to POTW; Form 1; Form 2C; Form 2E
Milne Fruit Products	Reporting Permit Violations - Written Report	Received		11/12/2015	S3	Included text information inside of e-DMR regarding October 2015 DMR violation.

II.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 Federal Water Quality Criteria Applicable to Washington (40 CFR 131.45).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

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

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

III.A. Design criteria

According to WAC 173-220-150 (1)(g), neither flows nor waste loadings may exceed approved design criteria, however, Ecology does not have an engineering report that specifies the design criteria for the wastewater treatment plant at this facility. The proposed permit requires the facility to prepare an engineering report to establish design criteria.

III.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. Limits remain the same from the previous permit.

Table 8 - Technology-based Limits – Cooling Wastewater Discharge to the Yakima River

Parameter	Average Monthly Limit	Maximum Daily Limit
Flow	N/A	29,000 Gallons per day

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

III.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 (TMDL) study.

1. Numeric criteria for the protection of aquatic life and recreation

Numeric 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.

2. Numeric criteria for the protection of human health

Numeric criteria for the protection of human health are promulgated in Chapter 173-201A WAC and 40 CFR 131.45. These criteria are designed to protect human health 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.

3. Narrative criteria

Narrative water quality criteria (e.g., WAC 173-201A-240(1)) 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) and of all marine waters (WAC 173-201A-210) in the state of Washington.

4. Antidegradation

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330) 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.

5. Mixing zones

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

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

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

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. 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:

- a. 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).

- b. 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 Milne meets the requirements of AKART (see “Technology-based Limits”).

- c. 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's Permit Writer's Manual (Ecology, 2018) describes additional guidance on criteria/design conditions for determining dilution factors.

Table 9 - Critical Conditions Used to Model the Discharge

Critical Condition	Value
Seven-day-average low river flow with a recurrence interval of ten years (7Q10)	770.9 CFS
River depth at the 7Q10 period	4.5 feet
River velocity	0.5 ft per second
Manning roughness coefficient	0.020
Channel width	328 feet
Maximum daily flow limit for Dilution Modeling	29,000 gallons per day (GPD)
Effluent temperature 95 th Percentile	29.3 degrees C

Ecology obtained ambient data at critical conditions in the vicinity of the outfall from the USGS Kiona Station gage.

- d. 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.

- e. 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.

- f. 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. 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.

g. Maximum size of mixing zone.

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

h. 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 (or volume fraction) 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.

i. Overlap of Mixing Zones.

This mixing zone does not overlap another mixing zone.

III.D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. The table included below summarizes the criteria applicable to this facility's discharge.

1. Freshwater Aquatic Life Uses and Associated Criteria

Aquatic Life Uses are designated based on the presence of, or the intent to provide protection for the key uses. All indigenous fish and non-fish aquatic species must be

protected in waters of the state in addition to the key species. The Aquatic Life Uses for this receiving water are identified below.

Table 10 - Salmonid Spawning, Rearing, and Migration

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

2. Recreational use and criteria

The recreational use for this receiving water is primary contact recreation. *E.coli* organism levels must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL.

3. Water supply uses

The water supply uses are domestic, agricultural, industrial, and stock watering.

4. Miscellaneous freshwater uses

The miscellaneous freshwater uses are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

III.E. Water quality impairments

Sections of the Yakima River are listed on the current 303(d) and are impaired for dioxin, toxaphene, 4,4'-DDE, dissolved oxygen, temperature, chlordane, dieldrin and polychlorinated biphenyls (PCBs). Ecology is currently conducting studies which may lead to TMDLs for these compounds in the future. Ecology has completed a TMDL Analysis for turbidity. The Yakima River, at the point of the Milne discharge, has not been identified as having an impairment.

III.F. Evaluation of surface water quality-based effluent limits for narrative criteria
Ecology must consider the narrative criteria described in WAC 173-201A-260 when it determines permit limits and conditions. Narrative water quality criteria limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge

which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health.

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.

