# Appendix J
# ENVIRONMENTAL DOCUMENTATION

- Checklists/Notice of Application (NOA)
  - SERP Checklist
  - SEPA Checklist
  - Notice of Application for SEPA
- SERP Crosscutter Report
- Biological Assessment
- Section 106 of NHPA Compliance
  - Plan to Comply with Section 106 of the NHPA
  - Outfall Memo
  - WWTP Memo

# SERP Checklist

# State Environmental Review Process (SERP) Coversheet for SRF Applicants and Recipients

DEPARTMENT OF ECOLOGY
State of Washington

| **Applicant and Project Information** | |
|---|---|
| Applicant Name (Agency): City of Oak Harbor | |
| Project Title: Oak Harbor Wastewater Facilities Plan and Treatment Facility | |
| Project Contact Person: Joe Stowell, PE | Telephone: (360)-279-4520 |
| Address: 865 SE Barrington Drive, Oak Harbor, WA 98277 | |
| Email: jstowell@oakharbor.org | |
| Brief Project Description: The City of Oak Harbor is currently serviced by two aging wastewater treatment facilities. A new treatment facility is needed to replace the City's existing treatment facilities with a plant capable of meeting the City's wastewater utility goal to "obtain the highest water quality practical while recognizing the limitations of rate payers of the City to fund the improvements." The City is proposing to replace it's existing wastewater facilities and failing outfalls with a new treatment plant and replacement outfall into Oak Harbor. | |

Please submit all SERP documentation listed below together with this form to Ecology's Regional Engineer or Manager and the SERP Coordinator for review and approval.

Check the boxes below to indicate that the SERP Packet includes the documentation for the items listed and complies with Ecology guidance and procedures. Provide comments for additional information when needed.

Detailed SERP guidance can be found on the internet:
http://www.ecy.wa.gov/programs/wq/funding/GrantLoanMgmtDocs/Eng/GrantLoanMgmtEngRes.html

1. SEPA review documentation:
   a. ☒ SEPA checklist.
   b. ☒ The signed SEPA determination.
   c. ☒ Documentation that the lead agency solicited public comments (affidavit of publication or similar).
   d. ☐ Any comments received by the lead agency.
      ☐ No comments received.
   e. ☐ Categorical exemption. (*Provide documentation of the review and determination that the project qualified for categorical exemption.*)

   Comments:

2. Cost effectiveness analysis documentation:
   (*Required for projects that are categorically exempt from SEPA. Not all boxes have to be checked to meet this requirement. Not required for nonpoint projects that are also considered facilities.*)
   a. ☒ A complete description of the alternatives that were considered.

b. ☒ Documentation that all appropriate alternatives were considered (regional approaches, reclaimed water, alternative technologies, I/I correction, etc.)

c. ☒ Comparison of monetary costs/benefits of each alternative.

   i. ☒ Consideration of capital, operation, maintenance, replacement costs (20 year present value).

   ii. ☒ Estimate of sewer rates using different financing alternatives.

   iii. ☒ Data for hardship analysis (if appropriate).

d. ☒ Comparison of non-monetary costs/benefits of each alternative, including environmental impact, energy impacts, growth impacts, and community priorities.

e. ☒ Information supports that selected alternative represents the cost effective alternative.

Comments: Chapter 8 of the Facilities Plan contains a summary of the alternatives evaluated as part of this project. Chapter 9 of the Facilities Plan contains details of the financial analysis conducted for the project.

3. Documentation of public participation in the selection process:

a. ☒ Public meeting announcement.

b. ☒ Meeting agenda listing discussion of environmental impacts.

c. ☒ Meeting agenda listing discussion of alternatives, costs, and rate impacts.

d. ☐ Public meeting not required due to SEPA categorical exemption.

Comments: Section 6.5.1 and Appendix A of the Facilities Plan summarize all of the public and city council presentations that have been conducted as part of this project.

# SEPA Checklist

# OAK HARBOR WASTEWATER FACILITIES PLAN AND TREATMENT FACILITY

## SEPA Checklist

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JUL 3 1 2013

CITY OF OAK HARBOR
Development Services Department

**Prepared for:**

**City of Oak Harbor** **July 2013**

# TABLE OF CONTENTS

# ENVIRONMENTAL CHECKLIST

## A. BACKGROUND

**1. Name of the proposed project:**

Oak Harbor Wastewater Treatment Facility

**2. Name of Applicant:**

City of Oak Harbor

**3. Address and telephone number of applicant and contact person:**

Joe Stowell, PE, City Engineer
City of Oak Harbor Department of Public Works
865 SE Barrington Drive
Oak Harbor, Washington 98277
(360) 279-4520

**4. Date checklist prepared:**

July 2013

**5. Agency requesting checklist:**

City of Oak Harbor

**6. Proposed timing or schedule (including phasing, if applicable):**

Construction of the treatment plant is proposed to begin in mid-2015 and last for approximately 2 years. Outfall construction is proposed to begin in the late summer of 2014 and last for approximately 3 months.

**7. Plans for future additions, expansion, or further activity related to or connected with this proposal:**

This wastewater facility, collection system, and outfall are being designed to accommodate flows projected through 2030, and be expandable to accommodate flows projected through 2060. Additional conveyance lines may be needed in the service area (the Urban Growth Area (UGA)) as flows increase.

The City evaluated several options in the Facilities Plan, and is moving forward with two options: 1) includes flows from the Navy; and 2) does not include flows from the Navy (City flows only). Although both options are described in the Facilities Plan, this SEPA document addresses only the second option, flows from the city only. This option includes a new outfall into Oak Harbor, and a new MBR treatment facility in the Windjammer Vicinity. Should the Navy decide to participate, the project scope will be expanded to include conveyance improvements between the new MBR facility and the Navy base. To convey flows from the Navy Seaplane Base to the new MBR treatment plant, approximately 20,000 feet of new pipe and additional pump stations would be required to convey flows to the City's new treatment plant. This piping will be included in the project only if the Navy chooses to connect to the City's new facility.

These improvements are described in detail in the Facilities Plan (Carollo Engineers, March 2013). If the Navy decides to convey flows to the City's new treatment facility, additional environmental review will be conducted of the conveyance system. Depending upon the type and location of the facilities required, the system will undergo NEPA and /or SEPA review. A decision from the Navy whether to transfer flows to the city is anticipated in the fall of 2013.

**8. Environmental information that has been prepared, or will be prepared, directly related to this project:**

- *Draft City of Oak Harbor Wastewater Facilities Plan*, Carollo and BHC Consultants, March 2013
- *Oak Harbor Wastewater Treatment Facilities Biological Assessment*, ESA, March 2013
- Cultural Resources for City of Oak Harbor Wastewater Treatment Plant Memorandum, ESA Paragon, March 2013.
- *Final Technical Memorandum No. 5 Evaluation of Outfall Alternatives,* Cosmopolitan Marine Engineering, October 1, 2012.
- *Oak Harbor Wastewater Treatment Plant Site Selection – Wetland Reconnaissance of Freund Site and Windjammer Park Technical Memorandum*, Environmental Science Associates, November 2012.

**9. Applications that are pending for governmental approvals or other proposals directly affecting the property covered by the proposal:**

There are no pending governmental project approvals.

**10. List of governmental approvals or permits that will be needed for the proposal:**

Numerous federal, state and local permits and approvals will be required for this project. Listed below are the anticipated permits and approvals.

Federal

- Endangered Species Act (ESA) Compliance – US Fish and Wildlife Service / National Marine Fisheries Service
- Section 106 of the National Historic Preservation Act compliance – Washington Department of Archaeology and Historic Preservation
- Section 404/401 of the Clean Water Act Nationwide Permit – Corps of Engineers

State

- Wastewater Facility Plan and State Environmental Review Process approval - Washington Department of Ecology
- National Pollution Discharge Elimination Systems (NPDES) wastewater discharge – Washington Department of Ecology
- NPDES Construction Stormwater General Permit – Washington Department of Ecology
- Water Reclamation Standards Compliance – Washington Departments of Ecology and Health
- Section 401 Water Quality Certification - Washington Department of Ecology
- Hydraulic Project Approval – Washington Department of Fish and Wildlife
- Coastal Zone Management Consistency Determination - Washington Department of Ecology
- Aquatic Land Lease – Washington Department of Natural Resources
- Air Quality Order of Approval to Construct– Northwest Clean Air Agency

Local

- Comprehensive Plan Amendment – City of Oak Harbor
- Shoreline Substantial Development Permit - City of Oak Harbor
- Critical Areas Review – City of Oak Harbor
- Site Plan Approval (and associated approvals) - City of Oak Harbor
- Floodplain Development Permit – City of Oak Harbor
- Grading Permit– City of Oak Harbor
- International Fire Code Compliance – City of Oak Harbor
- Building Permit – City of Oak Harbor
- Excavation (Right of Way) Permit – City of Oak Harbor

**11. Brief, complete description of the proposal, including the proposed uses and the size of the project and site:**

The City of Oak Harbor (City) began their wastewater facility planning process in 2009. The City's wastewater system serves approximately 24,000 people within the City and the Navy Seaplane Base. Wastewater is currently treated at two facilities: a rotating biological contactor (RBC) facility in Windjammer Park, and a lagoon facility on the Navy's Seaplane Base. The City is proposing to replace the current wastewater treatment facilities with a new 3.9 million gallon per day (mgd) wastewater treatment facility located on 4 acres in the vicinity of Windjammer Park inside city limits (Figure 2).

A facility is needed to meet the objectives listed below. Although the existing facilities are currently able to meet the requirements of the City's National Pollution Discharge Elimination System (NPDES) Permit, they are not able to provide reliable long term service for a number of reasons:

- The existing RBC facility is nearing the end of its useful life.
- Both the RBC and Lagoon Plants lack the technology to meet increasingly stringent water quality standards, and have inadequate capacity to keep pace with anticipated population growth.
- Both effluent outfalls have seen major failures; the RBC Oak Harbor outfall no longer functions and the Crescent Harbor outfall is functional but damaged.
- The area surrounding the Seaplane Base Lagoon Plant was reclaimed as a saltwater marsh in 2009. The lagoons are now surrounded by environmentally sensitive areas and are subject to frequent high water conditions, making expansion or modifications to the new lagoons infeasible.

A new treatment facility is needed to replace the City's existing treatment facilities with a plant capable of meeting the City's wastewater utility goal to "obtain the highest water quality practical while recognizing the limitations of rate payers of the City to fund the improvements." Specific project objectives include:

1. Providing continued reliable wastewater treatment service,
2. Meeting high standards for water quality,
3. Allowing phased expansion to meet future demands, and
4. Delivering construction and operation of a new facility by 2017 in a cost-effective manner.

As part of the facility planning, the City of Oak Harbor began reaching out to residents and stakeholders when they began the site selection process in November 2010. A public meeting was held in December of 2010 to introduce the project and gather input about candidate sites. Between April 2011 and March 2013, the City held five public open houses (three of which were combined with City Council workshops) to present and get input on site locations, cost analyses, rate information, conceptual renderings, and the proposed schedule. The project was presented and discussed at eight additional City Council meetings and workshops, which were open to the public. The City issued a press release in January 2011 illustrating the proposed sites and soliciting public input. In spring 2011, the City conducted an online survey, which was completed by over 100 individuals. The City produced a program for public television in June 2011 covering the final list of sites selected by the City Council and requesting input on the site evaluation process, the treatment plant process selection, and the outfall location. The City also presented to the Rotary Club in March 2012 and hosted a two-day Site Master Planning Charrette in June 2012. Through this process, the City selected the Windjammer Vicinity site as their preferred alternative based upon community input and a comparison of cost and non-cost parameters. Detailed information on the alternatives evaluation and the public process can be found in section 6.5.1 of the Facility Plan – Volume I and Appendix A of the Facility Plan (Volume II) (Carollo Engineers, March 2013).

The proposed project will include the following components (Figure 2):

- Membrane biological reactor (MBR) wastewater treatment facility in the vicinity of Windjammer Park. The project consists of:
    - Construction of eight buildings on a roughly 4-acre site. The exact footprint has not been determined at this time, but is expected to range from 87,000 to 169,000 square feet. The buildings will be 15 to 35 feet high and will house preliminary treatment, MBR facilities, UV disinfection, chemicals, solids treatment, odor control, effluent storage, and administration, laboratories, maintenance and electrical.
    - Construction of two aeration buildings, an equalization basin and waste activated sludge basin below ground.
    - Preliminary treatment: Raw sewage will be pumped, screened, degritted and equalized prior to secondary treatment.
    - Secondary treatment: The screened, degritted raw sewage will be treated in an aeration basin followed by membrane filtration with MBR. The secondary effluent will be capable of meeting an effluent total inorganic nitrogen concentration of 8 mg/L, effluent total suspended solids and carbonaceous biochemical oxygen demand concentration of 10 mg/L.
    - Disinfection: Ultra Violet (UV).
    - Solids Treatment: Waste activated sludge (WAS) will be dewatered and dried producing a Class A beneficial reuse product.

- Conveyance facilities and support buildings and facilities, as identified during preliminary design:
  - Approximately 300 feet of new pipe from the treatment facility to the replacement outfall in Oak Harbor.
- Replacement of the 2,100-foot long outfall constructed in close proximity to the existing failed outfall in Oak Harbor:
  - 30-inch diameter pipe,
  - High density polyethylene (HDPE) or concreted coated steel,
  - Pipe will be fully buried from the shoreline to the diffuser,
  - Existing outfall pipe will be abandoned in place, and
  - New 184-foot long diffuser at the end of the outfall with 24 diffuser ports.

Currently the project is at the pre-design stage. A Facility Plan has been prepared and submitted to the Department of Ecology (Ecology) for review and approval. Several aspects of the facility design and treatment quality have been finalized; however some items are still being developed. Design of the treatment plant will follow later this year, following selection of a site footprint. The outfall location has been finalized, and design is currently at the 30 percent stage. Outfall construction is anticipated to occur sooner than construction of the treatment plant to allow use by the existing RBC plant in the event of a failure of the RBC diversion pump station or force main.

**12. Location of the proposal, including street address, if any, and section, township, and range; legal description; site plan; vicinity map; and topographical map, if reasonably available:**

The project site is located in the vicinity of Windjammer Park, located in the City of Oak Harbor at 1600 S. Beeksma Drive. The site is located in Township 32 North, Range 01 East, Sections 2 and 39. See Figures 1 and 2 for project location.

## B. ENVIRONMENTAL ELEMENTS

### 1. Earth

#### a. General description of the site (underline):

<u>Flat</u>, rolling, hilly, steep slopes, mountainous.

The project site is relatively flat with some steeper slopes down to Oak Harbor to the south of the project area.

**b. What is the steepest slope on the site (approximate percent slope)?**

The wastewater service area consists of gently sloping terrain toward Oak Harbor. Typical slopes within the study area are 3 to 6 percent. The area of the proposed treatment plant is flat.

**c. What general types of soils are found on the site (for example clay, sand, gravel, peat, muck)? Specify the classification of agricultural soils and note any prime farmland.**

Geologic characteristics in the City of Oak Harbor are largely the result of regional glacial processes. Erosion and deposition associated with glaciation have strongly influenced regional topography, soils, and groundwater characteristics.

The park and commercial areas are located within the City's commercial core and have been developed for decades. Soils mapping shows that soils in Windjammer Park are organic and consist of peat deposit, and are not considered prime farmland (Carollo Engineers, March 2013).

**d. Are there any surface indications or a history of unstable soils in the immediate vicinity? If so, describe.**

Soils mapping shows that Windjammer Park has a moderate to high susceptibility to liquefaction (Carollo Engineers, March 2013).

**e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate the source of the fill.**

Construction of the proposed MBR facility would require extensive excavation and grading within the 3 to 4 acre area. Some of the facilities, such as the aeration basins and waste activated sludge (WAS) basins would be constructed below ground surface elevation; therefore, some shoring and installation of stone columns to support the tanks would be required. This would require excavation approximately 35 feet below ground surface elevation.

It is estimated that between 5,000 and 9,000 cubic yards of fill and approximately 1,400 to 1,800 cubic yards of stone will be needed to be imported for the project. Site grading activities are site-specific, and will be determined when the final location and footprint for the MBR facility have been selected within the Windjammer Vicinity. In general, the grade of the treatment plant site will be elevated approximately 2 to 3 feet above existing grade to provide the required level of flood control. Excavated material will likely be used for site fill, and the balance of excavated material will be removed from the site.

**f. Could erosion occur as a result of clearing, construction, or use?**

The proposed action will include the temporary disturbance of soils during grading and excavating activities and potential construction dewatering activity necessary to construct the MBR facility and associated conveyance lines and pump stations. Grading and excavating could result in erosion from disturbed upland soils and increase the sediment load in runoff potentially entering Oak Harbor, Windjammer Park Lagoon, and adjacent wetlands.

**g. About what percent of the site will be covered with impervious surfaces after project construction (for example buildings or asphalt)?**

Construction of the treatment facility is expected to consist of approximately 155,000 square feet of impervious surface area, or 90 percent of the 4-acre site. Depending upon final site location, the facility may be located in areas currently covered by impervious surfaces. The existing 1.5 acre RBC facility will be demolished during construction of the new treatment plant and depending on the final site location the space of the existing RBC plant will either be used for the new treatment plant or will be returned to park space.

**h. Describe the proposed measures to reduce or control erosion, or other impacts to the earth, if any.**

Erosion and sedimentation impacts during construction are anticipated to be minor as the site is mostly flat. During construction, Best Management Practices (BMPs) will be employed to minimize the amount of erosion and sediment leaving the site. The BMPs will be consistent with the Washington State Department of Ecology and the City of Oak Harbor erosion control standards and, and may include the use of inlet protection, silt fence, straw wattles, and sediment traps as necessary. Following construction, disturbed areas will be paved or hydroseeded promptly. Temporary erosion and sedimentation control (TESC) measures will be included as part of the project design and construction. The TESC Plan will meet the requirements of Ecology and the City of Oak Harbor standards, as well as additional measures deemed appropriate for the project. The measures may be adjusted in the field as necessary based upon changing site conditions. Additional BMPs are listed below in question 6.d.

Sub-surface measures will be implemented to address liquefaction potential. At present, the most likely method of sub-surface stabilization appears to be stone columns. This will be confirmed during design.

**2. Air**

**a. What types of emissions to the air would result from the proposal (e.g. dust, automobile, odors, industrial, wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities, if known.**

Typical construction machinery will be used for this project. There will be minimal impacts from dust and equipment exhaust emissions during construction. These impacts would be temporary.

The treatment plant will be equipped with odor-reducing systems and will be largely enclosed which will reduce the potential for odor impacts after project completion. The plant will include multiple stages of treatment for all potential sources of foul odor. These sources will be covered, scrubbed, and diluted prior to release into the atmosphere. The proposed odor control system is much improved over the current odor control systems at the RBC plant. In addition, an air quality Order of Approval to Construct will be required from the Northwest Clean Air Agency (NWCAA) for construction and operation of the treatment plant.

While operation of the treatment plant will result in some air emissions, industrial processes are not viewed as a significant source of greenhouse gas emissions (Ecology, 2007).

A portion of the effluent will be treated to Class A standards for reclaimed water. Class A reclaimed water typically has no odors associated with it.

**b. Are there any off-site sources of emissions or odors that may affect your proposal? If so, generally describe.**

There are no off-site sources of emissions or odors affecting this project.

