Spring 2010

Post Point Wastewater Treatment Plant: environmental impact assessment

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Author
Devon Gilland, Miles Gilmore, Blake Larimer, Noelani Penney, Megan Watson, and William Wyler

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Post Point Wastewater Treatment Plant
Environmental Impact Assessment

Professor Jean O. Melious
ESTU 436: Environmental Impact Assessment
Spring 2010
Huxley College of the Environment
Western Washington University

Prepared By:
Devon Gilliand
Miles Gilmore
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Noelani Penney
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William Wyler

This report presents a class project undertaken by students at Huxley College of the Environment, Western Washington University. It has not been performed at the request of any person or organization, public or private. Furthermore, it does not represent the position or opinions of individuals from the government or private sector.
Dear Concerned Citizen:

In accordance with the State Environmental Policy Act (SEPA, WAC 197-11), this Environmental Impact Assessment (EIA) was developed for academic purposes by students of the Huxley College of the Environment’s ESTU 436 class at Western Washington University. The ESTU 436 class is designed to model the official Environmental Impact Statement (EIS) process that is outlined under SEPA in Washington State. The contents of this student report include studies and analysis by our team, official documents, figures, and maps that existed prior to our involvement, and interviews with City of Bellingham Public Works officials.

The State Environmental Policy Act requires an EIA if a proposal received a determination of significance (DS). The proposed wastewater treatment plant site expansion examined in this report has been determined as significant by the City of Bellingham though an official EIA has yet to be completed. This student project EIA on the Post Point Wastewater Treatment Plant expansion is being completed for learning purposes only.

This EIA addresses two separate scenarios. The Proposed Action involves expanding the core process of the wastewater treatment plant, and requires the expansion of the existing Pure Oxygen Activated Sludge treatment system. This entails the addition of a primary and secondary clarifier, an anaerobic selector, an oxygen system, and two activated sludge basins. The Alternative Action provides both primary and secondary upgrades that will ensure adequate capacity and performance at the plant. This requires the addition of a Chemically Enhanced Primary Treatment (CEPT) facility, a new rectangular primary clarifier, an additional high purity oxygen (HPO) generator, and a new aerobic basin. This EIA places primary focus on the most significant environmental impacts that the proposal and alternative will have on the area. The main areas of concern are soils, air quality, animals, noise, recreation, land use, the site footprint, housing, and visual aesthetic appeal.

Sincerely,

The Post Point Wastewater Treatment Plant Expansion EIA Project Team

Devon Gilliland  Miles Gilmore
Blake Larimer               Noelani Penney
Megan Watson  William Wyler
Environmental Impact Assessment
Huxley College of the Environment

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Signature: Devon Gilland
Devon Gilland

Signature: Miles Gilmore
Miles Gilmore

Signature: Blake Larimer
Blake Larimer

Signature: Noelani Penney
Noelani Penney

Signature: Megan Watson
Megan Watson

Signature: William Wyler
William Wyler

Date: June 4, 2010
Figure 2. Location map of Post Point Wastewater Treatment Plant (Wyler, 2010).
Figure 3. Map of Post Point Wastewater Treatment Plant (COB, 2010).
**Fact Sheet**

**Title:** Post Point Wastewater Treatment Plant

**Description of Project:** The Post Point Wastewater Treatment Plant is approaching capacity and must be expanded to meet current and future needs, as the City of Bellingham continues to grow. The plant presently has a peak capacity of 72 million gallons a day and services 83,000 customers over approximately 30 square miles.

**Legal Description of Location:** The Post Point Wastewater Treatment Plant is located at the intersection of sections two and eleven of the Northeast 1/4 of township 37N, range 2E. The address associated with the treatment plant is 200 McKenzie Ave., Bellingham, WA 98225.

**Proposer:** City of Bellingham Public Works Department

**Lead Agency:** City of Bellingham Public Works Department

**Required Permits:**
- Federal: NPDES Discharge Permit
  - Wetlands Permit
- State: Hazardous Chemical Inventory Reporting Requirements
  - Wetlands Permit
- Local: Building Permit
  - Noise Ordinance Permit

**Authors:**
- Devon Gilliand - housing, aesthetics, light & glare, facilitator, citizens letter and executive summary
- Miles Gilmore - transportation, historic, recreation and alternative summary
- Blake Larimer - public facilities, utilities and proposal summary
- Noelani Penney - plants, animals, energy & natural resources, greenhouse gases, fact sheet, no action summary, photos and layout
- Megan Watson - environmental health, noise, land & shoreline use, permits and editing
- William Wyler - water, air, earth, maps, site history and primary contact person

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Ann Eissinger - Biologist, Nahkeeta Northwest
Heather Higgins-Aanes – Education and Communications Coordinator, Public Works, City of Bellingham
Jean Melious - Environmental Impact Assessment Advisor
Rory Routhe – Assistant Director, Public Works Department, City of Bellingham
Kim Weil - Wetlands Specialist, City of Bellingham

Date of Issue: June 4, 2010

Public Meeting: Arntzen Hall, Room 225, Western Washington University, June 4, 2010, 10 am.
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Section One:

An Overview

Figure 4. Path running along the wastewater treatment plant’s northern side.
1.1 EXECUTIVE SUMMARY

Growth in the City of Bellingham is currently projected at a rate of 1,580 people a year and with this rapid growth comes an increased need to provide vital services to the citizens of Bellingham (City of Bellingham 2006). One of these services is wastewater treatment. Currently the Post Point Wastewater Treatment Plant, located at the end of Harris Avenue in Fairhaven, is responsible for the wastewater treatment in the Bellingham area. The plant serves a total of 83,000 customers on a daily basis. Due to rapid expansion it is reaching its maximum capacity of 55 million gallons per day (mgd), and can no longer safely treat the volume of wastewater that is coming into the plant without breaking its compliance permits (City of Bellingham 2006). Since the plant is reaching its limit, it is necessary to expand the wastewater treatment plant in order to provide accommodation for current and future wastewater treatment in the Bellingham city limits and its future growth areas.

There are two suggestions for Post Point Wastewater Treatment Plant expansion offered in this environmental impact assessment. The first project proposal involves expanding the existing Pure Oxygen Activated Sludge treatment system (the core process), which will involve a total of six new structures to be built on the southern end of the Post Point site (City of Bellingham, June 2009). The addition of these six structures will increase the plant capacity and provide service for projected future growth in the Bellingham area. The project proposal will most severely impact soils, air quality, birds, noise, recreation, the site footprint, land use, housing and the plant’s aesthetic appeal. Mitigation measures for this proposal include actions such as plant and shrub buffers to decrease erosion and improve aesthetics. Likewise, soil removed during construction will be covered to lessen air quality impacts. In addition, newly built structures should have noise absorption materials. The walking trail will need to be relocated in order to decrease impact on heron habitat. For wetland mitigation, in lieu fees should be used. On a larger scale, building permits should be monitored in Urban Growth Areas to ensure the most effective use of the plant.

The second alternative proposal involves the use of a new Chemically Enhanced Primary Treatment (CEPT) process. This alternative will require the construction of fewer structures on the plant site than the project proposal, but does require the construction of a Chemically Enhanced Primary Treatment (CEPT) facility, a new rectangular primary clarifier, an additional high purity oxygen (HPO) generator, and a new aerobic basin (City of Bellingham 2009). The implementation of this alternative would increase the plant capacity and provide service for the projected future growth in the serviced area. This alternative proposal would have the greatest impact on soils, air quality, vegetation, the site footprint, housing, and the plant’s aesthetic appeal. Mitigation measures for this proposal include actions such as plant and shrub buffers to decrease erosion and improve aesthetics. Likewise, soil removed during construction will be covered to lessen air quality impacts. In addition, newly built structures should have noise absorption materials. For wetland mitigation, in lieu fees should be used. On a larger scale, building permits should be monitored in Urban Growth Areas to ensure the most effective use of the plant.
1.2 Project Proposals & Alternatives

Project Proposal Summary

The Bellingham Post Point Wastewater Treatment Plant is expanding to accommodate expected future growth within Bellingham and its respective Urban Growth Areas. To prepare for this growth, the Plant will also need to be in compliance with its NPDES permits (City of Bellingham, June 2009). The proposed action for the Post Point Facility is expanding the existing Pure Oxygen Activated Sludge treatment system (hereafter referred to as the core process). The necessary expansion of the core process will call for the addition of a primary and secondary clarifier, anaerobic selector, oxygen system and two activated sludge basins with most of the expansion occurring towards the southern half of the facility (Carlson 2010).

The City of Bellingham is expecting significant population growth within the next 30 years. By 2026, the population of Bellingham, which includes existing UGAs, will be 116,200 up from 81,000 in 2002 (Table M., Appendix). The existing plant is already nearing its capacity to effectively treat sewage within the allowable levels of state and federal NPDES permits for BOD levels (Figure L., Appendix). During large storm events there has also been an increase in combined sewer overflows (Washington State Department of Ecology, 2010) which could be prevented by expanding the existing process. To meet the demands of an expanding city population and wastewater permits, the Post Point Facility will need to expand.

Project Proposal Description

The expansion of the core process was decided upon by using the Triple Bottom Line Plus (TBL+) approach which evaluates environmental, social, financial, and technical benefits and impacts for the wastewater facility and the City of Bellingham (Figures J. and K., Appendix). Compared to other alternatives for expansion the proposal was deemed to have the most efficient use of existing infrastructure, familiar technology, lowest energy use and greenhouse gas emissions, least chemical usage and preserved property to the north of the facility for future use and lowest capital costs (City of Bellingham, July 14, 2009).

The expansion of the Post Point Wastewater Treatment Plant will be an expansion of the current core process. To expand the core process to meet current NPDES permit requirements, the plant will require an additional secondary and primary clarifier, two activated sludge basins, a new oxygen generator system and a new anaerobic selector (definitions in Glossary). Most of the new structures will occur on the grounds of the current facility though the secondary clarifier and activated sludge basin are the notable exceptions (Figure C., Appendix). The new secondary clarifier will be located at the southwest corner of the facility with a large portion outside of the boundaries of the current facility. The two activated sludge basins will be on the southernmost end and will also be outside the boundaries of the current facility. The additional structures will expand both the primary and secondary treatment process so as not to exceed the NPDES permit for BOD loads in the future.