III.G. Evaluation of surface water quality-based effluent limits for numeric criteria

1. Mixing zones and dilution factors

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 BOD (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 pipeline conveying cooling water to Outfall 001 from the Milne plant runs approximately 200 feet from Milne to the river. The outfall is elevated five to eight feet above the river and discharges about five feet from the shore at low river conditions.

Chronic Mixing Zone – WAC 173-201A-400(7)(a) specifies that mixing zones must not extend in a downstream direction from the discharge ports for a distance greater than 300 feet plus the depth of water over the discharge ports or extend upstream for a distance of over 100 feet, not utilize greater than 25% of the flow, and not occupy greater than 25% of the width of the water body. The mixing zone extends from the bottom to the top of the water column.

The chronic dilution factor below is based on a downstream distance of 300 feet

Acute Mixing Zone – WAC 173-201A-400(8)(a) specifies that in rivers and streams a zone where acute toxics criteria may be exceeded must not extend beyond 10% of the

distance towards the upstream and downstream boundaries of the chronic zone, not use greater than 2.5% of the flow and not occupy greater than 25% of the width of the water body. The mixing zone extends from the bottom to the top of the water column.

The acute dilution factor below is based on a downstream distance of 30 feet.

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

Table 2 - Dilution Factors (DF)

Criteria	Acute	Chronic
Aquatic Life	1461	8491

Ecology determined the impacts of dissolved oxygen deficiency, pH, ammonia, and temperature 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.

2. Dissolved Oxygen: BOD₅ 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 (BOD₅) 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.

3. pH

Ecology modeled the impact to receiving waters under critical conditions using technology-based limits for pH (6.0 – 9.0) and the *pH-mix-fresh* worksheet in Ecology's PermitCalc spreadsheet. Appendix D includes the model results. Model calculations predict no violation of the pH criteria under critical conditions.

4. Turbidity

The Turbidity TMDL in place on this stretch of the Yakima River was put in place to address primarily nonpoint sources. 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.

5. Toxic Pollutants

Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those

chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The following toxic pollutants are present in the discharge: ammonia. Ecology conducted a reasonable potential analysis (See Appendix D) on these parameters to determine whether it would require effluent limits in this permit.

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature and pH in the receiving freshwater. To evaluate ammonia toxicity, Ecology used the available receiving water information collected by the Grandview POTW and Ecology spreadsheet tools.

Ecology determined that ammonia poses no reasonable potential to cause or contribute to exceedances of the water quality criteria at the critical condition using procedures given in EPA, 1991 (Appendix D) and as described above. Ecology's determination assumes that this facility meets the other effluent limits of this permit.

6. Temperature

The state temperature standards (WAC 173-201A, WAC 173-201A-200, WAC 173-201A-600, and WAC 173-201A-602) include multiple elements:

- a. Annual summer maximum threshold criteria (June 15 to September 15)
- b. Supplemental spawning and rearing season criteria (September 15 to June 15)
- c. Incremental warming restrictions
- d. Guidelines on preventing acute lethality and barriers to migration of salmonids

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

- a. Annual summer maximum and supplementary spawning/rearing criteria

Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), and WAC 173-201A-602, 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 some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

b. 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)]. 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.

c. Guidelines to prevent acute lethality or barriers to migration of salmonids. These site-level considerations do not override the temperature criteria listed above.

- i. 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.
- ii. General lethality and migration blockage: The temperature at the edge of a chronic mixing zone must not exceed either a 1DMax of 23°C or a 7DADMax of 22°C. When adjacent downstream temperatures are 3°C or more cooler, the 1DMax at the edge of the chronic mixing zone must not exceed 22°C.
- iii. Lethality to incubating fish: The temperature must not exceed 17.5°C at locations where eggs are incubating.

Reasonable Potential Analysis

The background (ambient) temperature of the receiving water exceeds the annual summer maximum, the supplementary spawning criterion. Ecology has not yet completed a TMDL to establish the wasteload allocation for this discharge. The proposed permit includes a performance-based limit for temperature.

III.H. Human health

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

Ecology determined the applicant's discharge does not contain chemicals of concern based on existing effluent data or knowledge of discharges to the system. Ecology will reevaluate this discharge for impacts to human health at the next permit reissuance.