**c. Describe proposed measures to reduce or control emissions or other impacts to air, if any.**

Measures that could be incorporated during construction to minimize impacts to air quality include:

- Watering of construction surfaces to control dust, temporary ground covers, sprinkling the project site with approved dust palliatives, or use of temporary stabilization practices upon completion of grading.
- Contract specifications would encourage use of well maintained construction vehicles, to reduce vehicle emissions. Contractors would be encouraged to offer carpooling options for employees. When possible, use of local building materials would be preferred to reduce transport distances.

The NWCAA regulates construction and modification of potential air contaminant sources in Island, Skagit, and Whatcom Counties. The Agency must be notified of construction projects so that it may review whether a permit is required; review requirements are outlined in Section 300 of the NWCAA regulations. As mentioned above, an air quality Order of Approval to Construct will be required from the Northwest Clean Air Agency (NWCAA) for construction of the treatment plant. It is anticipated that the operation of the new treatment plant would meet or exceed the applicable air quality requirements.

## 3. Water

### a. Surface:

**1. Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, and wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

Windjammer Lagoon, a small man-made lagoon, is located in the project area (Figure 2). The lagoon was constructed in Windjammer Park to provide a community swimming area. This lagoon is connected to Oak Harbor via a narrow 40-foot channel. A pedestrian trail and bridge cross the Windjammer Lagoon at the channel connection with Oak Harbor.

Oak Harbor, a marine water body connected to Saratoga Passage, is located immediately south of the project area (Figure 1). Oak Harbor, in the vicinity of the existing and proposed outfall, is an area considered as excellent marine receiving water for aquatic life uses, shellfish harvest, primary contact recreational uses and other miscellaneous uses including wildlife habitat, harvesting, commerce navigation, boating, and aesthetics (WAC 173-201A-612). However, It should be noted that Oak Harbor is listed as an area where shellfish harvest if prohibited by the Washington State Department of Health (DOH) due to proximity stormwater outfalls, wastewater outfalls, and the marina (DOH, 2009).

During site evaluations, consultant staff observed a ditch along the north property boundary of Windjammer Park. The ditch runs for almost 1,000 feet along the north end of the property. The ditch is narrow at the east and west ends (approximately 2 feet wide), and the central portion (approximately 700 feet) is up to 12 feet wide. Native wetland plants are dominant in the ditch and surface water was present. Formal delineation of the wetland has not been conducted on site, but criteria were met for all three wetland parameters. There was no flow in the ditch on October 30, 2012, but it appears that the ditch drains through culverts at both the west and east ends. This ditch would likely be regulated as a wetland (ESA, 2012).

Constructed wetlands are also present in the project vicinity, located on the west side of Beeksma Drive, on the south side of Bayshore Drive. These wetlands were constructed as mitigation for an offsite project as well as for wetland fill associated with the Bayshore Drive alignment.

2. **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

While the exact treatment plant footprint has not been determined at this time, it is likely that it would occur within 200 feet of Windjammer Lagoon and Oak Harbor (Figure 2). Construction of the new MBR facility may be in the vicinity of the wetland described in section 3.a.1 and may require filling portions of the wetland. The new outfall would be constructed across the beach and below the mean higher high water (MHHW) line in Oak Harbor adjacent to the existing outfall. Because of the location in the shoreline zone, a habitat impact assessment will be conducted as part of the shoreline permitting process.

3. **Estimate the amount of fill and dredge material that could be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill materials.**

Estimated earthwork quantities for outfall construction include:

- Excavate 11,000 cubic yards of native material for pipeline trench;
- Place 500 cubic yards of clean crushed aggregate for pipe bedding material;
- Backfill trench with 11,000 cubic yards of native material;
- Place 2,200 cubic yards of fish mix pea gravel within the intertidal zone.

Depending on the final location within the Windjammer Vicinity, the proposed treatment plant improvements could result in up to 4,000 square feet of fill within the on-site wetland ditch. The extent of wetland fill, if any, will be determined following final site selection. If fill of wetland ditch onsite is unavoidable, applicable permits and approvals would be obtained from the Corps of Engineers, Department of Ecology, and the City of Oak Harbor, and appropriate mitigation measures would be conducted in accordance with all agency requirements. Measures would likely include wetland creation, wetland enhancement, and/or wetland buffer enhancement of nearby wetland areas.

4. **Will the proposal require surface water withdrawals or diversion? Give general description, purpose, and approximate quantities, if known.**

This project is not expected to require surface water withdrawals or diversions.

5. **Does the proposal lie within a 100-year flood plain? If so, note location on the site plan.**

Depending upon the final site layout, the proposed new MBR facility may be located within a 100-year flood plain. Construction of new critical facilities would be, to the extent possible, located outside the limits of the base floodplain. Construction of new critical facilities are permissible within the base floodplain if no feasible alternative site is available (OHMC 17.20.190(3)). If development within a floodplain is required, the project must obtain a floodplain development permit. Critical facilities constructed within the base floodplain would have the lowest floor elevated to three feet or more above the level of the base flood elevation at the site. Floodproofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into floodwaters. Access routes elevated to or above the level of the base floodplain would be provided to all critical facilities to the extent possible. Any measures to elevate or improve existing streets will be addressed if the final location impacts existing elevations.

6. **Does the proposal involve discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

The overarching purpose of the project is to improve the quality of effluent that is currently discharged from two antiquated facilities (Lagoon and RBC Plants, which are among the poorest performing technologies known to the industry) with membrane quality effluent, which is widely accepted as state of the art for municipal wastewater treatment plants.

Overall, water quality in effluent and within the receiving water (Oak Harbor) is anticipated to improve as a result of the proposed action. Table 1 provides a summary of the existing effluent quality conditions at the RBC and Lagoon Plants and the targets and goals for the new facility.

**Table 1. Effluent Quality Goals
City of Oak Harbor**

| | RBC Plant NPDES Permit Limit | Lagoon Plant NPDES Permit Limit | New Facilities Target / Goal |
|---|---|---|---|
| **TSS** | 30 mg/L<br><br>85% removal | 75 mg/L<br><br>85% removal | 10 mg/L<br><br>95% removal |
| **CBOD5** | 25 mg/L<br><br>85% removal | 25 mg/L<br><br>85% removal | 10 mg/L<br><br>95% removal |
| **Turbidity** | Not applicable | Not applicable | 1 NTU |
| **Chlorine Residual** | 0.114 mg/L | 0.5 mg/L | No discharge |
| **Fecal Coliform** | 200/100 mL | 200/100 mL | <200/100 mL |

Wastewater effluent would be discharged from a new approximately 2,100-foot outfall into Oak Harbor, located immediately adjacent to an existing, failed outfall line. Effluent would be discharged via evenly spaced ports along the 184-foot long diffuser at the terminus of the outfall.

There will be an increase in effluent volume discharged from the outfall over the planning horizon, and the location of the outfall will change slightly, though it will be placed within 50 feet of the existing outfall. The proposed facility would meet more stringent NPDES permit limitations for applicable surface water quality standards, and is anticipated to improve effluent water quality over current conditions.

Based on historical records, the RBC Plant has reached its permitted flow limit of 0.7 mgd, and the Lagoon Plant is within 85 percent of the rated influent flow and BOD loading capacity. In response, the City developed the 2013 Draft Facilities Plan to assess the potential for upgrading the existing RBC and lagoon facilities (which was determined to be infeasible), recommend alternative treatment technologies and processes, and put forth a preferred alternative that would continue to meet current NPDES permit limits, provide improved effluent water quality, as well as meet the needs of future growth in the Service Area by increasing treatment capacity.

Construction of the new MBR facility would increase treatment capacity from a current monthly maximum of 3 mgd to a projected 3.9 mgd by 2030 (a 30 percent increase in discharge volume over existing conditions). This increase in capacity is needed to continue to meet applicable permit requirements while accommodating projected increases in wastewater influent flows and BOD and TSS loads over the 20-year planning horizon.

Based on maximum month flow projections, BOD loading is anticipated to be 6,849 lbs/day, TSS loading is anticipated to be 6,397 lbs/day, and ammonia loading is anticipated to be 768 lbs/day by the end of the planning horizon of 2030. The City has effluent target goals that are more stringent than the existing NPDES permit limits for conventional pollutants. Effluent quality targets for TSS and BOD are 95 percent removal, which would indicate that effluent concentrations would continue to meet current NPDES limits until the end of the planning horizon. In addition, the proposed facility would discontinue the use of chlorine in its disinfection process due to a conversion to UV, which would remove residual chlorine from the effluent. The reasonable potential analysis (RPA) conducted for the new MBR facility also indicated that there is no potential to exceed water quality standards for a variety of contaminants, including metals and ammonia based upon current flow and load projections for the to the year 2030.

The treatment plant will be equipped with standby power to operate during power outages. In addition, the facility will be designed for Class II redundancy and reliability in accordance with Washington State requirements.

**b. Ground**

**1. Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.**

Construction dewatering will be required for deep excavation areas (e.g., the two aeration basins, equalization basin and WAS storage basin, blower building and gallery). Quantities of water to be withdrawn are unknown at this time. It is expected that groundwater will be pumped to Baker Tanks (or another suitable means of dewatering treatment), allowed to settle, and then discharged to vegetated areas where it will either infiltrate on-site or be hauled off-site for disposal at an approved facility. BMPs will be in place to minimize erosion and sediment delivery to surface waters and reduce flow velocities that may result in erosion of upland soils. These BMPs would likely include silt fencing, straw bales, check dams, and straw wattles.

Up to 0.5 mgd of wastewater, treated to Class A reclaimed water standards, will be available for use at ballfields, parks, and for other municipal needs. Use of reclaimed water would reduce the need for potable water currently being used for these purposes.

**2. Describe waste material that will be discharged into the ground from septic tanks or other sources, if any. Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) is expected to serve.**

No waste material will be discharged into the ground as a result of this project. Highly treated reclaimed water, consistent with Washington State Class A Reclaimed Water Standards, would be available for surface application as irrigation water at ballfields, parks, and other municipal needs. Use of reclaimed water for irrigation and other non-potable uses would reduce demands on ground water used for other purposes in the area. All uses of reclaimed water will be consistent with the Washington State reclaimed water standards (DOH and Ecology, 1997).

**c. Water Runoff (including storm water)**

**1. Describe the source of runoff (including storm water) and method of collection and disposal, if any (including quantities if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

During project construction the work sites would be managed to control runoff and prevent erosion and sedimentation.

Stormwater design has not been completed at this time for the new MBR facility; however, stormwater will be treated for quantity and quality in accordance with the current Stormwater Management Manual for Western Washington (2012). It is anticipated that the majority of on-site stormwater that is generated within process areas (areas potentially exposed to influent or chemicals) would be diverted to and collected by the facility's storm drainage system and conveyed to the MBR facility for treatment and discharged to Oak Harbor via the new outfall. Stormwater generated from non-process areas will be directed to an approved process for controlled release to an infiltration trench at the lower end of the site. A final geotechnical report will be completed during final design and will address methods for surface and stormwater management.

**2. Could waste materials enter ground or surface waters? If so, generally describe.**

Runoff from the construction site has the potential to contain sediment and small amounts of equipment-related materials (motor oil, diesel fuel, hydraulic fluid). BMPs would be implemented to minimize equipment-related materials and sediment from leaving the site and potentially entering surface and ground waters.

**d. Describe proposed measures to reduce or control surface, ground, and runoff water impacts, if any.**

The project would be constructed in accordance with applicable state and local permits issued through Ecology and the City of Oak Harbor, which would specify a range of measures designed to reduce or control potential surface, ground, or runoff water impacts. Construction BMPs to reduce water quality impacts would include:

- Comprehensive erosion and sediment control plans will be developed and implemented for each phase of construction in accordance with the 2012 Stormwater Management Manual for Western Washington (Ecology, 2012) or updated versions as they become available. The plans could include elements for site stabilization, slope protection, drainage way protection, and sediment retention. The proposed action would also comply with applicable erosion control standards for the City of Oak Harbor.

- Spill and erosion prevention and sediment control plans, as well as observance of all applicable safety and environmental regulations for handling chemicals, will be in place to minimize risks.

- Straw bales or silt fences will be used to reduce runoff velocity in conjunction with collection, transport, and disposal of surface runoff generated in the construction zone.

- A silt/turbidity curtain would be used to confine turbidity within the immediate work area when constructing the in-water portion of the outfall.
- During construction, monitoring programs could be required to ensure compliance with the site erosion control plan and with local regulatory requirements. A Stormwater Pollution Prevention Plan (SWPPP) and Temporary Erosion and Sediment Control (TESC) plan will be included in project contract documents. The construction contractor and/or City staff would measure parameters such as turbidity, temperature, and pH of surface water discharge and visually monitor the site for signs of erosion and for correct implementation of control measures per these plans.
- To the extent possible, equipment will be stored and staged a minimum of 200 feet from surface waters when not in use.
- Refueling of equipment will take place a minimum of 200 feet from surface waters.
- In water work will be conducted in accordance with hydraulic code rules (Chapter 220-110 WAC), including approved in-water work windows for tidal reference area 8 (WAC 220-110-240), which typically corresponds to times when listed fish and forage species are least likely to be present (Corps, 2012). For the project area, this is anticipated to be July 16 through October 14. A hydraulic project approval (HPA) from WDFW has yet to be obtained for the proposed action; therefore, this is an approximate date.
- Any wetland impacts will be mitigated in accordance with local, state, and federal permit requirements.

## 4. Plants

### a. Types of vegetation found on-site:

Vegetation in the vicinity of Windjammer Park and the area proposed for the new MBR facility is comprised almost entirely of lawn grasses with scattered landscaping trees throughout the park, including ornamental maples and pine trees. The beach area adjacent to the shoreline contains scattered patches of dunegrass. A ditch on the site contains wetland plants including cattail, reed canarygrass, and spirea.

**b. What kind and amount of vegetation will be removed or altered?**

The exact project footprint for the treatment facility has not been determined at this time; however, it is expected to range from 87,000 to 169,000 square feet. The Windjammer Vicinity area includes an existing developed commercial property (buildings/asphalt) and a portion of Windjammer Park west of the existing RBC Plant. The park area consists primarily of maintained lawn; however, some landscaping trees occur in the vicinity of the proposed MBR facility and may be removed to accommodate the new facility. These landscaping trees currently provide little function to the marine nearshore, and their removal, if necessary, would not degrade existing baseline conditions. Outfall construction will result in temporary removal of some dune grasses; however these will be replanted following construction. At this time it is unknown if construction activities will impact the ditch containing wetland plants.

**c. List threatened or endangered species or critical habitat known to be on or near the site.**

Whidbey Island is home to five of the remaining 11 populations of golden paintbrush left in the world. The species once grew in prairie habitats from Vancouver Island, Canada south to Oregon's Willamette Valley. Golden paintbrush grows primarily in upland prairies, on generally flat grasslands. The largest of the Whidbey Island populations occurs near Forbes Point at Whidbey Island Naval Air Station immediately south of the project area. Whidbey Island populations also occur primarily along southwest and west facing grasslands. The project area is located within developed commercial properties and portions of a 28-acre community park. The park contains maintained lawn grass and landscaping trees and shrubs. The developed nature of the site as well as regular maintenance (mowing) of park lawn likely limits the potential for establishment of golden paintbrush. Therefore, golden paintbrush is not anticipated to occur within the immediate project area.

**d. Describe proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on-site.**

Vegetation likely to be removed would include maintained lawn and landscaping trees. Following construction, the site will be landscaped around the new facility, and the area of the existing treatment plant would be reclaimed for park use. Where possible, native vegetation would be used for landscaping, and lawn areas would be restored. Any dune grasses disturbed during construction will be replanted with native dune grasses. Final facility siting will take into account the presence of the wetland ditch on the site, and measures will be taken to avoid and/or minimize impacts to this area if possible. Therefore, impacts to vegetation in the area are anticipated to be minor.

## 5. Animals

**a. Underline any birds and animals which have been observed on or near the site or are known to be on or near the site:**

Due to the project location within commercial and public open space near the central business district, the terrestrial environment provides little in the way of habitat for wildlife species, other than those species adapted to developed landscapes. Birds and small mammals frequent the area.

The shallow intertidal areas of Oak Harbor are known to support spawning populations of sand lance and surf smelt and regular concentrations of Pacific herring are known to occur outside of the bay in Saratoga Passage. Pacific salmon, while not known to reproduce in any streams within the project area, are likely to utilize the nearshore zone for rearing and migration as juveniles. Other fish that may be found in Oak Harbor include steelhead, rockfish, bull trout, sturgeon, among other finfish and bottom fish.

An eelgrass (*Zostera marina*) survey was conducted of the outfall area, and eelgrass has not been documented within the vicinity of the proposed outfall and macro-algae presence is fairly limited due to the mud substrate and lack of structure for the algae to cling too (Grette Associates, 2012).

No known seal or sea lion haulouts are located within inner Oak Harbor; however, marine mammals including harbor seals, sea lions, and killer whales may use the area for migration, foraging, and resting (Orca Network, 2013).

**b. List any threatened or endangered species or critical habitat near the site.**

Several federally listed threatened or endangered species may be present in the project area. Table 2 shows the threatened and endangered species that may be present within the service area for the wastewater treatment facility.

While some of the listed species *may* be present in the Oak Harbor area, species such as all species of rockfish, humpback whale, and killer whale are not known to occur, or are highly unlikely to occur, within Oak Harbor. Other species, such as the salmonids and bull trout, are likely to occur within Oak Harbor and migrate through the area, but are not known to occur within any stream in the vicinity of Oak Harbor or its urban growth area.

**Table 2. Occurrence of Listed Species and Critical Habitat within the Project Area**

| Common Name | Scientific Name | ESA Status* | Jurisdiction | Critical Habitat** |
|---|---|---|---|---|
| Coastal-Puget Sound DPS Bull Trout | *Salvelinus confluentus* | Threatened | USFWS | Present |
| Puget Sound Evolutionarily Significant Unit (ESU) Chinook Salmon | *Oncorhynchus tshawytscha* | Threatened | NMFS | Present |
| Puget Sound Distinct Population Segment (DPS) Steelhead | *Oncorhynchus mykiss* | Threatened | NMFS | No |
| Yelloweye Rockfish | *Sebastes ruberrimus* | Threatened | NMFS | No |
| Canary Rockfish | *Sebastes pinniger* | Threatened | NMFS | No |
| Bocaccio Rockfish | *Sebastes paucispinis* | Endangered | NMFS | No |
| Southern DPS Green Sturgeon | *Acipenser medirostris* | Threatened | NMFS | No |
| Humpback Whale | *Megaptera novaeangliae* | Endangered | NMFS | No |
| Southern Resident Killer Whale | *Orcinus orca* | Endangered | NMFS | Present |
| Stellar Sea Lion | *Eumatopias jubatus* | Threatened | NMFS | No |
| Marbled Murrelet | *Brachyramphus marmoratus* | Threatened | USFWS | No |

***Threatened:** Species are likely to become endangered within the foreseeable future.

**Endangered:** A species that is in danger of extinction throughout all or a significant portion of its range.

The Endangered Species Act requires the Federal government to designate **"critical habitat"** for any species it lists under the ESA. Critical habitat is defined as:

1. Specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and
2. Specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation.