Currently, the Post Point facility is experiencing BOD loads which are above permitted influent levels. According to Carollo Engineers, which has evaluated the capacity of the facility, these high concentrations of BOD reduce the ability of certain functions of the facility which are now in need of expansion. BOD limits the flow to the aeration basins and thus limiting their function, reduces the capacity of the secondary clarifiers, and requires more oxygen generation than the facility can provide with such high concentrations of BOD (City of Bellingham, July 14, 2009). The new secondary clarifier and activated sludge basin are expected to have the greatest impact on the surrounding environment due to their intrusion and proximity to Class IV wetlands and a Great Blue Heron nesting site. The new second-
ary clarifier will be the same size as the existing ones which are 120 feet wide and 15 feet deep. The activated sludge basin will expand the footprint of the existing basin to the south and west sides and will be the same height as the existing sludge basin structure, which is about 3 stories tall. The secondary clarifier and activated sludge basins will also have an impact on undeveloped areas surrounding the facility which is used by the public for recreational purposes such as jogging and dog walking (City of Bellingham, July 14, 2009). There are also expected temporary impacts to air quality and noise during construction due to the use of heavy machinery (Routhe, 2010).

ALTERNATIVE PROJECT SUMMARY
The expansion of the Post Point Waste Water Treatment plant will require the construction of facilities to upgrade both primary and secondary treatment. Primary treatment includes the construction of a CEPT facility. The CEPT process will greatly increase the efficiency in which BOD and other suspended solids will be removed from the flow. This increase will allow modifications of existing primary clarifiers to be used as secondary clarifiers. Secondary treatment will include the construction of a High Purity Oxygen generator, anaerobic selector and expansion of the activated sludge basin. These upgrades will allow for enhanced treatment of increased flow. The anaerobic selector and the expansion of the activated sludge basin will have environmental impacts and mitigation measures will be needed.

ALTERNATIVE PROJECT PROPOSAL DESCRIPTION
This alternative plan considers both primary and secondary upgrades that will provide adequate capacity and performance to accommodate the expected increase. Dr. David Jenkins, Dr. Mike Stenstrom and Richard Finger an independent consultant, reviewed and submitted this plan.

The primary treatment upgrades include the construction of a Chemically Enhanced Primary Treatment (CEPT) facility. CEPT is the process by which chemicals, usually metal salts, polymers or a combination of the two are added in the form of organic polyelectrolytes, to primary sedimentation basins. The chemicals enable the suspended particles to clump together through the processes of coagulation and flocculation. These clumps of suspended particles settle faster thereby enhancing treatment efficiency (Chagnon). The addition of CEPT process allows for the increased removal of phosphorus, suspended solids and its associated biochemical oxygen demand (BOD). CEPT is an efficient, cost-effective and easily implemented wastewater treatment technology. The increased removal efficiency allows for the design of smaller basins and greater overflow rates. The facility also has a smaller building footprint than the proposal’s primary clarifier. Due to the increase in efficiency of primary treatment, modifications will be made to an existing primary clarifier for use as a secondary clarifier.

Secondary treatment upgrades include an additional high purity oxygen (HPO) generator, which will reduce the amount of dissolved oxygen in the effluent (Morin). This, in conjunction with the anaerobic selector, will allow for increased extraction of nitrogen, phosphorus and biological material. The HPO generator will be constructed on the north side of the property and will have only temporary construction impacts, and the anaerobic selector will be located on the southeast corner (City of Bellingham, July 14, 2009). A new aerobic basin (activated sludge basin) will be added to the end of the existing basin to allow for treatment of increased flow. There are two areas of noticeable impacts associated with the construction of these facilities. The first is the placement of the Anaerobic Selector. It cannot currently be determined if, or how far this building will impede on the Lower Padden Creek and Larabee trail, but if it does, mitigation measures will be required. The second noticeable impact is the extension of the existing activated sludge basin. The addition will increase the size of the building to the south and west, protruding into sensitive wetland and heron habitat.
This plan was chosen as the alternative expansion because it will greatly reduce the amount of BOD entering Bellingham Bay and is easily integrated with existing infrastructure. Also, the expansion to the plant will only require four new structures, compared to the six of the proposed plan, and will have an overall smaller building footprint. The smaller footprint allows for a reduced impact on the sensitive wetland and Heron habitat. However, the CEPT process relies on continuously imported chemicals, instead of natural processes such as gravity and settling used currently and in the proposed action. The use of chemicals outweighs the negative impacts of building the secondary clarifier on the sensitive area; therefore it has been determined that the proposed expansion is preferred to the alternative plan.

**NO ACTION ALTERNATIVE SUMMARY**

The no action alternative will involve no construction. It would have a negative impact on both plant effluent and hazardous chemicals. With no action, effluent is projected to periodically be over the permitted BOD level and chemicals would need to be used to reduce the BOD levels.
### 1.3 Decision Matrix - Part I

<table>
<thead>
<tr>
<th>The Natural Environment</th>
<th>Proposed Action</th>
<th>Alternative Action</th>
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### The Built Environment

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Table 1. Decision Matrix, 1.
| **ENERGY AND NATURAL RESOURCE USE** | Energy Use |  |  |  |  |
|  | Solar Access |  |  |  |  |
| **PUBLIC SERVICES AND UTILITIES** | Fire |  |  |  |  |
|  | Police |  |  |  |  |
|  | Schools |  |  |  |  |
|  | Utilities |  |  |  |  |
| **HOUSING** | Growth Inducing |  |  |  |  |
| **AESTHETICS** | Views |  |  |  |  |
|  | Visual Facility Impact |  |  |  |  |
| **LIGHT AND GLARE** | Light Pollution |  |  |  |  |

Table 2. Decision Matrix, 2.

**KEY**

<table>
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<td>Moderately Negative Impact</td>
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<td></td>
<td>Significantly Negative Impact</td>
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1.4 OVERVIEW OF SIGNIFICANT SEPA SECTIONS

Earth - Different aspects of the earth need to be considered when analyzing the impacts of the project. One way to do so is to look at general soils, slopes, and potential geologic hazards in and around the site. Situated on the Post Point site are class IV wetlands, previous infill of wetland, and steep bluffs. Risks involving erosion and destabilization of the bluff and the further damaging of the wetlands need to be considered.

Air - Air quality needs to be considered due to possible increases in emissions from construction traffic and the operation of heavy equipment. Airborne particulates could also pollute the air in and around the plant with increased amounts of dust resulting from digging and moving of soils. Greenhouse gases will be added to the atmosphere, though not to a significant level.

Animals- This section includes impacts to all animals on the site, during and after construction. It is separated into two areas; (a) birds, and (b) fish and other species, as the impacts between these two groups vary greatly. For fish and other species, impacts will be minimal. For heron, there will be major impacts to the site with the proposed action and reduced impacts with the alternative and no action plans.

Environmental Health- Environmental Health involves hazardous chemicals and noise. It includes the potential impacts of toxic substances introduced and stored at the site, due to the expansion. If chemicals are introduced to the plant to assist in the primary treatment process, the impacts of the toxic substances to the environment should be considered. Both the alternative and the no action alternative involve the use of chemicals in the plant and could increase the environmental impact.

Noise impacts include any temporary or long term noise as a result of this project. Temporary noise impacts include construction, traffic and transportation. Long term noise impacts include the additional noise from new additional structures in the plant. Both the proposal and the alternative will involve temporary noise impacts due to construction and traffic and could have additional long term impacts from the newly constructed structures.

Land and Shoreline Use- This section considers any changes to the use of the land in and around the facility. This includes impacts to the shoreline, zoning of the site, and environmentally sensitive areas. This project will result in an impact to the wetland, an environmentally sensitive area. The alternative and no action will not change the boundary to the site and will result in a minimal impact to land and shoreline use.

Housing - Housing is considered in this EIA because the expansion of the wastewater treatment plant, either by the proposed or alternative action, could be considered as a growth inducing action. Since growth in Bellingham is an important issue, anything that could be considered as growth inducing could be considered as a moderate impact on the built environment.

Aesthetics - Any alteration to the current wastewater treatment plant will have some change to the aesthetics of the site. Both the proposed and alternative actions will involve the construction of new structures on the site, and any new structures will affect the overall aesthetic appeal of the facility.

Recreation - This section considers the short and long term impacts on the Lower Padden Creek and Larabee trail, and the adjacent dog park due to the proposed upgrade to the Waste Water Treatment Facility. This trail runs along the perimeter of the Post Point Waste Water Facility, and is used frequently.
1.5 SITE HISTORY

The Post Point lagoon was constructed during the 1930s by the Burlington Northern Railway in order to replace an aging wooden trestle with one made of stone. By the 1970s the property was purchased by the City for the site of the new wastewater treatment plant. It was built to replace the simple clarifiers situated at the mouth of Whatcom Creek which were built in the 1940s. Most of the land that the current treatment plant sits on is infill of the lagoon. The City owns property on both sides of the plant with the idea of future expansion in mind. The land to the south of the plant has been loaned to the public for a dog park and walking trail around the property. The current plant was built in 1974 and utilized primary treatment. In 1993, the plant was expanded and secondary treatment was implemented to properly treat the growing inflow due to population growth within Bellingham (Eissinger 2003).
1.6 PERMIT CHART

<table>
<thead>
<tr>
<th>Permit Name</th>
<th>Activity</th>
<th>Contact Agency</th>
</tr>
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<tbody>
<tr>
<td><strong>Federal</strong></td>
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</tr>
<tr>
<td>NPDES Water Discharge Permit</td>
<td>Any discharge of a pollutant into the waterways requires this permit. (RCW 90.48, Clean Water Act)</td>
<td>Department of Ecology Water Quality Program</td>
</tr>
<tr>
<td>Section 404 Wetlands Permit</td>
<td>Any activity involving filling in wetlands for infrastructure development (Clean Water Act Section 404)</td>
<td>United States Fish and Wildlife Service</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous Chemical Inventory Reporting Requirements</td>
<td>Any storage of hazardous chemicals that requires MSDS lists on site. (WAC 118-40)</td>
<td>Department of Ecology Community Right-to-know Unit</td>
</tr>
<tr>
<td>Wetlands</td>
<td>Any work and construction on or near a wetland. (WAC 173-201A)</td>
<td>Department of Ecology Office of Regulatory Assistance</td>
</tr>
<tr>
<td><strong>Local</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Permit</td>
<td>Any construction to new building and additions to the facility (WAC 51-50, 51-51)</td>
<td>Planning Division City of Bellingham (360) 778-8300</td>
</tr>
<tr>
<td>Noise Ordinance</td>
<td>Any additional noise as a result of the project (WAC 173-60, RCW 70.107)</td>
<td>Department of Ecology Office of Regulatory Assistance</td>
</tr>
</tbody>
</table>

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1.8 GLOSSARY

Activated Sludge Basin- Uses 90% pure oxygen to stimulate bacterial growth which further treats the waste and is part of the secondary treatment process.

