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PREVENTION OF SIGNIFICANT DETERIORATION APPLICABILITY ANALYSIS FOR STOCK PREPARATION PROJECT

Property:
McKinley Paper Company – Washington Mill
1902 Marine Drive
Port Angeles, Washington

Prepared for:
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Report Date:
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ACRONYMS AND ABBREVIATIONS

µg/m^3	micrograms per cubic meter
ADT/day	air dried tons per day
BAE	baseline actual emissions
CFR	Code of Federal Regulations
CO	carbon monoxide
Ecology	Washington State Department of Ecology
km	kilometer(s)
McKinley	McKinley Paper Company
the Mill	McKinley Paper Company – Washington Mill
NCASI	National Council for Air and Stream Improvement
NOC	Notice of Construction
NO_x	nitrogen oxides, or oxides of nitrogen
NSR	New Source Review
OCC	old corrugated container
ONP	old newsprint
ODTP/day	oven dried tons of pulp per day
ORCAA	Olympic Regional Clean Air Agency
PAE	projected actual emissions
PM	particulate matter
$PM_{2.5}$	particulate matter smaller than 2.5 microns in diameter
PM_{10}	particulate matter smaller than 10 microns in diameter
PSD	Prevention of Significant Deterioration
SER	significant emission rate
SoundEarth	SoundEarth Strategies, Inc.

ACRONYMS AND ABBREVIATIONS (CONTINUED)

SO_2	sulfur dioxide
tpd	tons per day
tpy	tons per year
VOC	volatile organic compound
WAC	Washington Administrative Code

1.0 PROJECT DESCRIPTION

1.1 BACKGROUND

McKinley Paper Company (McKinley) owns and operates an integrated pulp and paper mill in Port Angeles, Washington. Bio Pappel S.A.B. de C.V. is the parent company of McKinley. The McKinley Paper Company – Washington Mill (the Mill) was purchased by McKinley from Nippon Paper Industries in April 2017. McKinley proposes to upgrade the mill's existing pulping and stock preparation system to allow the use of alternative recovered fiber sources and allow the Mill to produce more competitive paper grades. McKinley does not plan to produce printing and writing paper after the Stock Preparation Project is completed.

The existing Mill is an integrated pulp and paper mill with two paper machine lines and three modes for producing pulp: a mechanical refiner pulp mill, a post-consumer recycled fiber pulp mill (deinking plant), and old corrugated container (OCC) tub pulper. Additionally, the Mill currently has the capability to purchase virgin pulp to blend with the other pulp feedstocks. McKinley operates under Air Operating Permit No. 11AOP816 issued by the Olympic Regional Clean Air Agency (ORCAA) on November 12, 2014 (first revision issued March 31, 2017). The most recent modification to the Mill's pulping system was the installation of the OCC tub pulper system in 2015 under Notice of Construction (NOC) permit No. 15NOC1115 issued by the ORCAA.

McKinley requests that the Washington State Department of Ecology review this Prevention of Significant Deterioration (PSD) Applicability Analysis and provide a written concurrence on the applicability of the PSD regulations to this project. McKinley appreciates Ecology's timely review of this submittal.

1.2 EXISTING STOCK PREPARATION AND PAPER MACHINE SYSTEM

Stock Preparation System. The existing stock preparation system includes an old newsprint (ONP) drum pulper, an OCC tub pulper, a deinking plant, two mechanical refiner lines, and a purchased kraft re-pulper. The maximum pulping capacity with the existing system configuration is 700 oven dried tons of pulp per day (ODTP/day).

There are two existing paper machines that have an existing capacity of 550-800 air dried tons per day (ADT/day) depending on the paper grade being manufactured to meet market demand.

Kraft Re-pulper. This project does not directly affect the current kraft re-pulper. Virgin kraft pulp may still be purchased from other pulp producers and re-pulped on site, depending on market conditions.

Refiners. The existing two refiner lines will be decommissioned as part of the proposed project. The existing refiners are used to make virgin groundwood pulp. The design capacity of the existing refiners is 500 ODTP/day.

OCC Tub Pulper. This unit will be decommissioned as part of the proposed project. The design capacity of the existing OCC tub pulper is 230 ODTP/day.

Paper Machines. The existing system is optimized for the production of light-weight directory grade paper, for which there is a declining market. The existing paper machine capacity when manufacturing light-weight printing and writing grades is 550 ADT/day. The existing paper machine capacity when manufacturing heavyweight liner and bag grades is 800 ADT/day.

Cogen Boiler. There is no anticipated increase in the steam demand and subsequent emissions from the #11 Cogen Boiler (EU8) or the Cogen Cooling Tower (EU9) associated with this project. A separate reliability improvement project is planned for the cogeneration boiler, which will not increase boiler capacity or emissions. Therefore, these two emission units are not included in this PSD Applicability Analysis.

1.3 PROPOSED STOCK PREPARATION SYSTEM AND PAPER MACHINE CHANGES

PROPOSED STOCK PREPARATION SYSTEM. In order to accommodate a wider variety of recycled feedstocks and meet changes in customer demand, the following changes are proposed to the existing pulping system:

- The existing ONP pulper will be replaced by a new single-line continuous pulper with 900 tpd capacity.
- Existing stock contaminant removal system will be modified by the addition of new cleaning and screening equipment.
- Upgrades to the pulping reject removal, dewatering, and compaction system.
- Addition of a dissolved air flotation system for effluent clarification.
- The OCC tub pulper and refiners will be decommissioned.

All proposed equipment upgrades will occur inside the existing recycling plant buildings. The existing ONP drum pulper equipment, and the proposed continuous pulper, will be enclosed in the existing building. No new vents to the exterior will be constructed as a result of the proposed project.

PROPOSED PAPER MACHINE CHANGES. In order to produce new paper grades, some supporting changes to the two paper machines are planned. The new targeted grades of paper planned for production are bag and liner grades. If the paper machines in their existing configuration are used to produce heavyweight liner and bag grades, the capacity of the existing paper machines would be 800 ADT/day. A gross production capacity of 840 ADT/day of liner and bag grades (representing a 40 ADT/day increase) are anticipated after the following proposed changes are made to the paper machines:

- Improvements to the Paper Machine 1 (formerly PM3) to improve formation and increase paper strength.
- Replacement of four dryer cans to the drying section of PM1 (formerly PM3) that are currently not in service.

2.0 REGULATORY APPLICABILITY

The Mill is located in Clallam County, Washington, which is an attainment area for all pollutants. The following sections evaluate the regulatory requirements for the proposed project. The Mill is located within 10 km from a Class I Area, the Olympic National Park.

2.1 NOTICE OF CONSTRUCTION APPLICABILITY

The Washington Administrative Code (WAC) 173-400-110 and ORCAA regulations discuss the NOC and the Order of Approval requirements necessary for the construction of a new source or modification of an existing source. **The proposed project will be evaluated for NOC permitting requirements following Ecology's review of this application PSD Applicability Analysis.**

2.2 PREVENTION OF SIGNIFICANT DETERIORATION APPLICABILITY

In areas that currently meet the National Ambient Air Quality Standards, major modifications at existing sources are subject to federal new source review requirements under the PSD program. The purpose of the PSD program is to maintain air quality in areas that currently meet the standards, and to provide additional air quality protection to areas where maintaining pristine air quality is required.

Under WAC 173-400-110 and WAC 173-400-112, an emission source is subject to the PSD permitting program for attainment pollutants if the new installation is either a "major modification" to an existing "major source" or is a major source unto itself.

The Mill is classified as an existing major stationary source under the PSD permitting program. A major modification at a major stationary source is defined as any physical change in or change in the method of operation that would result in: a significant emission increase of a regulated New Source Review (NSR) pollutant and a significant net emission increase of that pollutant from the major stationary source.[1]

Because the Mill is located within 10 km of a designated Class I Area, the Olympic National Park, PSD regulations require that air dispersion modeling be conducted for NSR regulated pollutants. Any emissions rate or any net emissions increase associated with this project with an impact on the Olympic National Park equal to or greater than 1 $\mu g/m^3$, (24-hour average) will be deemed "significant."