III.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 website¹](#).

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

III.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).

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

III.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.

Using the screening criteria in chapter 173-205-040 WAC, Ecology determined that toxic effects caused by unidentified pollutants in the effluent are unlikely. Therefore, this permit does not require WET testing. Ecology may require WET testing in the future if it receives information indicating that toxicity may be present in this effluent.

III.L. Comparison of effluent limits with the previous permit issued on August 31, 2010.

Table 3 - Comparison of Previous and Proposed Effluent Limits – Outfall 1 to the Yakima River

Limit	Basis of Limit	Existing permit limit	Proposed permit limit
Flow	Technology	29,000 gallons	29,000 gallons
Temperature	Technology	29.4 °C	17.5 °C
pH	Technology	Daily minimum is equal or greater than 6 and the daily maximum is less than or equal to 9	Daily minimum is equal or greater than 6 and the daily maximum is less than or equal to 9

¹<https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Sediment-cleanups>

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 DMR or in the required report.

IV.A. Wastewater monitoring

Milne monitors for flow, daily maximum temperature, Total Ammonia, Chemical Oxygen Demand, and pH in the discharge to the Yakima River (Outfall 1) and Flow, BOD, TSS, Total Ammonia and pH in the discharge to the City of Prosser POTW. These pollutant(s) could have a significant impact on the quality of the surface water.

The monitoring schedule is detailed in the proposed permit under Special Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, and significance of pollutants.

IV.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).

V. Other Permit Conditions

V.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).

V.B. Non routine and unanticipated wastewater

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

The permit authorizes the discharge of non-routine and unanticipated wastewater under certain conditions. 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.

V.C. Spill and Slug discharge Control 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].

Milne developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. Ecology also determined that Milne has the potential for a slug discharge that could adversely affect the City of Prosser POTW. The proposed permit requires the facility to update the Spill Control plan as needed and submit a slug discharge control plan [(40 CFR 403.8 (f)(I) (iii)(B)(6) and (f) (2)(vi)] to Ecology through Water Quality Permitting Portal as required in Special Condition S7 and S8 of the permit.

V.D. Solid waste control plan

Milne 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. The facility must submit the updated plan to Ecology for approval (RCW 90.48.080). Refer to the Ecology guidance document, [Developing a Solid Waste Control Plan²](#).

V.E. Operation and maintenance manual

Ecology requires industries to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state and federal regulations [40 CFR 122.41(e) and WAC 173-220-150 (1)(g)]. The facility has prepared and submitted an operation and maintenance manual as required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). Implementation of the procedures in the operation and maintenance manual ensures the facility's compliance with the terms and limits in the permit.

V.F. 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.

²<https://apps.ecology.wa.gov/publications/documents/0710024.pdf>

VI. Permit Issuance Procedures

VI.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.

VI.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 five years.

VII. References for Text and Appendices

Ecology. (2010). *Water Quality Program Guidance Manual: Procedures to Implement the State's Temperature Standards through NPDES Permits, Publication 06-10-100*. Retrieved from <https://apps.ecology.wa.gov/publications/summarypages/0610100.html>

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Ecology. (2016). *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria (Publication 95-80)*. Retrieved from <https://apps.ecology.wa.gov/publications/SummaryPages/9580.html>

Ecology. (2018). *Water Quality Program Permit Writer's Manual, Publication 92-109*. Retrieved from <https://apps.ecology.wa.gov/publications/summarypages/92109.html>

Ecology. (2019). *Stormwater Management Manual for Eastern Washington, Publication 18-10-044*. Retrieved from <https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMEW/2019SWMMEW.htm>

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USEPA. (1985). *Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. Part 2, EPA/600/6-85/002B.*

USEPA. (1988). *Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling.*

USEPA. (1991). *Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001).* Washington, DC. Retrieved from <https://www3.epa.gov/npdes/pubs/owm0264.pdf>

USEPA Region 10. (2021). *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load.* Seattle, WA.