**c. Is the site part of a migratory route? If so, explain.**

The Puget Sound area, including Oak Harbor and the swimming lagoon in Windjammer Park, is located within the Pacific Flyway, which is a flight corridor for migrating waterfowl and other avian fauna. The Pacific Flyway extends south from Alaska to Mexico and South America. No portion of the proposed project would interfere with or alter the Pacific Flyway.

**d. Proposed measures to preserve or enhance wildlife, if any.**

Measures to preserve fish and other wildlife would include:

- In-water construction would occur during approved in-water work windows to minimize the potential for overlap of construction with fish presence, in accordance with permit requirements issued by the Washington Department of Fish and Wildlife.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.
- Spill prevention plans and other construction related BMP's will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No direct discharge of turbid construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.
- All equipment and hazardous materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters to the greatest extent possible.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a Spill Prevention Countermeasure and Control (SPCC) plan will be prepared specifically for this project.
- While some new impervious surface area will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for*

*Western Washington.* Stormwater generated from process areas will be collected and conveyed to the treatment plant for processing.

- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with work in regulated critical areas that are protective of aquatic resources. Future development requiring a federal permit or federal funding will undergo separate Endangered Species Act consultation.
- The proposed action will allow for the facility to provide improved water quality standards and meet future, more stringent NPDES permit requirements, which are expected to be increasingly protective of in-water resources and biota.

## 6. Energy and Natural Resources

**a. What kinds of energy (electric, natural gas, oil, wood, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.**

Construction and operation of the wastewater treatment facility will require utilities including electricity, communications, and water. Electrical energy will be required to provide lighting and run the pumps and treatment facilities at the wastewater treatment facility. All new construction must conform to the current edition of the Washing State Energy Code. This code regulates energy efficiency in buildings and specifically addresses requirements for building envelope construction, thermal insulation values of building elements, heating, air-conditioning and ventilation systems, and lighting systems.

The facility would replace the existing RBC and Lagoon facilities. The new MBR facility would require more energy to operate than the existing RBC and lagoon facilities, but the MBR plant is capable of producing cleaner effluent than the existing treatment technologies.

**b. Would the project affect the potential use of solar energy by adjacent properties? If so, explain.**

This project is not expected to affect the potential use of solar energy by adjacent properties.

**c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.**

The treatment plant will be a new facility with new equipment that will operate efficiently and reliably, in accordance with current energy standards.

## 7. Environmental Health

**a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spills, or hazardous waste that could occur as a result of this proposal? If so, describe.**

With any construction project, there is the risk of potential construction related spills or leaks. This project would face similar risks, but all risks would be well within the range of typical construction projects. No toxic chemicals would be used or stored at the construction sites, other than fuels and other construction-related fluids. Should suspected contaminated materials be encountered, appropriate testing would be done to determine containment and/or disposal requirements.

The waters of Oak Harbor, in the area proposed for the wastewater outfall, as well as the small lagoon swimming area within Windjammer Park near the proposed MBR facility, are listed on the 303(d) list of impaired waterbodies for the bacteria parameter. The existing RBC Plant outfall, which is currently abandoned, along with urban runoff, leaking septic systems and marina operations likely contributed to the 303(d) listing for bacteria. There are three documented leaking underground storage tanks in the project vicinity, including one at the existing RBC plant.

Wastewater effluent would be discharged from an approximate 2,100-foot outfall into Oak Harbor. Effluent would be treated to a higher standard than effluent from the existing RBC plant and would pose less of an environmental health risk. Existing effluent quality and effluent targets and goals are listed in Table 1 above. Additionally, up to 0.5 mgd of wastewater, treated to Class A reclaimed water standards, will be available for use at ball fields, parks, on-site irrigation, and for other municipal needs. Use of reclaimed water for irrigation will offset the need to purchase potable water for this use.

No new environmental health hazards are expected to occur as a result of operation of the new wastewater treatment facility and outfall.

**1. Describe special emergency services that might be required.**

The wastewater treatment facility would not require any special emergency services. The facility would replace the existing RBC facility and would not require emergency services beyond those required by the existing facility.

**2. Describe proposed measures to reduce or control environmental health hazards.**

Although not likely, accidents such as spills of hazardous materials (typically green cement or grout, fuel, oil, and hydraulic fluid) or other unanticipated construction accidents could occur which would degrade water quality and/or be toxic to fish, marine mammals, and birds. Project construction will be performed in accordance with terms and conditions of local, state, and federal permits that include protection of local water quality within the construction areas, construction equipment will be inspected daily for leaks and cleaned of debris (if working near surface waters), refueling of equipment will occur a minimum of 200 feet from surface waters, and equipment, when not in use, will be stored or staged a minimum of 200 feet from surface waters to the greatest extent possible. In addition, a Spill Prevention Countermeasure and Control (SPCC) plan to address the potential release of hazardous materials will be developed and implemented as necessary for the proposed action.

Operational mitigation measures for the plant will include:

- Treatment plant design will include source controls to minimize the risk of contamination from spills and leaks in accordance with Uniform Fire Code regulations. Spill containment provisions include double-walled storage facilities and emergency cleanup procedures. The site would be sloped to direct any drainage from spill-prone areas (i.e., sludge loading and chemical loading) back to the Plant for processing.

- All stormwater facilities will be designed in accordance with the 2012 *Stormwater Management Manual for Western Washington* (Ecology, 2012).
- Stormwater generated in areas of the MBR Plant site where it could potentially be exposed to contaminants, will be collected and processed through the Plant.
- The new MBR facility will accommodate higher flow volumes and BOD loading.
- Relative to the City's existing facility, the proposed MBR process will be capable of meeting more stringent permit limits on influent loading and effluent discharge concentrations.

**b. Noise**

**1. What types of noise exist in the area which may affect your project (for example: traffic, equipment operation, other)?**

There are no major sources of noise within the project area that would affect the proposed project. Ambient noise is primarily traffic-related, and will not affect the project.

**2. What types and levels of noise would be created by or associated with the project on a short-term or long-term basis (for example: traffic, construction, operation, other)?**

Construction of the project would require the use of heavy equipment including excavators, front-end loaders, cranes, auger drill rigs, backhoes, dozers, forklifts, concrete mixers, concrete pump trucks, man lifts, air compressors, welding machines, hand tools, high cycle generators, and dump trucks. It is likely that sheet piles will be driven and removed with a vibratory hammer during excavation shoring activities.

Construction noise is exempt from noise regulations, but it is anticipated that work would occur during the weekday daytime hours of 7:00 am to 9:00 pm. Construction noise would be most noticeable to nearby businesses and residences, and park users. Nighttime construction would only occur on a limited or as-needed basis if at all. Should nighttime construction be necessary, nearby residents would be notified well in advance of any construction activity.

Operation of the facility is not anticipated to result in noises greater than occur with the existing RBC facility. The treatment plant would include noise control facilities. Excessive noise-producing equipment would be enclosed by noise attenuating covers or rooms to reduce the amount of noise leaving the site.

**3. Describe proposed measures to reduce or control noise impacts, if any.**

During construction, vehicles and heavy equipment will be required to have standard noise reduction equipment. Once the facility is operating, excessive noise-producing equipment would be enclosed by noise attenuating covers or rooms.

## 8. Land and Shoreline Use

**a. What is the current use of the site and adjacent properties?**

The project area is currently used as a city park (Windjammer Park). It is also the site of the existing wastewater treatment facility. The project area also includes commercial properties to the north of Windjammer Park (Figure 2).

**b. Has the site been used for agriculture? If so, describe.**

The site has not been previously used for agriculture. It has been developed as a park and commercial area for decades.

**c. Describe any structures on the site.**

Structures in Windjammer Park include those structures associated with the existing RBC plant and some structures, including accessory buildings, associated with recreational activities in the park. Structures in the project vicinity to the north of the park are associated with commercial and office uses.

**d. Will any structures be demolished? If so, what?**

All structures associated with the existing RBC plant will be decommissioned and demolished, when construction of the new facility is complete. Depending on site location, some existing commercial structures may also be demolished.

**e. What is the current zoning classification of the site?**

Windjammer Park, including the existing RBC plant, is zoned Public Facilities (PF). The project area directly to the north of Windjammer Park is zoned Community Commercial (C-3).

**f. What is the current comprehensive plan designation of the site?**

Windjammer Park, including the existing RBC plant, is designated Public Facilities. The project area directly to the north of Windjammer Park is designated Community Commercial.

**g. If applicable, what is the current shoreline master program designation of the site?**

In the adopted 1998 shoreline master program, the project area is designated Conservancy. In the 2013 updated shoreline master program, which has not yet been approved by Ecology, the project area is designated Urban Public Facility.

**h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.**

Portions of Windjammer Park are mapped as having high aquifer susceptibility on the City's Critical Aquifer Recharge Area map. Oak Harbor off the shore of Windjammer Park is mapped as a forage fish spawning area and a Bald Eagle conservation area. The site is also designated a frequently flooded area and a potential liquefaction area (moderate risk). A wetland ditch, identified during a wetland reconnaissance conducted for the project, is also present in the Windjammer vicinity. Should this area be impacted as part of any site development, a formal wetland delineation and rating will be conducted and appropriate mitigation measures will be developed in accordance with federal, state, and local regulations.

i. **Approximately how many people would reside or work in the completed project?**

No one would reside in the completed project. The treatment facility would be operated and maintained by approximately six (6) City personnel.

j. **Approximately how many people would the completed project displace?**

If the selected alternative includes the use of existing commercial structures, workers in those buildings would be displaced. It is anticipated that the businesses and workers would relocate to a building in the area.

k. **Describe proposed measures to avoid or reduce displacement impacts, if any.**

No individuals will be displaced due to this project.

l. **Describe proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.**

Location of the treatment facility would occur in either a commercial area (zoned Community Commercial) and/or within a portion of Windjammer Park (zoned Public Facility). Development of a treatment plant is allowed in a Public Facility Zone, and is not addressed in a Community Commercial zone. It is likely that a Comprehensive Plan amendment, rezone, or a Conditional Use permit would be required for development in a Community Commercial zone.

The proposal would replace an existing antiquated wastewater treatment facility near the same location. The project is required to provide improved water quality treatment and to support population growth within the UGA projected in the Oak Harbor Comprehensive Plan.

As summarized in question 11 above, the City of Oak Harbor underwent a long public facility planning process to evaluate alternative locations for siting a new treatment facility. Through that process, the Windjammer Vicinity site was selected as the preferred alternative.

The project is consistent with the goals and objectives outlined in the existing 2010 Comprehensive Plan and the 2008

Comprehensive Sewer Plan. The Wastewater Facility Plan will be incorporated into the City's Comprehensive Sewer Plan/Comprehensive Plan update. The plan will be proposed for approval by City Council toward the end of 2013, and be added to the docket for the 2014 Comprehensive Plan amendment.

## 9. Housing

**a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.**

The project does not involve the construction of any housing units.

**b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.**

The project would not eliminate any housing units.

**c. Describe proposed measures to reduce or control housing impacts, if any.**

The project would not cause any housing impacts.

## 10. Aesthetics

**a. What is the tallest height of any of the proposed structure(s), not including antennas? What is the principal exterior building material(s) proposed?**

The tallest buildings on the site will be approximately 35 feet high. Other structures, including the administration, lab, maintenance, and electrical buildings, will have a height of approximately 15 feet. Exterior materials and finishes will be selected during design.

**b. What views in the immediate vicinity would be altered or obstructed?**

The new facilities and structures would replace existing treatment plant structures and would be visible from Windjammer Park and the surrounding commercial areas. Regardless of location, views in the immediate vicinity would be altered from current conditions. As part of the shoreline permitting process, a view analysis would likely be required. As part of the final site design, views will be considered and maintaining view corridors will be a priority.

**c. Describe proposed measures to reduce aesthetic impacts, if any.**

The existing RBC plant is currently located at Windjammer Park. Views of the new MBR facility would be similar to the RBC plant and may be located in, within or overlapping the footprint of the existing RBC plant; however the RBC plant is more industrial looking than the proposed MBR facility would be.

The aesthetics of the new facility would take into account the context, scale and visual buffer of the site. The plant design will relate to the surrounding architectural history of the area, and will relate to the adjacent commercial buildings and the park. Buildings will be designed so that the scale of the buildings is compatible with the surrounding buildings and neighboring uses. Where possible, the buildings will be located around the perimeter of the site. This allows the building walls to become security elements, thus eliminating unsightly fences. Landscape plantings will provide a layered visual buffer from key vantage points.

The existing industrial looking RBC plant will be decommissioned and demolished, and any areas of the existing RBC plant that are not used for the new MBR facility will likely be converted to open space for public use. Therefore, views of and within Windjammer Park would not be significantly changed, though locations of wastewater facilities within the park may change. As described in question B.2. above, the new MBR facility will have much better odor control than the current RBC plant, and will meet or exceed the standard of care with regard to odor control.

## 11. Light and Glare

**a. What type of light and glare will the proposal produce? What time of day would it mainly occur?**

Construction will occur primarily during the daytime, negating the need to utilize artificial lighting. The treatment plant will be illuminated with only security lighting and would be similar to lighting at the existing RBC facility. The lighting will be aimed downward to reduce the potential for light or glare impacts on adjacent properties. Nighttime construction may be conducted on a limited or as-needed basis that may require lighting for limited amounts of time.

**b. Could light or glare from the finished project be a safety hazard or interfere with views?**

Light or glare would not be a safety hazard and would not interfere with views.

**c. What existing off-site sources of light or glare may affect your proposal?**

Off-site sources of light will not affect this proposal.

**d. Describe the proposed measures to reduce or control light and glare impacts, if any.**

Lighting will be downward facing, with full cut-off shields to minimize light and glare impacts to adjoining properties. Surfaces at the plant will be non-glare surfaces to further reduce glare possibilities. Nighttime construction activities will be very limited, if needed at all. Any nighttime work would be scheduled in advance, and nearby residents would be notified of such work.

## 12. Recreation

**a. What designated and informal recreational opportunities are in the immediate vicinity?**

The project site is within and in the vicinity of Windjammer Park. Windjammer Park, located on the Oak Harbor waterfront, is a popular 28.5 acre park that features a waterfront trail, multiple playgrounds, ball fields and courts, a boat launch, a recreational vehicle park, a swimming lagoon, restrooms, and two accessory buildings. The park is a heavily-used popular local amenity, also locally known as City Beach.

**b. Would the proposed project displace any existing recreational uses? If so, describe.**

Construction activities and noise would temporarily disrupt recreational use of Windjammer Park. Portions of the park would be inaccessible during construction for up to 2 years. Depending upon final site location, the park would be permanently impacted as portions of the park would be turned over for development of the new facility. Following construction, the existing RBC facility located in the park would be decommissioned and demolished. Any portion of the existing RBC plant space not used for the new MBR treatment plant will be returned to public park space.

c. **Describe proposed measures to reduce or control impacts on recreation, including recreational opportunities to be provided by the project or applicant.**

To the extent possible, construction activities will be timed to minimize the impact to park and waterfront users. Areas that are closed to construction would be clearly marked so that recreational users can avoid the area during the construction time frame. Following construction, the park area will be fully restored and returned for park use. Depending upon final site location, the City may undertake additional park improvements to mitigate permanent impacts to the park.

The existing RBC facility would be decommissioned and demolished. Any areas of the existing RBC plant that are not used for the new MBR facility would be converted to park space for public use within Windjammer Park. Close collaboration with the City Parks Department will occur to minimize the impacts to the park and provide the greatest long-term benefits and amenities for the park and its users.

## 13. Historic and Cultural Preservation

a. **Are there any places or objects listed on or eligible for national, state, or local preservation registers known to be on or next to the site? If so, generally describe.**

Yes, 45-IS-298, a pre-contact shell midden archaeological site, is recorded within Windjammer Park. It is expected that disturbed or intact buried site deposits will be encountered during the construction of the new Wastewater Treatment Plant. We expect that the intact and disturbed deposits associated with 45-IS-298 will be determined eligible for the National Register of Historic Places.

b. **Generally describe any landmarks or evidence of historic, archeological, scientific, or cultural importance known to be on or next to the site.**

The Windjammer Park vicinity has had numerous uses and filling and grading events over the last 140 years. It has had and continues to have natural and cultural process working on it continually. The properties in and adjacent to the present day Windjammer Park have high potential for buried cultural resources.

There are eleven previously recorded archaeological sites on file at the Department of Archaeology and Historic Preservation (DAHP) within one mile of the project Area of Potential Effect (APE) including seven prehistoric sites, two historic sites, one site with both precontact and historic components, and one cemetery. Three of the prehistoric sites include burials. Many of the sites were first identified in the 1950s and the site boundaries have not been confirmed; this suggests that additional buried cultural materials could be present outside of the recorded boundaries. One of the sites consists of redeposited cultural deposits taken from one location to another.

Additionally, the project area is categorized as "very high risk" for buried cultural resources in the Washington State Archaeological Predictive Model.

There have been several previous cultural resources investigations in the project vicinity including two within Windjammer Park. There are multiple historic age above ground structures adjacent to Windjammer Park; once the project plans are developed it may be necessary to document those structures.

**Table 1: Recorded Archaeological Sites on file with DAHP.**

| Number | Type | Distance from Site |
|---|---|---|
| 45-IS-298 | Pre Contact Lithic Material, Pre Contact Shell Midden | Within |
| 45-IS-45 | Pre Contact and Historic Components, Pre Contact Camp, Pre Contact Shell Midden, Pre Contact Burials | ~0.1 mile |
| 45-IS-300 | Pre Contact Burial, Pre Contact Shell Midden, **Redeposited** | ~0.2 mile |
| 45-IS-46 | Pre Contact Camp, Pre Contact Shell Midden | ~0.3 mile |
| 45-IS-100 | Historic Residential Structures | ~0.3 mile |
| 45-IS-99 | Historic Property | ~0.5 mile |
| 45-IS-296 | Freund Cemetery | ~0.5 mile |
| 45-IS-204 | Pre Contact Camp, Pre Contact Shell Midden | ~0.7 mile |
| 45-IS-79 | Pre Contact Camp, Pre Contact Shell Midden | ~0.8 mile |
| 45-IS-80 | Pre Contact Camp, Pre Contact Shell Midden | ~0.8 mile |
| 45-IS-82 | Pre Contact Camp, Pre Contact Shell Midden, Pre Contact Burial | ~1 mile |

c. **Describe proposed measures to reduce or control impacts, if any.**

As the intact and disturbed deposits associated with 45-IS-298 are expected to be determined eligible for the National Register of Historic Places under Criterion D, work within the project area will need to be conducted under the terms of either:

1. An Archaeological Site Alteration and Excavation Permit (Permit) from the Washington State Department of Archaeology and Historic Preservation as per RCW 27.44 and RCW 27.53
2. Or, if the project involves federal funding or a federal permit: A Memorandum of Agreement (MOA) with the lead federal agency for the wastewater treatment plant project developing this agreement for signatories as defined by National Historic Preservation Act (NHPA) (16 U.S.C. 470f).

With either the Permit or the MOA a number of components will need to be included in this plan:

1. A mitigation plan would need to be developed with additional data provided after the final selection for the location of the Wastewater Treatment Plant is completed. The additional data will include the results of subsurface testing by both machine and hand excavations. This testing would be implemented to the depth and areal extent of the proposed development. The data will need to include the extent of both intact and disturbed archaeological deposits of both historic and/or pre contact components, in the footprint of the proposed development and the calculations of how much cultural material will be disturbed by the proposed development.