Aerobic Basin- Produces aerobic conditions throughout the entire selector and subsequent basins, converting ammonia into nitrates.

Anaerobic Selector - A tank which creates an environment devoid of oxygen where primary effluent and return activated sludge is sent. This material is then sent to the aeration process of activated sludge treatment.

BOD (Biochemical Oxygen Demand)- An indirect way of measuring the amount of organic material present in water. In the case of the Post Point facility it is measured in pounds per day (ppd). The oxygen demand is how much dissolved oxygen in the water is used by bacteria. Therefore a higher presence of BOD means less dissolved oxygen.

BTU (British Thermal Unit) - A unit of energy that measures the heat given off when fuel is combusted. It is equivalent to a unit of heat equal to the amount of heat required to raise one pound of water one degree Fahrenheit at one atmosphere of pressure. One hundred BTUs per hour is equivalent to 29 watts.

CEPT (Chemically Enhanced Primary Treatment) – The process by which chemicals are added to primary sedimentation basins, causing suspended particles to clump together and settle out of the treated wastewater quickly, making water treatment fast and efficient.

Climate change - “a statistically significant variation in the mean state of the climate or its variability, persisting for an extended period (typically decades or longer). Climate change, as defined here, may be caused by natural internal processes or external forcings or by persistent anthropogenic changes in the composition of the atmosphere or land use” (IPCC, 2007, Working Group I).

COB - The City of Bellingham

eCO2 (equivalent CO2) - measurement of greenhouse gases in terms of their ratio of potency to carbon dioxide (CO2). ex., methane (CH4) is 21 times as potent as CO2, though much less abundant than CO2.

EIA (Environmental Impact Assessment) – An assessment of the possible impact that a proposed project may have on the surrounding environment.

EIS (Environmental Impact Statement) – A statement prepared under the requirements of the National Environmental Policy Act (NEPA) and Washington’s State Environmental Policy Act (SEPA) that analyzes any actions which will significantly affect the quality of the environment. It is a tool used for decision making, and suggests alternative actions as well as mitigation measures.

Flocculation - a process of contact and adhesion whereby the particles of a dispersion form larger-size clusters.

Greenhouse gas - Gases in the atmosphere which capture incoming solar radiation and re-radiate infrared heat to Earth’s surface. (based on IPCC, 2007)
HPO Generator (High Purity Oxygen Generator) - An activated sludge process which is fed from a pure oxygen gas stream (instead of air) to accomplish secondary level biological wastewater treatment in an enclosed bioreactor followed by a clarifier.

Methane - An odorless, colorless, flammable gas, CH₄. It is the major constituent of natural gas that is used as a fuel. It can be produced by the decomposition of organic matter, including wastewater sludge.

MGD - Million Gallons a Day

Mitigation – An action that will lessen, offset or alleviate a negative impact on the environment caused by a proposed project action.

Pocket estuary – A small, partly enclosed coastal body of water in which river water is mixed with seawater.

Polyelectrolyte - a substance of high molecular weight (as a protein) that is an electrolyte.

Primary Clarifier – A wastewater treatment component that allows inorganic and organic suspended solids to settle using gravity to the bottom of the tank, and be scraped away and removed from the wastewater before moving on to secondary treatment.

Rookery - The breeding ground for herons.

Salmonids – Includes salmon species, such as Chinook salmon, as well as trout and chars.

Secondary Clarifier – Similar function as the primary clarifier by using gravity to separate solids from the water in large tanks with a rotating arm. The water is then sent to a chlorine contact basin for further disinfection. The solids are then pumped back to the solids contact basin for further treatment.
Section Two:

Significant Impacts to the Natural Environment

Figure 5. View of Post Point Lagoon and Wastewater Treatment Plant, looking southwest.
2.1 EARTH

EXISTING CONDITIONS
The Post Point Wastewater Treatment Plant is located at the foot of a coastal bluff near the shores of Bellingham Bay. The topography of the site is relatively flat with slopes of 1-3 degrees running towards the bay. The soils are a Whatcom-Labounty mixture consisting of deep, level, and poorly drained soils which are remnants of glaciomarine drift plains. The upper part of the subsoil is made up of silt loam and the lower part mottled loam (USDA). Much of what the site is situated on is infill of previous wetland where the plant was first built in 1972. To the south and west of the plant lies a series of wetlands that lead to a lagoon on the edge of Bellingham Bay.

IMPACTS OF PROPOSED ACTION
The proposed action adopted by the City of Bellingham to expand the core process at the Post Point Wastewater Treatment Plant would entail building two large clarifiers (one for primary treatment and the other for secondary) along with four separate, smaller buildings housing oxygen pumps, anaerobic selectors, and sludge basins. The construction of these structures will occur predominantly on previously developed land that has been infilled, graded and paved. The exceptions are the two clarifiers, which have a portion of their footprint extending outside of the current perimeter fence. The position of the new primary clarifier is at the foot of the bluff (Building A, Fig. C, Appendix) while the new secondary clarifier (Building C, Fig. C, Appendix) extends out into the wetlands. Since the site was previously infilled and graded the risks regarding the stability of topography and soils on Post Point are minimal to none but geologically the risks of having one of the new clarifiers at the foot of the bluff poses moderate risk if there is an earth quake.

Building the new infrastructure may not pose issues with soils within the treatment plant’s perimeter fence, but could pose some risks to the soils in the vicinity of the plant. Currently the area to south and west of the new structures (Building A, Building B, and Building D, Fig. C, Appendix) are part of a public walking trail and off leash dog park. According to City of Bellingham officials, the weekly dog excrement bag use on the site averages about 400 bags (Routhe 2010). With a high weekly visitation rate on the site by both trail walkers and dog walkers, pushing the trail further out from the plant will mean that most of this traffic will be shifted into areas previously untouched by the majority of park users (assuming they all stay on the trail) into fragile wetlands.

On the property, a series of ten wetlands have been identified with varying importance. The City of Bellingham has set up a Critical Areas Ordinance (Chapter 16.55 of the Bellingham Municipal Code) in order to protect and regulate wetlands. Exemptions can be made that would declassify a wetland from carrying the critical area label. These exemptions would be based on the following information (City of Bellingham, 2009):

1) Wetlands less than 1,000 square feet that meet the following criteria.
   a) Wetland is not hydrologically connected to a Type 1 through Type 5 stream.
   b) Wetland does not contain habitat identified as essential for local populations of priority species identified by the Washington Department of Fish and Wildlife.
   c) Wetland is not part of a mosaic of wetlands.

2) Wetlands classified as Category III or IV between 1,000 square feet and 4,000 square feet may be exempt if they meet the following criteria.
   a) Wetland is hydrologically connected to a Type 1 through Type 5 stream
b) Wetland does not contain habitat identified as essential for local populations of priority species identified by the Washington Department of Fish and Wildlife.
c) Wetland is not part of a mosaic of wetlands.
d) Wetland does not score 20 points or more for habitat or 24 points or more for water quality in the wetland.

Out of the ten wetlands, three are considered critical areas and would require mitigation. The new secondary clarifier (Structure D., Fig. C, Appendix) will impede into one of these three critical area wetlands (wetland A, Fig. I, Appendix). The risks associated with expansion regarding the critical area wetlands on the site are moderate.

**IMPACTS OF THE ALTERNATIVE ACTION**

Utilizing the chemically enhanced primary treatment (CEPT) system, as outlined in the City of Bellingham’s alternative action, would have a lower physical footprint as compared to the proposed action (Fig. E, Appendix). As a result, infrastructure under this alternative would impede less than the proposal on the wetlands as the recreational trail would not need to be relocated. It may also have a reduced impact on soils in the open space to the south of the property. With a smaller footprint, this alternative does not require additional clarifiers and therefore will not impede on the bluff behind the treatment plant. There are no risks involved with topography, soils, and geology with the Alternative Action.

**IMPACTS OF NO ACTION**

The No Action Alternative will have no impacts on the soils, geology, or topography of the site.

**MITIGATION**

Efforts to effectively lessen the impact on wetland A (Fig. I, Appendix) must be considered particularly if the walking trail will impede further out into the wetlands as a result of the expansion. Plant buffers would be the most effective way to remove the majority of foot traffic away from the wetlands. Based on the Critical Areas Ordinance it is suggested that wetland A have a 50 foot buffer surrounding its boundary. Issues arise since the new secondary clarifier as outlined in the proposal will impede on the buffer. Thus, it is suggested that the City of Bellingham look into alternatives to onsite mitigation such as the In Lieu Fee (ILF). The ILF mitigation allows municipalities to pay a third party the expected costs of replacing the lost ecological functions of a wetland affected by a construction project. This payment would be pooled with others like it by a non-profit trust to be used on larger mitigation projects (Washington State Department of Ecology 2010).
2.2 AIR: AIR QUALITY & GREENHOUSE GASES

EXISTING CONDITIONS

Air pollution from the wastewater treatment plant primarily comes in the form of odors emitted from the clarifiers off gassing. Another source of air pollution comes from the solid waste incinerator, permitted by the State of Washington and held to specific performance and safety standards as outlined in WAC 173-350-040.

According to an internationally recognized body of climate scientists, the International Panel on Climate Change, “global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values” (IPCC Summary 2007). The group adds that “most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations” [(IPCC Summary 2007), emphasis added]. This anthropogenic climate change is also anticipated to cause further average planetary warming in a range between 1.8 and 6.4 degrees Celsius in the period 2090 – 2099 relative to the period 1980-1999. A simplified diagram of the greenhouse effect by which climate change occurs is shown below.

![Diagram of the greenhouse effect](image)

While the exact effects of climate change will vary from region to region (IPCC, Summary 2007) climate change is very likely to affect Bellingham. For instance, it is expected to cause rising sea levels and a diminishing glacial pack, which Bellingham residents rely upon for water (City of Bellingham 2007).

