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Port Townsend liquids depot: environmental impact assessment of a biofuels facility on the Port Townsend Paper Corporation site

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Port Townsend Liquids Depot: Environmental Impact Assessment of a Biofuels Facility on the Port Townsend Paper Corporation Site

Andrea Brudnicki, Ashley Cabe, Sean Petersmark, Bret Stevens



Huxley College of the Environment, Western Washington University

Prepared for ENVS 493, Fall 2015

Under the Supervision of Dr. Tamara Laninga



Environmental Impact Assessment

Huxley College of the Environment

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Port Townsend Paper Mill EIA Project Team
Environmental Impact Assessment- ENVS 493
Huxley College of the Environment
Western Washington University
Bellingham, WA 98225

December 2015

Dear Concerned Citizen,

In accordance with the State Environmental Policy Act (SEPA, WAC 197-11), this Environmental Impact Assessment (EIA) was developed to evaluate the impacts of constructing a liquids depot facility on the existing Port Townsend Paper Corporation (PTPC) Mill site, a project of the Northwest Advanced Renewables Alliance (NARA). This report contains analysis conducted by our teams as well as official documents, figures, maps, and facts about the NARA project and the site in Port Townsend.

This document was prepared as a requirement for a capstone Environmental Studies class offered at Western Washington University. This class is intended to model the Environmental Impact Assessment process, as outlined under SEPA. When a determination of significance (DS) is made, SEPA stipulates that an EIA must be compiled before construction of a project may begin. The goal of this project is to convert woody biomass into the end product of bio-jet fuel, but with other co-products along the way.

This EIA addresses the proposed action, an alternative action, and a no action alternative in Port Townsend Washington. Jefferson County, where Port Townsend is located, is actively searching for ways to include renewable energies into their utility system, as evidenced by their draft Green Electricity/Green Fuel Study Project. It is relevant to note that NARA's project would fit into the criteria of Jefferson County's Study Project. The proposed action involves constructing a liquids depot on the Port Townsend Paper Corporation land, near the existing pulp mill. A liquids depot converts post-harvest forest residues as well as construction and demolition waste into a sugar rich syrup using a mechanical and thermochemical pretreatment process. The alternative action calls for a liquids depot with a pretreatment process that involves a mechanical process to produce a wood flour, rather than a chemical process. Under the micronized wood alternative proposal fewer chemicals but more energy would be used. By taking no action, a liquids depot would not be constructed and the 20 acres of land would remain unchanged.

Sincerely,

Andrea Brudnicki

Ashley Cabe

Sean Petersmark

Bret Stevens



Port Townsend Liquids Depot: Environmental Impact Assessment of a Biofuels Facility on the Port Townsend Paper Corporation Site

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This report represents a class project that was carried out by students of Huxley College of the Environment, Western Washington University. It has not been undertaken at the request of any persons representing local government or private individuals. Nor does it necessarily represent the opinion or positions of individuals from government or the private sector.



FACT SHEET

Project Title:

Port Townsend Liquids Depot

Project Description:

The Northwest Advanced Renewables Alliance (NARA) is currently working in conjunction with educational institutions and private industry to assess the feasibility of harnessing woody biomass for aviation biofuel. The goal of the project is to create a sustainable industry to produce aviation biofuels and important co-products. NARA is focusing on increasing the efficiency for each supply chain step from forestry operations to the conversion processes. Presently, NARA is examining the possibility of co-locating a liquids depot facility on an existing paper mill in the Northwest.

The location of the proposed project is the northwest portion of land owned by the Port Townsend Paper Corporation. The parcel number is 001161002, which extends north of Mill Road up to the Northwest Pacific Trail. The figure below shows the exact location of the proposed project in shaded orange.



Figure 1. Proposed site location. Parcel #001161002, owned by Port Townsend Paper Corporation (PTPC).

Name and Address of Proponent:

Northwest Advanced Renewables Alliance
Washington State University
PO Box 641227
Pullman, WA 99164



Name and Address of Lead Agency Responsible Officials:

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List of Permits and Approvals:

Industrial Stormwater General Permit: Washington State Department of Ecology
Water Treatment Plant General Permit: Washington State Department of Ecology
Reclaimed Water Use Permit: Washington State Department of Ecology
Title V Air Operating Permit: United States Environmental Protection Agency
National Emission Standards for Hazardous Air Pollutants; U.S. Environmental Protection Agency

Laws and Regulations

Endangered Species Act
Clean Water Act

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Figure 3. Aerial view of PTPC pre-existing wastewater pipeline structures.



Glossary of Technical Terms, Acronyms, and Abbreviations

Technical Terms

Biofuel: Any fuel whose energy is obtained through a process of biological carbon fixation.

Biomass: The trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment. This is the byproduct of forest management.

Brackish: Water that has more salinity than fresh water; usually the result from seawater mixing with freshwater.

Clearcutting: The felling and removal of all trees from a given tract of forest.

Coniferous: Any of numerous, chiefly evergreen trees or shrubs of the class Coniferinae (or group Coniferales), including the pine, fir, spruce, and other cone-bearing trees and shrubs.

Deciduous: Meaning "falling off at maturity" or "tending to fall off", and is typically used in order to refer to trees or shrubs that lose their leaves seasonally (most commonly during autumn) and to the shedding of other plant structures such as petals after flowering or fruit when ripe.

Drought: A lack of precipitation over an extended period of time that results in a water shortage.

Fauna: Animals that live in a particular region, time period, or environment.

Flora: Plant life occurring in a particular region or time, generally the naturally occurring or indigenous—native plant life.

Impervious: Describing a surface that does not allow water to pass through.

Kraft Mill: Milling process that converts wood into wood pulp consisting of cellulose fibers, also known as Kraft pulping or the sulfate process.

Lignin: A complex organic polymer deposited in the cell walls of many plants, making them rigid and woody.

Liquids depot: A pre-treatment facility that receives raw and mechanically processed woody residuals directly from nearby forests, or chips from a solids depot. A liquids depot produces a concentrated sugar-rich syrup that would be transported for conversion to isobutanol at a conversion plant for further refining into bio-jet fuels or other chemical conversion facilities.

Loam: A soil with roughly equal proportions of sand, silt, and clay.

Micronized wood: Biomass product created through the milled wood process. A fine, flour material.