This mitigation plan would include all the components of the process up to and including data collection, analysis, reporting and curation.

2. A Monitoring Plan as part of the mitigation plan with a detailed contingency plan that would include the infield plan for every kind of cultural resource that can reasonably be expected to be encountered including both the pre contact and historic components. This is not a phone tree for an unanticipated discovery; this is detailed plan up to and including analysis and curation that should parallel the original mitigation plan and will deal with all resources encountered during the professional archaeological monitoring of the construction of the Wastewater Treatment Plant.

3. A Plan for the Treatment of Human Remains will need to be prepared to outline the procedures to be followed if human remains are identified during testing or construction.

Additional consideration will need to be given to the potential historic structures that may be affected by the proposed project implementation. When the final site has been chosen then any historic structures above or below ground will be identified and archaeological site inventory forms (relic features) or historic property inventory forms (intact structures) will be completed. The data from this inventory will be used in the Mitigation and Monitoring Plans.

Early consultation by the Lead Agency, with the Affected Tribes is recommended.

## 14. Transportation

**a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on-site plans, if any.**

The project site is located along West Pioneer Way (to the north), SW Beeksma Drive (to the west) and SE City Beach Street (to the east) (Figures 2 and 3). Pioneer Way is Highway 20 to the west of the project site. At the intersection with Beeksma Drive, Highway 20 turns north. It is anticipated that construction vehicles would access the site via Highway 20 and Pioneer Way. Traffic could be periodically stopped along access roads to allow truck and trailer access to the construction site. This could result in temporary delays for general purpose traffic along the roadways. The facility will be located and designed to allow the future extension of Bayshore Drive according to current City plans.

**b. Is the site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?**

Island Transit's Harbor Station Transfer Center is located adjacent to Windjammer Park on Bayshore Drive and is served by many bus routes. It is not likely that this bus station will be affected by construction or will need to be relocated.

**c. How many parking spaces would the completed project have? How many would the project eliminate?**

Parking spaces at the completed project would be determined in site design. Some parking spaces associated with commercial uses to the north of the project site may be eliminated. The exact number would be determined during final site design. It is not likely that this project would reduce the number of parking spaces available for park use.

d. **Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe.**

A new access road will likely be required. This road will be constructed according to City standards, will likely be less than 1,000 linear feet, and will be constructed in a way to fit with potential future realignment of Bayshore Drive. More extensive improvements to Bayshore Drive, Beeksma, Pioneer Way, or City Beach Street are possible depending upon the final alternative location selected.

e. **Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.**

The project does not occur in the vicinity of water, rail, or air transportation.

f. **How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.**

Construction of the treatment facility is anticipated to last approximately 2 years. During construction, additional truck traffic will be entering and exiting the construction site. The volume of trucks on any one day would depend upon the stage of construction. At peak times traffic may average 40 round trips per day. Worker trips would typically range from 10 to 30 round trips per day throughout the project, depending upon construction activities.

Minimal traffic per day, estimated between 6 and 9 round trips, will be generated by the operation of treatment facility. The number of trips would be slightly higher than the trips currently generated by the existing RBC facility.

Should additional community facilities be developed in association with the new treatment plant, additional traffic studies would be conducted to determine any traffic impacts to area roadways.

**g. Describe proposed measures to reduce or control transportation impacts, if any.**

At least one lane of any affected roadways will be open to allow for emergency vehicles and local access during construction, and emergency services such as fire and police will be notified of any lane closures. Detour routes will be provided where possible, and routes will be clearly marked with signage. Local residents and businesses will be notified of lane closures as appropriate.

Operation of the project is not expected to noticeably affect area transportation.

Transportation impact fees will be paid for any new pm peak hour trips generated by the new facility.

**15. Public Services**

**a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally explain.**

The project would not result in an increased need for public services. The project is designed to meet some of the public service needs associated with project population growth by providing increased capacity for wastewater treatment.

**b. Describe proposed measures to reduce or control direct impacts on public services.**

There would be no direct impacts on public services.

**16. Utilities**

**a. Underline utilities currently available at the site:**

<u>Electricity</u>, <u>natural gas</u>, <u>water</u>, <u>refuse service</u>, <u>telephone</u>, <u>sanitary sewer</u>, septic systems, other

**b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.**

Construction and operation of the wastewater facility will require utilities including electricity, communications, and water. These services are available in the area. Wastewater service will remain operational during construction of the new facility. Overall, the new facility will provide a more reliable wastewater treatment system that produces a higher quality of effluent.

## C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Lisa B. Adolfson, ESA

Name (print): Lisa B. Adolfson

Title: Senior Project Manager

Date Submitted: July 31, 2013

# REFERENCES

Carollo and BHC Consultants. 2013. *City of Oak Harbor Wastewater Facility Plan.* March 2013.

Environmental Science Associates (ESA). 2012. *Oak Harbor Wastewater Treatment Plant Site Selection – Wetland Reconnaissance of Freund Site and Windjammer Park.* Technical Memorandum. November 12, 2012.

Environmental Science Associates (ESA). 2013. *Oak Harbor Wastewater Treatment Facilities Biological Assessment.* March 2013.

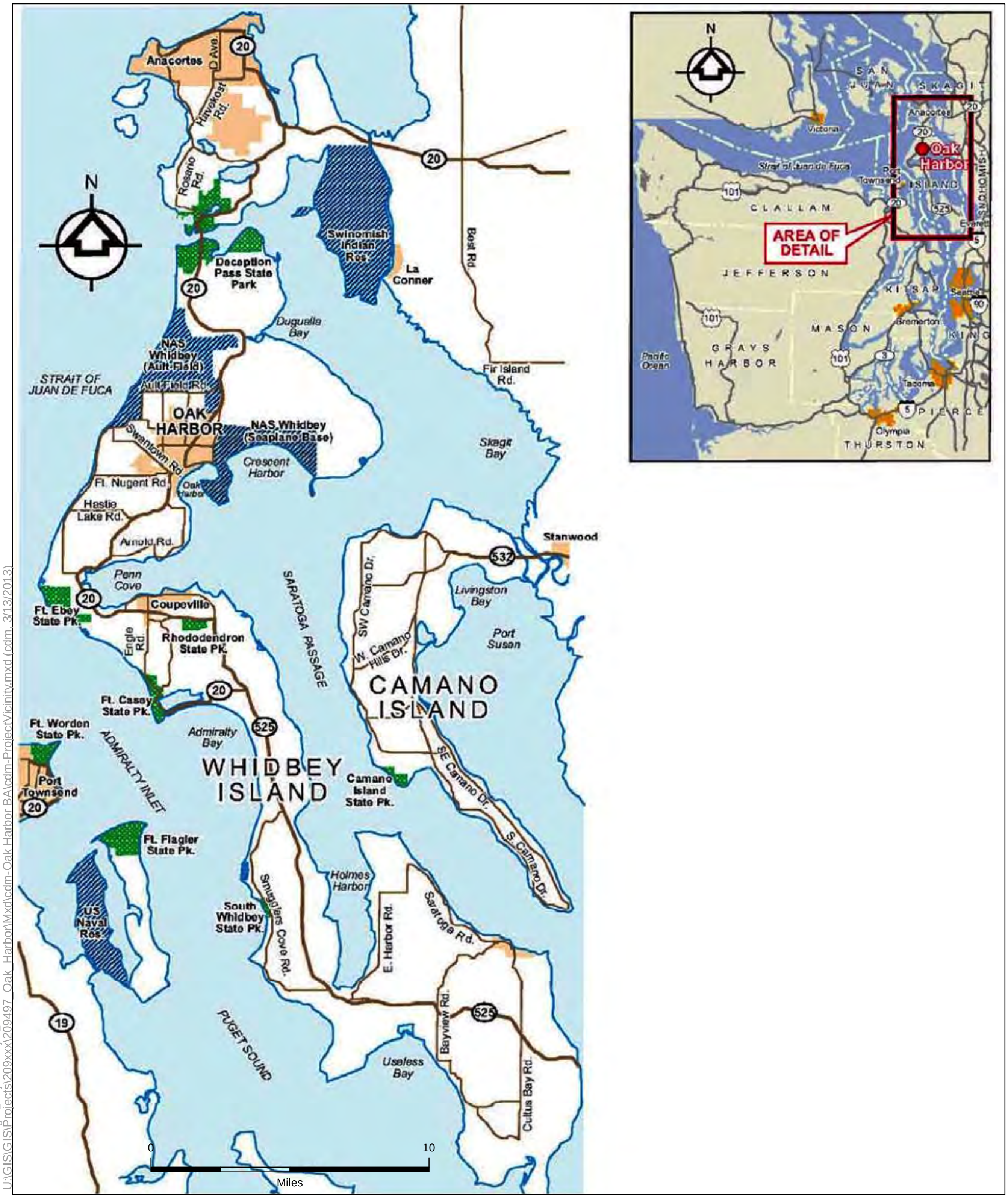
ESA Paragon. 2013. Cultural Resources for City of Oak Harbor Wastewater Treatment Plan Memorandum. March 2013.

Grette Associates. 2012. *Oak Harbor Facilities Plan Eelgrass and Macroalgae Survey.* October 11, 2012.

ORCA Network, 2013. Website accessed 2013. http://www.orcanetwork.org/

Washington Department of Health. 2009. Annual Report for the Saratoga Passage Growing Area.

# FIGURES





SOURCE: City of Oak Harbor Comprehensive Plan,
City of Oak Harbor Development Services Department,
December 2009

Oak Harbor Wastewater Treatment Facilities Project . 209497

**Figure 1**
Project Vicinity
Oak Harbor, Washington


Project Vicinity

**WINDJAMMER VICINITY**

FILE NAME: Fig02_Vicinity.ai_2013-05-28 / CREATED BY: JAC / DATE LAST UPDATED: 05/28/13
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SOURCE: City of Oak Harbor 2009

Oak Harbor Wasterwater Treament Facilities Project . 209497

**Figure 2**
Vicinity Map
Oak Harbor WWTP Facility
Oak Harbor, Washington


FILE NAME: Fig03_conceptualsitelayout.ai_2013-05-28 / CREATED BY: JAC / DATE LAST UPDATED: 05/28/13
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SOURCE: City of Oak Harbor 2009

Oak Harbor Wasterwater Treament Facilities Project . 209497

**Figure 3**
Conceptual Site Layout
Oak Harbor WWTP Facility
Oak Harbor, Washington

# NOA for SEPA

CITY OF Oak Harbor
WHIDBEY ISLAND, WASHINGTON

**NOTICE OF APPLICATION**

# City of Oak Harbor Wastewater Treatment Facility

**APPLICATION: SEPA Environmental Checklist SEP-13-00004**

PROJECT PROPOSAL AND LOCATION: The proposed project is to replace the current wastewater treatment facilities with a new 3.9 million gallon per day (mgd) wastewater treatment facility located on 4 acres in the vicinity of Windjammer Park inside city limits. Several aspects of the facility design and treatment quality have been finalized; however some items such as a precise location and configuration of the facility are still under development. Further refinement in design of the treatment plant will follow later this year, following selection of a site. The City's new wastewater system is designed to serve approximately 24,000 people within the City and the Navy Seaplane Base. The new wastewater facility, collection system, and outfall are being designed to accommodate flows projected through 2030, and be expandable to accommodate flows projected through 2060. Construction of the treatment plant is proposed to begin in mid-2015 and last for approximately 2 years. The current treatment plant's outfall is in need of replacement and since the new treatment facility will be designed to use the same outfall its construction is proposed to begin earlier in the late summer of 2014 and will likely last for approximately 3 months.

A SEPA environmental checklist for the proposed City of Oak Harbor Wastewater Treatment Facility Plan has been submitted by Lisa Adolfson of ESA, a consultant for the City on this project. This SEPA checklist review is a necessary step in the City's application for Water Pollution Control Revolving Fund (SRF). The review of projects for potential environmental impacts of construction projects financed through SRF is referred to as State Environmental Review Process (SERP).

The SEPA checklist for the project is posted on the city's website (www.oakharbor.org) under the Development Services page and under the News and Notices section. The document can be directly accessed with the QR codes provided below (smart phone and application required).

http://www.oakharbor.org/get_document.cfm?document=2279

SEPA COMMENT PERIOD: To make written comments, please mail or hand-deliver specific comments to: City of Oak Harbor, Development Services Department, 865 SE Barrington Drive, Oak Harbor, WA 98277, no later than **5:00 p.m. on August 22, 2013**. You can also email your comments to ckamak@oakharbor.org.

PUBLIC PARTICIPATION REQUIRED: The SERP requires public participation in addition to the 14 day comment period provided through the SEPA process. A public meeting to describe the preferred alternative and the environment, technical and financial issues of the project is tentatively scheduled for the City Council meeting of September 17, 2013, beginning at 6:00 pm.

ESTIMATED DATE OF DECISION: It is anticipated that a SEPA determination will be made at the end of the comment period. At that time, another comment period will be opened on the SEPA determination.

To receive notification of the decision on this proposal, please send a self-addressed, stamped envelope and request a Notification of Decision for SEPA environmental checklist SEP-13-00004 from the City of Oak Harbor, Development Services Department, 865 SE Barrington Drive, Oak Harbor, WA 98277.

Lisa Bebee
Permit Coordinator

Published: Whidbey News Times
Date: **August 7, 2013**

# SERP Crosscutter Report

# State Environmental Review Process Federal Crosscutter Review and Related Documentation

# Oak Harbor Wastewater Treatment Facility

Prepared for
City of Oak Harbor

Prepared by
Environmental Science Associates

August 2013

# Table of Contents



## List of Figures



## Appendices

# INTRODUCTION

This document has been prepared to meet the requirements of the State Environmental Review Process (SERP) (WAC 173-98-100). The SERP is a process required if state and federal funds are used for the planning, design, or construction of wastewater collection and /or treatment facilities. The Department of Ecology (Ecology) released *Draft Revolving Fund State Environmental Review Process and Federal Cross Cutter Guidelines* in August 2011. This SERP documentation is based upon the Ecology guidelines and supplements the SEPA Environmental Checklist evaluating the proposed Oak Harbor Wastewater Treatment Facility (*Wastewater Treatment Facility SEPA Checklist*, City of Oak Harbor, anticipated August 2013).

# PROJECT DESCRIPTION

The City of Oak Harbor (City) is proposing to construct a new 3.9 million gallon per day (mgd) wastewater treatment facility located on 4 acres in the vicinity of Windjammer Park inside city limits (Figure 1). Currently the City's wastewater is treated at two facilities: a rotating biological contactor (RBC) facility near Windjammer Park, and a lagoon facility on the Navy's Seaplane Base (the Lagoon Plant). Although the existing facilities are currently able to meet the requirements of the City's National Pollution Discharge Elimination System Permit (NPDES), they are not able to provide reliable long-term service for the following reasons:

- The existing RBC facility is nearing the end of its useful life;
- Both the RBC and lagoon facilities lack the technology to meet increasingly stringent water quality standards for wastewater discharge, and have inadequate capacity to keep pace with anticipated population growth.
- Both of the existing effluent outfalls have seen major failures; the Oak Harbor outfall no longer functions and the Crescent Harbor outfall is functional but damaged.
- The area surrounding the Lagoon Plant was reclaimed as a saltwater marsh in 2009. The existing wastewater lagoons are now surrounded by environmentally sensitive areas and are subject to frequent high water conditions, making expansion or modification to the lagoons infeasible.

A new modern treatment facility is needed to replace the City's existing treatment facilities with a facility capable of meeting the City's wastewater utility goal to "obtain the highest water quality practical while recognizing the limitations of rate payers of the City to fund the improvements." Specific project objectives include:

1. Providing continued reliable wastewater treatment service,
2. Meeting high standards for water quality,
3. Allowing phased expansion to meet future demands, and
4. Delivering construction and operation of a new facility by 2017 in a cost-effective manner.

The proposed project will include the following components (Figure 2):

- Membrane biological reactor (MBR) wastewater treatment facility in the vicinity of Windjammer Park. Treatment at this facility will consist of:
  - Construction of eight buildings covering approximately 38,400 square feet or 20 percent of the 4-acre site. The buildings will be 15 to 20 feet high and will house preliminary treatment, MBR facilities, UV disinfection, chemicals, solids treatment, odor control, effluent storage, and administration, laboratories, maintenance and electrical.
  - Construction of two aeration buildings, an equalization basin and waste activated sludge basin below ground.
  - Preliminary treatment: Raw sewage will be pumped, screened, degritted and equalized prior to secondary treatment.
  - Secondary treatment: The screened, degritted raw sewage will be treated in an aeration basin followed by membrane filtration with MBR. The secondary effluent will be capable of meeting an effluent total inorganic nitrogen concentration of 8 mg/L, effluent total suspended solids and carbonaceous biochemical oxygen demand concentration of 10 mg/L.
  - Disinfection: Ultra Violet (UV).
  - Solids Treatment: Waste activated sludge will be dewatered and initially lime stabilized producing a Class B beneficial use product for land application at a designated facility in Eastern Washington and in the future dried producing a Class A beneficial reuse product.
- Conveyance facilities and support buildings and facilities, as identified during preliminary design:
  - Approximately 300 feet of new pipe from the treatment facility to the replacement outfall in Oak Harbor.
  - Approximately 20,000 feet of new pipe to convey wastewater flows from the Navy Seaplane Base to the new wastewater facility. This piping will be included in the project only if the Navy chooses to connect to the City's new facility.
- Replacement of the 2,100-foot long outfall constructed in close proximity to the existing failed outfall in Oak Harbor:
  - 30-inch diameter pipe,
  - High density polyethylene (HDPE) or concreted coated steel,
  - Pipe will be fully buried from the shoreline to the diffuser,
  - Existing outfall pipe will be abandoned in place, and
  - New 184-foot long diffuser at the end of the outfall with 24 diffuser ports.

# PUBLIC PARTICIPATION PROCESS

The City of Oak Harbor began reaching out to residents and stakeholders as part of the site selection process in November 2010. A public meeting was held in December of 2010 to introduce the project and gather input about candidate sites. Between August 2011 and February 2013, the City held four public open houses (three of which were combined with City Council workshops) to present and get input on site locations, cost analyses, rate information, conceptual renderings, and the proposed schedule. The project was presented and discussed at eight additional City Council meetings and workshops, which were open to the public. The City issued a press release in January 2011 illustrating the proposed sites and soliciting public input. In spring 2011, the City conducted an online survey, which was completed by over 100 individuals. The City produced a program for public television in June 2011 covering the final list of sites selected by the City Council and requesting input on the site evaluation process, the treatment plant process selection, and the outfall location. The City also presented to the Rotary Club in March 2012 and hosted a two-day Site Master Planning Charrette in June 2012. Detailed information on all public meetings can be found in section 6.5.1 of the Facility Plan – Volume II and Appendix A of the Facility Plan (Volume III).

# FEDERAL REGULATIONS

## *Clean Air Act*

The federal Clean Air Act (CAA) imposes responsibilities for its implementation on all levels of government. The CAA requires Washington State to develop an implementation plan to bring each nonattainment area into compliance. The cross cutting authority in the CAA applies to projects located in nonattainment or maintenance areas. The City of Oak Harbor and Island County are not in an EPA-designated nonattainment or maintenance area, and as such, is not subject to the provisions of the Clean Air Act. Figure 3 shows the proximity of Oak Harbor to the closest maintenance and nonattainment areas. The closest maintenance area is the Snohomish County maintenance area for ozone and carbon monoxide which is over 10 miles from Oak Harbor. These areas would not be affected by the Oak Harbor facility.