Carbon dioxide, one of the greenhouse gases which is very likely to be causing anthropogenic climate change, is used as a standard measurement of the many types of greenhouse gases, called eCO₂ or equivalent CO₂ (City of Bellingham 2007). As of 2005, it was estimated to be at 379 parts per million (ppm) in the atmosphere. This is a sharp increase over the 280 ppm in pre-industrial times (IPCC Summary 2007).
Currently, greenhouse gases are not part of SEPA’s environmental checklist. Thus, this section is written in anticipation of its future inclusion. The most recent adjustments to the federal American Power Act (S. 1733) call for “a 17 percent reduction in carbon pollution from 2005 levels by 2020; 42 percent by 2030 and 83 percent by 2050” (Samuelsohn 2010). This would also require states and cities to set greenhouse gas emission reduction goals (Samuelsohn 2010).

While greenhouse gas legislation has not been finalized at the federal level, the City of Bellingham has been planning for a reduction in greenhouse gases for many years. According to Bellingham’s 2007 Greenhouse Gas Inventory Report and Action Plan, government at all levels has an important role to play in the reduction of greenhouse gases. Part of this report analyzed sources of CO$_2$. In 2000, Bellingham produced about 950,793 tons of eCO$_2$. Of this, around 19,945 tons of eCO$_2$ were produced from municipal operations such as building’s energy use, vehicle usage, and streetlights. In 2000, 45.5% of municipal operations’ greenhouse gas equivalent came from water and wastewater treatment. However, the report also states that “management practices implemented in the 1990s have dramatically reduced the natural gas used at Post Point” (City of Bellingham 2007).

![Figure 7](image.jpg)

Figure 7. Greenhouse gas emissions in municipal water and sewage operations in 2000 and 2005, based on CACP Model Output (COB 2007).

Though the City is reducing its greenhouse gases by purchasing 100% green power, it does not have many means of producing energy thus far. This is known as attaining “technical carbon neutrality” which is defined as matching carbon output with offset practices while “aggressively” working to minimize carbon output (WWU 2009). On the other hand, “technical climate neutrality” would involve actually reaching net zero carbon emissions (WWU 2009). In order to get closer to “technical climate neutrality,” renewable energy would need to actually fuel the City.

Currently, there are several sources of greenhouse gases on-site, in addition to the energy produced for the plant. This includes the anaerobic respiration which occurs at the site, (COB 2007) producing methane gas, a greenhouse gas. It also includes the wetlands around the site, as wetlands are, worldwide, the largest natural source of methane (Wania, et al. 2004). The vehicles on-site are also sources of greenhouse gases.
IMPACTS OF PROPOSED ACTION

Increases in air pollution are expected as a result of construction. Emissions from construction vehicles and machinery will be the largest contributors to the temporarily decreased air quality during construction. The unearthing of soils may temporarily add to dust in the air around the treatment plant during expansion. With the addition of two more large clarifiers, likelihood that odors enter the air around the plant is increased.

An increase in the capacity of the plant will add to the amount of greenhouse gases. This can be measured, roughly, using King County’s carbon calculator tool (see below). However, much more data would be needed in order to calculate the exact carbon footprint. This information includes data on the life-cycle carbon costs of the buildings including their materials, their manufacturing, transport, assembly, and usage costs (ECIRC, n.d.). It would also include an analysis of the processes used in the buildings for wastewater treatment. While the exact materials used for the plant are not yet known, a rough estimate of their area was found utilizing GIS. In addition, there would be impacts from increased growth through housing, though the exact numerical value of this cannot yet be determined.

### Table 4. Greenhouse gas emissions in eCO2 as measured by the King County Greenhouse Gas Calculator (courtesy of King County)

<table>
<thead>
<tr>
<th>Type (Residential or Principal Activity (Commercial))</th>
<th># Units</th>
<th>Square Feet (in thousands of square feet)</th>
<th>Emissions Per Unit or Per Thousand Square Feet (MTCO2e)</th>
<th>Lifespan Emissions (MTCO2e)</th>
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</thead>
<tbody>
<tr>
<td>Single-Family Home</td>
<td>0</td>
<td>56</td>
<td>672</td>
<td>792</td>
</tr>
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<td>33</td>
<td>357</td>
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<td></td>
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<tr>
<td>Multi-Family Unit in Small Building</td>
<td>54</td>
<td>696</td>
<td>766</td>
<td></td>
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<tr>
<td>Mobile Home</td>
<td>41</td>
<td>476</td>
<td>706</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0</td>
<td>39</td>
<td>646</td>
<td>361</td>
</tr>
<tr>
<td>Food Sales</td>
<td>0</td>
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<td>1,541</td>
<td>282</td>
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<tr>
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<td>561</td>
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<tr>
<td>Health Care Inpatient</td>
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<td>1,338</td>
<td>582</td>
</tr>
<tr>
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<td>737</td>
<td>571</td>
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<tr>
<td>Lodging</td>
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<td>117</td>
</tr>
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<td>0</td>
<td>39</td>
<td>162</td>
<td>47</td>
</tr>
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</table>

**Total Project Emissions:** 85005

IMPACTS OF ALTERNATIVE ACTION

The impacts to air quality will be similar, if not slightly less as compared to the Proposed Action. With the CEPT process creating a smaller physical footprint there would be less digging and hauling of soils and therefore fewer particulates entering the air in and around the treatment plant. Reductions in fossil fuel emissions would also be expected to drop because fewer materials would need to be trucked into the site due to the smaller site footprint.
This design involves a smaller amount of square footage, so the estimate of greenhouse gases is smaller. The exact amount of materials used for this is not presently known, so it cannot be conclusively stated at the present time. In addition, the exact greenhouse gas impacts from growth and increased numbers of housing cannot yet be determined. However, an estimate, using the same procedures as in the Proposed Action is shown below.

<table>
<thead>
<tr>
<th>Type (Residential) or Principal Activity (Commercial)</th>
<th># Units</th>
<th>Square Feet (in thousands of square feet)</th>
<th>Emissions Per Unit or Per Thousand Square Foot (MTCO2e)</th>
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<tr>
<td>Single-Family Home ....................................</td>
<td>0</td>
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<td>Multi-Family Unit in Small Building .................</td>
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<td>681 766 0</td>
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<td>0.0</td>
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<tr>
<td>Food Sales ............................................</td>
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<td>1541 282 0</td>
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<td>1594 561 0</td>
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<td>0.0</td>
<td>39</td>
<td>577 247 0</td>
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<tr>
<td>Vacant ..................................................</td>
<td>0.0</td>
<td>39</td>
<td>162 47 0</td>
</tr>
</tbody>
</table>

| Total Project Emissions: ................................| 39354   |                                             |                                                             |

Table 5. Greenhouse gas emissions in eCO2 as measured by the King County Greenhouse Gas Calculator (courtesy of King County)

**IMPACTS OF NO ACTION**
There will be no significant impacts on air quality or greenhouse gases if no action is taken.

**MITIGATION**
In order to lessen the impacts that construction will have on air quality, measures must be taken to cut down on airborne particulates. Mitigation could include full covering of removed soils when being transported and keeping unearthed soils moist with water on site to cut down on dust particles entering the air.

There would be a small increase in the amount of greenhouse gases, as more chemicals would be needed to treat the wastewater (Routhe 2010). However, this amount is dependent on the life-cycle of the chemicals as explained above and is not calculable based on current information. There is no feasible mitigation for this at this point in time, though alternatives should be explored in the future.
2.3 ANIMALS: HERON, FISH, AND OTHER SPECIES

EXISTING CONDITIONS
The upland portion of the property provides habitat for bald eagles and heron (Eissinger, Draft Wildlife Assessment, 2003). The site is also home to “a variety of water birds, shorebirds and gulls” (Eissinger, Draft Wildlife Assessment, 2003).

Heron are a Priority Species according to the Washington State Department of Fish and Wildlife due to their “vulnerability of aggregations, and [because they also] include species or groups of animals susceptible to population declines by virtue of their inclination to aggregate” (Conolly 2009). A rookery between the site and the Edgemoor neighborhood to the South has been monitored since 2000, after heron sightings were reported. The City of Bellingham prepared a management plan for the rookery in 2003 (Eissinger, Heron Management Plan, 2003). Monitoring of the site has occurred since 2002 (Eissigner 2009).

The rookery site is bordered by other essential heron habitat, including upland forest, grassland field, freshwater, estuarine and nearshore marine areas. It is occupied by large numbers of heron in the spring and summer and by smaller numbers of heron year-round. The numbers of heron roosting at the site have varied, reaching a maximum of 74 adults in 2006. However, the colony was abandoned mid-season in 2008 and 2009. The exact cause for this is unknown, though bald eagle predation and human disturbance are likely to have played a part (Eissinger 2009).

A major cause of human disturbance is a trail which was put in illegally by residents of Shorewood in early 2009. This trail allowed access from the residences above to the wastewater treatment’s main trails, cutting through heron habitat. This trail was subsequently blocked by the City of Bellingham (Eissinger 2009). Noise may still be an issue, but as heron fledglings have just been born, as of early May 2010, it is currently unknown if the colony will or will not abandon mid-season this year (Eissinger 2010).