Washington State and Ecology website general reference links:

[Laws and Regulations](#)³

[Permit and Wastewater Related Information](#)⁴

³ <https://leg.wa.gov/LawsAndAgencyRules/Pages/default.aspx>

⁴ <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance>

Appendix A – Public Involvement Information

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

Ecology placed a Public Notice of Application on **date and date in name of publication** to inform the public about the submitted application and to invite comment on the reissuance of this permit.

Ecology will place a Public Notice of Draft on **date in name of publication** 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.

[\[Attach printed copy of the Public Notice mail-out\]](#)

[Frequently Asked Questions about Effective Public Commenting](#)⁵

You may obtain further information from Ecology by telephone, 509-379-3967, or by writing to the address listed below.

Water Quality Permit Coordinator Department of Ecology
Central Regional Office
1250 West Alder Street
Union Gap, WA 98903

The primary author of this permit and fact sheet is Stephanie Giesin.

⁵ <https://apps.ecology.wa.gov/publications/SummaryPages/0307023.html>

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 as defined in WAC 371-08-305 and -335. “Notice of appeal” is defined in WAC 371-08-340.
- Serve a copy of your appeal and this permit on Ecology the Department of Ecology mail, in person, or by email (See addresses below.)
- You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Filing with the PCHB

For the most current information regarding filing with the PCHB: visit <https://eluhho.wa.gov/> or call 360-664-9160.

Service on Ecology

Street Address:

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:

ecologyappeals@ecy.wa.gov

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 RCW 90.48.520, 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 months' time taking into account zero discharge days.

Average monthly discharge limit – The average of the measured values obtained over a calendar months' 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 BOD₅ 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 level – or method detection limit means the minimum concentration of an analyte (substance) that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results as determined by the procedure given in 40 CFR part 136, Appendix B.

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 WAC 173-240-130.

Enterococci – A subgroup of fecal streptococci that includes *S. faecalis*, *S. faecium*, *S. gallinarum*, and *S. avium*. The enterococci are differentiated from other streptococci by their ability to grow in 6.5% sodium chloride, at pH 9.6, and at 10°C and 45°C.

E. coli – A bacterium in the family Enterobacteriaceae named Escherichia coli and is a common inhabitant of the intestinal tract of warm-blooded animals, and its presence in water samples is an indication of fecal pollution and the possible presence of enteric pathogens.

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 limit (MDL) – See Detection level.

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) – Section 402 of the Clean Water Act, 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 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:

- Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- 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 (ML) – The term “minimum level” refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (DL), whichever is higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the DL in a method, or the DL determined by a laboratory, by a factor of 3. For the purposes of NPDES compliance monitoring, EPA considers the following terms to be synonymous: “quantitation limit,” “reporting limit,” and “minimum level”.

Reasonable potential – A reasonable potential to cause or contribute to 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) –

- All industrial users subject to Categorical Pretreatment Standards under 40 CFR Chapter I, Subchapter N and 40 CFR 403.6 and;
- 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 the second paragraph 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 BOD₅ – 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 BOD₅ 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 BOD₅ 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.

TSS (TSS) – TSS 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

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:

CORMIX SESSION REPORT:

XX

CORMIX MIXING ZONE EXPERT SYSTEM

CORMIX Version 12.0GTD

HYDRO1:Version-12.0.0.0 December,2020

SITE NAME/LABEL:

DESIGN CASE:

FILE NAME: Y:\WQ\WPFILES\Giesin\Milne Fruit Products\CORMIX-MilneTrial3.22.prd-Acute Dilution

Using subsystem CORMIX1: Single Port Discharges

Start of session: 09/19/2023--09:59:02

SUMMARY OF INPUT DATA:

AMBIENT PARAMETERS:

Cross-section	bounded
Width	BS = 99.97 m
Channel regularity	ICHREG = 1
Ambient flowrate	QA = 21.83 m ³ /s
Average depth	HA = 1.52 m
Depth at discharge	HD = 1.07 m
Ambient velocity	UA = 0.1437 m/s
Darcy-Weisbach friction factor	F = 0.0273
Calculated from Manning's x	HD = 1.07 m
Wind velocity	UW = 0.3 m/s
Stratification Type	STRCND = U
Surface temperature	28 degC