## *Coastal Zone Management Act*

The project is located in Island County, one of Washington's coastal counties, bordering Puget Sound and therefore requires a written Coastal Zone Management (CZM) Consistency Determination by Ecology. Consistency necessitates that the project must meet the requirements of six enforcement policies, as applicable. The City will apply for required permits and will comply with all the requirements of the applicable policies once the project design is complete. Based on the Facility Plan information, the City anticipates that the project will comply with applicable Shoreline Master Program (SMP) requirements. The proposed treatment plant site is located in Marine Reach 3 Oak Harbor Segment (MR3). MR3 has a medium low to low ecological function (Grette Associates, LLC, and AHBL, 2011). The City will submit a Coastal Zone Certification of Consistency to Ecology for approval once the project design is complete and appropriate permits and approvals have been obtained. The project will also comply with the goals and requirements of the *Oak Harbor Shoreline Master Program* (Grette Associates, LLC, and AHBL, 2011).

Table 1 summarizes the enforceable policies and the status of compliance.

**Table 1. Coastal Zone Certification Policies**

| Policy | Status of Compliance |
|---|---|
| Washington's Shoreline Management Act (SMA) | Project requires a shoreline substantial development permit which will be submitted once the design is complete. The proposed plant is located within the City's SMP designated Marine Reach 3 Oak Harbor Segment. |
| State Environmental Policy Act (SEPA) | The City will prepare a SEPA Checklist for the project. |
| Clean Water Act (401 Certification, stormwater permits) | The City will apply for and comply with appropriate water quality and stormwater permits when the design is complete. |
| Clean Air Act | As noted above, the project complies with the Clean Air Act. |
| Ocean Resources Management Act (ORMA) | Does not apply. Island County is not in an ORMA defined ocean county. |
| Washington Energy Facility Site Evaluation Council (EFSEC) | Does not apply. The project does not require any energy production. |

## *Endangered Species Act*

Table 2 lists the occurrence of Endangered Species Act (ESA) listed species in the project area. The City has completed a Biological Assessment (BA) for consultation under Section 7 of the ESA.

In general, the proposed MBR facility and new outfall will result in substantially improved effluent quality and therefore improved water quality conditions in the receiving water in comparison to prior effluent quality. Construction is anticipated to have temporary-short term direct effects to listed species due to increased noise and human activity, soil and sediment disturbance in both aquatic and terrestrial habitats that could degrade water quality if not properly controlled, and disruptions in predator/prey relationships. Indirect effects of the action are primarily related to future growth within the service area. Growth within the service area of the MBR facility is planned growth as outlined in the City's adopted Comprehensive Plan (December 2010); the proposed facility is intended to accommodate planned growth, as opposed to causing it. The new facility is being constructed in response to growth projections and projected increases in influent loading to the facility as well as future, anticipated more stringent water quality regulations that cannot be met with the existing treatment facilities.

With the implementation of best management practices during construction to minimize noise and human disturbance and to minimize disturbance of upland soils and aquatic sediments, conducting in-water work during approved construction windows, and implementing state-of-the-art wastewater treatment technologies during operation of the facility, the proposed action is anticipated to result in a "may affect, not likely to adversely affect" determination for the majority of species under consideration. It is anticipated that some species may warrant a determination of "no effect."

Critical habitat for Southern Resident killer whale, Coastal-Puget Sound bull trout and Puget Sound Chinook salmon has been designated in the project action area. Direct and indirect effects to critical habitat will be minor and temporary with respect to construction impacts and long-term effects to water quality will be beneficial to designated critical habitat in the action area; therefore, the proposed action is anticipated to warrant a "may affect, not likely to adversely affect" determination for designated critical habitat for these species in the Action Area. The City will submit the BA to Ecology for review and will modify the BA as required so that Ecology may submit it to EPA.

**Table 2. Occurrence of Listed Species and Critical Habitat within the Project Action Area**

| Common Name | Scientific Name | ESA Status * | Jurisdiction | Critical Habitat |
|---|---|---|---|---|
| Puget Sound Evolutionarily Significant Unit (ESU) Chinook Salmon | *Oncorhynchus tshawytscha* | Threatened | NMFS | Yes |
| Puget Sound Distinct Population Segment (DPS) Steelhead | *Oncorhynchus mykiss* | Threatened | NMFS | No |
| Coastal-Puget Sound DPS Bull Trout | *Salvelinus confluentus* | Threatened | USFWS | Yes |
| Southern DPS Green Sturgeon | *Acipenser medirostris* | Threatened | NMFS | No |
| Yelloweye Rockfish | *Sebastes ruberrimus* | Threatened | NMFS | No |
| Canary Rockfish | *Sebastes pinniger* | Threatened | NMFS | No |
| Bocaccio Rockfish | *Sebastes paucispinis* | Endangered | NMFS | No |
| Marbled Murrelet | *Brachyramphus marmoratus* | Threatened | USFWS | No |
| Southern Resident Killer Whale | *Orcinus orca* | Endangered | NMFS | Yes |
| Stellar Sea Lion | *Eumatopias jubatus* | Threatened | NMFS | No |
| Humpback Whale | *Megaptera novaeangliae* | Endangered | NMFS | No |
| Golden Paintbrush | *Castilleja levisecta* | Threatened | USFWS | No |

## Environmental Justice Executive Order 12898

Federal Executive Order 12898 is titled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons in the United States. Environmental justice is achieved when everyone has the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environmental in which to live, learn, and work.

According to the U.S. Census and the American Community Survey, the project area has a smaller proportion of minority residents and a higher per capita income than the City of Oak Harbor as a whole (Census and American Community Survey data can be found in Appendix A). Oak harbor has a larger minority population that Island County. Additionally, the project is not anticipated to have human health and environmental impacts beyond typical construction impacts. Therefore, the project is not anticipated to have human health and environmental impacts that disproportionately fall on minority or low-income members of the community. The City conducted a public outreach campaign using a variety of methods (including public meetings and workshops, City Council meetings, an online survey, press releases, charrettes, and a public television program) to ensure that a broad range of stakeholders could participate and give input on the process.

## Farmland Protection Act

It is EPA policy under the Farmland Protection Policy Act (PL 97-98) to protect agricultural lands from "irreversible loss as an environmental or essential food production resource." The project will be located in the City of Oak Harbor's Urban Growth Area in an area that has been zoned and developed for public facilities and commercial development. These areas have not been used for agriculture and there are no agricultural lands near the proposed facilities.

## Floodplain Management Executive Order 11988

Executive Order 11988 entitled "Floodplain Management" dated May 24, 1977 (42 C.F.R. 26971) requires federal agencies to evaluate the potential effects of actions those agencies may take in floodplains in order to avoid adversely impacting floodplains wherever possible, and to ensure that their planning programs and budget request reflect consideration of flood hazards and floodplain management. The intent of the Executive Order is that, wherever possible, federal agencies will implement floodplain requirements through existing procedures.

EPA has adopted regulations regarding the implementation of Executive Order 11988. Pursuant to those regulations, EPA determines whether a proposed action will be located in or will affect a floodplain. If so, the responsible official shall prepare a floodplain/wetlands assessment. The responsible official shall either avoid adverse impacts or minimize them if no practicable alternative exists.

The project site is partially within the 100-year floodplain. Depending on the final building footprint, it may be possible to avoid placing new structures in the floodplain. The outfall pipe will have to cross a small segment of floodplain before extending into Oak Harbor, but as the pipe will be underground it would not impact the floodplain. All proposed facilities will comply with Oak Harbor Municipal Code (OHMC) floodplain requirements (OHMC 17.20). The requirements for critical facilities such as the proposed project include:

- Have the lowest floor elevated to 3 feet or more above the base flood elevation;
- Take floodproofing and sealing measures to ensure toxic substances will not be displaced or released into flood waters; and
- Have access routes at or above the level of the base flood elevation.

## National Historic Preservation Act and Executive Order 11593

For the site selection process, the City reviewed existing information including historic maps, archaeological site data, Washington State Archaeological Predictive Model, and geological maps in order to provide a summary of known cultural resources (including archaeological sites and historic properties) and the likelihood for buried cultural resources in areas that had not been previously surveyed. The information was used to evaluate the relative risk of cultural resources being located on the alternative sites. The Windjammer Vicinity site was determined to have a high probability of encountering cultural resources. Once alternative preferred locations within the Windjammer Vicinity are selected, the City will conduct additional analysis of cultural resources including a subsurface survey to further determine the likelihood of encountering cultural resources. One a preferred site is selected, the Area of Potential Effect will be determined, and potentially additional subsurface survey work. A cultural resources report will be prepared and an Archaeological Resources Monitoring Plan or Unanticipated Discovery Plan will be developed for the project based on results of the survey. Government to government consultation under Section 106 of the NHPA will be initiated once the site and design have been selected.

## *Safe Drinking Water Act*

The proposed project is located in the Whidbey Island sole source aquifer area. There will be no withdrawals of groundwater or discharges to the aquifer system. Drinking water for Oak Harbor is provided by the Oak Harbor Public Works Department through an agreement with the City of Anacortes. The project would not affect this drinking water source.

The City has conducted an analysis to determine if the project could contaminate the aquifer (Appendix B). The analysis concluded that the wastewater treatment facilities will not contaminate the aquifer.

## *Sustainable Fisheries Act (Essential Fish Habitat)*

In compliance with the Magnuson-Stevens Fishery Conservation and Management Act, Essential Fish Habitat (EFH) was assessed for the proposed project. Designated EFH for the federally managed Pacific salmon and Pacific coast groundfish fisheries occurs in the vicinity of the proposed project. Potential effects to Pacific salmon EFH, including Chinook, coho, and pink salmon habitat, are similar to that discussed above under the Endangered Species Act. No areas of EFH are present for other federally managed species, including coastal pelagic species. It was determined that the project will have *no adverse effect* on EFH for Pacific Salmon and Pacific coast groundfish and *no effect* on Coastal Pelagic species.

## *Wetlands Protection*

Executive Order 11990, *Protection of Wetlands*, govern the protection of wetlands. ESA senior wetland ecologist (Michael Muscari) conducted a wetland reconnaissance on the Windjammer Vicinity site, on October 30, 2012. Observations were made of a ditch along the northern property boundary of Windjammer Park. The ditch runs for almost 1,000 feet along the north end of the site, appears to straddle the property boundary and may be entirely off-site in some areas. Native wetland plants are dominant in the ditch and surface water was present. Criteria were met for all three wetland parameters used by the Corps of Engineers to determine the presence of wetlands. There was no flow in the ditch on October 30, 2012, but it appears that the ditch drains out culverts at both the west and east ends. Site specific wetland evaluation and delineation would be conducted when the site location is finalized. The City will comply with all applicable federal, state, and local permit requirements as appropriate.

## Wild and Scenic Rivers Act

The Klickitat River, Skagit River, and White Salmon River are the only designated Wild and Scenic Rivers in Washington. The proposed project is not located in the drainage basins of any of these designated rivers; therefore, no impacts to wild and scenic rivers will occur as a result of this project.

## Agency Coordination and Public Involvement

The City of Oak Harbor has undertaken a great deal of environmental planning and documentation over the past four years associated with development and implementation of the new wastewater treatment facility. The City conducted a public outreach campaign using a variety of methods (including public meetings and workshops, City Council meetings, an online survey, press releases, and a public television program) to ensure that a broad range of stakeholders could participate and give input on the process.

The City also solicited comments from affected Tribes and affected state and federal agencies through letters describing the project and requesting comments. The City sent one letter to agencies and another similar letter to affected Tribes and the Department of Archaeology and Historic Preservation. The second letter included a clarification that Section 106 consultation would be initiated when the project is designed. Copies of the two letters, sent on February 28, 2013, are included in Appendix C. Table 3 lists the Tribes and agencies that received the letter, and a summary of responses to the letters.

**Table 3. Agency Coordination Summary**

| Recipient | Response Received | Response Summary |
|---|---|---|
| Rob Whitlam, Department of Archaeology and Historic Preservation | | |
| Kevin Fitzpatrick, Ecology Water Quality Program | | |
| Linda Rankin, Ecology CZM | March 15, 2013 from Jessica Moore, Federal Permit Coordinator | Commented that the project would require a Coastal Zone Management Consistency Determination and that the outfall replacement would trigger a Section 401 water quality certification. |
| Tom Sibley, NOAA NMFS | | |
| Brian Cladoosy, Swinomish Indian Tribal Community | | |
| Steve Nissley, Natural Resources Conservation Service | | |
| Mark Asmundson, Northwest Clean Air Agency | | |
| Tulalip Tribes Natural Resource Office | | |
| Ken Berg, USFWS | | |
| Doug Thompson, WDFW | | |
| Tom Wooten, Jacqueline Ferry, Samish Indian Nation | | |
| Shawn Yanity, Kerry Lyste, Stillaguamish Tribe of Indians | | |
| Leonard Forsman, Dennis Lewarch, Suquamish Tribe | | |
| Jennifer Washington, Harry Chesnin, Upper Skagit Indian Tribe | | |

# COST BENEFIT ANALYSIS

The City of Oak Harbor evaluated various infrastructure alternatives to provide new wastewater treatment in its Facilities Plan (Carollo, 2013). Several sites were evaluated for locating the new wastewater treatment facilities and the outfall as well as alternatives for types of treatment of wastewater and biosolids.

Using a triple bottom line plus (TBL+) analysis, the City selected three final alternatives for further evaluation: (1) an activated sludge facility at Crescent Harbor North; (2) a MBR facility at Crescent Harbor North; and (3) a MBR facility within the Windjammer Vicinity. These alternatives provide diversity with respect to location and non-cost challenges and opportunities. Additional community input was also solicited to assist in refining alternative layouts and to better determine community perceptions related to non-cost factors. The Crescent Harbor North AS alternative has the lowest project cost ($89.0 million). Estimated project costs for the other two final alternatives are within five percent of this ($93.5 million). Annual O&M costs for the Crescent Harbor North alternatives are higher, reflecting approximately $170,000 per year in O&M cost for wastewater and effluent conveyance. The net present value of all three of the final alternatives is within five percent of one another. Based upon the analysis of the technical data, comparison of the evaluation criteria, and all public comment received to date, the City Council has determined that the Windjammer Vicinity site using a MBR process best meets the needs of the City.

# Figures


S:\GIS\Projects\209xxx\209497_Oak_Harbor\Mxd\cdm-Oak Harbor BA\Oak_Harbor_working.mxd (cdm, 3/15/2013)

SOURCE: City of Oak Harbor 2009

Oak Harbor Wasterwater Treament Facilities Biologial Evaluation. 209497

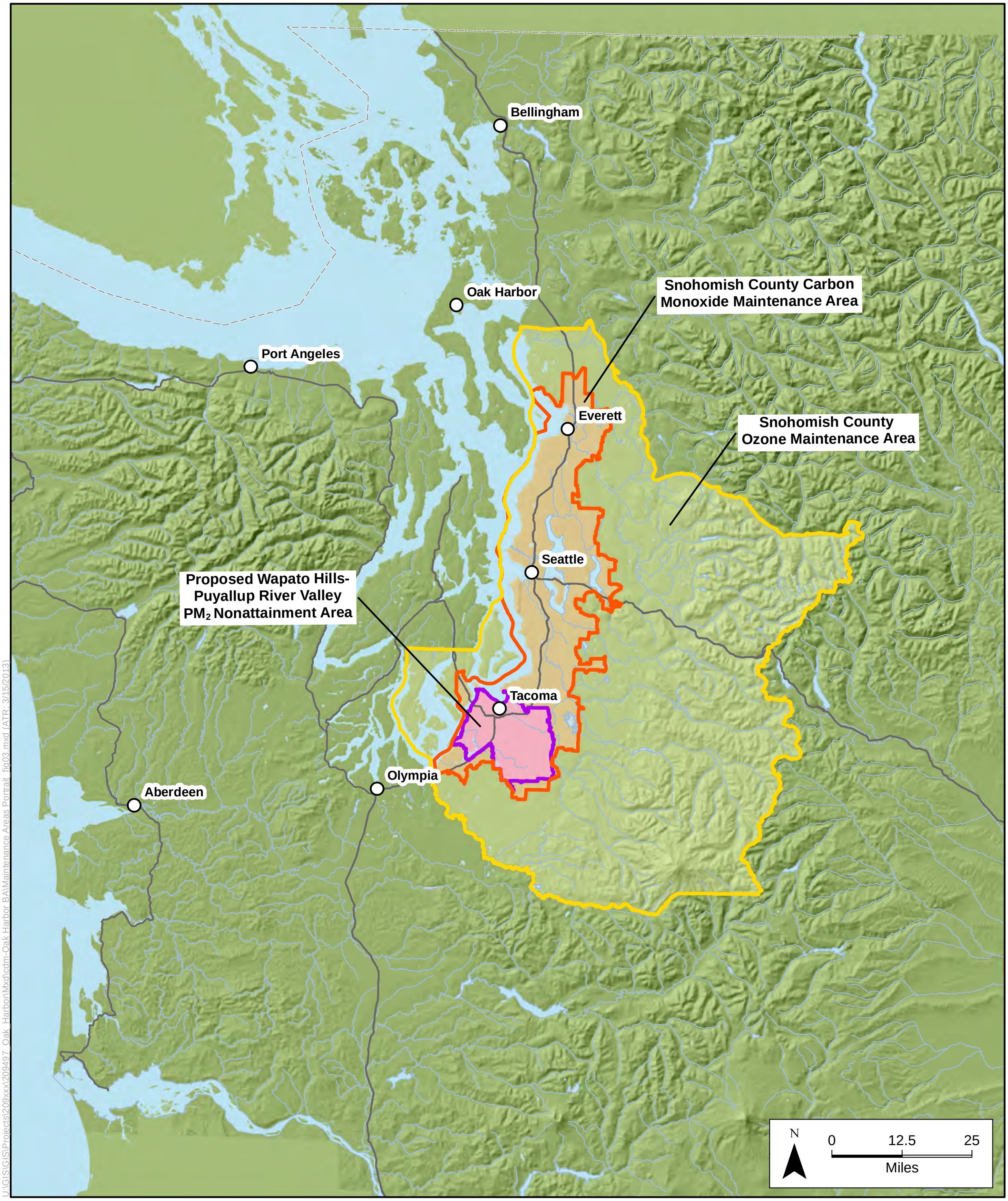
**Figure 1**
Vicinity Map
Oak Harbor WWTP Facility
Oak Harbor, Washington


S:\GIS\Projects\209xxx\209497 Oak Harbor\Mxd\cdm-Oak Harbor BA\Oak Harbor working.mxd (cdm, 3/15/2013)

SOURCE: City of Oak Harbor 2009

Oak Harbor Wasterwater Treament Facilities Biologial Evaluation. 209497

**Figure 2**
Conceptual Site Layout
Oak Harbor WWTP Facility
Oak Harbor, Washington




SOURCE: Ecology, 1998

Oak Harbor WWTP . 209497

**Figure 3**
Air Quality Maintenace Area
Oak Harbor, Washington

# Appendix A: Environmental Justice Information

Federal Executive Order 12898 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations") requires the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in the development, implementation, and enforcement of environmental laws, regulations, and policies. U.S. Census and American Community Survey data was used to determine whether the Oak Harbor Wastewater Treatment Facility would have environmental justice impacts. Income data from the American Community Survey used in the analysis is presented in Table 1. Race and ethnicity data from the U.S. Census is presented below in Table 2.