Pacific Flyway: A major north-south flyway for migratory birds in America, extending from Alaska to Patagonia, South America.

pH: A number between 0 and 14 that indicates if a chemical is an acid or a base.

Priority Species: Fish and wildlife species requiring protective measures and/or management actions to ensure their survival.



Permeable: Allowing water to pass through.

Slash: Coarse and fine woody debris produced from logging operations.

Solids depot: A pre-conversion facility that receives post-harvest residuals, forest thinnings, and/or construction and demolition waste biomass. Mechanically processed materials could be shipped by rail or highway truck to a receiving liquids depot, conversion plant, IBR or other potential end user (NARA).

Stormwater: The portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features.

Woody biomass: The accumulated mass, above and below ground, of the roots, wood, bark, and leaves of living and dead woods shrubs and trees.

Acronyms and Abbreviations

AgB: Agnew silt loam.

BDT: Bone-dry tons.

CO: Carbon monoxide.

CO₂: Carbon dioxide.

CmC: Clallam gravelly sand loams.

DS: Determination of Significance.

EIA: Environmental Impact Assessment.

GPM: Gallons per minute.

MGD: Million gallons/day.

Mm: McMurray and Mukilteo Peat Soils.

Mu: Mukilteo soil series.

NARA: Northwest Advanced Renewables Alliance.

NH₄: Ammonia.

PTPC: Port Townsend Paper Company.

RCW: Revised Code of Washington.

SEPA: State Environmental Protection Act

SO₂: Sulfur Dioxide.

TnC: Townsend gravelly loams.

WAC: Washington Administrative Code.

WWTP: Wastewater treatment plant.



SECTION 1: Executive Summary

This Environmental Impact Assessment (EIA) has been compiled in accordance to the Washington State Environmental Protection Act (SEPA). Its purpose is to analyze and determine the environmental, social, and economic impacts of co-locating a liquid depot facility at the pre-existing Port Townsend Paper Corporation. The Northwest Advanced Renewables Alliance (NARA) has proposed the project, which is siting a liquids depot on land owned by the PTPC. This EIA will analyze all potential significant impacts produced by the proposal and consider all elements as outlined by SEPA.

1.1 Background

NARA has currently been working in conjunction with educational institutions and private industry to assess and increase efficiency of all areas of the supply chain to create aviation biofuel from woody biomass. NARA has chosen the Port Townsend Paper Corporation (PTPC) as a potential location for siting a liquids depot. The company owns 600 acres, has 300 employees, and process 1,100-1,200 tons of wood chips per day (Laniga, 2015). The paper mill currently uses the Kraft-milling process where paper and fiber are produced. The surrounding area has a sufficient supply of biomass to fuel the operation.

1.2 Proposed Action

The proposed action is to co-locate a liquids depot facility on the north side of the PTPC site. In order to build a liquids depot, NARA would require less than 10 acres to develop the facility. The liquids process would use feedstock (post-harvest forest residuals and construction and demolition waste) to mechanically and chemically separate the sugars and lignin. The vital equipment needed for such a process are a boiler, digesters, separator, chemical storage tanks, furnace, vacuum filter, and air classifying mill. Wood pile storage lots are also needed to accommodate the 100,000 bone dry tons (BDT) of feedstock to be processed at the site.

1.3 Alternative Action

The alternative action is for a micronized wood liquids depot, which relies on a mechanical pretreatment process that converts slash into wood flour. The alternative action would be developed on the same plot of land. It would be less chemically intensive, however require more energy inputs.

1.4 No Action

The no-action alternative would leave the Port Townsend Paper Corporation site as it is.



1.5 Recommended Action

The authors recommend that the alternative action would be preferable to the proposed plan. The alternative action addresses the concerns of the citizens found in the scoping period. It uses far less water, which will lower strain on the municipal system in drought times, and also greatly reduces odor pollution. These attributes make the project much less strenuous on the environment and surrounding community.

1.6 Decision Matrix

Key	Impact
Strong Positive Impact	+++
Moderate Positive Impact	++
Slight Positive Impact	+
No Impact/Neutral	0
Slight Negative Impact	-
Moderate Negative Impact	--
Strong Negative Impact	---

Elements	Proposed	Alternative	No Action
Natural Environment			
Earth	-	-	0
Water	---	-	0
Air	--	0	--
Plants	-	-	0
Animals	-	-	0
Built Environment			
Energy and Natural Resources	-	---	0
Environmental Health	--	0	0
Land and Shoreline Use	-	-	0
Aesthetics	-	-	0
Light and Glare	-	-	0
Recreation	-	-	0
Transportation	-	-	0
Public Services	-	--	0
Utilities	--	--	0
Total	19	16	2



SECTION 2: The Natural Environment

This section discusses the potential impacts of the proposed, alternative, and no action alternatives on the natural environment. The natural environment as defined by this project encompasses five characteristics of the natural world: Earth, Water, Air, Plants, and Animals. The scope of this section will include human health but not human infrastructure. As mandated by the Washington's State Environmental Policy Act, the upstream and downstream effects of activities will also be taken into consideration, as well as immediate and long-term impacts.

2.1 Earth

2.1.1 EXISTING ENVIRONMENT

The Port Townsend Paper Corporation mill site lies within the Puget Lowlands of the north-eastern segment of Jefferson County. The location of the proposed project is the northwest section of land owned by the Port Townsend Paper Corporation. The parcel number is 001161002, which extends north of Mill Road up to the Northwest Pacific Trail. The parcel is characterized by wooded, gently sloping, north/south trending hills (Sepler, 4). With less than a 15% grade slope and elevations ranging from 50-100ft above sea level, the soil consists predominantly of Townsend gravelly loams (TnC) and Clallam gravelly sand loams (CmC). The hydric soils that are present consist of Agnew silt loam (AgB), Mukilteo soil series (Mu), and McMurray and Mukilteo Peats (Mm).

2.1.2 PROPOSED ACTION

2.1.2.1 Impacts

The proposed action would require the clear cutting and grading of the chosen parcel for the construction of a liquids depot facility. Approximately, 4-5 acres would be cleared and logged for heavy industrial purposes. Clear cutting removes the vegetation and root systems that maintain the integrity of the soil. The slight contours in elevation suggest slight landslide hazards within the immediate vicinity. Furthermore, seismic activity of moderate to high severity could exacerbate the erosion and the risk for landslide occurrences.