2.3 CRITERIA POLLUTANTS

A change to an existing major source is considered to be a major modification if the emissions increase resulting from the modification is greater than the PSD significant emissions rate (SER) for any regulated pollutant. Review under the PSD program is triggered when a modification at a major source results in a net emission increase that is greater than the PSD SERs.[2] The PSD SER emission rates for the criteria pollutants are listed in Table 2-1.

Table 2-1
PSD SERs

Criteria Pollutant Name	Pollutant Abbreviation	PSD SER (tons/year)
Carbon Monoxide	CO	100
Particulate Matter	PM	25
Particulate Matter (<10 microns)	PM_{10}	15
Particulate Matter (<2.5 microns)	$PM_{2.5}$	10
Sulfur Dioxide	SO_2	40
Nitrogen Oxide	NO_x	40

1 As defined in 40 CFR 52.21(b)(2).
2 As defined in 40 CFR 52.21(b)(3).

Volatile Organic Compounds	VOC	40
Lead	Pb	0.6

NOTES:
< = less than
PSD = Prevention of Significant Deterioration
SER = Significant Emission Rate

Under the PSD regulations in 40 Code of Federal Regulations (CFR) 52.21 and WAC 173-400, the increase in emissions is calculated as the difference between baseline actual emissions (BAE) and projected actual emissions (PAE). BAE are the pre-project actual emissions from a consecutive 24-month period in the ten-year time period preceding the project change. The PAE are the projected actual emissions after the project is completed.

This PSD Applicability Analysis compares the BAE and PAE for criteria pollutants at the existing and proposed pulping/stock preparation operations and paper machine changes. The criteria pollutants that are emitted from the existing air emissions units or that will be emitted from the modified air emission units affected by this project are PM, PM_{10}, $PM_{2.5}$, SO_2, and VOC.

2.2.1 Baseline Actual Emissions

The term "Baseline Actual Emissions" is defined in 40 CFR 52.21(b)(48)(ii) for existing emission units that are not electric utility steam generating units as ''the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Administrator for a permit required under this section or by the reviewing authority for a permit required by a plan, whichever is earlier... "

- The existing pulping system and paper machines, as well as the proposed emissions after the installation of the new stock preparation system, are not emissions sources for CO, NO_x, or Lead.
- The calculation of baseline actual emissions for particulate matter and VOC from the paper machines, sulfur dioxide and VOC from the refiners, and VOC from the existing pulpers is based on production data from January 2012 through December 2013. VOC emissions as reported on a propane basis in Tables 2-2, 2-3, and 2-4.

Emissions from the Stock Preparation Project and were calculated using emission factors for similar processes as presented in the National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 1020 (NCASI, 2013), Technical Bulletin No. 737 (NCASI, 1997a), and Technical Bulletin No. 739 (NCASI, 1997b) and using site-specific air emissions testing data (Avogadro, 2011). The BAE from the existing facility units are shown in Table 2-2.

- The emission factors used to calculate VOC emissions from the OCC Tub Pulper were obtained from Table B.5, NCASI Technical Bulletin No. 737 (1997a):
  - VOC Emission Factor = 9.83E-03 lb/ADTP
- The emission factors used to calculate VOC emissions from the existing ONP Pulper were obtained from Table 7.2 NCASI Technical Bulletin No. 1020:
  - VOC Emission Factor = 1.8E-02 lb C/ADTP

- The emission factor used to calculate VOC emissions from the existing refiners were obtained from Table 7.1, NCASI Technical Bulletin No. 1020:
  - VOC Emission Factor = 0.23 lb C/ADTP
- The emission factor used to calculate SO_2 emissions from the existing refiners were obtained from site-specific testing conducted at the Mill (Avogadro, 2011):
  - SO_2 Emission Factor = 191.5 ppmvd; 21.50 lb/hr; 1.3081 lb/ADST
- The emission factor used to calculate PM, PM_{10}, and $PM_{2.5}$ emissions from the paper machines were obtained from Table 8.4, NCASI Technical Bulletin No. 1020:
  - PM Emission Factor = 0.042 lb/ADTFP
- The emission factor used to calculate VOC emissions from the proposed new mixed paper pulper was obtained from Table 7.2, NCASI Technical Bulletin No. 1020:
  - VOC Emission Factor = 0.007 lb C/ADTP

Table 2-2
Baseline Actual Emissions from existing Stock Preparation and Pulping System and the Paper Machines (January 2012–December 2013)

Pollutant	BAE OCC Tub Pulper (tpy)	BAE Deinking/ ONP Pulper (tpy)	BAE Refiners (tpy)	BAE Paper Machines (tpy)	Total BAE for all units (tpy)
$PM_{2.5}$	0	0	0	2.1	2.1
PM_{10}	0	0	0	3.0	3.0
PM	0	0	0	3.3	3.3
SO_2	0	0	78.9	0	78.9
NO_x	0	0	0	0	0
CO	0	0	0	0	0
VOC	<1	1.4	17.0	11.5	29.9
Lead	0	0	0	0	0

NOTES:
tpy = tons per year
< = less than
CO = carbon monoxide
NO_x = nitrogen oxide
OCC = old corrugated container
$PM_{2.5}$ = Particulate Matter <2.5 microns
PM_{10} = Particulate Matter <10 microns
SO_2 = sulfur dioxide
VOC = volatile organic compound (as propane)

2.2.2 Projected Actual Emissions

The term ''projected actual emissions" is defined in 40 CFR 52.21(b)(41)(i) as:

"the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated NSR pollutant in any one of the 5 years (12-month period) following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emission unit's design capacity or its potential to emit that regulated NSR pollutant and full utilization of the unit would result in a significant emissions increase or a significant net emissions increase at the major stationary source."

The projected actual emissions are estimated based on the potential pulping production tons.[3] Because this project changes the types of fiber that is pulped, as well as the configuration of the pulping equipment, there will be a change to the emissions factors used in the calculation of the project baseline actual emissions (see Table 2-3).

Note that none of the assumptions used in estimating the projected actual emissions are intended as future operational limits on the boiler. In fact, the projected actual emissions shown in Table 2-3 is a conservative calculation as it was assumed that equipment will operate 24 hours per day and 365 days per year. Typically, preventative maintenance work on major equipment pieces at paper mills require 5-8% downtime annual.

For this analysis, the future pulping production used was 900 tpd, which is the manufacturer's design capacity pulping rate. After project completion, the new pulper installed will have the capability to pulp feedstocks that range from 0-100% OCC or Mixed Paper. Projected actual emissions are provided in Table 2-3.

Table 2-3
Projected Actual Emissions

Pollutant	PAE OCC Tub Pulper (tpy)	PAE Deinking/ ONP Pulper (tpy)	PAE Refiners (tpy)	PAE New MP Pulper (tpy)	PAE Paper Machines (tpy)	Combined PAE for all units (tpy)
$PM_{2.5}$	0	0	0	0	4.1	4.1
PM_{10}	0	0	0	0	5.9	5.9
PM	0	0	0	0	6.5	6.5
SO_2	0	0	0	0	0	0
NO_x	0	0	0	0	0	0
CO	0	0	0	0	0	0
VOC	0	0	0	1.4	54.3	55.7
Lead	0	0	0	0	0	0

NOTES:
tpy = tons per year
CO = carbon monoxide
NO_x = nitrogen oxide
OCC = old corrugated container
PM = Particulate Matter
$PM_{2.5}$ = Particulate Matter <2.5 microns
PM_{10} = Particulate Matter <10 microns
SO_2 = sulfur dioxide
VOC = volatile organic compound (as propane)

Further description of the term "*projected actual emissions*" in 40 CPR 52.21(b)(41)(ii)(c) states that the applicant: "shall exclude, in calculating any increase in emissions that results from the particular project, that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions under paragraph (b)(48) of this section and that are also unrelated to the particular project, including any increased utilization due to product demand growth."

The existing ONP pulper, OCC Tub Pulper, refiners, and stock preparation system design production rate is 700 ODTP/day. After the Proposed Stock Preparation Project is installed, the new pulping and stock preparation system design production rate will be 900 ODTP/day.

[3] For this analysis, it is assumed that pulping feedstock consists of Mixed Paper and OCC.