Bottom temperature	28 degC
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Calculated FRESH-WATER DENSITY values:

Surface density	RHOAS = 996.2338 kg/m ³
Bottom density	RHOAB = 996.2338 kg/m ³

DISCHARGE PARAMETERS: Single Port Discharge

Nearest bank = right	
Distance to bank	DISTB = 1.53 m
Port diameter	D0 = 0.0172 m
Port cross-sectional area	A0 = 0.0002 m ²
Discharge velocity	U0 = 0.38 m/s
Discharge flowrate	Q0 = 0.000088 m ³ /s
Discharge port height	H0 = 1.07 m
Vertical discharge angle	THETA = 90 deg
Horizontal discharge angle	SIGMA = 0 deg
Discharge temperature (freshwater)	28 degC
Corresponding density	RHO0 = 996.2338 kg/m ³
Density difference	DRHO = 0.0000 kg/m ³
Buoyant acceleration	GP0 = 0 m/s ²
Discharge concentration	C0 = 100 %
Surface heat exchange coeff.	KS = 0 m/s
Coefficient of decay	KD = 0 /s

DISCHARGE/ENVIRONMENT LENGTH SCALES:

LQ = 0.02 m	Lm = 0.04m	Lb = 0 m
LM = 99999 m	Lm' = 99999 m	Lb' = 99999 m

NON-DIMENSIONAL PARAMETERS:

Port densimetric Froude number	FR0 = 99999
Velocity ratio	R = 2.63

MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:

Toxic discharge	no
Water quality standard specified	no
Regulatory mixing zone	yes
Regulatory mixing zone specification	distance
Regulatory mixing zone value	9.35 m (m ² if area)
Region of interest	1000 m

HYDRODYNAMIC CLASSIFICATION:

| FLOW CLASS = IPH4 |

This flow configuration applies to a layer corresponding to the full water depth at the discharge site.

Applicable layer depth = water depth = 1.07 m

Limiting Dilution $S = (QA/Q0) + 1.0 = 249123.8$

MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

X-Y-Z Coordinate system:

Origin is located at the BOTTOM below the port/diffuser center: 1.53 m from the right bank/shore.

Number of display steps NSTEP = 50 per module.

NEAR-FIELD REGION (NFR) CONDITIONS :

Note: The NFR is the zone of strong initial mixing. It has no regulatory implication. However, this information may be useful for the discharge designer because the mixing in the NFR is usually sensitive to the discharge design conditions.

Pollutant concentration at NFR edge	c = 58.823500 %
Dilution at edge of NFR	s = 1.7
NFR Location:	x = 0.02 m
(centerline coordinates)	y = 0 m
	z = 1.07 m
NFR plume dimensions: half-width	(bh) = 0.02 m
thickness	(bv) = 0.02 m
Cumulative travel time:	0.1197 sec

Buoyancy assessment:

The effluent density is equal or about equal to the surrounding ambient water density at the discharge level.

Therefore, the effluent behaves essentially as NEUTRALLY BUOYANT.

FAR-FIELD MIXING SUMMARY:

Plume becomes vertically fully mixed at 66.72 m downstream.

PLUME BANK CONTACT SUMMARY:

Plume in bounded section contacts one bank only at 47.67 m downstream.

***** TOXIC DILUTION ZONE SUMMARY *****

No TDZ was specified for this simulation.

***** REGULATORY MIXING ZONE SUMMARY *****

The plume conditions at the boundary of the specified RMZ are as follows:

Pollutant concentration	c = 0.068546 %
Corresponding dilution	s = 1461.2
Plume location:	x = 9.35 m
(centerline coordinates)	y = 0 m
	z = 1.07 m
Plume dimensions: half-width	(bh) = 0.68 m
thickness	(bv) = 0.66 m
Cumulative travel time:	65.0725 sec

Note:

Plume concentration c and dilution s values are reported based on prediction file values - assuming linear interpolation between predicted points just before and just after the RMZ boundary has been detected.