2.1.2.2 Mitigation

There is a need to develop an erosion control and re-vegetation plan to delineate measures to minimize soil loss and reduce sedimentation to protect water quality.

2.1.3 ALTERNATIVE ACTION

2.1.3.1 Impacts

The alternative of building a micronized wood liquids depot poses similar risks as the construction of a liquids depot facility. The construction of this mill will require an additional acre to support the facility. Erosion from the leveling and grading poses a potential risk for slide hazards.



2.1.3.2 Mitigation

The same erosion controls and vegetation plans, as the proposed action, will need to be implemented.

2.1.4 NO ACTION

2.1.4.1 Impacts

The No Action alternative would leave the integrity of the soil in its current state, lessening the potential risk for natural disasters caused by erosion, flooding, and seismic events.

2.2 Water

2.2.1 EXISTING ENVIRONMENT

The PTPC uses 10 million gallons/day (MGD) of water, and processes between 10 (summer) and 12 (winter) mgd of water in its combined wastewater/stormwater treatment plant. PTPC receives its water from the city of Port Townsend. Within the selected parcel, 001161002, there is pre-existing waste water pipelines present under the heavily wooded area. The pipelines flow into the wastewater treatment plant. Stormwater from the parcel is currently piped into the existing wastewater treatment plant (WWTP). The WWTP owned by PTPC, located on adjacent parcel 001161003, lies within the 100-year floodplain and is considered a flood hazard. Residing within the 100-year floodplain means that in any given year, there is a 1% chance that a major flooding event will occur. Other streams may be present and flow into Glen Cove but would not be directly affected by the project.

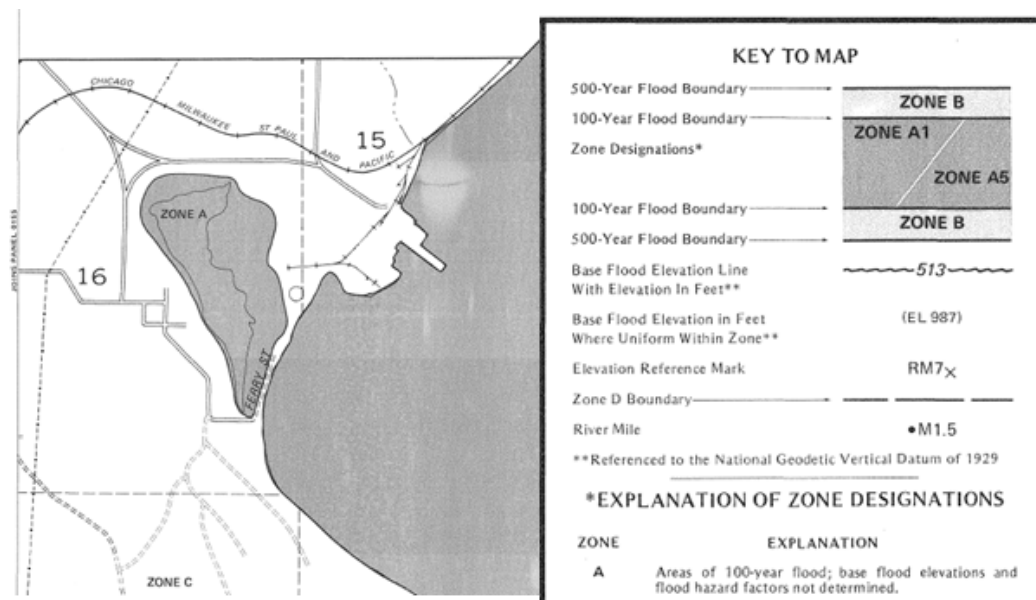


Figure 2. FEMA Flood Zone map #5300690160B, Port Townsend Paper Corporation mill site. Flood Zone A, 100 Year Flood Boundary.



Figure 3. Aerial view of PTPC pre-existing wastewater pipeline structures.

2.2.2 PROPOSED ACTION

2.2.2.1 Impacts

The proposed action, which will take in 100,000 BDT of feedstock, will require water for the chemical processes involved. One digester requires 530,000L of liquid and, based on the feedstock estimates, this process will require 3. The liquids depot will require approximate 2 MGD of water, or 1,432 gallons per minute. Currently, the PTPC produces 10 MGD of wastewater and has a capacity of 17-18. This large water usage is a concern for the city of Port Townsend. PTPC has already been close to having to shut down their facility because of drought conditions. 2015's prevalent drought throughout the United States has raised concerns about appropriate water usage. Water has become a precious commodity, and as the climate continues to change water will become scarcer and more difficult to come by. This additional water demand will also be a concern for a community that relies upon municipal water. After the changing of the permeable soils to surfaces that are impervious, an increase in storm water runoff will occur, placing a greater demand on the WWTP.

2.2.2.2 Mitigation

With increased use of the WWTP facility, making improvements to parts of the conveyance system, including pipes and pump stations, will help to handle additional flows in the system. Flood proofing of any electrical equipment in low lying areas can also prevent any safety hazards.



2.2.3 ALTERNATIVE ACTION

2.2.3.1 Impacts

The micronized wood milling process is a mechanical process that does not require water for the pre-treatment portion of the process. The water demand will come during the enzymatic hydrolysis process. This process will require 60 gallons per minute as opposed to the proposed action's 1,432 gallons per minute, a significant difference. This is an important consideration, given the scarcity of water mentioned above.

2.2.3.2 Mitigation

The same mitigation measures are recommended as suggested for the proposed action.

2.2.4 NO ACTION

2.2.4.1 Impacts

No action would keep the permeable surfaces intact as well as the integrity of the existing soil. No action would also keep assure that the site would not put additional water strain on the city of Port Townsend.