2.2.3 Emissions Increase Calculation and PSD Applicability

The emissions increase from the project is calculated as the future projected actual emissions, minus excluded emissions, minus baseline actual emissions. This calculation is shown in Table 2-4 below.

There were no emissions excluded when performing these calculations, however there may be emissions exclusions for which the Mill is eligible.

Pollutant	Pre-Project Actual Emissions (tpy)	Projected Actual Emissions (tpy)	Emissions Increase/Decrease (tpy)
$PM_{2.5}$	2.1	4.1	+2.0
PM_{10}	3.0	5.9	+2.9
PM	3.3	6.5	+3.2
SO_2	78.9	0	-78.9
NO_x	0	0	0
CO	0	0	0
VOC	29.9	55.7	+25.8
Lead	0	0	0

NOTES:

tpy = tons per year
CO = carbon monoxide
NO_x = nitrogen oxide
OCC = old corrugated container
PM = Particulate Matter
$PM_{2.5}$ = Particulate Matter <2.5 microns
PM_{10} = Particulate Matter <10 microns
SO_2 = sulfur dioxide
VOC = volatile organic compound (as propane)

The emissions increase from the proposed project is compared to the PSD SER for each pollutant in Table 2-5.

Table 2-5
PSD Applicability Comparison

Pollutant	Emission Increases/ Decreases (tpy)	PSD Threshold (tpy)	PSD Triggered?
PM	+3.2	25	No
PM_{10}	+2.9	15	No
$PM_{2.5}$	+2.0	10	No
SO_2	-78.9	40	No
NO_x	0	40	No
VOC	+25.8	40	No
CO	0	100	No

NOTES:

tpy = tons per year
CO = carbon monoxide
PM = Particulate Matter
$PM_{2.5}$ = Particulate Matter <2.5 microns
PM_{10} = Particulate Matter <10 microns
SO_2 = sulfur dioxide
PSD = Prevention of Significant Deterioration
VOC = volatile organic compound (as propane)

As shown in Table 2-5, the emission increase from the proposed project does not trigger PSD permitting for the criteria pollutants. Emissions calculations are included in Appendix A. However, because the project location is within 10 km of a Class I Area, air dispersion modeling is required for all emission increases. The results of air dispersion modeling are included in Appendix B.

2.2.4 Air Emissions Modeling

Even though no PSD SER's were triggered, air dispersion modeling was required for this PSD Applicability Determination, as the Mill is located within 10 km of a designated Class I Area, the Olympic National Park. PSD regulations require that air dispersion modeling be conducted for NSR regulated pollutants that show a projected increase as a result of a proposed project. Air dispersion modeling was conducted and the results are included in Appendix B. Air dispersion modeling showed that the maximum 24-hour impacts due to the emissions increase for NSR pollutants from this project were less than the 1 $\mu g/m^3$ threshold. Therefore, the project is not considered "significant" based on the definition in 40 CFR 52.21(b)(23)(iii).

3.0 SUMMARY

Because the project emission increases for all NSR pollutants are below the SER, and the modeled maximum 24-hour impacts due to project NSR emissions increases are below the "significant" threshold of 1 $\mu g/m^3$, the Stock Preparation project is not subject to PSD review for any pollutant.

4.0 REFERENCES

Avogadro Group, LLC. 2011. *Source Test Report, 2011 Sulfur Dioxide Emissions Testing, Nippon Paper Industries USA, Refiner Mill Lines #2 and #3 (EU1), Port Angeles, Washington.*

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United States Environmental Protection Agency, 2018. *Project Emissions Accounting Under the New Source Review Preconstruction Permitting Program.* Memorandum from EPA Administrator E. Scott Pruitt to Regional Administrators. March 8, 2018.

APPENDIX A
EMISSIONS CALCULATIONS

Baseline Actual Emissions for Refiners 2012–2013

120,679 avg tpy in 2012–2013 Refiner production

Pollutant	EF lb/ADTP	lb pollutant per year	tons pollutant per year	VOC as propane (tpy)
VOC	0.23	27756.17	13.9	**17.0**
SO2	1.3081	157860.2	**78.9**	[redacted]

NOTES:

VOC emission factor (EF) from Table 7.1 NCASI Technical Bulletin 1020 (2013).

SO2 emission factor from Avogadro onsite stack test 10/21/2011 at Nippon Paper Industries Reginers #2 and #3.

EF = emission factor

No Projected Actual Emissions for Refiners will be decommissioned in 2019

Baseline Actual Emissions from OCC Tub Pulper for 2016 (was not installed in 2012–2013)

70,000 ADTP OCC Tub Pulper production

Pollutant	EF lb/ADTP	lb pollutant per year	tons pollutant per year	VOC as propane (tpy)
VOCs	9.83E-03	6.88E+02	0.344	**0.4**

NOTES:

EF = emission factor

OCC ADTP = total paper tons minus ONP tons

No Projected Actual Emissions from OCC Tub Pulper will be decommissioned in 2019

Baseline Actual Emissions from ONP Pulper 2012–2013

27,539 avg ODTP production in 2012–2013

Pollutant	EF lb C/ADTFP	lb pollutant per year	tons pollutant per year	VOC as propane (tpy)
VOC	0.085	0	0.00	**0.0**

Projected Actual Emissions for Voith MP Pulper

328,500 tpy production

Pollutant	EF lb/ADTFP	lb pollutant per year	tons pollutant per year	VOC as propane (tpy)
VOC	0.007	0	0.00	**0.0**

NOTES:

VOC emission factor from Table 7.1 NCASI Technical Bulletin 1020 (2013).

EF = emission factor

Baseline Actual Emissions from Paper Machines 2012–2013

156,879 tpy 2012–2013 avg production from paper machines

Pollutant	EF lb/ADTFP	lb pollutant per year	tons pollutant per year	VOC as propane (tpy)
VOC	1.20E-01	1.88E+04	9.4	**11.5**
PM	0.042	6588.918	**3.3**	[redacted]
PM10	91.4% of PM		**3.0**	[redacted]
PM2.5	63.6% of PM		**2.1**	[redacted]

NOTES:

VOC EF from NCASI TB 739 (1997) Table 6-1 VOC emissions for Deinking Process (used in Nippon AEI reports).

PM EF from NCASI TB 1020 Table 8-4.

EF = emission factor

Projected Actual Emissions from Paper Machines

306,600 tpy projected production paper machines

Pollutant	EF lb/ADTFP	lb pollutant per year	tons pollutant per year	VOC as propane (tpy)
VOC	0.29	88914	44.5	**54.3**
PM	0.042	12877.2	**6.4**	[redacted]
PM10	91.4% of PM		**5.9**	[redacted]
PM2.5	63.6% of PM		**4.1**	[redacted]

NOTES:

VOC EF from NCASI TB 1020 Table 8-3.

PM EF from NCASI TB 1020 Table 8-4.

EF = emission factor

APPENDIX B

RESULTS OF AIR DISPERSION MODELING

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Date:

November 2, 2018

Project Number:

1690010081

STOCK PREPARATION PROJECT

PSD APPLICABILITY CLASS I AREA AIR DISPERSION MODELING REPORT

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1. INTRODUCTION

McKinley Paper Company (McKinley) owns and operates an integrated pulp and paper mill located at 1902 Marine Drive in Port Angeles, Washington (hereafter, "the facility"). McKinley plans to upgrade the facility's existing pulping and stock preparation system (hereafter, "the proposed project") to allow the use of alternative recovered fiber sources and allow the facility to produce more competitive paper grades.

The facility is classified as an existing major stationary source under the Washington Department of Ecology's (Ecology's) Prevention of Significant Deterioration (PSD) permitting program. As a result, any modification to the facility, including the proposed project, must be evaluated to determine whether the project is "significant," and, therefore, subject to review under the PSD program. Proposed emission increases associated with the project have been evaluated against the PSD Significant Emission Rate (SER) thresholds outlined in Title 40 of the Code of Federal Regulations (CFR), Part 52.21(b)(23)(i) to determine whether the proposed project is considered significant. However, because the facility is located within 10 kilometers (km) of a Class I Area (Olympic National Park), an additional significance evaluation is required. Per 40 CFR 52.21(b)(23)(iii), if emissions attributable to the proposed project result in an impact to a Class I Area that is greater than 1 microgram per cubic meter ($\mu g/m^3$), the proposed project will be considered significant.