Recommendations from the 2003 Heron Colony Management Plan (Eissinger 2003) include:
- 100 ft permanent No-Entry/ No-Activity Buffer
- 250-ft permanent Non-Disturbance buffer, with restricted use limited to primarily passive recreation. Seasonal timing restrictions would limit other activities between March 1 and August 31
- Refining buffers through a systematic monitoring effort

Since heron are a Priority Species, their habitat is a critical area, part of the City’s Fish and Wildlife Conservation Area, as stated in the Bellingham Municipal Code (BMC 16.55.470). While critical areas must usually “be managed consistent with best available science” (BMC 16.55.470 B), there are exemptions to this, including “Waste Water Treatment Plant expansion” (BMC 16.55.080 D11). In order to receive an exemption though, the project proponent, in this case, the City, must show that:

1. There is no practical alternative to the proposed development with less impact on the City’s critical areas
2. Any proposed alteration of a critical alteration of a critical area to construct the essential public facility is the minimum necessary to accommodate the essential public facility
3. The construction of the essential public facility minimizes the adverse impacts on the critical area; and
4. The construction of the essential public facility utilizes best available science and results in no net loss of function to the type of critical area being impacted (BMC 16.55.080 D11)
The Post Point Lagoon and nearby Bellingham Bay provide habitat for numerous other species, including the following:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dungeness crab</td>
<td>Cancer magister</td>
</tr>
<tr>
<td>six rayed sea star</td>
<td>Leptasterias hexactis</td>
</tr>
<tr>
<td>red rock crab</td>
<td>Cancer productus</td>
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<tr>
<td>white tentacles</td>
<td>Cucumaria piperata</td>
</tr>
<tr>
<td>Graceful, smooth carapace</td>
<td>Cancer gracilis</td>
</tr>
<tr>
<td>orange common</td>
<td>Cucumaria miniata</td>
</tr>
<tr>
<td>hermit crabs</td>
<td>Pagurus spp.</td>
</tr>
<tr>
<td>long-rayed brittle star</td>
<td>Amphiodia occidentalis</td>
</tr>
<tr>
<td>Graceful kelp crab</td>
<td>Pugettia gracilis</td>
</tr>
<tr>
<td>Northern kelp crab</td>
<td>Pugettia producta</td>
</tr>
<tr>
<td>small amphipod</td>
<td>Idotea spp.</td>
</tr>
<tr>
<td>smalleyed &amp; Sitka shrimp</td>
<td>Heptacarpus spp.</td>
</tr>
<tr>
<td>Oregon crab</td>
<td>Hemigrapsus oregenensis</td>
</tr>
<tr>
<td>encrusting sponge</td>
<td>Haliclona spp.</td>
</tr>
<tr>
<td>nude claw</td>
<td>Hemigrapsus nudus</td>
</tr>
<tr>
<td>small urn sponge</td>
<td>Leucilla nuttingi</td>
</tr>
<tr>
<td>littleneck clam</td>
<td>Clinocardium spp.</td>
</tr>
<tr>
<td>colonial tunicate</td>
<td>Distaplia occidentalis</td>
</tr>
<tr>
<td>mud snail</td>
<td>Batillaria attramentaria</td>
</tr>
<tr>
<td>tiny clam</td>
<td>Gemma gemma</td>
</tr>
<tr>
<td>hooded nudibranch</td>
<td>Melibe leonina</td>
</tr>
<tr>
<td>chiton</td>
<td>Mopalia spp.</td>
</tr>
<tr>
<td>clear shell</td>
<td>Haminaea vesicula</td>
</tr>
<tr>
<td>limpet</td>
<td>Collisella pelta</td>
</tr>
<tr>
<td>orange nudibranch</td>
<td>Anisodoris nobilis</td>
</tr>
<tr>
<td>Chink shell</td>
<td>Lacuna variegata</td>
</tr>
<tr>
<td>bryozoan</td>
<td>Bugula spp.</td>
</tr>
<tr>
<td>bay mussel</td>
<td>Mytilis edulis</td>
</tr>
<tr>
<td>hydroid</td>
<td>Obelia spp.</td>
</tr>
<tr>
<td>Japanese oyster</td>
<td>Crassostrea gigas</td>
</tr>
<tr>
<td>white-spotted rose anemone</td>
<td>Tealia lofotensis</td>
</tr>
<tr>
<td>barnacle</td>
<td>Balanus spp.</td>
</tr>
<tr>
<td>brooding sea anemone</td>
<td>Epiactis prolifera</td>
</tr>
<tr>
<td>common sticklebacks</td>
<td>Gasterosteus aculeatus aculeatus</td>
</tr>
<tr>
<td>tube-snout fish</td>
<td>Aulorhynchus flavidus</td>
</tr>
<tr>
<td>shiner perch</td>
<td>Cymatogaster aggregata</td>
</tr>
<tr>
<td>pacific staghorn sculpin</td>
<td>Leptocottus armatus</td>
</tr>
<tr>
<td>starry flounder</td>
<td>Platichthys stellatus</td>
</tr>
<tr>
<td>pacific herring</td>
<td>Clupea pallasii pallasii</td>
</tr>
<tr>
<td>Chinook salmon</td>
<td>Oncorhynchus tshawytscha</td>
</tr>
<tr>
<td>Chum salmon</td>
<td>Oncorhynchus keta</td>
</tr>
<tr>
<td>Sockeye salmon</td>
<td>Oncorhynchus nerka</td>
</tr>
</tbody>
</table>

Table 6. Post Point Lagoon animal species (Post Point Lagoon Monitoring 2005).
In addition, “otter and muskrat [have been] observed” in this area (Eissinger Draft Wildlife Assessment 2003).

The Bellingham Bay is considered to be “critical habitat” for three salmonids listed above and the species are afforded protection under the Endangered Species Act of 1973 (Post Point Lagoon Monitoring 2005).

Pharmaceutical chemical leaching from the WWTP may be of concern to species around the bay, particularly fish. Estrogen is one such chemical of concern. It has been shown to cause hormone disturbances in fish near wastewater treatment systems. One effect of this includes male fish becoming females (Kidd, et al. 2007). While the study was done in a freshwater system, Chinook salmon have also been shown to be affected by the same chemicals (Piferrer 1992).

The WWTP does not currently measure pharmaceutical chemicals nor does it have methods to prevent them from entering the water stream (Eissinger 2010). Further research should be performed in Bellingham Bay to determine the extent of such exposure, if any.

**IMPACTS OF PROPOSED ACTION**

Construction will impact the heron site, as it will be completed within the 100ft boundary of the site. Under Bellingham law, this is allowed if the conditions under BMC 16.55.080 D11 are met, including the provision of utilizing “best available science” (Connolly 2009). However, further study of the heron colony’s ability to tolerate the construction should occur before decisions are made (Eissinger 2010). Thus, such study is mandated prior to construction.

Construction will have minimal impact on the fish and other species, except birds, in the area. Pharmaceuticals and other synthetic chemicals could be an issue as detailed above and should be further researched.

**IMPACTS OF ALTERNATIVE ACTION**

Construction will have minimal impact on the fish and other species, except birds, in the area. While more research is needed, it is likely that heron could be impacted due to noise caused by construction (Eissinger 2010). Thus, more research into the effects on heron by an appropriately trained biologist is necessary before construction proceeds. Pharmaceuticals and other synthetic chemicals could be an issue as detailed above and should be further researched.

**IMPACTS OF NO ACTION**

There will be minimal impact to the site’s heron and other birds if no action is taken, due to disturbance caused by recreational users and their dogs as described above. Pharmaceuticals and other synthetic chemicals could be an issue as detailed above.

**MITIGATION**

For the proposed action, due to space limitations (Fig C., Appendix) it will not be possible to utilize the area next to the clarifier for a trail once construction has begun. Thus, the trail should be relocated.

Building should not occur during the breeding season (March 1 to August 31), as per the Heron Recommendations (Eissinger 2003). This restriction could be abbreviated if a biologist determines that the heron young have fledged or abandonment has occurred before August 31 (Conolly 2009). It is
further recommended by ESA Adolfson, an environmental consulting group, that red alders should be planted around the 100 foot buffer to enhance this buffer. It is suggested that the lagoon habitat is fenced to provide protection and that the eelgrass beds continue to be protected. While these recommendations are not currently law, they fall under the definition of “best available science” (Conolly 2009), which is a necessary part of the critical areas ordinance.

As noted above, further studies should be done by an appropriately trained biologist, as detailed above, in order to determine the impacts of this project (Eissinger 2010). Additional signage should be put up by the City and affiliated non-profit organizations around the heron nesting area and the lagoon in order to educate users about their impact on the area, including noise caused by the recreational users and their dogs. This will encourage less damage on the property as has been noted in previous studies of the area (Post Point Lagoon Monitoring 2005).

Pharmaceuticals should be monitored in accordance with current (and future) research studies. This is in accordance with the necessity of using the “best available science” in these areas, as described in a 2009 letter to the City by an environmental consultant (Conolly, 2009).

For the alternative action, buildings and trails will not go in the heron 100-ft buffer zone. The same recommendations for construction times, alder plantings, and eelgrass restrictions as above are under effect. In addition, further studies need to be completed, additional signage, and additional pharmaceuticals research is suggested as per the remarks in mitigation of the proposed action.

For no action, the same recommendations for alder plantings, and eelgrass restrictions as above are under effect. In addition, further studies need to be completed, additional signage, and additional pharmaceuticals research is suggested.
Section Three:

Significant Impacts to the Built Environment

Figure 8. Entrance to Post Point Wastewater Treatment Plant.
3.1 ENVIRONMENTAL HEALTH: HAZARDOUS MATERIALS AND NOISE

EXISTING CONDITIONS
The existing facility has a chlorine gas system which is used in the secondary treatment process. This chlorine could be used to compensate for the increased demand for primary treatment if expansion occurs (City of Bellingham June 2009, 8-12). Chlorine is currently used in the secondary process because there is no additional primary clarifier and there are already safety procedures in place for this system (City of Bellingham June 2009, 9-15). The facility follows necessary safety procedures for the use of this potentially toxic substance at the level at which chlorine is currently used in the treatment process.

There are currently some noise impacts on the neighborhoods near the Post Point WWTP. These impacts are a result of operations of the plant, including the running of the plant machinery. Most of the noise impacts in the previous plant expansion were voluntarily mitigated for by planting a perimeter of trees outside of the fence and all machinery is housed within buildings and building materials are absorptive which decreases the noise impacts on the surrounding community (City of Bellingham 1988, 3).

IMPACTS OF PROPOSED ACTION
The addition of a primary clarifier prevents the use of chemicals in the primary and secondary treatment processes. The construction of a third primary clarifier would limit the amount of chemicals used and the risk of exposure and hazards would be greatly reduced.

The noise impacts of the proposal are minimal with mitigation which is already included in the proposal and moderate without. Noise created by this project will be from construction, traffic to the construction site and operations of the plant.

IMPACTS OF ALTERNATIVE ACTION
The CEPT process is classified as a minimal impact by this study. The CEPT process uses chemical treatment to increase the capacity of the Post Point WWTP (City of Bellingham July 14, 2009). The chemicals used in this process are typically ferric chloride and aluminum sulfate, which are common chemicals used in treatment facilities (Chagnon). The addition of chemicals and the transportation and storage of the chemicals on site will increase the risk of exposure and danger for the plant.

As compared to the proposal this alternative will have fewer noise impacts. Fewer structures would be constructed, allowing for decreased construction noise (City of Bellingham July 14, 2009).

IMPACTS OF NO ACTION
There will be significant impacts if no action occurs. The City would have to use chemicals to compensate for the limited capacity of the plant if the expansion does not take place (Routhe 2010). Hazards posed by the chemicals would have to be taken into account if they are introduced to the plant.