2.3 Air

2.3.1 EXISTING ENVIRONMENT

PTPC is required to have a Title V Air Operating Permit because it emits or has the potential to emit, one hundred tons per year or more of one or more air pollutants (WAC 173-401-300(1)). Also, it is regulated under the National Emission Standards for Hazardous Air Pollutants. During periodic monitoring it has been determined that chlorine, chloroform, and chlorine dioxide are not being released. However, annual air emissions reported in 2005 (Table 1) showed that the mill released 3,657 tons per year of total chemical releases. From that report the mill emits 51% carbon monoxide (CO), 17% nitrogen dioxide (NO₂), 12% sulfur dioxide (SO₂), 10% particulate matter, and 2% volatile organic carbons. Of that, the community of Port Townsend has expressed concern over the release of SO₂ and NO₂. Claims have reported smells of rotten egg, odors triggering asthma, odors that irritate eyes, nose, throat, and cause headaches. However, a report done by the Washington State Department of Health states that the information about health risks of the people living near the pulp mill is inconclusive. Also, that "it is not possible to directly associate any observed disease conditions at Port Townsend to the mill" (Washington State Department of Health, 2008, p.26)

Current forestry operations that supply the PTPC with feedstock leave slash piles at the log landing. Under Washington state law (Chapter 70.94 RCW), forest contractors are required to remove slash piles to reduce forest fires; the primary method is to burn them during the winter. Slash pile burning releases a 37-day averaged 2.5PM concentration of carbon dioxide (CO₂) (Ravi, 2014).



Pollutant	Annual emissions, Tons/year	
	2002	2005
Acetaldehyde	32	44
Ammonia	36	41
Benzo(g,h,i)perylene	0.001	NA
Cresol (mixed isomers)	NA	9
Dioxin & dioxin-like compounds*	0.4 g	0.4 g
Formaldehyde	5	8
Hydrochloric acid aerosols	137	11
Lead compounds	0.04	0.04
Manganese compounds	0.7	0.05
Mercury compounds	0.0005	0.0005
Methanol	57	56
Naphthalene	NA	7
Phenol	3	3
Polycyclic aromatic compounds	0.03	0.03
Propionaldehyde	NA	11
PM ₁₀	268	333
PM _{2.5}	240	282
SO ₂	545	410
NO _x	550	582
VOC	63	72
CO	1,680	1,788
Total reduced sulfur (TRS)	18	15

Source: Port Townsend Paper Emissions Inventory & Toxic Release Inventory, year 2002 & 2005.¹²

NA – Pollutant was not reported because mass emissions were zero or below federal reporting thresholds.

VOC = volatile organic compounds; PM = particulate matter; PM_{2.5} = particle matter size equal or less than 2.5 micrometers (µm); PM₁₀ = particle matter size equal or less than 10µm; SO₂ = sulfur dioxide; NO_x = nitric oxide; CO = carbon monoxide.

* Dioxin & dioxin-like compounds are in grams (g) per year.

Table 1. Summary of PTPC Annual air emissions.

2.3.2 PROPOSED ACTION

2.3.2.1 Impacts

A liquids depot facility would produce several polluting emissions. Mostly, it would produce sulfur dioxide (SO₂) and nitrous oxide (NO₂). The liquids digest would also vent CO₂ and ammonia (NH₃). However, the quantities would vary on production levels but would be relative to the current mill operations.

A liquids depot would decrease air pollution emissions from slash pile burning by up to 70% (Ravi, 2014). The liquids depot would eliminate that emission by harvesting biomass from slash piles for biofuels.

2.3.2.2 Mitigation

In order to control the odors that would be produced from the emissions we propose to inject liquid oxygen. PTPC has built a pipe attached to a liquid oxygen tank to inject a rate of 3 tons per day into its own water pond (Bermant, 2013). In order to control the odors that would be produced from the emissions we propose to inject liquid oxygen from this tank. PTPC is still in the process of a required permit test for the state Department of Ecology for this project.



2.3.3 ALTERNATIVE ACTION

2.3.3.1 Impacts

The addition of a micronized wood liquids depot would not directly increase local air pollutant emissions. The energy use would increase; however, the majority of air emissions would be in the form of steam/heat.

2.3.3.2 Mitigation

There are no recommended mitigation actions considering the fact that the facility is legally obligated to have air scrubbers installed on their emission stacks.

2.3.4 NO ACTION

2.3.4.1 Impacts

The current emissions of SO₂ would remain the same instead of increasing. However, instead of decreasing air pollution emissions by harvesting slash piles, the current process of burning would continue and release of CO₂, nitrous oxide, and volatile organic compounds.

2.4 Plants

2.4.1 EXISTING ENVIRONMENT

Jefferson County is host to a variety of native and non-native vegetation. From diverse forests to marine/estuarine vegetation, the Port Townsend Paper Mill Corporation is neighboring too many habitat types. The parcel for the proposed site consists primarily of deciduous and coniferous trees (See Appendix; Table 2). The most abundant trees are Douglas fir, cedar, pine, and maples. This mix of conifers and deciduous trees, along with numerous standing dead trees, provides a diversity of habitat types. Although not present within the project location, adjacent locations host eelgrass, an endangered/threatened plant species. Any non-native plants are considered noxious weeds. They are invasive, competitive and very hard to control once established.

2.4.2 PROPOSED ACTION

2.4.2.1 Impacts

The proposed action would require the removal and alteration of the vegetation present within the chosen project site. The net reduction of vegetation within the parcel is estimated to be between 4 and 5 acres. Significant impacts are not expected at the site due to the project's relative size.

2.4.2.2 Mitigation

A buffer zone will remain, made up of existing trees along the Northwest Pacific Trail/Larry Scott Trail. Reducing the amount of impermeable surfaces and leaving as much vegetation as possible is recommended for this action. Use of gravel for parking lots will reduce impermeable surfaces on the site and allow for filtration during precipitation events to allow for vegetation growth.



2.4.3 ALTERNATIVE ACTION

2.4.3.1 Impacts

The alternative action of building a micronized wood liquids depot will require removal of present vegetation from the project site. Woody biomass from other locations not present on the site will be used in conjunction with the micronized wood mill. The parcel will experience similar environmental impacts as seen in the proposed action.

2.4.3.2 Mitigation

The same mitigation measures that have been suggested for the proposed action are recommended.

2.4.4 NO ACTION

2.4.3.1 Impacts

No action will leave the present vegetation in its current ecological state.

2.5 Animals

2.5.1 EXISTING ENVIRONMENT

The chosen parcel is considered a heavily wooded area that provides a habitat corridor for many species and lies between zones of both residential and heavy industrial use. Several species have been classified as threatened/endangered throughout Jefferson County and depend on the county's diverse habitats. In particular, migratory birds and salmonid species are reliant on the surrounding marine and freshwater ecosystems for survival.

Migratory Birds

The federal governments of the United States, Canada, and Mexico, under the authorities of bilateral treaties and federal legislation, are ultimately responsible for the protection and conservation of migratory birds in North America (Bartonek, 2015). Port Townsend lies within the Pacific Flyway. It is a major north-south flyway for migratory birds. Trees and other vegetation provide a migratory resting place for many species of migratory birds, particularly within brackish wetlands.