**Table 1. Per Capita Income**

| | **Per Capita Income** |
|---|---|
| Island County | $30,352 |
| Oak Harbor | $22,679 |
| Census Tract 9707 | $26,201 |

Source: American Community Survey, 2009

## Table 2. Race and Ethnicity

| | Island County (%) | Oak Harbor (%) | Census Tract 9707 (%) | Census Block 2014 (%) |
|---|---|---|---|---|
| **Total Population** | 78,506 (100%) | 22,075 (100%) | 1,922 (100%) | 74 (100%) |
| **One race** | 74,996 (95.5%) | 20,364 (92.2%) | 1,798 (93.5%) | 74 (100%) |
| White | 67,611 (86.1%) | 16,023 (72.6%) | 1,504 (78.3%) | 72 (97.3%) |
| Black or African American | 1,716 (2.2%) | 1,071 (4.9%) | 83 (4.3%) | 1 (1.4%) |
| American Indian and Alaska Native | 658 (0.8%) | 195 (0.9%) | 21 (1.1%) | 0 (0%) |
| Asian | 3,440 (4.4%) | 2,254 (10.2%) | 118 (6.1%) | 1 (1.4%) |
| Native Hawaiian and Other Pacific Islander | 390 (0.5%) | 221 (1.0%) | 19 (1.0%) | 0 (0%) |
| Some other race | 1,181 (1.5%) | 600 (2.7%) | 53 (2.8%) | 0 (0%) |
| **Two or more races** | 3,510 (4.5%) | 1,711 (7.8%) | 124 (6.5%) | 0 (0%) |
| **Racial Minority** | 10,895 (13.9%) | 6,052 (27.4%) | 418 (21.7%) | 2 (2.7%) |
| **Hispanic or Latino (of any race)** | 4,295 (5.5%) | 2,055 (9.3%) | 172 (8.9%) | 1 (1.4%) |
| **Minority[1]** | 13,297 (16.9%) | 8,107 (36.7%) | 502 (26.1%) | 3 (4.1%) |

Source: US Census Bureau, 2010

[1] The total Minority calculation includes all respondents who selected a race other than white as well as all respondents who selected both white and Hispanic or Latino.

# Appendix B: Sole Source Aquifer Checklist

# Sole Source Aquifer Checklist

1. Location of Project and name of Sole Source Aquifer:
   *The project is located on Whidbey Island in the City of Oak Harbor in Section 2, T32N, R1E. The entire project is located in the Whidbey Island Sole Source Aquifer.*

2. Project description and federal funding source (e.g., Federal Highway Administration, Housing and Urban Development etc.):
   *The City of Oak Harbor (City) is proposing to construct a new wastewater treatment facility located on 4 acres in the vicinity of Windjammer Park inside city limits. The proposed project will include a membrane biological reactor (MBR) facility. Treatment at this facility will consist of: preliminary treatment in which sewage will be pumped, screened, degritted, and equalized; secondary treatment in an aeration basin followed by membrane filtration with MBR; Ultra Violet disinfection; and solids treatment. The secondary effluent will be capable of meeting an effluent total inorganic nitrogen concentration of 8 mg/L, effluent total suspended solids and carbonaceous biochemical oxygen demand concentration of 10 mg/L. The project will also include: approximately 20,000 feet of new pipe to convey wastewater flows from the Navy Seaplane Base to the new facility should the Navy wish to connect to the new plant; construction of eight buildings covering approximately 38,400 square feet to house preliminary treatment, MBR facilities, UV disinfection, chemicals, solids treatment, odor control, effluent storage, and administration, laboratories, maintenance and electrical; two aeration buildings; an equalization basin; a waste activated sludge basin; approximately 300 feet of new pipe from the treatment facility to the outfall in Oak Harbor. The project will also include a 2,100-foot long replacement outfall in Oak Harbor.*

3. Is there any increase of impervious surface? If so, what is the area?
   *The new wastewater treatment facilities will be located on approximately 4 acres in the Windjammer Park area. The facilities will increase impervious surface on the site by approximately 60 percent.*

4. Describe how storm water is currently treated on the site?

   *Storm water collection and treatment is regulated through Title 12 of the Oak Harbor Municipal Code (OHMC). Additionally, the City has adopted by reference the Washington Department of Ecology's Storm Water Management Manual for the Puget Sound Basin (OHMC 12.30.310). There are four existing storm water facilities on the Windjammer Vicinity site: (1) two large, 42" diameter storm drain pipelines that run from Pioneer Way to Oak Harbor; (2) a smaller (8" to 18") storm drain pipeline that runs along pioneer way and connects with the two large 42" lines; (3) a smaller 8" storm drain pipeline that runs along SE City Beach Street, connecting with the storm drainage pipeline along Pioneer Way; and (4) a ditch north of the Windjammer Park that connects with the two large 42" diameter storm drain pipelines.*

5. How will storm water be treated on this site during construction and after the project is complete?

*During the construction phase, all facilities will be built following the requirements of a Construction Stormwater Pollution Prevention Plan issued by the Washington State Department of Ecology. Construction storm water permit compliance will be managed by a Certified Erosion and Sediment Control Lead (CESCL). Construction will be monitored by CESCL train construction inspectors.*

*Storm water management for the facility site will be designed in accordance with the most recent Washington State Department of Ecology Stormwater Management Manual for Western Washington. Site specific information about storm water management can be provided when the facility is designed for construction.*

6. Are there any underground storage tanks present or to be installed? Include details of such tanks.

   *There are three leaking underground storage tank sites in the vicinity of the proposed new facilities. Two are gas station locations to the northwest of the proposed new facilities and the third is a leaking petroleum tank at the existing wastewater treatment plant site. Ecology lists all three sites as having started cleanup. The status of clean up and the potential for disturbing the underground plume and monitoring wells will be evaluated as part of the design of the new facilities.*

   *The wastewater treatment facility will include four below ground structures: an equalization basin, two aeration basins, and a waste activated sludge storage basin. These basins will be covered and liquid levels will be continuously monitored. Basins will be constructed of concrete. Further details can be provided when the sewage facilities are designed for construction*.

7. Will there be any liquid or solid waste generated? If so how will it be disposed of?

   *Liquid waste will not be generated; however, this project will collect liquid and solid waste in the form of sanitary sewage. Sewage will be treated using membrane bioreactor technology. Treated wastewater will be discharged to Oak Harbor through a replacement outfall. All treatment and disposal will meet the requirements of the NPDES permit for the facilities. Initially, the solids removed from the sewage will be dewatered and lime stabilized, producing a Class B beneficial reuse product. In the future, the solids will be dewatered and dried to produce a Class A beneficial reuse product.*

8. What is the depth of excavation?

   *The deepest depths of exaction will be associated with the below-ground facilities--two aeration basins, equalization basin and waste activated sludge storage basin. Maximum depth will be approximately 20 feet*. *The new sewer lines and outfall will require excavation of approximately 6 to 12 feet. Additional details will be provided when the facilities are designed.*

9. Are there any wells in the area that may provide direct routes for contaminates to access the aquifer and how close are they to the project?

*There are no known wells in the area that would convey contaminants to the aquifer. The project will not discharge any contaminates to the aquifer*.

10. Are there any hazardous waste sites in the project area…especially if the waste site has an underground plume with monitoring wells that may be disturbed? Include details.
    *There are no known hazardous waste sites or plumes in the project area. An Environmental Site Assessment will be conducted of the project area prior to construction.*

11. Are there any deep pilings that may provide access to the aquifer?
    *Pile foundations will be required for water bearing tanks to a depth of approximately 30 to 34 feet below the ground surface*. *For the buried tanks (the two aeration basins, equalization basin and WAS storage tank) pile foundations will be required to a depth of 10 to 14 feet below the depth of the tanks.*

12. Are Best Management Practices planned to address any possible risks or concerns?
    *Any risks or concerns to the aquifer will be mitigated by the use of best management practices and industry best practices.*

13. Is there any other information that could be helpful in determining if this project may have an effect on the aquifer?
    *No additional information is available at this time. Additional detail will be provided when the facilities are designed*.

14. Does this Project include any improvements that may be beneficial to the aquifer, such as improvements to the wastewater treatment plan?
    *The project will help prevent aquifer contamination now and in the future. The existing facilities are adequate to meet current NPDES requirements, but they are not capable of providing reliable long-term service. The project could provide direct benefits to the aquifer by providing the capacity to eliminate on-site sewer systems in the City and Urban Growth Area. The project will improve water quality in Oak Harbor Bay and Crescent Harbor by replacing the existing outfalls. The existing outfall in Oak Harbor Bay does not function and is no longer used and the Crescent Harbor outfall is functional, but damaged*.

The EPA Sole Source Aquifer Program may request additional information if impacts to the aquifer are questionable after this information is submitted for review.

# Appendix C: Agency and Tribal Correspondence

February 28, 2013

Linda Rankin
CZM/Shorelines Management
Washington Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

**RE: SERP Environmental Review for the proposed Oak Harbor Wastewater Treatment Facility**

Dear Ms. Rankin:

The City of Oak Harbor (City) is in the process of performing an environmental review pursuant to the State Environmental Review Process (SERP) to assess the environmental impacts of a proposed new wastewater treatment facility in the City. The new treatment facility would be constructed on approximately 4 acres in the Windjammer Park vicinity within City limits (Figure 1). A new outfall, replacing the City's existing failed outfall, would discharge to Oak Harbor Bay. The SERP documentation will be undertaken concurrently with preparation of a State Environmental Policy Act (SEPA) checklist. The proposed project is necessary to replace the City's two existing treatment facilities with a modern facility capable of meeting future demands and water quality requirements. The purpose of this letter is to: 1) request information that might be useful to the environmental review; and 2) request your comments or concerns regarding the proposed project.

The new wastewater treatment plant will be a membrane biological reactor (MBR). Treatment at this facility will include preliminary and secondary treatment, membrane filtration, ultra violet (UV) disinfection, and treatment of solids to produce a beneficial reuse product. Facilities at the site will include eight buildings covering approximately 38,400 square feet or approximately 20 percent of the 4-acre site. The buildings will be 15 to 20 feet tall. Preliminary treatment, MBR filtration, UV disinfection, solids treatment and odor control facilities will all be housed in covered buildings. Other buildings on the site will be the administration, laboratory, maintenance and electrical buildings. Two below ground aeration basins and a 20 foot tall effluent storage tank will also be located on the site. Approximately 20,000 feet of new pipe will be required to convey wastewater flows from the Navy Seaplane Base to the new facility should the Navy wish to connect to the City's new facility.

A replacement outfall, 2,100 feet long, will be built in close proximity to the alignment of the existing failed outfall in Oak Harbor. The replacement outfall includes a new 184-foot long diffuser at the end of the outfall. Approximately 300 feet of new pipe will connect the treatment plant to the outfall. The existing outfall pipe will be abandoned in place.

The City intends to apply for funding for the project through the State Revolving Fund (SRF) which is federal funding administered locally by Ecology. The State Environmental Review Process (SERP) is a process required if state and federal funds are used for the planning, design, or construction of wastewater collection and/or treatment facilities. The requirements for compliance with SERP are provided in the Draft Revolving Fund State Environmental Review Process and Ecology's 2001 Federal Cross Cutter Guidelines document. A Federal Cross Cutter Review is being prepared to comply with these requirements. SERP also requires that all applicants obtain comments from resource agencies, in regard to important issues of concern.

The City would appreciate your review of this proposal and comments from your agency regarding any issues of concern or information that should be included in the environmental documentation. Please identify any additional review requirements your agency may have. Also, please provide any recommendations you may have to avoid or mitigate potential impacts to resources in the project vicinity. We would appreciate a response by March 28, 2013. If you need any further information or wish to discuss the project, please contact me at (360) 279-4750.

Sincerely,

Cathy Rosen
Public Works Director
City of Oak Harbor

cc: Lisa Adolfson, ESA

Attachment: Vicinity Map

CITY OF Oak Harbor
WHIDBEY ISLAND, WASHINGTON

February 28, 2013

Brian Cladoosby, Chairman
Swinomish Indian Tribal Community
11404 Moorage Way
LaConner, WA 98257

**RE: SERP Environmental Review for the proposed Oak Harbor Wastewater Treatment Facility**

Dear Mr. Cladoosby:

The City of Oak Harbor (City) is in the process of performing an environmental review pursuant to the State Environmental Review Process (SERP) to assess the environmental impacts of a proposed new wastewater treatment facility in the City. The City intends to apply for funding for the project through the State Revolving Fund (SRF) which is federal funding administered locally by Ecology. The State Environmental Review Process (SERP) is a process required if state and federal funds are used for the planning, design, or construction of wastewater collection and/or treatment facilities. The requirements for compliance with SERP are provided in the Draft Revolving Fund State Environmental Review Process and Ecology's 2001 Federal Cross Cutter Guidelines document. A Federal Cross Cutter Review is being prepared to comply with these requirements. SERP also requires that all applicants obtain comments from resource agencies, in regard to important issues of concern.

The City anticipates that the project will be subject to Section 106 consultation. The City has been working with an archaeologist and will be conducting surveys of the selected site for the wastewater treatment facility and Section 106 consultation in the near future.

The new treatment facility would be constructed on approximately 4 acres in the Windjammer Park vicinity within City limits (Figure 1). A new outfall, replacing the City's existing failed outfall, would discharge to Oak Harbor Bay. The SERP documentation will be undertaken concurrently with preparation of a State Environmental Policy Act (SEPA) checklist. The proposed project is necessary to replace the City's two existing treatment facilities with a modern facility capable of meeting future demands and water quality requirements.

The purpose of this letter is to: 1) request information that might be useful to the environmental review; and 2) request your comments or concerns regarding the proposed project.

The new wastewater treatment plant will be a membrane biological reactor (MBR). Treatment at this facility will include preliminary and secondary treatment, membrane filtration, ultra violet (UV) disinfection, and treatment of solids to produce a beneficial reuse product. Facilities at the site will include eight buildings covering approximately 38,400 square feet or approximately 20 percent of the 4-acre site. The buildings will be 15 to 20 feet tall. Preliminary treatment, MBR filtration, UV disinfection, solids treatment and odor control facilities will all be housed in covered buildings. Other buildings on the site will be the administration, laboratory, maintenance and electrical buildings. Two below ground aeration basins and a 20 foot tall effluent storage tank will also be located on the site. Approximately 20,000 feet of new pipe will be required to convey wastewater flows from the Navy Seaplane Base to the new facility should the Navy wish to connect to the City's new facility.

A replacement outfall, 2,100 feet long, will be built in close proximity to the alignment of the existing failed outfall in Oak Harbor. The replacement outfall includes a new 184-foot long diffuser at the end of the outfall. Approximately 300 feet of new pipe will connect the treatment plant to the outfall. The existing outfall pipe will be abandoned in place.

The City would appreciate your review of this proposal and your comments regarding any issues of concern or information that should be included in the environmental documentation. As noted above, the City will also be complying with Section 106 consultation in the near future. Please identify any additional review requirements your agency may have. Also, please provide any recommendations you may have to avoid or mitigate potential impacts to resources in the project vicinity. We would appreciate a response by March 28, 2013. If you need any further information or wish to discuss the project, please contact me at (360) 279-4750.

Sincerely,

Cathy Rosen
Public Works Director
City of Oak Harbor

cc: Lisa Adolfson, ESA

Attachment: Vicinity Map

# Biological Assessment

# OAK HARBOR WASTEWATER TREATMENT FACILITIES

Biological Assessment

Prepared for

City of Oak Harbor
Department of Public Works

August 2013

# TABLE OF CONTENTS

## List of Tables

# 1.0 INTRODUCTION

The City of Oak Harbor (City), Washington is currently serviced by two aging wastewater treatment facilities, including a rotating biological contactor facility (RBC) facility near Windjammer Park, and a lagoon facility on the Navy's Seaplane Base. The City is proposing to replace both of these wastewater treatment facilities with an entirely new and modern facility capable of providing continued reliable wastewater service to the community of Oak Harbor while protecting and preserving the surrounding environment (Figure 1). While the existing facilities are currently capable of meeting the requirements of the City's National Pollutant Discharge Elimination System (NPDES) Permit, they are not able to provide reliable long-term service for several reasons, including:

- The existing RBC facility is nearing the end of its useful life;
- Both the RBC and lagoon facilities lack the technology necessary to meet increasingly stringent water quality standards and have inadequate capacity to keep pace with anticipated population growth;
- Both effluent outfalls have experienced major failures; the RBC outfall into Oak Harbor no longer functions and the lagoon facility's outfall into Crescent Harbor is functional but damaged; and
- Due to environmental constraints, expansions or modifications to the lagoon facilities are infeasible.

**Project Information**

| | |
|---|---|
| Project Name | Oak Harbor Wastewater Treatment Facility Project |
| State: | Washington |
| County: | Island |
| Location: | Township 32 North, Range 01 East, Sections 2 and 39 |
| Proponent: | City of Oak Harbor Department of Public Works<br>865 SE Barrington Drive<br>Oak Harbor, Washington 98277<br>Contact: Joe Stowell, PE, City Engineer<br>Phone: (360) 279-4520 |
| Preparer: | Environmental Science Associates (ESA)<br>5309 Shilshole Avenue NW, Suite 200<br>Seattle, Washington 98107 |
| Preparer Contact: | Steve Krueger<br>Phone: (206) 789-9658 |

## 1.1 Background

The information presented herein was largely taken from the 2013 *Draft Facilities Plan* prepared by Carollo Engineers (Carollo, 2013). The City's wastewater system serves approximately 24,000 people within the City and the Navy Seaplane Base. In 1978 the RBC Plant was constructed to upgrade the existing primary treatment plant, which was originally constructed in 1954. Parts of the primary treatment plant, including the primary clarifiers and a digester, are still in service today. Historically, effluent from the RBC Plant was discharged through an outfall into Oak Harbor; however, this outfall failed in 2010 and is no longer used. Instead, all flow treated at the RBC Plant is currently pumped to the Seaplane Base Lagoons Plant (Lagoon Plant).

The Lagoon Plant was constructed and operated by Naval Air Station (NAS) Whidbey to serve the Seaplane Base, and originally consisted of a large facultative cell, a small settling cell, disinfection, and a marine outfall discharging into Crescent Harbor. In 1990, the City secured a 50-year lease from the Navy to operate the lagoons. A pump station was subsequently constructed at the RBC Plant to divert City flows in excess of 0.7 mgd to the Lagoon Plant. The City has made a number of upgrades to the lagoons since the pump station began operation in 1991. The lagoons are used today to treat raw wastewater and RBC effluent. Lagoon effluent is discharged through an outfall pipe into Crescent Harbor.

Based on historical records, the RBC Plant has reached its permitted flow limit of 0.7 mgd, and the Lagoon Plant is within 85 percent of the rated influent flow and biochemical oxygen demand (BOD) loading capacity. In response, the City developed the 2013 *Draft Facilities Plan* to assess the potential for upgrading the existing RBC and lagoon facilities, recommend alternative treatment technologies and processes, put forth a preferred alternative that would continue to meet current NPDES permit limits, provide improved effluent water quality, as well as meet the needs of future growth in the Service Area by increasing treatment capacity.