There are no noise impacts for the no action alternative. No additional structures will be built and no construction will take place, resulting in no change to the current noise impacts.
Mitigation

Proper MSDS standards and fact sheets would have to be followed and included where the chemicals are housed on the plant to mitigate for the potential impacts (City of Bellingham June 2009). These procedures are utilized by the plant but these standards will need to be improved and maintained to mitigate for the impacts of the addition of new chemicals and increase in the quantity of the existing chlorine.

To mitigate for noise, construction will only take place during business hours, 7am-7pm, some concrete structures will be pre-cast and shipped to the site, limiting the construction noise onsite, and trees and a fence will be replaced around the perimeter of the plant after completion of the project to mitigate for additional noise (Routhe 2010). Methods that were used to prevent noise in the past include noise structures inside buildings and building materials that are absorptive to decrease noise impacts (City of Bellingham 1988, 3). These methods should also be used in the construction of the new structures. In mitigating for noise, city regulations for noise must be complied with as well (Washington State Department of Ecology 2007).


3.2 LAND & SHORELINE USE

EXISTING CONDITIONS
The site is owned by the city and is primarily used for the treatment plant facility. Other uses on the site include a dog park and a walking trail, which cuts through the wetland, located outside of the fenced treatment plant. The shoreline master program for the shoreline is classified as urban maritime-water oriented uses and urban maritime-shoreline mixed uses, adjacent to the Post Point WWTP (City of Bellingham June 2009, Appendix A).

IMPACTS OF PROPOSED ACTION
Some change for land and shoreline use of the site will occur as a result of the proposal. The trail will be moved with expansion and the expansion will take place within city property lines, on the site in question. Impact on environmentally sensitive areas on the wetlands will occur as a result of this proposal. The fourth secondary clarifier will be built within the buffer for heron habitat in the wetland and the fence and walking trail will be moved around the new secondary clarifier, further into the wetland and heron habitat area (City of Bellingham June 2009, 10-16). (Fig C, Appendix)

IMPACTS OF ALTERNATIVE ACTION
There will be a minimal to no impact for the alternative action. The boundaries of the plant would not be changed and less onsite construction would be used (Fig E, Appendix). The primary impact is infill of open space on the treatment site, however the open space is within the fenced perimeter and surrounded by other facility treatment structures.

IMPACTS OF NO ACTION
There is no impact for the no action alternative. The uses of the site will not change.

MITIGATION
The proposed action would replace the old walking trail with a new one within the heron habitat and build a new secondary clarifier within the same area. There is no known on site mitigation for the impacts of the moving of the trail to the wetland and the heron habitat other than no action. The trail would have to be moved somewhere else, so that it was not rebuilt within the heron habitat.
3.3 HOUSING

EXISTING CONDITIONS
The Post Point Wastewater Treatment Plant provides wastewater treatment for the citizens of the City of Bellingham and the surrounding community, in addition to treating septic tank waste that is brought in from private homes throughout Whatcom County. It is currently estimated that the Post Point WWTP serves about 30 square miles with about 83,000 customers in the Bellingham area (City of Bellingham, Post Point Wastewater Treatment Plant Facilities Planning). The City provides sewer services to all customers within the city limits, and currently limits sewer access to customers in the Urban Growth Areas. Most housing units in the Bellingham area are sewer serviced, and the wastewater collected through the sewer service is treated at Post Point WWTP.

IMPACTS OF PROPOSED ACTION
Bellingham, Washington is a growing community, and development is currently pushing the city boundaries as the community continues to expand. Urban Growth Areas have been identified for the City of Bellingham, and are expected to support the population growth forecasts for the next 20 years. The City is required to show that there is enough developable space in the city and the UGA to accommodate the forecasted growth in Bellingham, and this must be supported by a plan that will provide vital services and public facilities to the newly developed areas. Sewage and wastewater treatment is certainly a part of these services and public facilities, and is an important consideration. The Growth Management Act requires that a public facilities plan is made which will show how sewage treatment will occur for any newly developed areas.
The City of Bellingham’s 2006 Comprehensive Plan states that the projected growth for Bellingham is about 1,580 people per year, making the projected population for Bellingham in the year 2026 about 116,200 people (Fig. J, Appendix). It is clear that as the population of Bellingham continues to grow, there will be more wastewater that needs to be treated at Post Point Wastewater Treatment Plant. At the same time, it can be argued that the plant’s proposed expansion through the City of Bellingham’s Comprehensive Sewer Plan, Alternative 1B (presented here as the Proposed Action), will in turn cause more development and population growth because the needed infrastructure for expansion and development will already be in place. When important service infrastructure like wastewater treatment is already in place, it is easier for developers to develop new areas. It is impossible to predict how much, if any, development the presently proposed expansion action would inspire, but it is important to note that the expansion of the plant as explained in the proposed action could potentially act as a catalyst to future development in the City of Bellingham.

**IMPACTS OF ALTERNATIVE ACTION**

Since the alternative action also increases the wastewater treatment capacity that the Post Point Wastewater Treatment Plant, it can also be argued that this improved capacity could cause more development and growth in the City of Bellingham and its UGA’s. Since the plant will be capable of supporting a higher infl ow of wastewater, developers could be persuaded more easily to develop in Bellingham due to the infrastructure improvements for wastewater treatment.

**IMPACTS OF NO ACTION**

If no action was taken and the wastewater plant was not improved or expanded in any way, the population of Bellingham would continue to expand and the total housing number would continue to rise. As mentioned earlier, the projected population for Bellingham in the year 2031 is about 116,200 residents. With new residents come new houses, and this is projected to occur with or without expansion of the wastewater plant.

**MITIGATION**

Mitigation for this possible growth inducement is difficult to do, but it could be done by not allowing building permits for development outside of the UGAs and also limiting development to acceptable levels that match with the City of Bellingham’s Comprehensive Plan for future development. Growth beyond Bellingham’s current city limits is planned and capital facilities are required in this planning. This means that growth enducement would not go beyond the planned level provided that the possible growth is planned and monitored.
3.4 AESTHETICS

EXISTING CONDITIONS
The Post Point Wastewater Treatment plant is located at the end of Harris Avenue in Fairhaven. It is in the Fairhaven Neighborhood and its southern boundary touches the Edgemoor Neighborhood. The housing in the immediate vicinity of the plant is in both the Fairhaven and Edgemoor Neighborhoods, and consists of low density detached single family dwelling units. Eighteen single family homes currently line the perimeter of the Post Point Wastewater Treatment Plant property on the East and South sides, and have views of the plant. Additional homes surrounding the plant also have the potential for views of the plant depending on the home orientation. Currently a downward slope, trees, vegetation, and open space work to separate the homes from the wastewater plant and orient the views from the homes toward Bellingham Bay and away from the Post Point plant (Edgemoor Land Use 2006). The entire perimeter of the plant is surrounded by trees in order to block views of the plant as much as possible. Due to the change in topography between the plant and the residential area, the treatment plant blends in well with the area, and is easily overlooked for views of Bellingham Bay.

IMPACTS OF PROPOSED ACTION
The Proposed Action to expand the core process will result in aesthetic changes to the affected area. This proposed action requires a total of six new structures to be built which includes one primary clarifier, one anaerobic selector, two activated sludge basins, one new secondary clarifier, and a replacement/additional oxygen system. Although the building footprints for all of these structures are mostly within the trail boundary that currently surrounds the plant, the overall look of the plant will be altered due to the addition of the new structures. The primary clarifier (Structure A on Fig. C, Appendix) is a circular structure that is primarily built underground. The diameter of the primary clarifier is approximately 120 feet. Its upper structure is about ten feet above ground and it drops fifteen feet below ground making it have the lowest height of any newly proposed structure. The two activated sludge basins, identified as (Structure C, Fig. C, Appendix), will likely be tallest height of any of the newly proposed structures. The estimated height of the structure is about 20 feet. This is comparable to the existing structures that are currently on the site and will not likely obstruct any views of the bay area. The primary building material for the newly proposed structures is concrete, some of which is pre-cast, and will be brought into the plant in large pre-constructed pieces. The construction of the six proposed structures will not likely cause the obstruction of any views, as the construction is mostly within the existing perimeter of the plant.

IMPACTS OF ALTERNATIVE ACTION
The alternative action involves the use of a new CEPT process, and will result in aesthetic changes to the affected area. The alternative action requires the construction of a CEPT facility, a new rectangular primary clarifier, an additional HPO generator, and a new aerobic basin. No new structures will be higher than any structures that currently exist on the site, and it is unlikely that any views will be blocked, altered or obstructed.

The primary building material for the newly proposed structures is concrete, some of which is pre-cast, and will be brought into the plant in large pre-constructed pieces. The construction of the six proposed structures will not likely cause the obstruction of any views, as the construction is mostly within the existing perimeter of the plant.
IMPACTS OF NO ACTION
There will be no aesthetic impacts under the condition that no action is taken to expand the Post Point Wastewater Treatment plant.

MITIGATION
In order to mitigate the aesthetic changes that building the new structures will cause, a perimeter of trees and shrubs will be planted around the site and along the site’s fence. Newly planted trees will be comparable in size to the fence height, and likely between six and ten feet tall at the time of planting. This will work to help block of view of the new structures, and help the plant as a whole blend in with the natural surroundings of the area. In addition, the secondary clarifier will be covered by concrete arches to screen views of the treated water, and all structures will have some architectural treatment that will make them similar to the other building styles that currently exist on the site. All of these measures will work to reduce visual impacts in the area related to the plant expansion (City of Bellingham 1988).
3.5 Recreation

Existing Conditions
The Lower Padden Creek and Larabee trail runs along the perimeter of the Post Point Wastewater Treatment Facility. There is also a large open field used as a dog park on the southeast corner of the property. This trail and adjacent dog park are open for public use and are used quite frequently.

Impacts for Proposed Action
The proposed plan will require the construction of a secondary clarifier on the west side of the facility. This structure will impede on the existing lower Padden Creek and Larabee trail, requiring the trail to be moved approximately 10 feet to the west. The change in the trail will infringe on the designated wetlands and Heron site. The trail will also be closed during construction (Fig. D, Appendix).

Impacts for Alternative Action
The alternative proposal will require the construction of an Anaerobic Selector. The placement of the Anaerobic Selector might impede on the lower Padden Creek and Larabee trail. This will require the trail to be slightly modified and extended into the open area dog park. The trail will be closed during construction (Fig E., Appendix).