The Audubon Society's Blue List was designed to identify patterns of impending or ongoing serious losses in regional bird populations, not to duplicate the function of the U.S. Fish and Wildlife Service's Threatened and Endangered Species List (Ehrlich, n.d.). The Blue List takes into consideration of North American bird populations whose habitat range is being compromised. The species coded in blue (Appendix; Table 3), are identified through the Audubon Society.

Priority Species Designations: See Appendix; Table 3

"Priority species" are fish and wildlife species requiring protective measures and/or management actions to ensure their survival. A species identified and mapped as priority species fit one or more of the following criteria:

Criterion 1, State-Listed and Candidate Species: State-listed species are native fish and wildlife species legally designated as Endangered (WAC 232-12- 014), Threatened (WAC 232-



12-011), or Sensitive (WAC 232-12-011). State Candidate species are fish and wildlife species that will be reviewed by the department (POL-M-6001) for possible listing as Endangered, Threatened, or Sensitive according to the process and criteria defined in WAC-232-12-297.

Criterion 2, Vulnerable Aggregations: Vulnerable aggregations include species or groups of animals susceptible to significant population declines, within a specific area or statewide, by virtue of their inclination to aggregate. Examples include heron rookeries, seabird concentrations, marine mammal haul outs, shellfish beds, and fish spawning and rearing areas.

Criterion 3, Species of Recreational, Commercial, and/or Tribal Importance: Native and non-native fish and wildlife species of recreational or commercial importance, and recognized species used for tribal ceremonial and subsistence purposes, whose biological or ecological characteristics make them vulnerable to decline in Washington or that are dependent on habitats that are highly vulnerable or are in limited availability.

2.5.2 PROPOSED ACTION

2.5.2.1 Impacts

The lack of diversity of vegetation, along with the proposed parcel's proximity to heavy industrial and residential zoning, results in low value wildlife habitat. Wildlife in the existing parcel is limited to species that typically are found in the urban and wetland environments. These species include waterfowl, crows, raccoons, opossum, Columbian black-tailed deer and possibly coyote. Displacement and pressures from construction will be non-significant because of the already present PTPC.

2.5.2.2 Mitigation

Buffer zones created between the forested area and the proposed action will lessen the impacts on any species present within the selected parcel. Limiting the development footprint will create less impermeable surfaces that may restrict movement of any migratory species.

2.5.3 ALTERNATIVE ACTION

2.5.3.1 Impacts

The alternative action will see similar fauna displacement values as the proposed action.

2.5.3.2 Mitigation

The same mitigation measures will be recommended for the alternative action as the proposed action.

2.5.3 NO ACTION

2.5.3.1 Impacts

If no action is taken, existing fauna will not experience additional environmental pressure. Habitats will remain unaltered.



SECTION 3: Built Environment

This section focuses on the impacts made by the project on the human made infrastructure in the area. There are nine characteristics that will be examined in this section. These include: Energy and Natural Resources, Environmental Health, Land and Shoreline Use, Aesthetics, Light and Glare, Recreation, Transportation, Public Services, and Utilities. The scope of this section will also include upstream and downstream effects of the plant as well as the immediate and long-term impacts.

3.1 Energy and Natural Resources

3.1.1 EXISTING ENVIRONMENT

PTPC is a large consumer of energy. The paper company emitted 29% of all CO₂ pollution from Jefferson County in 2005 (Jefferson County, 2008). The plant currently uses 24 MW of energy, 4 of which are generated on site by a cogeneration boiler. Most of the energy consumed by PTPC is from reprocessed fuel oil and biofuels (hog fuel), with the rest of the mix coming from electricity and propane (Jefferson County, 2008).

3.1.2 PROPOSED ACTION

3.1.2.1 Impacts

The proposed action's energy demand would be met by multiple fuels. For the chipper, pump house, general lighting needs and digesters, electricity would be used. To fuel a proposed cogeneration boiler, the company is planning on using a mixture of biomass and natural gas. Steam would be used to power the pretreatment digester.

The steam used in the pre-treatment process would be provided from the excess from the boiler. Furthermore, the biomass known as hog fuel would be used by the boiler.

3.1.2.2 Mitigation

Mitigations for energy consumption of this site have the potential to have moderate energy conservation gains. The first mitigation to energy demand would be to install a cogeneration boiler at the site. This would allow the plant to offset some of its electricity demand by creating its own onsite energy from waste products. To fuel this boiler hog fuel and natural gas should be used. Particulate matter will be emitted from the cogeneration boiler. These particulates must be contained as much as possible. Tactics for this kind of abatement include scrubbers and alternative burning techniques. Another mitigation measure for the proposed site is to recycle the steam created by the boiler back into the chemical pretreatment phase. This will decrease energy demand as well.

3.1.3 ALTERNATIVE ACTION

3.1.3.1 Impacts

The alternative process would add more chippers which would greatly increase electricity use while decreasing stresses on water demand. The added energy consuming equipment for the milled wood process will be: feed belt, hammer mill, 3 incline conveyors, 6 ACM fine mills, 7 ball mills, air compressor, air dryer, and a plant air receiver. According to



NARA estimates, this extra facility will consume about an additional annual 13 MWh. This would account for more than half of all of the energy used at the site.

3.1.3.2 Mitigation

The mitigation measures for the alternative action will resemble the proposed action's plan. The only difference is that there is no chemical pretreatment phase in the milled wood process, so the recycling of steam is not necessary.

3.1.4 NO ACTION

3.1.4.1 Impacts

If a no action decision is made there will be no added energy demand to the utility system.

3.2 Environmental Health

3.2.1 EXISTING ENVIRONMENT

The mill site is a Class 1 facility according to (WAC) 173-180-020. This means that it has the potential for oil spills. However, the mill has current procedures in place to properly prevent such an event (Washington State Department of Ecology). According to the World Bank Group, Kraft paper mills also release sodium hydroxide, sulfuric acid, and turpentine (8). The mill is currently within compliance of all hazardous material handling and noise regulations.

3.2.2 PROPOSED ACTION

3.2.2.1 Impacts

The proposed action would include the use of a mild bisulfite pretreatment process, calcium carbonate (CaCO_3), ammonia, and acid in the digester.