Please ensure a small step size is used in the prediction file to account for this linear interpolation. Step size can be controlled by increasing (reduces the prediction step size) or decreasing (increases the prediction step size) the - Output Steps per Module - in CORMIX input.

***** FINAL DESIGN ADVICE AND COMMENTS *****

REMINDER: The user must take note that HYDRODYNAMIC MODELING by any known technique is NOT AN EXACT SCIENCE.

Extensive comparison with field and laboratory data has shown that the CORMIX predictions on dilutions and concentrations (with associated plume geometries) are reliable for the majority of cases and are accurate to within about +-50% (standard deviation).

As a further safeguard, CORMIX will not give predictions whenever it judges the design configuration as highly complex and uncertain for prediction.

CORMIX SESSION REPORT:

XX

CORMIX MIXING ZONE EXPERT SYSTEM

CORMIX Version 12.0GTD

HYDRO1:Version-12.0.0.0 December,2020

SITE NAME/LABEL:

DESIGN CASE:

FILE NAME: Y:\WQ\WPFILES\Giesin\Milne Fruit Products\CORMIX-MilneTrial3.22.prd-Chronic Dilution

Using subsystem CORMIX1: Single Port Discharges

Start of session: 09/19/2023--10:01:26

SUMMARY OF INPUT DATA:

AMBIENT PARAMETERS:

Cross-section	bounded
Width	BS = 99.97 m
Channel regularity	ICHREG = 1
Ambient flowrate	QA = 21.83 m ³ /s
Average depth	HA = 1.52 m
Depth at discharge	HD = 1.07 m
Ambient velocity	UA = 0.1437 m/s
Darcy-Weisbach friction factor	F = 0.0273
Calculated from Manning's	n = 0.02
Wind velocity	UW = 0.3 m/s
Stratification Type	STRCND = U
Surface temperature	28 degC
Bottom temperature	28 degC

Calculated FRESH-WATER DENSITY values:

Surface density	RHOAS = 996.2338 kg/m ³
Bottom density	RHOAB = 996.2338 kg/m ³

DISCHARGE PARAMETERS: Single Port Discharge

Nearest bank	right
Distance to bank	DISTB = 1.53 m
Port diameter	D0 = 0.0172 m
Port cross-sectional area	A0 = 0.0002 m ²
Discharge velocity	U0 = 0.38 m/s
Discharge flowrate	Q0 = 0.000088 m ³ /s
Discharge port height x	Q0 = 0.000088 m ³ /s

Vertical discharge angle	THETA = 90 deg
Horizontal discharge angle	SIGMA = 0 deg
Discharge temperature (freshwater)	28 degC
Corresponding density	RHO0 = 996.2338 kg/m ³
Density difference x	RHO0 = 996.2338 kg/m ³
Buoyant acceleration	GP0 = 0 m/s ²
Discharge concentration	C0 = 100 %
Surface heat exchange coeff.	KS = 0 m/s
Coefficient of decay	KD = 0 /s

DISCHARGE/ENVIRONMENT LENGTH SCALES:

LQ = 0.02 m	Lm = 0.04 m	Lb = 0 m
LM = 99999 m	Lm' = 99999 m	Lb' = 99999 m

NON-DIMENSIONAL PARAMETERS:

Port densimetric Froude number	FR0 = 99999
Velocity ratio	R = 2.63

MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:

Toxic discharge	no
Water quality standard specified	No
Regulatory mixing zone	yes
Regulatory mixing zone specification	distance
Regulatory mixing zone value	93.48 m (m ² if area)
Region of interest	1000 m

MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:

Toxic discharge	no
Water quality standard specified	no
Regulatory mixing zone	yes
Regulatory mixing zone specification	distance
Regulatory mixing zone value	93.48 m (m ² if area)
Region of interest	1000 m

HYDRODYNAMIC CLASSIFICATION:

| FLOW CLASS = IPH4 |

This flow configuration applies to a layer corresponding to the full water depth at the discharge site.