Impacts of No Action
There will be no impacts if there is no action.

Mitigation
Since the proposed plan will impede on the wetlands and heron site, mitigation measures should be taken to reduce the impact on the sensitive area. The Lower Padden Creek and Larabee Trial should be cut short and discontinued at the Y split, making the trail a closed loop. The alternative expansion will have a slight impact due to the placement of the Anaerobic Selector. This will require the trail to be circumvented around the building, placing the trail further into the open area dog park. No mitigation measures are necessary for the no action alternative.
Section Four:

Non-Significant Impacts
to the
Natural & Built Environment

Figure 10. Flowers near the Post Point Wastewater Treatment Plant.
4.1 WATER

EXISTING CONDITIONS
The site is located within 200 feet of Bellingham Bay. Situated between the treatment plant and the bay is one of six pocket estuaries located in the area. The groundwater in the surrounding area is characteristic of Whatcom-Labounty soils. The water table is relatively high, and sits closer towards the surface as a result of the poor drainage of these types of soil (U.S.D.A 1992).

IMPACTS OF PROPOSED ACTION
Impacts of the Proposed Action on surface water will be beneficial. The current discharge of BOD is nearing its capacity of a maximum BOD load of 25,000 lbs/day per month (City of Bellingham 2009), and during high flow events has gone above what is allowed by the City’s NPDES permit for wastewater discharge. With the new “expanded core process” the water being discharged into Bellingham Bay will contain less BOD since the plant will be able to handle more inflow and effectively remove the increases of BOD, currently predicted at around 39,900 lbs/day per month by 2026, as a result of city population growth (City of Bellingham 2009). Impacts regarding surface run off will be minimal during the construction phase and should not add to suspended solids entering the pocket estuary or the bay from digging soils.

IMPACTS OF ALTERNATIVE ACTION
Like the Proposed Action, the Alternative Action will have a beneficial impact on surface water. With the CEPT process, chemicals are added to primary treatment to allow suspended solids to clump together and sink quicker allowing the rest of the treatment plant to run more efficiently and not be burdened by high inflows of wastewater during storm events (Chagnon). The effluent pumped into Bellingham Bay will contain less BOD, particulates, and organisms.

IMPACTS OF NO ACTION
If no action were taken to expand the treatment plant, the effluent being discharged from the plant will not meet NPDES permitting requirements and would have negative impacts. As a result, the waters of Bellingham Bay would be receiving secondary treated wastewater with high loads of BOD, risking the ecological health of the bay and residents.

MITIGATION
To reduce the chances of soil particulates entering the bay, precautions must be taken during the construction process with regards to unearthed soils and fill. Mitigation efforts would include construction during drier parts of the year to cut down on rainwater runoff, and use of hay barriers around the areas under construction.
4.2 PLANTS

EXISTING CONDITIONS
The site currently contains areas with grass, trees, and several wetlands. There are no threatened or endangered plants on the site (Washington Natural Heritage Program 2010).

Towards the South of the site, there is a stand of trees, which includes “Pacific paper birch (Betula papyrifera), big-leaf maple (Acer macrophyllum) and red alder (Alnus rubra)… and Douglas fir (Pseudotsuga menziesii)” (Eissinger 2009). Red alder and Douglas fir are prominent species in this area.

To the Southeast, along the bluff, vegetation consists primarily of the following:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Alder</td>
<td>Alnus rubra</td>
</tr>
<tr>
<td>Willow species</td>
<td>Salix spp.</td>
</tr>
<tr>
<td>Buttercup</td>
<td>Ranunculus repens</td>
</tr>
<tr>
<td>Salmonberry</td>
<td>Rubus spectabilis</td>
</tr>
<tr>
<td>Himalayan Blackberry</td>
<td>Rubus procerus</td>
</tr>
</tbody>
</table>

Table 7. Bluff Vegetation.

On the east of the site, directly surrounding the chain-link fence on the property, vegetation consists primarily of the following:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shore Pine</td>
<td>Pinus contorta</td>
</tr>
<tr>
<td>Salal</td>
<td>Gaultheria shallon</td>
</tr>
<tr>
<td>Buttercup</td>
<td>Ranunculus repens</td>
</tr>
<tr>
<td>Red Alder</td>
<td>Alnus rubra</td>
</tr>
<tr>
<td>Quaking Aspen</td>
<td>Populus tremuloides</td>
</tr>
</tbody>
</table>

Table 8. Vegetation around the chain-link fence.

In the areas surrounding the trail, vegetation consists of a variety of grasses, along with a few individuals of camas (Camassia quamash), vetch species (Vicia spp.), and beach pea (Lathyrus japonicas) (Penney, personal observation, 2010).

Other species observed along the wetlands surrounding the Eastern edge of the site and on the bluff include (Cantrell and Associates 2009):

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spiraea Species</td>
<td>Spiraea spp.</td>
</tr>
<tr>
<td>Western Red Cedar</td>
<td>Thuja plicata</td>
</tr>
<tr>
<td>Twinberry</td>
<td>Lonicera involucrata</td>
</tr>
<tr>
<td>Reed Canarygrass</td>
<td>Phalaris arundinacea</td>
</tr>
<tr>
<td>Giant Horsetail</td>
<td>Equisetum telmateia</td>
</tr>
<tr>
<td>Stinging Nettle</td>
<td>Urtica dioica</td>
</tr>
<tr>
<td>Common Tansy</td>
<td>Tanacetum vulgare</td>
</tr>
<tr>
<td>Dandelion</td>
<td>Taraxacum spp.</td>
</tr>
</tbody>
</table>

Table 9. Other plant species observed along the wetlands (Cantrell and Associates, 2009)
To the West of the site is Post Point Lagoon. It is one of seven remaining pocket estuaries within Bellingham City limits and has been the site of City-sponsored restoration efforts since 2005. In a 2005 survey of the area, the following species of plants/protists were found in and around the lagoon:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spiraea Species</td>
<td>Spiraea spp.</td>
</tr>
<tr>
<td>Western Red Cedar</td>
<td>Thuja plicata</td>
</tr>
<tr>
<td>Twinberry</td>
<td>Lonicera involucrata</td>
</tr>
<tr>
<td>Reed Canarygrass</td>
<td>Phalaris arundinacea</td>
</tr>
<tr>
<td>Giant Horsetail</td>
<td>Equisetum telmateia</td>
</tr>
<tr>
<td>Stinging Nettle</td>
<td>Urtica dioica</td>
</tr>
<tr>
<td>Common Tansy</td>
<td>Tanacetum vulgare</td>
</tr>
<tr>
<td>Dandelion</td>
<td>Taraxacum spp.</td>
</tr>
<tr>
<td>Colonial Bentgrass</td>
<td>Agrostis capillaris</td>
</tr>
<tr>
<td>Redtop</td>
<td>Agrostis gigantea</td>
</tr>
<tr>
<td>Nookta Rose</td>
<td>Rosa nutkana</td>
</tr>
<tr>
<td>Lady Fern</td>
<td>Athyrium spp.</td>
</tr>
<tr>
<td>Slough Sedge</td>
<td>Carex obnupta</td>
</tr>
<tr>
<td>Fringe Cup</td>
<td>Tellima grandiflora</td>
</tr>
<tr>
<td>Sword Fern</td>
<td>Polystichum munitum</td>
</tr>
<tr>
<td>Black Hawthorn</td>
<td>Crataegus douglasii</td>
</tr>
<tr>
<td>Red Osier Dogwood</td>
<td>Cornus sericea</td>
</tr>
<tr>
<td>Western Hemlock</td>
<td>Tsuga heterophylla</td>
</tr>
<tr>
<td>Snowberry</td>
<td>Symphoricarpos albus</td>
</tr>
<tr>
<td>Indian Plum</td>
<td>Oemleria cerasiformis</td>
</tr>
<tr>
<td>Trailing Blackberry</td>
<td>Rubus ursinus</td>
</tr>
<tr>
<td>Dwarf Oregon Grape</td>
<td>Mahonia nervosa</td>
</tr>
<tr>
<td>English Holly</td>
<td>Ilex aquifolium</td>
</tr>
<tr>
<td>Oceanspray</td>
<td>Holodiscus discolor</td>
</tr>
<tr>
<td>Red Elderberry</td>
<td>Sambucus racemosa</td>
</tr>
<tr>
<td>Red Fescue</td>
<td>Festuca rubra</td>
</tr>
<tr>
<td>Orchard Grass</td>
<td>Dactylis spp.</td>
</tr>
<tr>
<td>English plantain</td>
<td>Plantago lanceolata</td>
</tr>
<tr>
<td>Velvetgrass</td>
<td>Holcus lanatus</td>
</tr>
<tr>
<td>Rock Weed</td>
<td>Fucus gardneri</td>
</tr>
<tr>
<td>Green Bladed Algae</td>
<td>Ulva spp.</td>
</tr>
<tr>
<td>Pickleweed</td>
<td>Salicornia virginica</td>
</tr>
<tr>
<td>Seashore Saltgrass</td>
<td>Distichlis spicata</td>
</tr>
<tr>
<td>Seashore Bluegrass</td>
<td>Poa macrantha</td>
</tr>
<tr>
<td>Mud Rush</td>
<td>Juncus gerardii</td>
</tr>
<tr>
<td>Orache/Spearscale</td>
<td>Atriplex patula</td>
</tr>
<tr>
<td>Sea Plantain</td>
<td>Plantago maritima spp.</td>
</tr>
<tr>
<td>Sea Arrow Grass</td>
<td>Triglochin maritimum</td>
</tr>
<tr>
<td>Meadow/Foxtail Barley</td>
<td>Hordeum</td>
</tr>
<tr>
<td>Tufted Hairgrass</td>
<td>Deschampsia spp.</td>
</tr>
<tr>
<td>Eelgrass</td>
<td>Zostera marina</td>
</tr>
</tbody>
</table>

Table 10. Other species observed along the wetlands (Cantrell and Associates 2009)

Table 11. Other plant species observed along the Post Point Lagoon (City of Bellingham 2005)
Restoration of the macro algae and saltwater marsh species in table 11 is currently ongoing at the Post Point Lagoon. These species provide habitat for many types of organisms, including salmonids and heron (City Of Bellingham 2005). Areas with the greatest amounts of eelgrass, a submerged aquatic plant, are the areas most frequently inhabited by heron (Eissinger 2009).