There may be more traffic noise from the increase of logging trucks unloading slash. Although the actions are considered motor vehicle noise they are considered nonsignificant under WAC 173-60-040.

3.2.2.2 Mitigation

When transporting the sugar rich slurry it is recommended to add water to neutralize its pH level.

3.2.3 ALTERNATIVE ACTION

3.2.3.1 Impacts

There may be more traffic noise from the increase of logging trucks to unload. Although these actions are considered motor vehicle noise they are considered non-significant under WAC 173-60-040. Noise created from the site will increase with the addition of the micronized wood mill. This is a result of added machinery processes for milling. The added noise is deemed insignificant because of two main factors: first, the property has a large stand of trees as a buffer between it and any residences or commercial properties, and second, the noise will be similar to what is already present at the Port Townsend Paper Mill Company operations.



3.2.3.2 Mitigation

There are no recommended mitigation efforts.

3.2.4 NO ACTION

3.2.4.1 Impacts

There will be a risk of wildfires if current practices of slash and biomass handling continue.

3.3 Land and Shoreline Use

3.3.1 EXISTING ENVIRONMENT

Presently, the site proposed for the liquids depot is owned by the PTPC, but is not being used. It is 20 acres of woods to the north of Kraft paper mill. Though the land is completely forested, it is zoned for heavy industrial use. No part of the proposed site is on a shoreline, though PTPC borders Glen Cove. The PTPC has a dock that it uses to import/export materials.

3.3.2 PROPOSED ACTION

3.3.2.1 Impacts

The proposal will work in conjunction with the existing mill operations. The land use will be converted from forested to impervious surfaces. The proposal might also include some shoreline use if the liquid sugar product were to be exported via Glen Cove. The transport of these chemicals poses somewhat of a risk.

3.3.2.2 Mitigation

Existing chemical spill response measures are recommended to reduce impacts to the shoreline if the liquid sugar product is shipped via barge or boat.

3.3.3 ALTERNATIVE ACTION

3.3.3.1 Impacts

The alternative option will have the same effects as the proposed action. The land use will change from forest to impervious industrial although the current zoning designates the change. As mentioned above, the risk to the shoreline of transport accidents applies to this alternative as well.

3.3.3.2 Mitigation

Existing chemical spill response measures are recommended to reduce impacts to the shoreline if the liquid sugar product is shipped via barge or boat.

3.3.4 NO ACTION

3.3.4.1 Impacts

If there is no action the land use will not change or the current shoreline usage.



3.4 Aesthetics

3.4.1 EXISTING ENVIRONMENT

The current aesthetics of the proposed site consist of trees and small shrubs on the site.

3.4.2 PROPOSED ACTION

3.4.2.1 Impacts

The buildings are not expected to be taller than 2 stories, an estimated maximum of 40 feet. While a smoke stack is estimated to be much taller, its diameter will be thin. The liquids depot would replace 4-5 acres of trees, amidst a large acreage of trees, so only a proportion of the trees would be removed. The Northwest Pacific Trail runs along the proposed site; the proposed action could impact people using the trail.

3.4.2.2 Mitigation

Keeping a line of trees along the side that lines the Northwest Pacific Trail could ensure the site is more aesthetically pleasing. Also, another mitigation measure could include informational signs about wood-based biofuels, the process, and the benefits of using it over conventional jet fuel.

3.4.3 ALTERNATIVE ACTION

3.4.3.1 Impacts

The impact from the alternative is very similar to the impact from the proposed action. The same mitigation measure would be recommended.

3.4.3.2 Mitigation

The same mitigation measure would be recommended.

3.4.4 NO ACTION

3.4.4.1 Impacts

No action would result in no resulting change to aesthetics.

3.5 Light and Glare

3.5.1 EXISTING ENVIRONMENT

The proposed site consists entirely of wooded forest; therefore, the site does not produce any light or glare nor reflects any light or glare, given the presence of the trees. However, the PTPC site does produce light and glare from its current operations.

3.5.2 PROPOSED ACTION

3.5.2.1 Impacts

Little glare is to be expected by the type of structures that this project includes. There will be some lights around the building for the purposes of visibility.

3.5.2.2 Mitigation

Any mitigation measures could include painting the building darker colors so that glare can be diminished.



3.5.3 ALTERNATIVE ACTION

3.5.3.1 Impacts

A slightly smaller amount of glare is expected from the alternative.

3.5.3.2 Mitigation

The same mitigation measures as above can be taken to lessen glare and light.

3.5.4 NO ACTION

3.5.4.1 Impacts

There will no change to the environment with no action, there will still be the same amount of light and glare.

3.6 Recreation

3.6.1 EXISTING ENVIRONMENT

The Northwest Pacific Trail/Larry Scott Trail lines the length of the proposed site. However, this section is a relatively small portion compared to the whole trail. The trails are frequented by many outdoor enthusiasts and sees moderate to heavy traffic.

3.6.2 PROPOSED ACTION

3.6.2.1 Impacts

The project would not displace the recreational use of the trail but could affect the aesthetic appeal of that particular section.

3.6.2.2 Mitigation

To reduce this possible impact, the proposal would leave a section of trees along the trail to act as a sound and visual buffer. Moreover, there will be several informational signs educating users about the renewable fuels facility at the mill.

3.6.3 ALTERNATIVE ACTION

3.6.3.1 Impacts

The recreation uses of the area would be as equally affected as the proposed action.

3.6.3.2 Mitigation

The recommended mitigation actions will be equal to the proposed mitigation.

3.6.4 NO ACTION

3.6.4.1 Impacts

There would be no effect on the recreation uses of the area.

3.7 Transportation

3.7.1 EXISTING ENVIRONMENT

The current roads leading to this site are State Highway 20 and Mill Road. State Highway 20 is the main land route to Port Townsend and thus experiences heavy residential and tourist traffic as well as traffic from PTPC. PTPC is also a major agent of transit on Mill Road, which is the only road that leads to their property. For reference, the intersection of SR 20 & Mill Rd



experiences about 16,000 vehicles going each direction on any given day. For employee transit, there is currently a large parking lot for the PTPC that is across the street from the proposed site. The nearest bus stop is roughly .9 miles away, making it moderately accessible via public transit.