Applicable layer depth = water depth	1.07 m
Limiting Dilution $S = (QA/Q0) + 1.0$	249123.8

MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

X-Y-Z Coordinate system:

Origin is located at the BOTTOM below the port/diffuser center: 1.53 m from the right bank/shore.

Number of display steps NSTEP = 50 per module.

NEAR-FIELD REGION (NFR) CONDITIONS :

Note: The NFR is the zone of strong initial mixing. It has no regulatory implication. However, this information may be useful for the discharge designer because the mixing in the NFR is usually sensitive to the discharge design conditions.

Pollutant concentration at NFR edge	$c = 58.823500 \%$
Dilution at edge of NFR	$s = 1.7$
NFR Location:	$x = 0.02 \text{ m}$
(centerline coordinates)	$y = 0 \text{ m}$
	$z = 1.07 \text{ m}$
NFR plume dimensions: half-width (bh) =	0.02 m
thickness (bv) =	0.02 m
Cumulative travel time:	0.1197 sec.

Buoyancy assessment:

The effluent density is equal or about equal to the surrounding ambient water density at the discharge level.

Therefore, the effluent behaves essentially as NEUTRALLY BUOYANT.

FAR-FIELD MIXING SUMMARY: Plume becomes vertically fully mixed at 66.72 m downstream.

PLUME BANK CONTACT

SUMMARY: Plume in bounded section contacts one bank only at 47.67 m downstream.

***** TOXIC DILUTION ZONE SUMMARY *****

No TDZ was specified for this simulation.

***** REGULATORY MIXING ZONE SUMMARY *****

The plume conditions at the boundary of the specified RMZ are as follows:

Pollutant concentration	$c = 0.011782 \%$
-------------------------	-------------------

Corresponding dilution	s = 8490.7
Plume location:	x = 93.48 m
(centerline coordinates)	y = -1.53 m
	z = 1.07 m
Plume dimensions:	half-width (bh) = 3.41 m
	thickness (bv) = 1.52 m
Cumulative travel time:	650.7248 sec.

Note:

Plume concentration c and dilution s values are reported based on prediction file values - assuming linear interpolation between predicted points just before and just after the RMZ boundary has been detected.

Please ensure a small step size is used in the prediction file to account for this linear interpolation. Step size can be controlled by increasing (reduces the prediction step size) or decreasing (increases the prediction step size) the - Output Steps per Module - in CORMIX input.

***** FINAL DESIGN ADVICE AND COMMENTS *****

REMINDER: The user must take note that HYDRODYNAMIC MODELING by any known technique is NOT AN EXACT SCIENCE.

Extensive comparison with field and laboratory data has shown that the CORMIX predictions on dilutions and concentrations (with associated plume geometries) are reliable for the majority of cases and are accurate to within about +-50% (standard deviation).

As a further safeguard, CORMIX will not give predictions whenever it judges the design configuration as highly complex and uncertain for prediction.

Calculation of 7Q10

Dflow Output

Dflow 7Q10 Report for USGS 12508990 station at Yakima River At Mabton, Wa

Period of Analysis

Variable	Values
Start Date	1990-01-01
End Date	2023-01-01
Water Year Start Month	Jan
No. of Months	12
Analysis Low Flow Years	30

Statistics & Results

Variables	7Q10	30Q5
Length (x)	7 days	30 days
Recurrence (y)	10 years	5 years
Mean_Logs (u)	7.0406	7.1231
SD_Logs (s.d.)	0.29784	0.28676
Skew_Logs (g)	-0.46649	-0.59951
K	-1.3195	-0.79561
Z	-1.2811	-0.83953
Result	770.9 cfs	987.3 cfs
Har_Mean	2,161.0 cfs	

Period of Record

Variable	Values
Start Date	1970-10-01
End Date	2023-02-14
Dataset Low Flow Years	53

Reasonable Potential Analysis:

Ecology uses spreadsheet tools to determine reasonable potential (to cause or contribute to violations of the aquatic life and human health water quality numeric standards) and to calculate effluent limits. The process and formulas for determining reasonable potential and effluent limits in these spreadsheets come from the *Technical Support Document for Water Quality-based Toxics Control*, (EPA 505/2-90-001 (TSD)). The adjustment for autocorrelation is from EPA (1996a), and EPA (1996b)

Calculation of Temperature

Instructions: Enter data on 'Input 1' tab and below with yellow fields.
 Delete column if not needed.
 -- Click here for more details --

Freshwater Temperature Reasonable Potential and Limit Calculation

Based on WAC 173-201A-200(1)(c)(i)–(ii) and the Water Quality Program Guidance. All data inputs must meet WQ guidelines.