**IMPACTS OF PROPOSED ACTION**
Construction will entail the removal of vegetation along the South and Southeastern portions near the current chain-link fence boundary (Fig. C, Appendix) between the site and the walking trail.

**IMPACTS OF ALTERNATIVE ACTION**
Construction will entail the removal of vegetation along the South and Southeastern portions near the current chain-link fence boundary, between the site and the walking trail. This involves less vegetation removal than the Proposed Action, due to the placement of the facilities.

**IMPACTS OF NO ACTION**
There is no impact to the site’s vegetation if no action is taken.

**MITIGATION**
For the proposed action, the vegetation should be replanted on the expected perimeter of the new site before construction of the new structures begins. This will prevent excess runoff and nutrient loss from occurring (Bormann 1968). The same recommendations suggested in the proposed action applies to the alternative action. No mitigation will be needed if no action is taken.
4.3 ENERGY & NATURAL RESOURCES

EXISTING CONDITIONS
Energy use at the current plant is approximately 51 billion BTUs (City of Bellingham 1988). This plant is served by electricity from Puget Sound Energy and natural gas from Cascade Gas. As per the City’s contract with Puget Sound Energy, one hundred percent of the electricity from Puget Sound Energy will be part of a renewable energy credit program administered by the City of Bellingham (Routhe 2010).

The potential use of solar energy by adjacent properties would not be affected by the proposal due to their location on the northern end of the parcel.

IMPACTS OF PROPOSED ACTION
The proposed action is expected to consume energy at a higher rate than that of the current plant. While methane production from sewage sludge has been used at similar facilities, this is not currently feasible at the Post Point Plant, due to the amount of water used in the sludge, which decreases its ability to be combusted (Routhe 2010).

IMPACTS OF ALTERNATIVE ACTION
The proposed alternative is also expected to consume a greater amount energy than the current plant. While methane production from sewage sludge has been used at similar facilities, this is not currently feasible at the Post Point Plant, due to the amount of water used in the sludge, which decreases its ability to be combusted (Routhe 2010).

IMPACTS OF NO ACTION
The no action alternative will not consume more energy than the current plant.

MITIGATION
For the proposed action, no mitigation is specifically required for this action. In the future, it is recommended that methane production options continued to be explored, to take advantage of improvements in methane production technology. Mitigation will be the same as for the proposed action and no mitigation will be needed as more energy will not be consumed in the no action alternative.
4.4 LIGHT AND GLARE

EXISTING CONDITIONS
Currently the Post Point Wastewater Treatment Plant uses lighting on the individual structures for safety purposes. The lighting is currently used at night, but is minimized by measures to deflect the light downward. Lighting along the periphery of the plant is used minimally to discourage the use of the peripheral trail during the night, and to minimized potential crime around the edge of the plant (Routhe 2010).

At this time, the greatest sources of off-site light pollution in the Post Point area are from the single family residential dwelling units that surround the wastewater treatment plant in the Edgemore Neighborhood and the industrial area to the North of the wastewater treatment plant, which includes a train station that is frequently serviced.

IMPACTS OF PROPOSED ACTION
The proposed action will require the construction of six new structures on the Post Point site. These structures will require lighting for safety reasons, but the lighting will be deflected downward so as to cause minimal disturbance. Also, the lighting along the periphery of the plant that would be needed on newly proposed structures A, the primary clarifier, B, the anaerobic selector, C, the two activated sludge basins, and D, the secondary clarifier, will be minimal in order to keep people from using the trail at night, and in order to mitigate potential crime (Fig. C, Appendix).

IMPACTS OF ALTERNATIVE ACTION
The alternative action will require the construction of a CEPT facility, a new rectangular primary clarifier, an additional HPO generator, and a new aerobic basin. These structures will also require lighting at night for safety reasons, but the lighting will also be deflected downward and used minimally along the periphery of the plant as described above.

IMPACTS OF NO ACTION
The impacts of light and glare will remain the same as they are currently under the condition that no action to expand the plant is taken.

MITIGATION
Mitigation for new lighting that will be installed at the wastewater treatment plant includes deflection of the light downward, which minimizes the larger effect of the artificial light on the larger area. Also, keeping lighting concentrated at the center of the plant and away from the edges makes lighting less visible to the surrounding homes, businesses, and industries.
4.5 HISTORICAL & CULTURAL PRESERVATION

EXISTING CONDITIONS
During the last upgrade of this facility the EIA recognized an archeological site registered with the State of Washington (45-WH-17). It was first recorded in 1970. There were cobble choppers, characterized as “open camps”. The site obliterated by construction of the Post point plant in mid 1970s. The previous EIA also noted that the upgrade to the plant will not affect the archeological site. However, precautions should be taken during construction (City of Bellingham 1988).

IMPACTS OF PROPOSED ACTION
There will be no impacts to the historical and cultural preservation under the proposed action.

IMPACTS OF ALTERNATIVE ACTION
There will be no impacts to the historical and cultural preservation under the alternative action.

IMPACTS OF NO ACTION
There will be no impacts to historical and cultural preservation if no action is taken.

MITIGATION
No mitigation necessary for historical and cultural preservation.
4.6 TRANSPORTATION

EXISTING CONDITIONS
The Post Point Waste Water Treatment Facility can only be accessed through McKenzie Ave. This road runs east to west and connects to 4th street which runs north and south. Fourth St. T’s with Harris Ave which is the main arterial. There are no bus routes that go to the facility, but there is a bus and train station and ferry terminal approximately .2 miles from the facility on Harris Ave.

IMPACTS OF PROPOSED ACTION
There will be minimal, temporary impact during the three year construction period with an approximate increase of two vehicles per day (Routhe 2010).

IMPACTS OF ALTERNATIVE ACTION
There will be minimal, temporary impact during the three year construction period with an approximate increase of two vehicles per day (Routhe 2010).

IMPACTS OF NO ACTION
There will be no impacts on transportation if no action is taken.

MITIGATION
For the proposed and alternative action, trucks will only enter the site during typical business hours (Routhe 2010).
4.7 Public Services

Existing Conditions
The Post Point Wastewater Treatment Plant currently has electrical, water, natural gas, refuse, telephone, and sanitary utilities provided on site. These utilities are provided by Puget Sound Energy, Sanitary Service Company, and Cascade Gas.

Impacts of Proposed Action
The expansion of the core process of the plant will have no apparent need for additional public services such as fire protection, police protection, health care and schools (Routhe 2010).

Impacts of Alternative Action
The CEPT process is expected to create a higher demand on energy usage but the facility's utilities serving such a process would be the same as those that serve the current facility.

Impacts of No Action
A no action alternative would place no further demand on public services than are currently present.

Mitigation
The impacts on public services by the proposed, alternative and no action options are seen as non-significant because they utilize much of the existing facility. The Post Point Plant will only operate at a greater capacity using the same processes which means there is not an increased need for public services. There are no recommended mitigation actions.
4.8 UTILITIES

EXISTING CONDITIONS
Public services utilized are fire and police protection which is provided by the Bellingham Fire Department and Bellingham Police Department.

IMPACTS OF PROPOSED ACTION
The expansion of the core process of the plant will have no apparent need for additional public services such as fire protection, police protection, health care and schools (Routhe 2010).

IMPACTS OF ALTERNATIVE ACTION
There is no foreseeable impact on public services since the CEPT process is relatively small and the plant would still operate using current processes (Carlson).

IMPACTS OF NO ACTION
A no action alternative would place no further demands on utilities than are currently present.

MITIGATION
The impacts on utilities by the proposed, alternative and no action alternatives are seen as non-significant because they utilize much of the existing facility. The Post Point Plant will only operate at a greater capacity using the same processes which means no additional utilities. With such extensive use of existing utilities, there are no recommended mitigation actions.
Section Five:

Works Cited

Figure 11. 100 ft-No Entrance Boundary for heron.


Conolly, Catherine Letter to Rory Routhe. 19 Oct. 2009. City of Bellingham Collection, Bellingham, WA.


Morin, Andrew L., and Thomas P. Gilligan. *High Purity Oxygen Biological and Nutrient Removal (BNR)*.


Piferrer, Francesco and Donaldson, Edward M. 1992. *The Comparative Effectiveness of the Natural and a Synthetic Estrogen for the Direct Feminization of Chinook Salmon (Oncorhynchus tshawytscha)*. Department of Fisheries and Oceans, Biological Sciences Branch, West Vancouver Laboratory, West Vancouver, B.C. Canada


Figure 12. Post Point Lagoon, looking West.
FIG. A- CITY OF BELLINGHAM MAP (WYLER 2010)
Components

A. Primary clarifier
   (NOTE: may be eliminated with chemically enhanced primary treatment)
B. Anaerobic selector
C. Two activated sludge basins
D. Fourth secondary clarifier
E. Replacement and addition of oxygen system
FIG. D. SCHEMATIC: PROPOSED ACTION (CITY OF BELLINGHAM 2010)

Secondary Process Bypass

Note:
Shaded items are existing.
Colored items are proposed.

PROCESS SCHEMATIC

PRELIMINARY SITE LAYOUT
FIG. E. MAP OF ALTERNATIVE ACTION (CITY OF BELLENGHAM 2010)
FIG. F. POST POINT NEST AREA WITH BUFFERS (EISSINGER 2003)
FIG G. POST POINT NEST AREA WITH PROPOSED ACTION (EISSINGER 2003)
FIG. H. POST POINT NEST AREA WITH ALTERNATIVE ACTION (EISSINGER 2003)
FIG. 1. DETAILED MAP OF ON-SITE WETLANDS (CANTRELL & ASSOCIATES 2009)
FIG. J. TRIPLE BOTTOM LINE CRITERIA (CARLSON)

FIG. K. TRIPLE BOTTOM LINE ANALYSIS FOR PROPOSED ACTION (CARLSON)
FIG. 1. INFLUENT BOD ANALYSIS (CARLSON)

![Influent BOD Pounds Post Point Treatment Plant](image)

TABLE A. BASIS OF PLANNING POPULATION (CARLSON)

<table>
<thead>
<tr>
<th>Population</th>
<th>Year 2002</th>
<th>Year 2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Limits</td>
<td>69,260</td>
<td>89,835</td>
</tr>
<tr>
<td>UGA</td>
<td>12,194</td>
<td>26,365</td>
</tr>
<tr>
<td>Total</td>
<td>81,454</td>
<td>116,200</td>
</tr>
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