3.7.2 PROPOSED ACTION

3.7.2.1 Impacts

For this project there will be traffic for both delivery of slash, processing materials, and export of the sugar slurry end product. Based on NARA information, accounting for an 8-hour work day and assuming for 100,000 BDT of feedstock per year, there would be an estimated additional 8,760 chip vans (input) on the road per year and an additional 2,920 additional sugar tanker trucks (export) per year, resulting in an estimated 12,000 additional truck trips per year to the site. Furthermore, NARA estimates 30 permanent employees. Washington's car ownership is 860 cars per 1,000 people (Federal Highway Administration, 2008). Using this statistic as a reference for calculations an estimated 26 employees would be driving in cars. Assuming 350 workdays a year, there would be an additional 9,030 car trips a year to the site.

3.7.2.2 Mitigation

A road study will need to be funded to understand the full effects of the transportation used by the project. However, preliminary calculations have shown that the local access road, Mill Road, will likely not need to be upgraded to accommodate the traffic. However, the intersection of Mill Road and SR 20 has been an area of concern by the public and local authorities. Construction of this facility would warrant faster implementation of the previously proposed plans of creating a two-lane roundabout at the intersection. Currently the intersection consists of a 4-way traffic light (Transpo Group, 2012).

Furthermore, to avoid extraneous construction of impermeable surfaces, the proposers of the project should seek cooperation from PTPC to rent or potentially expand their parking lot in order to share the space for both facilities.

3.7.3 ALTERNATIVE ACTION

3.7.3.1 Impacts

The alternative action for this project would warrant approximately the same amount of traffic.

3.7.3.2 Mitigation

The same considerations as the proposed action would need to be made.

3.7.4 NO ACTION

3.7.4.1 Impacts

If no action is taken, then only the normal traffic from PTPC would be on Mill Road.



3.8 Public Services

3.8.1 EXISTING ENVIRONMENT

Currently there are several public services available from the city of Port Townsend. There are two fire stations that are in the immediate area. The closest station is at 35 Critter Lane and is located 2.2 miles away and has an average 6-minute travel time. The other fire station in the area is at 701 Harrison Street and is 2.8 miles away with an 8-minute travel time.

3.8.2 PROPOSED ACTION

3.8.2.1 Impacts

The proposed action would include large open piles of feedstock. This woody biomass is flammable, but has a relatively low risk of natural combustion. There will also be a wood burning boiler on site, which has combustion capabilities but the risk of explosion from a modern boiler is low. The wood processing portion of the project would be the primary area of concern in this plant. This is because once the wood is broken down, fine wood particles and sawdust can be very hazardous. Reducing the size of the wood increases the surface area and thus the danger of combustion (NFPA, 1998). Storing the processed wood will create a hazardous area.

3.8.2.2 Mitigation

All workplace standards for wood mills must be met and employee information sessions must be given upon employment, with frequent reviews. Furthermore, it is recommended that most employees of the mill be given mandatory emergency medical technician (EMT) training. This will allow for a knowledgeable workforce to react appropriately to an emergency before first responders arrive on site.

3.8.3 ALTERNATIVE ACTION

3.8.3.1 Impacts

The alternative proposal would house the same amount of biomass but some of the stock will be in a finer powder form. The increased surface area of the wood flour product is more combustible than the normal hog fuel, which presents a much higher risk of a fire event.

3.8.3.2 Mitigation

Mitigations to the alternative are the same as mitigations to the proposed.

3.8.4 NO ACTION

3.8.4.1 Impacts

If no action is taken, the current fire risk at the site will remain the same. However, because the proposed lot is surrounded by trees it still poses a possible risk for the undeveloped lot to be susceptible to wildfire.



3.9 Utilities

3.9.1 EXISTING ENVIRONMENT

The current site is a vacant lot and so there are no utilities at the site. There is, however, a stormwater line that runs through the lot and drains into PTPC's wastewater pond.

3.9.2 PROPOSED ACTION

3.9.2.1 Impacts

There would need to be considerable utility infrastructure investments at the proposed site. The site will require access to electricity and natural gas. Telephone and internet lines will need to be run to the facility for communication needs. Municipal water, stormwater, and wastewater lines will need to be constructed from the plant as well.

All of the utilities that need to be constructed are relatively normal for this type of facility. The electrical draw from the site may need a different level of voltage from the standard residential line and may also need a substation to accommodate this change. However, there is a new substation at PTPC's site already, and if the two facilities use the same voltage it may be able to be shared. Existing storm and wastewater lines run through the property and may be able to be shared by both PTPC and the proposed project.

3.9.2.2 Mitigation

Ensure compact site development to reduce infrastructure costs and utilize, to the extent possible, existing utilities existing at the PTPC site.

3.9.3 ALTERNATIVE ACTION

3.9.3.1 Impacts

The addition of the milled wood plant will need more energy than the proposed action, but should not include any additional utility construction as compared to the proposed site.

3.9.3.2 Mitigation

The mitigations for the alternative site are the same as the proposed site.

3.9.4 NO ACTION

3.9.4.1 Impacts

If no action is taken there will be no need for additional utilities



SECTION 4: Conclusion

Recommendation

After assessing all the potential impacts as addressed in this report, the authors of this text have found that the alternative action would be preferable to the proposed plan including the proper mitigation efforts. As shown in section 1.6, Decision Matrix, the alternative action has a less severe impact. The proposed mitigations for the alternative action address the concerns of the citizens found in the scoping period. It uses far less water, which will lower strain on the municipal system in drought times, and also greatly reduces odor pollution. These attributes make the project much less strenuous on the environment and surrounding human population and should be permitted to move forward.



APPENDIX

Table 2. Vegetation types present in Jefferson County, Washington. Native and Non-Native species identification (Appendix).

	Native/Non-Native	Invasive?
Deciduous		
Alder	Native	N/A
Maple	Native	N/A
Aspen	Native	N/A
Coniferous/Evergreen		
Douglas Fir	Native	N/A
Cedar	Native	N/A
Pine	Native	N/A
Wet Soil Plants		
Cattail	Native	N/A
Bulrush	Native	N/A
Skunk Cabbage	Native	N/A
Water Plants		
Eelgrass	Native	N/A
Milfoil	Non-Native	Yes
Waterlily	Native	N/A
Other Plants		
Poison Hemlock	Non-Native	Yes
Knotweed	Non-Native	Yes
Giant Hogweed	Non-Native	Yes



Federal Status Codes: Table 3

Fco=Federal Species of Concern, FT= Federal Threatened, FE= Federal Endangered, FC= Federal Candidate

Bold= Deferally Threatened/Endangered; **Blue**= Audobon’s Blue List Species

Table 3. Priority Habitat Species that hold State and/or Federal listings that have been confirmed to be utilizing Jefferson County, 2013 (Appendix).