McKinley has retained SoundEarth Strategies, Inc. (SoundEarth) and Ramboll US Corporation (Ramboll) to perform the PSD applicability air dispersion modeling. This document describes the modeling procedures used to assess pollutant impacts on the Olympic National Park, summarizes the results of the modeling, and compares them to applicable regulatory thresholds.

2. EMISSION CALCULATIONS

Changes to the facility associated with the proposed project that will result in emission changes include:

- Replacement of the existing old newsprint (ONP) pulper with a new single-line continuous mixed paper (MP) pulper with a maximum capacity of 900 tons of paper per day (tpd);
- Decommissioning of the existing OCC tub pulper and refiners; and
- Increased utilization of the existing paper machines.

The proposed changes to the facility outlined above are expected to result in emission increases of particulate matter (PM), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and volatile organic compounds (VOCs). The only equipment change associated with the proposed project expected to result in an emission increase is the increased utilization of the existing paper machines. Emission increases included in the modeling analysis to determine significance under the PSD program were calculated by SoundEarth and provided to Ramboll. Table 2-1 shows the total emission increases for the proposed project.

Table 2-1. PSD Pollutant Emission Increases for Proposed Project

Pollutant	Emission Rate Increases [1]	
	(lb/day)	(tpy)
PM	17.2	3.14
PM_{10}	15.7	2.87
$PM_{2.5}$	11.0	2.00
VOC	142	25.8

Notes:
[1] Emission rate increases were calculated as the difference between baseline actual emissions and proposed actual emissions for all emission units affected by the proposed project, in accordance with PSD regulations.

3. AIR QUALITY IMPACT ANALYSIS

PSD regulations require an analysis of potential impacts to air quality in certain National Parks and Wilderness Areas that are designated as "Class I Areas." For facilities located within 10 km of a Class I Area, air dispersion modeling is required to evaluate whether a project is considered "significant", in accordance with 40 CFR 52.21(b)(23)(iii). If the emissions rate or net emissions increase associated with a project result in an impact on any Class I Area equal to or greater than 1 $\mu g/m^3$, the project is considered "significant."

The facility is located approximately 4.5 km northwest of the closest Olympic National Park boundary. Therefore, air dispersion modeling is required to assess potential impacts from the proposed project on the Class I Area.

3.1 Model Selection

Ramboll reviewed regulatory modeling techniques to select an appropriate air quality model to simulate dispersion of air pollutants emitted by the project. Because the Class I Area of concern is located within 50 km of the origin of the emissions, a near-field air quality impact analysis is required. The selection of regulatory modeling tools for a near-field analysis is influenced by the potential for exhaust plumes to interact with onsite structures (i.e., "building downwash") or to impact intermediate or complex terrain.

There are several on-site buildings at the facility with the potential to interact with exhaust plumes from the proposed project were identified, and the modeling domain includes both intermediate and complex terrain. As a result, the dispersion model selected for the analysis will be required to consider both intermediate/complex terrain and building downwash effects to allow for the possibility of emissions from stacks shorter than dictated by Good Engineering Practice (GEP).

In this situation, the United States Environmental Protection Agency's (EPA's) "Guideline of Air Quality Models" in 40 CFR 51 Appendix W ("the Guideline") recommends the use of AERMOD. AERMOD was specifically designed to estimate impacts of air pollutants in areas containing both simple and intermediate/complex terrain. AERMOD also includes the PRIME downwash algorithms to estimate effects of surrounding buildings on the dispersion of plumes. The most current version of AERMOD (Version 18081) was used for the dispersion modeling analysis.

3.2 Modeling Procedures

AERMOD was applied to model pollutant emission rates using the regulatory defaults in addition to the options and data discussed below. The option to adjust the surface friction velocity (U*) for low-wind or stable conditions is now considered a regulatory default setting and was used in this analysis. The option was applied without the Bulk Richardson Number option.

3.2.1 Averaging Periods

Ambient pollutant concentrations were calculated using AERMOD for the 24-hour averaging period, as required for comparison to the 1 μg/m^3 PSD significance threshold.

3.2.2 Elevation Data and Receptor Network

For the modeling analysis, discrete receptors developed by the National Park Service (NPS) for the Olympic National Park were obtained from the NPS; **Figure 3-1** shows the locations of these receptors.[1] Because the facility is located nearest to a section of the Olympic National Park where no receptors are present in the NPS receptor dataset, additional receptors were placed along the park boundary surrounding this area, spaced at each park boundary vertex and 10-m intervals between vertices, as shown in **Figure 3-2**.

Terrain elevations for receptors were prepared using 1/3rd arc-second elevation data from the National Elevation Dataset (NED), which is a product of the United States Geological Survey (USGS). The NED is a seamless elevation dataset covering the continental United States, Alaska, and Hawaii, and is available on the internet from the USGS National Map Viewer[2] These data have a horizontal spatial resolution of approximately 10 meters (m), or 33 feet (ft).

The base elevation and hill height scale for each receptor were determined using the EPA's terrain processor AERMAP (Version 18081), which generates the receptor output files that are then read by AERMOD. All receptor locations are in Universal Transverse Mercator (UTM) coordinates using the spatial reference of NAD 83, Zone 10.

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[1] http://www.nature.nps.gov/air/maps/receptors/#info