### 1.1.1 Outfalls

The City's RBC plant is located near the shoreline of Oak Harbor and the Lagoon plant is located adjacent to Crescent Harbor. Treated effluent from each facility is discharged through an outfall to Crescent Harbor. As noted above, the RBC plant outfall is no longer operational so effluent is pumped to the Lagoon plant for discharge to Crescent Harbor. The RBC and Lagoon wastewater treatment plant (Plant(s)) locations, as well as the outfall locations, are shown in Figure 2.

#### *1.1.1.1 RBC Outfall*

Treated effluent from the RBC Plant was historically discharged into Oak Harbor through an 18-inch-diameter corrugated metal pipe (CMP) outfall (Outfall #001). There are apparently no construction drawings available for the existing outfall. According to previous mixing zone study reports (URS, 1995), the outfall is 1,160 feet long, and terminates at a water depth of approximately -14 feet mean lower low water (MLLW). The outfall includes a diffuser section at the terminus consisting of five eight-inch ports arranged in a modified "H" pattern and a single six-inch port. The six-inch port is oriented as an opening in the top center of the diffuser. Four of the eight-inch ports are equally-spaced on seven-foot centers around the top port (two on each side of the diffuser) and discharge horizontally. The sixth port (eight-inch) discharges horizontally at the end of the pipe.

The diffuser has had a history of sediment buildup and blockage of individual ports. In summer 2010, a significant portion of the outfall was found to be filling with sediments, blocking flow to the diffusers. The City has abandoned the existing Oak Harbor outfall and is currently pumping treated effluent to the Lagoon facility for discharge in Crescent Harbor.

#### *1.1.1.2 Lagoon Plant Outfall*

Treated effluent from the Lagoon Plant is discharged into Crescent Harbor though an 18-inch diameter concrete outfall (Outfall #002). The outfall is 3,284 feet long, terminating at a water depth of -44 feet MLLW. The first 990 feet from the shoreline out to approximately -15 feet MLLW consists of reinforced concrete pipe (RCP) constructed circa 1960. The outfall was extended with concrete cylinder pipe (CCP) in 1989 from that point to the current diffuser location shown in Figure 2. The CCP portion of the outfall terminates in a diffuser section consisting of twenty-four 2-1/4-inch ports spaced alternately on eight-foot centers. The diffuser ports discharge horizontally at the spring line of the outfall diffuser pipe.

The Lagoon Plant outfall was inspected by Cosmopolitan Marine Engineers (Cosmopolitan) divers in October 2010. The summary conclusions and recommendations from the study are summarized below:

- The older RCP section of the outfall has reported leaks near shore, and is not considered suitable for long-term wastewater discharge scenarios.
- The thrust block and coupling joining the RCP and CCP pipe is separated and leaking.
- The CCP section of the outfall constructed in 1989 is in good condition and may be considered in any long-term wastewater discharge scenario.
- The diffuser section is structurally in good condition, but enlargement and various repairs to diffuser ports and the end cap would be necessary.

### 1.1.2 NPDES Permit Limitations

The RBC and Lagoon Plant both operate under a National Pollutant Discharge Elimination System (NPDES) permit, which places limits on various water quality parameters, flow rates, and waste loadings. The current NPDES permit (Permit No. WA0020567) was issued on August 29, 2011 by the Washington Department of Ecology (Ecology), revised on December 4, 2012, and expires on August 29, 2016 (Ecology, 2012). Discharge limits for water quality per the current NPDES permit for the wastewater treatment plant (WWTP) are listed in Table 1-1. The full NPDES permit is included in Appendix A.

**Table 1-1. City of Oak Harbor NPDES Effluent Limits for Outfall #002**

| Parameter | Average Monthly[a] | Average Weekly[b] |
|---|---|---|
| Carbonaceous Biochemical Oxygen Demand (5-day) ($CBOD_5$) | 25 mg/L, 521 lb/day; 85% removal of influent $CBOD_5$ | 40 mg/L, 834 lb/day |
| Total Suspended Solids | 75 mg/L, 1564 lb/day; 65% removal of influent TSS | 110 mg/L, 2294 lb/day |
| Total Residual Chlorine | 0.5 mg/L | 0.75 mg/L |
| **Parameter** | **Daily Minimum** | **Daily Maximum** |
| pH[c] | 6 standard units | 9 standard units |
| **Parameter** | **Monthly Geometric Mean** | **7-day Geometric Mean** |
| Fecal Coliform Bacteria[d] | 200/100 mL | 400/100 mL |
| **Acute Toxicity** | | |
| The effluent Acute Toxicity limit is: **No acute toxicity detected in a test concentration equal to the acute critical effluent concentration (ACEC).** The ACEC means the maximum concentration of effluent during critical conditions at the boundary of the acute mixing zone, defined in Section S9 of this permit. The ACEC equals 1.2 % effluent. | | |
| a | Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured. See footnote (d) for fecal coliform calculations. | |
| b | Average weekly discharge limitation means the highest allowable average of “daily discharges” over a calendar week, calculated as the sum of all “daily discharges” measured during a calendar week divided by the number of “daily discharges” measured during that week. See footnote d for fecal coliform calculations. | |
| c | Indicates the range of permitted values. The Permittee must report the instantaneous maximum and minimum pH monthly. Do not average pH values. | |
| d | Ecology provides directions to calculate the monthly and the 7-day geometric mean in publication No. 04-10-020, Information Manual for Treatment Plant Operators available at: http://www.ecy.wa.gov/pubs/0410020.pdf. | |

#### *1.1.2.1 Potential Future Permitting Considerations*

Although alternatives to expand capacity are largely evaluated on their ability to meet current NPDES permit limits, their flexibility to adapt to future regulatory requirements is an important planning consideration for the City. Potential future NPDES permit limits are considered are included in Appendix B, including an assessment of nutrient limits and the ability to meet potential future trace organic chemical (TOrC) limits, although there is insufficient data to fully quantify the impact of TOrC limits from the proposed action.

### 1.1.3 Historic and Current Flow and Loads

The historic and existing sewer flows and loads for the RBC and Seaplane Lagoon Plants were analyzed for the years 2004 through 2011 and used to calculate current per capita flows and loads and flow and load peak factors. These values were used as the basis of design for the proposed facility.

In summary, the combined (City + Navy) base wastewater flow (BWF) ranged from 1.7 mgd to 2.0 mgd. Combined average annual flow (AAF) has ranged from 1.9 mgd to 2.0 mgd, maximum month flows (MMF) have ranged from 2.4 mgd to 3.5 mgd, and peak day flow (PDF) has ranged from 3.2 mgd to 4.3 mgd. A per capita flow rate was also calculated and ranged from 75 gallons per capita per day (gpcd) to 96 gpcd.

The historical range of combined City and Navy BOD, Total Suspended Solids (TSS), and ammonia ($NH_3$) loads are presented in Table 1-2 below.

**Table 1-2. Historic Influent Loading Range for the Combined Plant Flow (2004 through 2011).**

| Parameter | Loading Range for Combined Flows | | | |
|---|---|---|---|---|
| | Average Annual Loading (ppd)[1] | Maximum Monthly Loading (ppd) | Peak Day Loading (ppd) | Per Capita Loading (gpcd) |
| **BOD** | 3,703 - 4,102 | 4366 - 5,319 | 4,317 - 6,875 | 0.17 – 0.19 |
| **TSS** | 3,007 - 3,556 | 3,621 - 5,156 | 4,301 - 7,138 | 0.14 – 0.16 |
| **$NH_3$** | 433 - 488 | 516 - 589 | 490 - 681 | 0.021 - 0.022 |

ppd = pounds per day

As noted above, the City has reached its permitted limit of 0.7 mgd at the RBC and the Lagoon Plant is at 85% of its rated BOD loading capacity. As such, the City must develop a plan to address anticipated future flow and loading conditions. Historic and current base wastewater flows are summarized in Chapters 4.3 and 4.4 of the *Draft City of Oak Harbor Facility Plan* (Carollo Engineers, 2013).

## 1.2 Project Objectives

The *Draft City of Oak Harbor Facility Plan* (Carollo Engineers, 2013) provides a prioritized implementation and construction sequence that addresses: 1) current and future needs of the WWTP to reliably meet permit limitations, 2) cost effective alternatives to prepare for growth through the 20 year planning period, and 3) the ability to meet more stringent regulatory targets related to nutrient removal in the future. The purpose of the proposed project is to construct the recommended improvements contained in the 2013 *Draft City of Oak Harbor Facility Plan*.

The proposed new wastewater treatment facility is designed to meet the following primary objectives:

- Provide continued reliable wastewater treatment service;
- Meet high standards for water quality;
- Allowing phased expansion to meet future demands; and
- Delivering construction and operation of a new facility by 2017 in a cost-effective manner.

## 1.3 Federal Nexus

The City is providing this Biological Assessment (BA) to facilitate review of the proposed action as required by section 7(c) of the Endangered Species Act (ESA). This BA has been prepared to facilitate coordination between the federal action agency and the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), jointly referred to as the Services. Section 7 of the ESA requires that, through consultation (or conferencing for proposed species) with the USFWS and/or NMFS, federal actions do not jeopardize the continued existence of any threatened, endangered, or proposed species or result in the destruction or adverse modification of critical habitat.

The proposed action will require federal funding and approval through the United States Environmental Protection Agency (EPA), which is the federal nexus for this project requiring consultation between the federal lead agency and the Services.

## 1.4 Report Objectives

This BA describes baseline conditions and potential effects to ESA regulated fish and wildlife and critical habitat that may be present in the vicinity of the action. This document describes potential direct and indirect effects of the proposed action as well as the effects of interrelated and interdependent actions upon listed species, critical habitat, and the environmental baseline within the project area related to the construction of a new wastewater treatment plant in the City of Oak Harbor, Washington; construction of a new outfall into Oak Harbor, and decommissioning the existing RBC Plant. The proposed action will be constructed, operated, and maintained by the City.

This BA has the following objectives:

- To review information on species within the Action Area. Information on baseline conditions was drawn from public resource documents as referenced in the text. In addition, regional experts with specific knowledge of habitat conditions and fish use within the Action Area were contacted. A listing of pertinent references and contacts is provided at the end of this report;
- To conduct a review of the project area to document species habitat and site-specific conditions;
- To discuss impacts of the proposed action and effects to the species and habitats;
- To discuss permit conditions and additional impact avoidance and minimization measures;
- To provide a recommendation with regard to effect determinations;
- In addition, this BA addresses the proposed action's compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), which requires Federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH). The objective of this EFH assessment is to determine whether or not the proposed action "may adversely affect" designated EFH for relevant commercially, federally-managed fisheries species within the proposed Action Area. For the purpose

of this assessment, the proposed action for the EFH assessment and BA incorporate the same project elements. The EFH Assessment is included as Appendix C to this document.

### 1.5 Consultation History

No communications with the Services have occurred prior to preparation of this document. All species listings were obtained from both agencies' websites and are included in Appendix D.

## 2.0 PROJECT DESCRIPTION

### 2.1 Project Location and Wastewater Service Area

The City of Oak Harbor is located near the northern end of Whidbey Island in Island County, Washington. As shown in Figures 1 and 2, Island County consists of Whidbey Island and Camano Island, in the area where Puget Sound meets the Strait of Juan de Fuca. The City is situated on Oak Harbor and near Crescent Harbor, which are adjoining embayments off Saratoga Passage, the waterway separating Whidbey Island from Camano Island. The United States Navy operates two bases on Whidbey Island: the Seaplane Base located in the eastern portion of the City and Ault Field which lies to the north of the City. The proposed new membrane bioreactor (MBR) facility would be constructed in the vicinity of the City's major community park, Windjammer Park (Figure 3). The park consists of a constructed lagoon utilized as a public swimming area, lawn and picnic areas, wading pools, and other public amenities including a pedestrian trail along the shoreline of Oak Harbor. The new facility would be sited in the vicinity of the existing RBC Plant, and the new outfall for the MBR facility would be constructed adjacent to the existing abandoned RBC Plant outfall into the marine waters of Oak Harbor.

The City covers approximately 6,030 acres (9.4 square miles), of which 2,820 acres (4.4 square miles) is occupied by the Navy's Seaplane Base. The City's Urban Growth Area (UGA) includes all of the City of Oak Harbor, as well as unincorporated areas to the north, between the City and Ault Field, and to the south and west of the City (Figure 5). The UGA represents all of the Oak Harbor vicinity likely to be needed for development to accommodate urban growth over the next 20 years. The City-owned wastewater collection and treatment system currently serves nearly all of the developed area within the city limits outside the Seaplane Base. Several pockets of unsewered areas exist within city limits. According to city records, an estimated 136 households within the current city limits are not connected to the City's sewer system and are using on-site sewer systems. This equates to less than two percent of the City's population. Outside the city limits but within the UGA boundary, all existing residences and businesses are served by on-site sewer systems.

#### 2.1.1 Topography

The wastewater service area generally consists of gently sloping terrain with undulating hills. There are the steep bluffs adjacent to the water in the southern part of the service area and the prominent hills west of the city center. Typical slopes within the study area are 3 to 6 percent. Elevations within the study area range from just over 400 feet (City of Oak Harbor datum) to sea level (100 feet, City of Oak Harbor datum).

### 2.1.2 Geology

Geologic characteristics in the study area are largely the result of regional glacial processes. Erosion and deposition associated with glaciation have strongly influenced regional topography, soils, and groundwater characteristics. Soils in the service area are generally a sandy loam, which developed under a heavy stand of timber in a mild, moist, nearly frost-free climate. The parent material can be described in general as undulating and rolling, gravelly and stony, coarse to moderately coarse textured material underlain by loose glacial outwash.

There are 18 soil classifications within the service area, with sub-classifications based on slope. Most of the soils in the central area of the City are of the Townsend variety. These areas have sloping, well-drained soil underlain by compact gravelly till. North of this zone, the soil transitions to Whidbey soils, which are well drained soils underlain by a cemented glacial till. To the west, the soil transitions to Coveland soil, a poorly drained soil underlain by fine-textured till, marine, or lake-laid sediments. Continuing west from this area, the soil then transitions into Hoypus soil, an excessively drained soil underlain by loose gravelly or sandy drift or wind-reworked areas.

### 2.1.3 Floodplains

Portions of the existing RBC Plant and the majority of the Lagoon Plant are within the mapped 100-year floodplain based upon current Flood Insurance Rate Maps (FIRMs) for the Oak Harbor vicinity prepared by the Federal Emergency Management Agency (FEMA). The proposed facility, to replace the RBC facility, would be located within the Windjammer Vicinity, which also contains areas within the 100-year floodplain.

### 2.1.4 Wetlands

Observations were made of a ditch along the north property boundary of Windjammer Park. The ditch runs for almost 1,000 feet along the north end of the property. The ditch is narrow at the east and west ends (approximately 2 feet wide), and the central portion (approximately 700 feet) is up to 12 feet wide (Figure 4). Native wetland plants are dominant in the ditch and surface water was present. Formal delineation of the wetland has not been conducted on site, but criteria were met for all three wetland parameters. There was no flow in the ditch on October 30, 2012, but it appears that the ditch drains out culverts at both the west and east ends. This ditch would likely be regulated as a wetland (ESA, 2012). Construction of the new MBR facility may require filling portions of the ditch. Mitigation would be provided for wetland and buffer impacts in accordance with local, state, and federal regulations.

### 2.1.5 Surface Waters

Oak Harbor and Crescent Harbor, the main surface waters adjacent to the Oak Harbor UGA, are marine waters on the east side of Whidbey Island next to Saratoga passage and Skagit Bay. There are no significant streams or rivers within the service area. In the central area of the City, nearly all former open channels have been piped into the City's storm drainage system. A few large open channels remain in Freund Marsh to the southwest of the RBC Plant. A small man-made lagoon (Windjammer Lagoon) was constructed in Windjammer Park to provide a community swimming area. This lagoon is connected to Oak Harbor via a narrow 40-foot channel. A pedestrian trail and bridge cross the Windjammer Lagoon at the channel connection with Oak Harbor.

The Lagoon Plant was constructed within Crescent Harbor Marsh, which is a wetland system on the Seaplane Base that contains both saltwater marsh and freshwater marsh communities. Crescent Creek provides seasonal freshwater to the system. This marsh was once the largest (300 acres) open barrier salt marsh on Whidbey Island. Like many coastal wetlands in the Puget Sound region, Crescent Harbor Marsh has experienced a long history of hydrologic modification. In the 1920s, it was diked and drained for agricultural use, and the natural channel was replaced with a gated culvert. In the 1960s, the U.S. Navy constructed the Lagoon Plant in the center of the marsh. In 1994, the tide gate separating the marsh from the harbor was permanently opened. However, the undersized culvert severely limited tidal heights during the summer and impedes freshwater discharge during the winter (URS, 2005).

In August of 2009, Island County and United States Navy worked together to improve tidal flow into and throughout the Crescent Harbor Marsh. This project consisted of four parts: (1) breaching the sewer intake dike between the northwestern and eastern parts of the marsh, (2) replacing the conduit pipe between the southwestern and eastern parts of the marsh, (3) improving the dike that separates the southwestern and northwest parts of the marsh and (4) building a channel to connect the marsh to Crescent Harbor and allow the tide to flood into the wetland. Today, Crescent Harbor Marsh is a sensitive environmental area surrounding the existing Lagoon Plant. The City's Shoreline Master Program (Grette Associates, LLC and AHBL, 2011) has identified the decommissioning of the Lagoon Plant, following construction of a new wastewater treatment facility, and restoration of tidal influence and fish access to the Crescent Harbor Marsh area as unique opportunities to improve habitat conditions and recovery efforts for Chinook salmon.

### 2.1.6 Current Land Use

The land use zoning designations are shown in Figure 5. A survey conducted for the *Comprehensive Sewer Plan* (Tetra Tech, 2008) found that Oak Harbor's mix of residential, commercial, and industrial uses is generally consistent with that of similar communities in the State of Washington. One exception is in the area of industrial land within the city limits, which is lower than typical. However, it is likely that the percentage of industrial land will be more in line with that of other communities as industrial land to the north of Oak Harbor is annexed over time.

The predominant land use in the City is residential development with densities from three to 22 dwelling units per acre. Higher densities are located primarily near the center of the City, which features a mix of single-family and multi-family dwellings. Lower density areas consisting mostly of single-family homes are located to the east, west, and south of the City's central core. Residential development has been limited in the northern portion of the City due largely to noise impacts from aircraft operations at Ault Field.

### 2.1.7 Upland Vegetation

Vegetation in the vicinity of Windjammer Park and the area proposed for the new MBR facility is comprised almost entirely of lawn grasses with scattered landscaping trees throughout the park, including ornamental maples and pine trees. The beach area adjacent to the shoreline contains scattered patches of dunegrass.

## 2.2 Project Description

The proposed project will include the construction of a new MBR wastewater treatment facility on an approximate three to four-acre site in the vicinity of Windjammer Park in Oak Harbor, Washington (Figures 3 and 6). Treatment provided at the new facility will consist of:

- Preliminary treatment: Raw sewage will be pumped, screened, degritted and equalized prior to secondary treatment.
- Secondary treatment: The screened, degritted raw sewage will be treated in an aeration basin followed by membrane filtration with MBR. The secondary effluent will be capable of meeting an effluent total inorganic nitrogen concentration of 8 mg/L, effluent total suspended solids and carbonaceous biochemical oxygen demand concentration of 10 mg/L.
- Ultra Violet (UV) Disinfection
- Facility would be designed to produce up to 0.5 mgd of Class-A Reclaimed Water for use at ballfields, parks, and for other municipal needs.
- Solids Treatment: Under Phase 1 construction, the facility will produce lime – stabilized Class B sludge to be land applied at approved beneficial use facilities in eastern Washington. The facility is being designed to accommodate future solids handling improvements where stabilized waste activated sludge would be dewatered and dried producing a Class A beneficial reuse product.