Species	Scientific Name	Protection Designation	
		State	Federal
<i>Fish</i>			
Pacific Lamprey	Entosphenus tridentata	Criterion 3	Fco
River Lamprey	Lampetra ayresi	Criterion 1	Fco
Green Sturgeon	Acipenser medirostris	Criterion 1,2,3	FT
White Sturgeon	Acipenser transmontanus	Criterion 2,3	None
Olympic Mudminnow	Novumbra hubbsi	Criterion 1	None
Pacific Herring	Clupea pallasii	Criterion 1,2,3	FC
Eulachon	Thaleichthys pacificus	Criterion 1,2,3	FT
Longfin Smelt	Spirinchus thaleichthys	Criterion 2, 3	None
Surfsmelt	Hypomesus pretiosus	Criterion 2, 3	None
Bull Trout/Dolly Varden	Salvelinus confluentus/S. malma	Criterion 1,2,3	FT
Chinook Salmon	Oncorhynchus tshawytscha	Criterion 1,2,3	FT
Chum Salmon	Oncorhynchus keta	Criterion 1,2,3	FT
Coho Salmon	Oncorhynchus kisutch	Criterion 1,2,3	FT
Searun Cutthroat	Oncorhynchus clarki clarki	Criterion 3	None
Kokanee	Oncorhynchus nerka	Criterion 3	None
Pink Salmon	Oncorhynchus gorbuscha	Criterion 2,3	None
Rainbow Trout/Steelhead	Oncorhynchus mykiss	Criterion 1, 3	N/A
Sockeye Salmon	Oncorhynchus nerka	Criterion 1,2,3	FT/FE
Pacific Cod	Gadus macrocephalus	Criterion 1,2,3	Fco
Pacific Hake	Merluccius productus	Criterion 1,2,3	Fco
Walleye Pollock	Theragra chalcogramma	Criterion 1,2,3	Fco
Rockfish	Sebastes	Criterion 1,2,3	None
Lingcod	Ophiodon elongatus	Criterion 2, 3	None
Pacific Sand Lance	Ammodytes hexapterus	Criterion 2,3	None
English/Rock Sole	Parophrys vetulus/Lepidopsetta bilineata	Criterion 3	None
<i>Amphibians</i>			
Van Dykes Salamander	Plethodon vandykei	Criterion 1	Fco
Western Toad	Bufo boreas	Criterion 1	Fco



Reptiles			
Pacific/Western Pond Turtle	Actinemys marmorata	Criterion 1	Fco
Birds			
Brandt's Cormorant	Phalacrocorax penicillatus	Criterion 1,2	None
Brown Pelican	Pelecanus occidentalis	Criterion 1,2	FE
Cassin's Auklet	Ptychoramphus aleuticus	Criterion 1,2	Fco
Common Loon	Gavia immer	Criterion 1,2	None
Common Murre	Uria aalge	Criterion 1,2	None
Marbled Murrelet	Brachyramphus marmoratus	Criterion 1,2	FT
Short-Tailed Albatross	Phoebastria albatrus	Criterion 1	FE
Tufted Puffin	Fratercula cirrhata	Criterion 1,2,3	Fco
Western Grebe	Aechmophorus occidentalis	Criterion 1,2	None
Great Blue Heron	Ardea herodias	Criterion 2	None
Brant	Branta bernicla	Criterion 2, 3	None
Cavity-nesting ducks: Wood Duck, Barrow's Goldeneye, Common Goldeneye, Bufflehead, Hooded Merganser	Aix sponsa Bucephala islandica Bucephala clangula Bucephala albeola Lophodytes cucullatus	Criterion 3	N/A
Harlequin Duck	Histrionicus histrionicus	Criterion 2,3	None
Trumpeter Swan	Cygnus buccinator	Criterion 2,3	None
Bald Eagle	Haliaeetus leucocephalus	Criterion 1	Fco
Golden Eagle	Aquila chrysaetos	Criterion 1	None
Northern Goshawk	Accipiter gentilis	Criterion 1	Fco
Peregrine Falcon	Falco peregrinus	Criterion 1	Fco
Mountain Quail	Oreortyx pictus	Criterion 3	None
Sooty Grouse	Dendragapus fuliginosus	Criterion 3	None
Band-Tailed Pigeon	Columba fasciata	Criterion 3	None
Spotted Owl	Strix occidentalis	Criterion 1	FT
Vaux's Swift	Chaetura vauxi	Criterion 1	None
Pileated Woodpecker	Dryocopus pileatus	Criterion 1	None
Purple Martin	Progne subis	Criterion 1	None
Mammals			
Roosting: Big-Brown Bat Myotis Bat Pallid Bat	Eptesicus fuscus Myotis spp. Antrozous pallidus	Criterion 2	N/A
Townsend's Big-eared Bat	Corynorhinus townsendii	Criterion 2,3	Fco
Keen's Long-eared Bat	Myotis evotis keenii	Criterion 2,3	None
Olympic Marmot	Marmota olympus	Criterion 1	None
Western Pocket Gopher	Thomomys mazama	Criterion 1	FC



Fisher	<i>Martes pennanti</i>	Criterion 1	FC
Marten	<i>Martes americana</i>	Criterion 3	None
Columbian Black-tailed Deer	<i>Odocoileus hemionus columbianus</i>	Criterion 3	None
Mountain Goat	<i>Oreamnos americanus</i>	Criterion 3	None
Elk	<i>Cervus elaphus</i>	Criterion 3	None
<i>Invertebrates</i>			
Johnson's Hairstreak (Butterflies)	<i>Mitoura johnsoni</i>	Criterion 1	None
Makah Copper (Butterflies)	<i>Lycaena mariposa charlottensis</i>	Criterion 1	Fco
Puget Blue (Butterflies)	<i>Plebejus icarioides blackmorei</i>	Criterion 1	None
Sand-Verbena Moth	<i>Copablepharon fuscum</i>	Criterion 1	None
Valley Silverspot (Butterflies)	<i>Speyeria zerene bremnerii</i>	Criterion 1	Fco



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