	Core Summer Criteria	Supplemental Criteria
INPUT	July 1-Sept 14	Sept 15-July 1
1. Chronic Dilution Factor at Mixing Zone Boundary	8490.0	
2. 7DADMax Ambient Temperature (T) (Upstream Background 90th percentile)	18.5 °C	
3. 7DADMax Effluent Temperature (95th percentile)	28.3 °C	
4. Aquatic Life Temperature WQ Criterion in Fresh Water	17.5 °C	
OUTPUT		
5. Temperature at Chronic Mixing Zone Boundary:	18.5 °C	
6. Incremental Temperature Increase or decrease:	0.0 °C	
7. Maximum Allowable Incremental Temperature Increase:	1.1 °C	
8. Maximum Allowable Temperature at Mixing Zone Boundary:	17.5 °C	
A. If ambient temp is warmer than WQ criterion		
9. Does temp fall within this warmer temp range?	YES	
10. If YES - Use TMDL-based or performance-based limit - Do Not use this spreadsheet		
B. If ambient temp is cooler than WQ criterion but within 28/(T_{amb}+7) of the criterion		
11. Does temp fall within this Incremental temp. range?	---	---
12. Temp increase allowed at mixing zone boundary, if required:	---	---
C. If ambient temp is cooler than (WQ criterion - 28/(T_{amb}+7))		
13. Does temp fall within this Incremental temp. range?	---	---
14. Temp increase allowed at mixing zone boundary, if required:	---	---
RESULTS		
15. Do any of the above cells show a temp increase?	NO	
16. Temperature Limit if Required?	NO LIMIT	

Notes:

Calculation of pH

Instructions: Enter data on 'Input 1' tab and below with yellow fields. Spreadsheet calculates pH at mixing zone boundaries, you can override this by entering your own data in these cells.
 - Click here for more details -

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

INPUT		
		@ Chronic Boundary
1. Dilution Factor at Mixing Zone Boundary		8536.6
2. Ambient/Upstream/Background Conditions		
Temperature (deg C):		25.20
pH:		9.02
Alkalinity (mg CaCO3/L):		110.80
3. Effluent Characteristics		
Temperature (deg C):		28.40
pH:	7.83	
Alkalinity (mg CaCO3/L):(estimated)	60.00	
4. Aquatic Life Use Designation	Char spawning & rearing and/or core summer habitat	
OUTPUT		
1. Ionization Constants		
Upstream/Background pKa:	6.57	6.35
Effluent pKa:	6.57	6.33

DRAFT Fact Sheet for NPDES Permit WA0052272

Permit Effective xx/xx/20xx

Milne Fruit Products

58 of 59

2. Ionization Fractions		
Upstream/Background Ionization Fraction:	0.00	1.00
Effluent Ionization Fraction:	0.00	0.97
3. Total Inorganic Carbon		
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	0	111
Effluent Total Inorganic Carbon (mg CaCO3/L):	0	62
4. Conditions at Mixing Zone Boundary		
Temperature (deg C):	#DIV/0!	25.20
Alkalinity (mg CaCO3/L):	#DIV/0!	110.79
Total Inorganic Carbon (mg CaCO3/L):	#DIV/0!	111.03
pKa:	#DIV/0!	6.35
5. Allowable pH change	NA	0.20
RESULTS		
pH at Mixing Zone Boundary:	#DIV/0!	9.02
pH change at Mixing Zone Boundary:	#DIV/0!	0.00
Is permit limit needed?	NO	YES

Appendix E — Response to Comments

[Ecology will complete this section after the public notice of draft period.]

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