[2] http://viewer.nationalmap.gov/viewer/

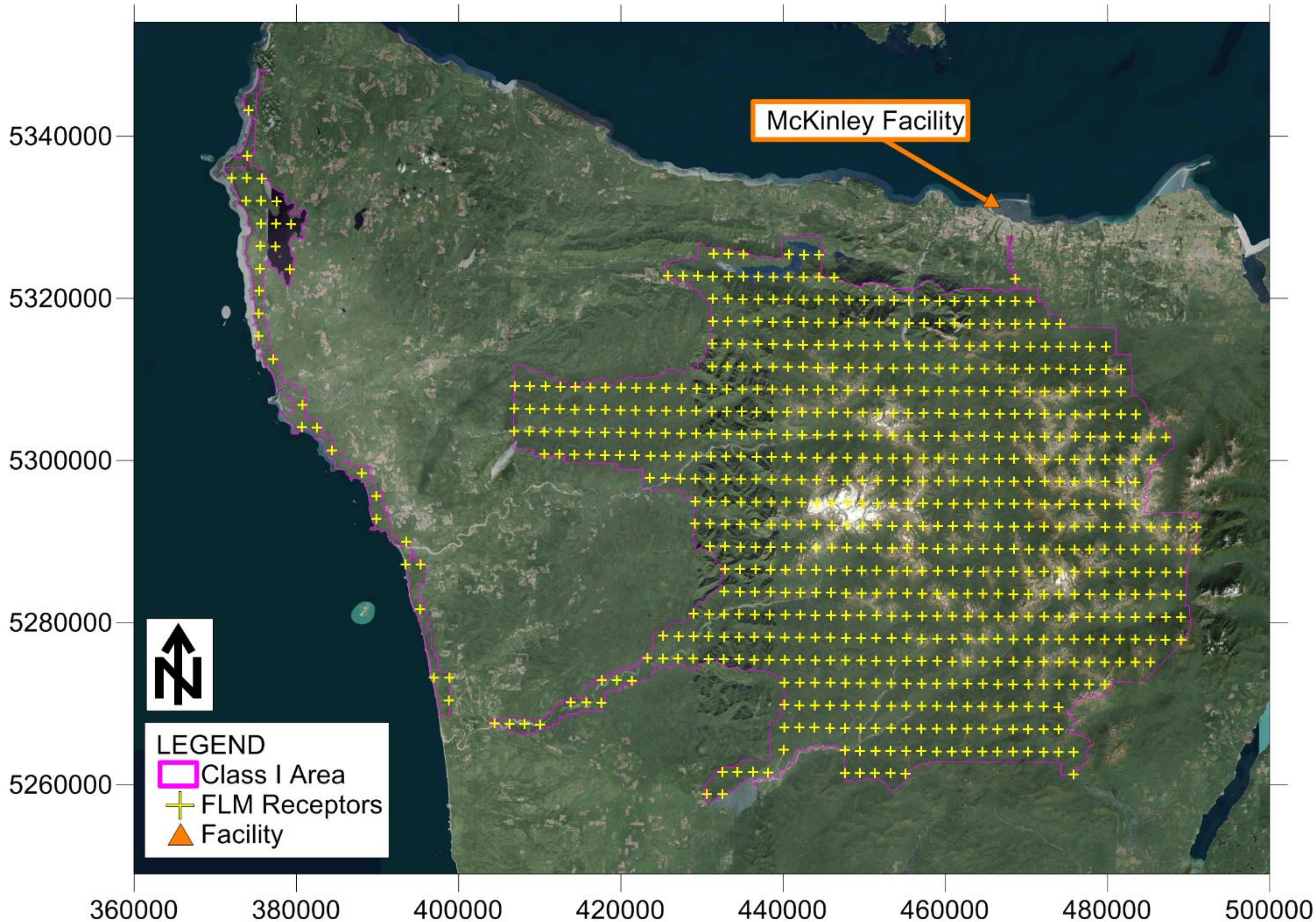


Figure 3-1. FLM Receptor Locations

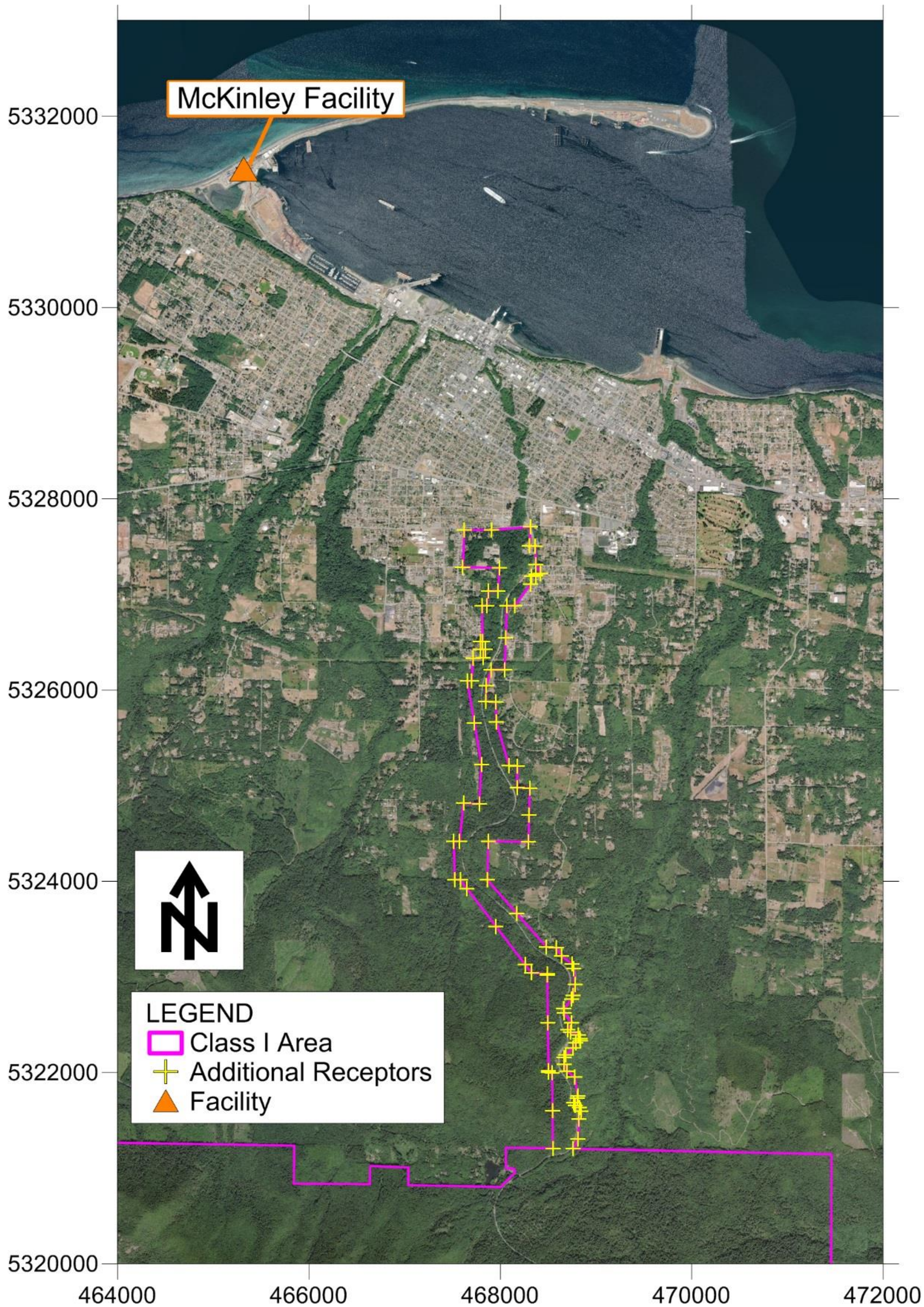


Figure 3-2. Additional Receptors Along Class I Boundary

3.2.3 Meteorological Data

A representative meteorological data set was prepared using site-specific surface data collected by the Olympic Region Clean Air Agency (ORCAA) between 2002-2005, and contemporaneous upper air data from the National Weather Service (NWS) station in Quillayute, Washington. The surface data (hereafter, "the Nippon data set") were collected at a meteorological station located at 1815 Marine Drive, which is adjacent to the northeast side of the facility.

Regional meteorological data, such as cloud cover, were obtained from the NWS station at the William R Fairchild International Airport (Fairchild Airport), which is located approximately 2 miles southwest of the facility. A windrose summarizing the wind speed and wind direction data from the Nippon data set along with wind data statistics is provided in Figure 3-3.

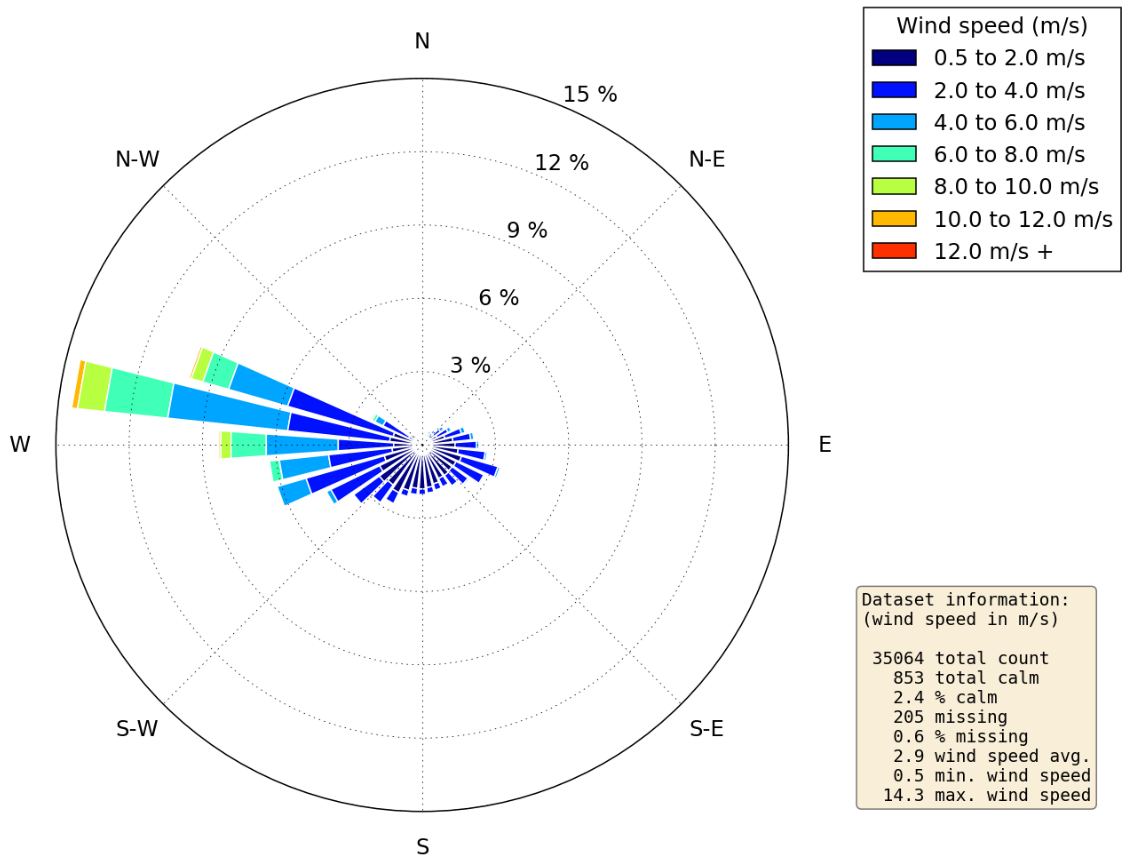


Figure 3-3. Nippon Dataset Windrose

Additional meteorological variables and geophysical parameters are required for the AERMOD dispersion model to estimate surface energy fluxes and construct boundary layer profiles. Surface characteristics including albedo, Bowen ratio, and surface roughness length were determined for the area surrounding the facility and the Fairchild Airport meteorological station using the AERMET surface characteristics pre-processor, AERSURFACE (Version 13061), and USGS National Land Cover Dataset (NLCD) landuse data.

Previous dispersion modeling analyses conducted for the facility with the Nippon data set for meteorology data specified that AERSURFACE was run with varying moisture conditions for the four years of data. According to the AERMET memo, the years 2002 and 2003 experienced average moisture conditions, whereas the years 2004 and 2005 experienced dry conditions. A review of the monthly precipitation throughout these four years indicate that 2004 and 2005 had lower annual averages than other years; however, these annual totals were missing one or more full months of data[3]. Hence, because the annual precipitation data is incomplete, these two years were assigned "average" moisture conditions, instead of "dry" conditions. All other AERSURFACE inputs specified in the AERMET memo were followed for this dispersion modeling analysis.

The EPA meteorological program AERMET (Version 18081) was used to combine the surface meteorological observations of the Nippon data set with the twice-daily upper air soundings from Quillayute, Washington and to calculate the meteorological variables and profiles required by AERMOD. Except as noted above, these data and the processing methodology are the same as those used in modeling analyses developed in support of permit applications previously submitted to ORCAA by the facility. Details of the Nippon data set and the processing methodology are provided in Attachment A.

3.2.4 Modeled Criteria Pollutant Emission Rates

For this analysis, only the emission increases from the proposed project are modeled to evaluate potential impacts to the nearby Class I Area. Only PM, PM_{10}, $PM_{2.5}$, and VOC emissions are expected to increase as a result of the proposed project. Because air dispersion modeling for near-field impacts correlate linearly with emission rates, and all emission increases are from the same emission unit (i.e., the paper

[3] https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?wa6624

machines), only the highest emitting pollutant was modeled. Based on the emission rates in Table 2-1, the pollutant with the greatest emission increase is VOC, and therefore this was the pollutant selected for the modeling. The modeled emission increase of VOC is the 24-hour emission rate, converted to a gram per second (g/s) rate for input into AERMOD, and is presented in Table 3-1 below.

Table 3-1. Modeled Emission Rates

Pollutant	Modeled Emission Rate [1]	
	(lb/day)	(g/s)
VOC	142	0.743

Notes:
[1] Modeled emission rate represents a 24-hour average emission rate

3.2.5 Emission Source Release Parameters

Emissions from the paper machines were assumed to be exhausted to the atmosphere through seven vents on the roof of the paper machine building. Each vent was represented in the modeling as a point source. The modeled VOC emission rate was divided evenly between the seven vents. Table 3-2 summarizes the parameters used in the modeling to represent exhaust from the paper machine building roof vents.

Table 3-2. Point Source Release Parameters

Emission Unit	Stack Height (ft)	Temperature (°F)	Exit Velocity (ft/s)	Diameter (ft)
PM2_3010	64	110	53.05	5
PM2_3020	64	110	65.78	5
PM2_3030	64	110	65.78	5
PM3_3010	64	110	53.05	5
PM3_3020	64	110	65.78	5
PM3_3030	64	110	65.78	5
PM3_3040	64	110	53.05	5

In addition to the release parameters in Table 3-2, on-site structure dimensions and facility configuration information were provided to AERMOD to assess potential downwash effects. Wind-direction-specific structure profiles were prepared for the modeling using the EPA's Building Profile Input Program for the PRIME algorithm (BPIP PRIME). The approximate facility layout and structure base elevations from previously submitted modeling files were used to prepare data for BPIP PRIME, which provides the necessary input data for AERMOD. **Table 3-3** provides the heights of all existing on-site structures reflected in the BPIP PRIME analysis. The "Boiler" structure was modeled as a two-tiered building. **Figure 3-4** shows the facility layout with all modeled emission sources and on-site structures.

Based on the site layout shown and the structure heights, it was assumed that emissions from the proposed project are potentially subject to downwash effects from nearby structures, and the necessary information provided by BPIP PRIME was included in the simulations to reflect these effects.

Table 3-3. Significant On-Site Structures

Structure	Description	Height Above Grade	
		(ft)	(m)
Building 1	Paper Machine Building	50.0	15.2
Building 2	Filter Plant	27.0	8.23
Building 3	Recycled Paper Plant	74.0	22.6
Building 4	Refiner Building	77.0	23.5
Building 5	Storage and Warehouse	30.0	9.14
Building 6	Storage	20.5	6.25
Boiler (2 tiers)	Boiler, Sludge Press, and Steam Turbine Generator	60.0 / 110	18.3 / 33.5
Tank 1	Oil Storage Tank	50.0	15.2
Biomass	Biomass Silo	121	36.9

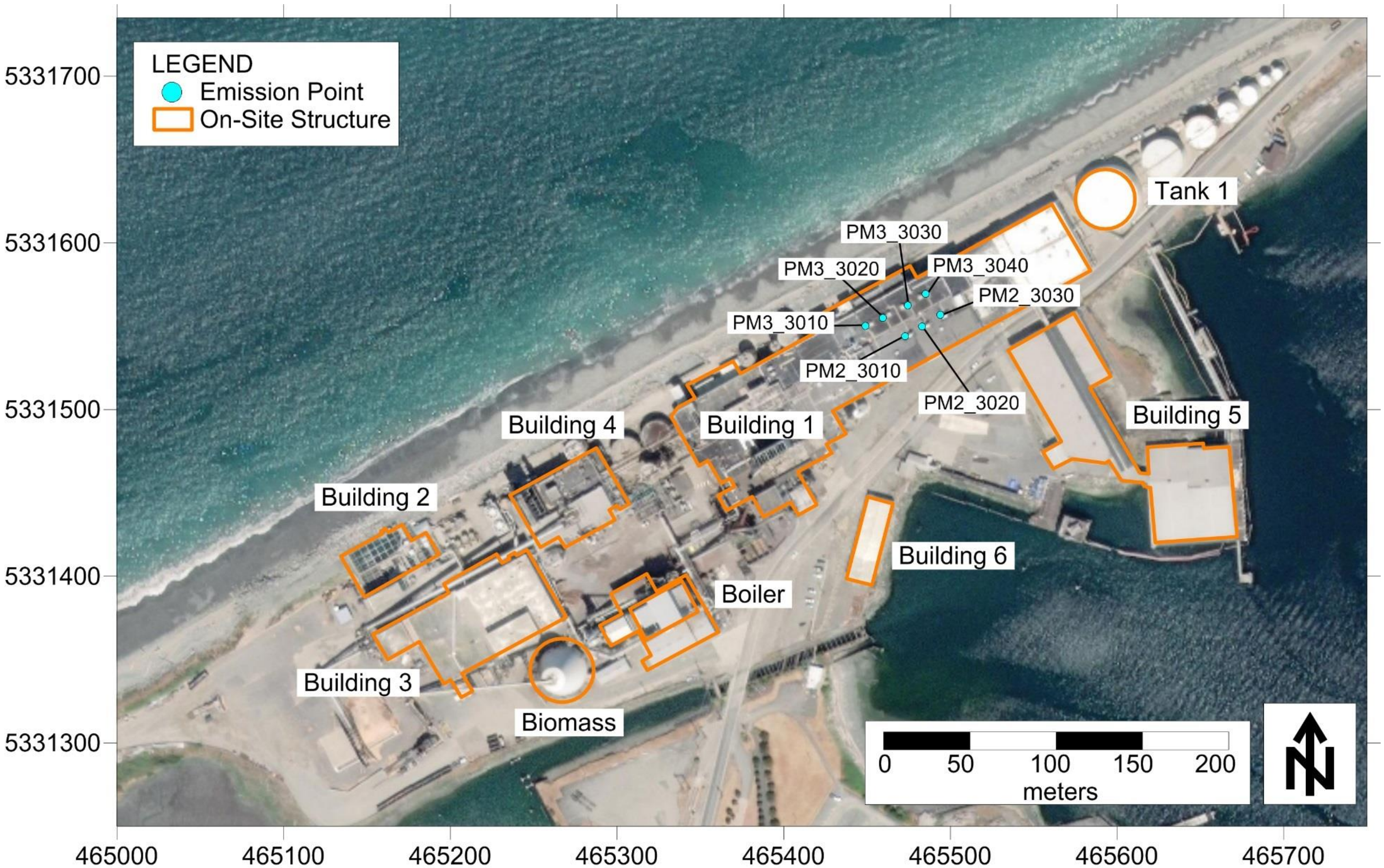


Figure 3-4. Facility Layout

3.3 Project Emissions Increase Analysis Results

Concentrations attributable to the proposed project were evaluated using AERMOD at Olympic National Park receptors using the inputs described above. Table 3-4 presents the maximum 24-hour average VOC concentration from four modeled years, and provides the PSD significance threshold for comparison. As shown in this table, the maximum 24-hour impacts due to the net emissions increase for VOC is less than the 1 μg/m^3 threshold. Because VOC is expected to be the pollutant with the greatest magnitude emission increase as a result of the proposed project, impacts from the other pollutants also expected to increase (i.e., PM, PM_{10}, and $PM_{2.5}$) are assumed to have impacts within the Olympic National Park that are less than the 1 μg/m^3 threshold. Therefore, the project is not considered "significant" based on the definition in 40 CFR 52.21(b)(23)(iii).

Table 3-4. Model-Predicted Concentrations

Pollutant	Maximum Concentration [1] (μg/m^3)	PSD Threshold [2] (μg/m^3)	Over Threshold?
VOC	0.38	1.0	No

Notes:

[1] Maximum concentration is the maximum concentration at any receptor over four modeled years.

[2] PSD threshold from 40 CFR 52.21(b)(23)(iii).

ATTACHMENT A

2011 Modeling AERMET Description

AERMET

The AERMET (Version 06341) pre-processor was used to prepare the meteorological data set. Guidance provided in the most recent *AERMOD Implementation Guide* [Environmental Protection Agency (EPA), March 2009] was used.

AERMET uses three steps to preprocess and combine the surface and upper-air soundings to output the data in a format which is compatible with the AERMOD model. The first step extracts the data and performs a brief quality assurance check of the data. The second step merges the meteorological data sets. The third step outputs the data in the AERMOD compatible format while also incorporating surface characteristics surrounding the data collection or application site.

The output from the AERMET model consists of two separate files: the surface conditions file and a vertical profile dataset. AERMOD utilizes these two files in the dispersion modeling algorithm to predict pollutant concentrations resulting from a source's emissions.

The mid-day albedo, daytime Bowen ratio, and surface roughness length are considered when conducting the third step of AERMET processing. Collectively, these factors are described as surface characteristics. Surface characteristics can vary by season and region (sector) around the data collection site.

The mid-day albedo is the fraction of total incident solar radiation reflected by the surface back to space without absorption. The daytime Bowen ratio is an indicator of surface moisture, which is the ratio of the sensible heat flux to the latent heat flux. The Bowen ratio is used to determine the planetary boundary layer parameters for convective conditions. Surface roughness length is related to the height of obstacles to the wind flow and is the height at which the mean horizontal wind speed is zero. The AERMOD model uses the surface characteristics to define dispersion coefficients in the model.

AERSURFACE

The AERSURFACE program (Version 08009) was used to determine the surface characteristics surrounding the monitoring site. AERSURFACE was developed by the EPA to assist in determining surface characteristics by using U.S. Geological Survey (USGS) land use maps and converting the land use type to values described in the *AERMET User's Guide* (EPA, November 2004, revised December 2006).

AERSURFACE uses a 1-kilometer (km) radius surrounding the data collection site to determine surface roughness values for each sector and a 10x10-km area to determine the mid-day albedo and daytime Bowen ratio.

The surface roughness, mid-day albedo, and Bowen ratio are affected by seasonal variations due to the yearly cycle of trees blooming and shedding leaves. The tree density affects the surface roughness while canopy leaf cover affects the amount of solar radiation reflected or absorbed as well as the amount of retained moisture. AERSURFACE accounts for these variations by assigning different seasons to specific months. The impact of these variations depends on the land use surrounding the data collection site.

Nippon Dataset

To prepare the AERMET meteorological data set, surface observations from Port Angeles, Washington, and twice daily upper-air soundings data from the Quillayute, Washington, upper air station (WBAN # 94240) were used to prepare the AERMET meteorological data set.

The surface data were collected by ORCAA and meet EPA's requirements in its *Meteorological Monitoring Guidance for Regulatory modeling Applications* [EPA, February 2000]. The surface data were collected at 1815 Marine Drive, adjacent to the northeast side of the Nippon property line. This data was obtained from EPA's Air Quality System (AQS) database, accessible via the AQS Data Mart (http://www.epa.gov/ttn/airs/aqsdatamart/access/interface.htm), which is available for public use. Additional cloud cover data was obtained from the William R Fairchild International Airport NWS station, located approximately 2 miles southwest of the project site. The surface data towers are located on the north coast of the Olympic Peninsula, within a mile of the Strait of Juan de Fuca. The terrain is flat in the immediate vicinity of the project site with the foothills of the Olympic Mountains beginning about five miles to the south. Land use surrounding the airport is residential with large forested areas.

The Quillayute upper air station is approximately 50 miles west of the project site. The Olympic Mountains lie between the two locations, but they are both located at lower elevations near the coast. Quillayute upper air station is the nearest upper air sounding station to Port Angeles.

Wind conditions at the surface station are predominantly from the west. Winds conditions are generally consistent throughout the year, with more variability in winds during the winter months (December through February)

When running the AERSURFACE program, the seasonal variations assumed no snow cover in the winter, a transitional spring with partial green coverage, a mid-summer with lush vegetation, and an autumn with un-harvested cropland. The moisture conditions varied according to the year: 2002 and 2003 experienced average conditions, and 2004 and 2005 experienced dry conditions. The following months were assigned to each season:

- Winter: December, January, and February
- Spring: March, April, and May
- Summer: June, July, and August
- Autumn: September, October, and November

Table 1 summarizes the albedo and surface roughness output from the AERSURFACE program and the parameters used in the third step of AERMET processing for the Nippon dataset. Table 2 summarizes the Bowen ratio, which varies by moisture conditions.

Attachment 1 displays the annual wind rose for the Nippon dataset.

TABLE 1
Surface Characteristics for the Nippon Dataset – Albedo and Surface Roughness

	ALBEDO				SURFACE ROUGHNESS			
SECTOR[1]	SPRING	SUMMER	FALL	WINTER	SPRING	SUMMER	FALL	WINTER
1	0.12	0.12	0.12	0.13	0.009	0.009	0.009	0.003
2	0.12	0.12	0.12	0.13	0.003	0.004	0.004	0.002
3	0.12	0.12	0.12	0.13	0.002	0.003	0.003	0.005
4	0.12	0.12	0.12	0.13	0.005	0.009	0.009	0.03
5	0.12	0.12	0.12	0.13	0.03	0.073	0.073	0.298
6	0.12	0.12	0.12	0.13	0.298	0.456	0.456	0.385
7	0.12	0.12	0.12	0.13	0.385	0.547	0.547	0.287
8	0.12	0.12	0.12	0.13	0.287	0.383	0.383	0.065
9	0.12	0.12	0.12	0.13	0.065	0.075	0.075	0.007
10	0.12	0.12	0.12	0.13	0.007	0.008	0.008	0.006
11	0.12	0.12	0.12	0.13	0.006	0.007	0.007	0.005
12	0.12	0.12	0.12	0.13	0.005	0.005	0.005	0.003

Note:
[1] Each sector is a 30 degree segment from true north.

TABLE 2
Bowen Ratio by Moisture Conditions for the Nippon Dataset

	Average Moisture Conditions				Dry Moisture Conditions			
SECTOR[1]	SPRING	SUMMER	FALL	WINTER	SPRING	SUMMER	FALL	WINTER
1	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
2	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
3	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
4	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
5	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
6	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
7	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
8	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
9	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
10	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
11	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38
12	0.27	0.20	0.27	0.27	0.35	0.29	0.38	0.38

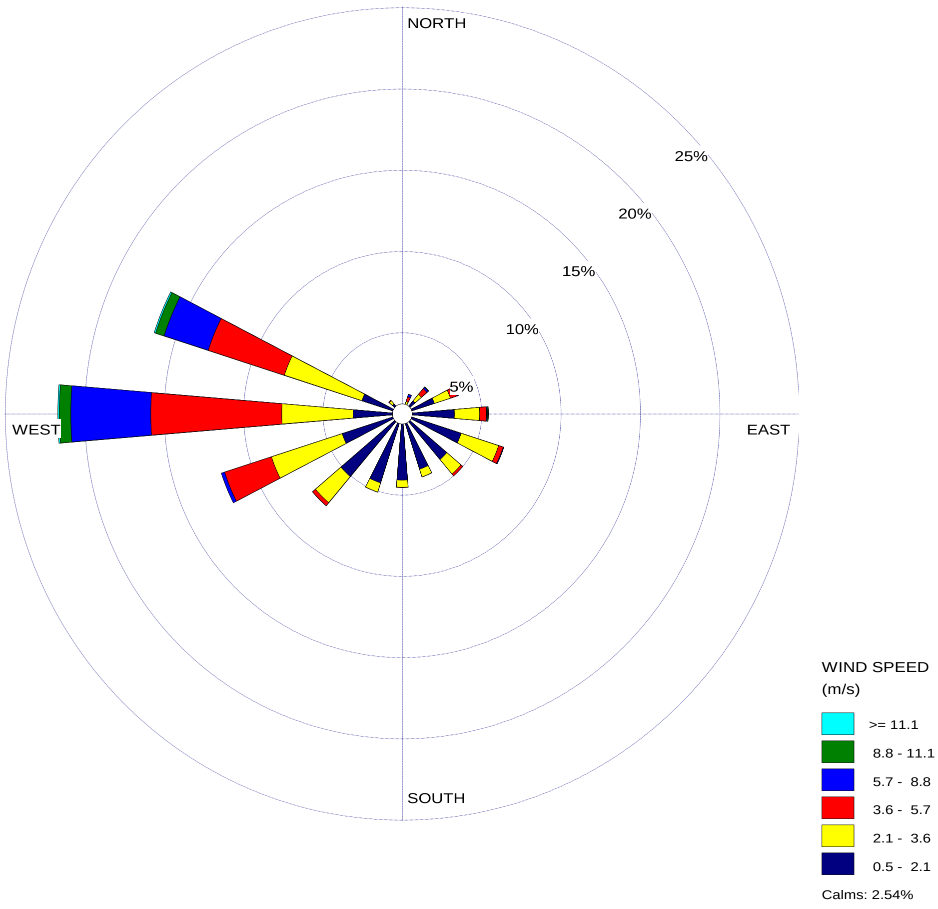
Note:
[1] Each sector is a 30 degree segment from true north.

WIND ROSE PLOT:

Attachment 1
Nippon Paper Wind Rose 2004-2008

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

CALM WINDS:

2.54%

TOTAL COUNT:

35050 hrs.

AVG. WIND SPEED:

2.88 m/s

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

ATTACHMENT B

AERMOD Modeling Files (electronic copy)

APPENDIX C

PSD APPLICABILITY DETERMINATION FORM

Application for a Prevention of Significant Deterioration Applicability Determination

DEPARTMENT OF ECOLOGY
State of Washington

INSTRUCTIONS

Use this form when you want Ecology to review the emissions from a project to determine whether it is subject to the Prevention of Significant Deterioration (PSD) Program. The project could be one that you are considering or it could be an actual project covered in an air permitting application filed with a permitting agency.

Complete this form. Attach a check for the $500 initial fee, and mail the ***original form and associated materials**** to:

Department of Ecology
Cashiering Unit
P.O. Box 47611
Olympia, WA 98504-7611

For Fiscal Office Use Only:
001-NSR-216-0299-000404

To begin Ecology's applicability review process, mail ***a copy of this form and associated materials**** to:

Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
Attn: Marc Crooks, P.E.

*** *Attach the following associated materials:***

1. Project description
2. Project location
3. Projects emission(s) increases
4. Project manager's contact information

Read each statement, then check the box next to it to acknowledge what you have read.

☒	$500 **PSD Program applicability determination** initial fee covers 6 hours of review.
☒	The initial fee you submitted may not cover the cost of processing your request. Ecology will track the number of hours spent on your project. If the number of hours exceeds the 6 hours included in your initial fee, Ecology will send you a bill for that extra time.
☒	Ecology will bill you $95 per hour for each hour worked beyond the 6 initial hours. You must pay the bill before we will issue a final decision on your request.

Applicant Information

The applicant is the business requesting services from Ecology and is responsible for paying the costs Ecology incurs.

Name of business McKinley Paper Company – Washington Mill

Physical location of project (city, county) 1902 Marine Drive, Port Angeles, WA 98363

Name of project Stock Preparation Project

For more information	
Science and Engineering Section Air Quality Program Ecology Headquarters Office	Marc Crooks, P.E. (360) 407-6803 marc.crooks@ecy.wa.gov

For special accommodations or documents in alternate format, call 360-407-6800, 711 (relay service), or 877-833-6341 (TTY).

Application for a Prevention of Significant Deterioration Applicability Determination

Check one box to indicate the air agency with jurisdiction over the project.

- ☐ Benton Clean Air Agency
- ☐ Northwest Clean Air Agency
- ☒ Olympic Region Clean Air Agency
- ☐ Puget Sound Clean Air Agency
- ☐ Southwest Clean Air Agency
- ☐ Spokane Regional Clean Air Agency
- ☐ Yakima Regional Clean Air Agency
- ☐ Ecology Central Regional Office Air Quality Program
- ☐ Ecology Eastern Regional Office Air Quality Program
- ☐ Ecology Industrial Section Waste 2 Resources Program
- ☐ Ecology Nuclear Waste Program – Hanford

Responsible Official

The responsible official is the person responsible for overall operation of and ongoing compliance at the facility.

Name, Title Mr. Isaac Rosas, General Manager

Mailing address 1815 Marine Drive

City, State, Zip Port Angeles, WA 98363

Phone, Fax, E-mail P: 505-972-2146, F: 360-457-8675, irosas@biopappel.com

Project Billing Contact Information

Ecology will send the responsible official the bills, if there are any.

☒ If the project billing contact is different from the responsible official, check this box and provide the required information.

Name, Title Ms. Amy Dougherty, Purchasing Manager

Mailing address 1815 Marine Drive

City, State, Zip Port Angeles, WA 98363

Phone, Fax, E-mail P: 360-565-7019, F: 360-457-8675, amy.dougherty@biopappel.com

Project Consultant Information

☒ If you hired a consultant to prepare the application (or materials), check this box and provide the required information.

Consultant Name, Title Ms. Annika Wallendahl, P.E., Principal

Organization SoundEarth Strategies

Mailing address 2811 Fairview Ave East, Suite 2000

City, State, Zip Seattle, WA 98102

Phone, Fax, E-mail P: 206-436-5921, F: 206-306-1907, awallendahl@soundearthinc.com

Responsible Official Signature Block (The responsible official is the person responsible for overall operation of and ongoing compliance at the facility.)

I certify, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.

Printed Name ISAAC ROSAS   Title General Manager

Signature [signature]   Date Nov/2/2018

For special accommodations or documents in alternate format, call 360-407-6800, 711 (relay service), or 877-833-6341 (TTY).