The following facilities and other improvements will be required for the MBR facility and include:

- Should the Navy wish to connect to the new facility, modifications to the City's collection system to convey wastewater flows from the Navy Seaplane Base to the new wastewater facility, requiring approximately 20,000 feet of new pipeline. The majority of this pipeline would be installed within existing right-of-way.
- Construction of the following buildings and facilities on a three to four-acre site:
    - <u>Preliminary treatment building</u>: The preliminary treatment building will house two coarse screens, two fine screens, five influent pumps and two grit basins. This building is anticipated to have a surface area of approximately 4400 square feet and a height of 15 feet.
    - <u>Two Aeration Basins, Equalization Basin and WAS Storage Basin, Blower Building and Gallery</u>: These facilities will be below ground with a surface area of approximately 48,000 square feet.
    - <u>MBR Building and Chemical Building</u>: These building will house the five membrane tanks, associated equipment and chemicals. It is anticipated that these building will have a surface area of approximately 8,000 square feet and a height of 20 feet.

  - UV Building: The UV building will house the three UV channels. It is anticipated that this building will have a surface area of approximately 1,200 square feet will be 15 feet tall.
  - Solids Treatment Building and Odor Control Building: These buildings will house the dewatering, lime addition, future drying and odor control equipment. It is anticipated that these buildings will have a surface area of approximately 13,600 square feet and will be 15 feet tall.
  - Effluent Storage: Effluent storage will be provided in a cylindrical tank with a surface area of approximately 1,200 square feet and a height of approximately 20 feet.
  - Administration, Lab, Maintenance and Electrical Buildings: These buildings will house the administration offices, lab equipment and the maintenance and electrical shops. It is anticipated that these buildings will have a combined surface area of approximately 10,000 square feet and a height of 15 feet.
  - 300 feet of new pipe from the treatment facility to the outfall in Oak Harbor.

The proposed action will require the installation of a new 1,400-foot long outfall adjacent to the existing RBC outfall in Oak Harbor. The new outfall will include the following:

- 30-inch diameter pipe (high density polyethylene (HDPE) or concreted coated steel)
- Pipe will be fully buried from the shoreline to the diffuser
- Existing outfall pipe will be abandoned in place
- Outfall extent:
  - 80 feet in the nearshore zone,
  - 100 feet steep gravel beach (MHHW to +5 ft MLLW)
  - 620 feet in the lower intertidal zone on sand flat (+5 ft MLLW to -3 MLLW) and
  - 600 feet in the subtidal zone including diffuser length (-3 ft MLLW to -14 ft MLLW)
- New 200-foot long diffuser at the end of the outfall with:
  - 26 diffuser ports
  - 8-foot port spacing
  - Water depth of -14 feet relative to MLLW
  - Port height 1-foot above mudline (-13 ft MLLW elevation)
  - Port diameter 4 inches (variable)
  - Port orientation: horizontal discharge perpendicular to diffuser pipe

In addition to new construction, the existing RBC Plant will be decommissioned and demolished. Any areas of the existing RBC plant that are not used for the new MBR facility will likely be converted to open space for public use.

### 2.2.1 Outfall Construction

The anticipated construction methods for the new MBR facility outfall into Oak Harbor are described below. The new outfall replacement pipe would be constructed adjacent to the existing abandoned RBC plant outfall pipe (within 50 feet of the existing alignment). Construction of the new outfall is anticipated to take approximately 12 weeks to complete. All construction will occur during the approved in-water work window, yet to be established for this project. It is anticipated that work would be allowed during the early summer to take advantage of the low tides. Outfall construction elements include:

1. The new outfall pipe will be buried all the way through the entire alignment out to the diffuser, thus minimizing environmental impact to the intertidal zone.
2. The nearshore portion from above mean higher high water (MHHW) out to approximately +5 ft MLLW will be constructed using shore-based equipment. The trench will be excavated to a maximum depth of approximately 6 feet with an excavator, principally in the dry, during low tides except for the deeper lower portion. If allowed by fisheries agencies, this work will be preferably conducted during June or July to target the lowest annual daytime tides. The allowable in-water work window for tidal reference area 8, which includes Oak Harbor, is anticipated to be from July 16 to October 14 (Corps, 2012).
3. The offshore section from +5 ft MLLW to the terminus will be excavated from a barge mounted crane with clamshell dredge. These excavations will be conducted during tidal inundation. Excavated material will be stored on an adjacent barge for reuse as final backfill in the trench. Trench depth will be approximately 6 feet in depth.
4. A ¾-inch minus clean crushed aggregate will be used for pipe zone bedding. Approximately 40 cubic yards of pipe bedding are anticipated. This material will be placed with a clamshell dredge and verified by diver.
5. The pipeline will be placed in the excavated and bedded trench under the direction and control of divers. The pipeline may be placed by cranes either or both from shore and from offshore crane barge. The trench will be backfilled with the native excavated material.
6. Certified divers using surface-supplied air will be used to support construction of the pipeline. Divers will stage from the barge, and assist with pipe placement, pipe joining, and verification of the pipeline profile and condition before backfilling.
7. In the intertidal area, the final layer over the backfilled pipe will consist of a 6-inch minimum thickness of a "fish mix" washed pea gravel meeting the State of Washington Department of Fish and Wildlife (WDFW) specifications.
8. Estimated earthwork quantities include:
    a. Excavate 7,000 cubic yards of native material for pipeline trench;

   b. Place 1,400 cubic yards of clean crushed aggregate for pipe bedding material;
   c. Backfill trench with 6,000 cubic yards of native material;
   d. Place 1,200 cubic yards of fish mix pea gravel within the intertidal zone.

9. The existing buried pipe will be abandoned in place.

### 2.2.2 Primary Features of the Proposed Action

#### *2.2.2.1 Site Preparation*

The new MBR facility will be constructed within a three to four acre area currently occupied by existing commercial properties or lawn areas within portions of Windjammer Park. Asphalt paving, lawn grass, and existing buildings would be removed to accommodate the new facility and associated parking areas. The proposed action would require extensive excavation and grading within the 3 to 4 acre area. Some of the facilities, such as the aeration basins, WAS basins would be constructed below ground surface elevation; therefore, some shoring and installation of stone columns to support the tanks would be required. This would require excavation approximately 35 feet below ground surface elevation. Equipment necessary to conduct these activities include dozers, excavators, cranes, loaders, dump trucks, vibratory pile drivers, auger drill rigs, generators, and pumps. Construction dewatering will be necessary and is discussed in more detail in later sections.

#### Wetland Fill

Depending on the final location within the Windjammer Vicinity, the proposed WWTP improvements could result in a total of 4,000 square feet of fill within the on-site wetland ditch. Wetlands could be filled to allow construction of the aeration basins, which would be buried beneath the access road. The extent of wetland fill, if any, will be determined following final site selection.

#### Tree Removal

The area proposed for construction of the new MBR wastewater treatment facility includes an existing developed commercial property (buildings/asphalt) and a small portion of Windjammer Park west of the existing RBC Plant. The Park area consists primarily of maintained lawn; however, some landscaping trees occur in the vicinity of the proposed MBR facility and may be removed to accommodate the new facility. These trees currently provide little function to the marine nearshore, and their removal, if necessary, would not degrade existing baseline conditions.

#### *2.2.2.2 Staging Areas and Haul Routes*

All equipment and materials will be stored and staged on-site. Material will likely be imported and exported from the site via Pioneer Road at the northern portion of the property.

#### *2.2.2.3 Temporary Erosion and Sediment Control*

Erosion and sedimentation impacts during construction are anticipated to be minor as the site is mostly flat. During construction, Best Management Practices (BMPs) will be employed to minimize the amount of erosion and sediment leaving the site. The BMPs will be consistent with the Washington State Department of Ecology (Ecology) and the City of Oak Harbor erosion control standards and, and may include the use of inlet protection, silt fence, straw wattles, and sediment traps as necessary. Following construction, disturbed areas will be paved or hydroseeded promptly. Temporary erosion and sedimentation control (TESC) measures will be included as part of the project design and construction. The TESC Plan will meet the requirements of Ecology and the City of Oak Harbor standards, as well as additional measures deemed appropriate for the project (see Section 2.5).

The proposed MBR facility would occupy an approximate three to four acre footprint within the overall Windjammer vicinity (an approximate 50-acre area comprised of Windjammer Park and adjacent commercial properties). Construction activities could include soil disturbance in or near the on-site wetland as well as in proximity to Windjammer Park Lagoon. The lagoon was constructed primarily as an easily accessible swimming area and is connected to Oak Harbor via a narrow (40-foot wide) opening (Figure 3). Work adjacent to the Windjammer Park Lagoon has the highest potential for delivery of sediment and increasing turbidity within the lagoon; however, TESC BMPs such as those discussed above will be in place to minimize these impacts.

### 2.2.3 Secondary Features of the Proposed Action

#### *2.2.3.1 Dewatering*

Construction dewatering will be required for deep excavation areas (e.g., the two aeration basins, equalization basin and WAS storage basin, blower building and gallery). Groundwater will be pumped to Baker Tanks (or another suitable means of dewatering treatment), allowed to settle, and then discharged to vegetated areas where it will either infiltrate on-site or be hauled off-site for disposal at an approved facility. BMPs will be in place to minimize erosion and sediment delivery to surface waters and reduce flow velocities that may result in erosion of upland soils. These BMPs would include silt fencing, straw bales, check dams, and straw wattles.

#### *2.2.3.2 Stormwater*

Stormwater design has not been completed at this time for the new MBR facility; however, stormwater will be treated for quantity and quality in accordance with the current Stormwater Management Manual for Western Washington. It is anticipated that the majority of on-site stormwater that is generated within process areas (areas potentially exposed to influent or chemicals) would be collected and conveyed to the MBR facility for treatment and discharged to Oak Harbor via the proposed outfall.

#### *2.2.3.3 Wetland Mitigation*

Mitigation for wetland impacts will occur on-site and in accordance with local, state and federal regulations. It is anticipated that the on-site wetland can be enhanced to meet mitigation requirements.

## 2.3 Operation

### 2.3.1 Projected Service Area Growth

Flow and load projections were developed using current flows and loads and anticipated community growth. The most recent population projections for the total City population (including the Navy) are presented in the City's *Draft Water System Plan* (Gray and Osborne, 2013) and differ from the population projections cited in the *City of Oak Harbor Comprehensive Plan* (December 2009) and the *Comprehensive Sewer Plan*. To be consistent with the City's most recent planning documents, design of the MBR facility used the more recent *Water System Plan* projections for the total City population. The population projections for the area within the City limits were determined by subtracting the Navy population projections (developed in the *Comprehensive Sewer Plan*) from the total City population projections. The long-term growth population projections developed in the *Comprehensive Sewer Plan* was also used. The adopted 2030 population forecast for Oak Harbor and the UGA is 28,907. This represents total growth of about 6,832 residents during the planning period.

The potential sewer service area includes Oak Harbor's incorporated City limits and its UGA. This future sewer service area, shown in Figure 7, is consistent with the Growth Management Act (GMA) and documented in the *Comprehensive Sewer Plan*. The combined City and Navy flow projections for annual average (AA), maximum month (MM), and peak day (PD) conditions are projected to be 2.8 mgd, 3.9 mgd, and 6 mgd, respectively. The load projections for BOD, TSS, and Ammonia are presented in Table 2-1 below.

**Table 2-1. Total Load Projections for Oak Harbor MBR Facility**

| Total Load, ppd[1] (includes loads from both City Proper and Navy facilities) | 2010 | 2030 |
|---|---|---|
| **BOD** | | |
| AAF | 4,127 | 5,444 |
| MMF | 5,049 | 6,849 |
| PDF | 6,510 | 8,646 |
| **TSS** | | |
| AAF | 3,371 | 4,504 |
| MMF | 4,792 | 6,397 |
| PDF | 8,373 | 11,227 |
| **$NH_3$** | | |
| AAF | 487 | 638 |
| MMF | 586 | 768 |
| PDF | 745 | 975 |

(1) Total load in pounds per day includes load from both the City proper and the Navy facilities.
(2) The Navy BOD load is projected to equal 514 ppd for AA, 732 ppd for MM, and 942 for PD.
(3) The Navy TSS load is projected to equal 440 ppd for AA, 638 ppd for MM, and 990 ppd for PD.
(4) The Navy NH3 load is projected to equal 84 ppd for AA, 110 ppd for MM, and 128 ppd for PD.

### 2.3.2 Municipal Discharge

Based on historical records, the RBC Plant has reached its permitted flow limit of 0.7 mgd, and the Lagoon Plant is within 85 percent of the rated influent flow and BOD loading capacity. In response, the City developed the 2013 *Draft Facilities Plan* to assess the potential for upgrading the existing RBC and lagoon facilities, recommend alternative treatment technologies and processes, and put forth a preferred alternative that would continue to meet current NPDES permit limits, provide improved effluent water quality, as well as meet the needs of future growth in the Service Area by increasing treatment capacity.

Construction of the new MBR facility would increase treatment capacity from a current monthly maximum of 3 mgd to a projected 3.9 mgd by 2030 (a 30 percent increase in discharge volume over existing conditions). This increase in capacity is needed to continue to meet applicable permit requirements while accommodating projected increases in wastewater influent flows and BOD and TSS loads over the 20-year planning horizon.

Based on maximum month flow projections, BOD loading is anticipated to be 6,849 lbs/day, TSS loading is anticipated to be 6,397 lbs/day, and ammonia loading is anticipated to be 768 lbs/day by the end of the planning horizon of 2030. The City has effluent target goals that are more stringent than the existing NPDES permit limits for conventional pollutants. Effluent quality targets for TSS and BOD are 95 percent removal, which would indicate that effluent concentrations would continue to meet current NPDES limits until the end of the planning horizon. In addition, the proposed facility would discontinue the use of chlorine in its disinfection process due to a conversion to UV, which would remove residual chlorine from the effluent. The reasonable potential analysis (RPA) conducted for the new MBR facility also indicated that there is no potential to exceed water quality standards for a variety of contaminants, including metals and ammonia based upon current flow and load projections for the to the year 2030.

### 2.3.3 Water Quality Requirements

#### *2.3.3.1 Mixing Zone Boundary*

Ecology has authorized an allowable discharge mixing zone for the existing RBC Plant and Lagoon Plant at Outfall # 002, which discharges to the marine waters of Crescent Harbor. Two levels of exposure are considered for water quality and human health impacts: acute and chronic. Chronic effects are those that can result from long-term exposure to concentrations of a particular pollutant. Acute effects are those that can occur as the result of short-term exposure. These effects are captured in a calculation of the reasonable potential for adverse water quality or human health effects by either chronic or acute exposure. Ecology defines the allowable mixing zone area for a permitted outfall in the Water Quality Program Permit Writer's Manual Publication No. 92-109 (Ecology, 2011).

- Chronic Boundary: The allowable mixing zone is defined as a cylinder from the sea bottom to the water surface a distance of 215 ft (200 ft plus water depth at the location of the diffuser) from the diffuser at any point.
- Acute Boundary: The allowable mixing zone diameter is one-tenth the diameter of the chronic mixing zone.

The proposed action would include the abandonment of both the currently unused RBC Plant outfall (Outfall #001) and the active Lagoon outfall (Outfall #002). Under the proposed action, a new outfall will be constructed adjacent to Outfall 001. The diffuser for the new outfall is located at a depth of -14 feet relative to MLLW and has a length of 200 feet. Therefore, the chronic mixing zone boundary is defined as a cylinder around the diffuser extending from the sea bottom to the surface with a diameter of 430 feet. The acute mixing zone boundary is equivalent to 10 percent of the chronic mixing zone boundary or a cylinder around the diffuser extending from the sea bottom to the surface with a diameter of 43 feet.

#### *2.3.3.2 Dilution Ratio*

Effluent dilution was predicted using the EPA and Ecology approved mixing zone model UM3, as contained in the Visual Plumes interface (Frick, et al., 2002). The model was run using input data based upon data collected previously for model analysis of existing City outfall and several assumptions. Input data includes current speed, salinity, temperature, ambient water quality conditions, and effluent water quality, and diffuser configuration, among others.

Model results are presented for Year 2025 design flows, as identified in the 2013 Facility Plan. The maximum month and maximum day effluent flow rates applicable to the dilution analysis are 3.6 and 6.0 mgd respectively. Maximum month flows are used to evaluate chronic dilution, while maximum day flows are used to evaluate acute dilution. Dilution results would be similar for higher effluent flows expected at build-out, assuming the design length and port characteristics of the diffuser are scaled appropriately.

The minimum model predicted acute and chronic dilution factors for the proposed diffuser location are 33.3 and 49.2, respectively. These dilution factors were used to assess compliance with state water quality standards using reasonable potential analysis protocol.

#### *2.3.3.3 Reasonable Potential Analysis*

The reasonable potential to exceed water quality standards is a standard statistical test developed by the EPA and Ecology to establish the need for effluent limits in NPDES permits. Reasonable potential analysis (RPA) procedures are outlined in the *Permit Writer' Manual* (Ecology, 2008) and the *Technical Support Document for Water Quality-Based Toxics Control* (EPA, 1991).

In addition to anticipated dilution values, the RPA requires effluent and ambient water data as input data. Effluent concentration data from the existing WWTPs are not relevant because the RBC and Lagoon Plant will no longer be in operation. Therefore, the RPA presented herein assumes effluent/ambient water quality values used by King County in their analysis of the Brightwater WWTP effluent (King County, 2003). King County developed effluent water quality assumptions for membrane treatment plants, and performed extensive ambient water quality testing to define background water quality within Puget Sound. Effluent (90th percentile) and ambient (mean) water quality used in the RPA is summarized in Table 2-2.

**Table 2-2. Effluent and Ambient Water Quality Data (King County, 2003)**

| Parameter | Ambient Water Quality | Effluent Water Quality Membrane Plant |
|---|---|---|
| Chromium (µg/L) | 0.006 | 0.7 |
| Copper (µg/L) | 0.43 | 9.4 |
| Mercury (µg/L) | 0.00036 | 0.1 |
| Nickel (µg/L) | 0.45 | 3.3 |
| Silver (µg/L) | 0.06 | 0.2 |
| Zinc (µg/L) | 0.52 | 41.1 |
| Ammonia (mg/L) | 0.02 | 20.0 |

An RPA typically uses data sets to define statistical parameters, such as the number of data points and the coefficient of variation (CV), that are used to provide a factor of safety for the results. For this RPA, a relatively small sample set was assumed (10) with a default CV of 0.6. The assumed statistical parameters provide a conservative factor of safety. RPA results are summarized in Table 2-3 and indicate that there is no reasonable potential to exceed water quality standards using the proposed diffuser location and assumed effluent water quality. Table 2-3 also presents an "RPA Ratio" for each parameter. The RPA Ratio is the ratio of the predicted contaminant concentration at the mixing zone boundary to the regulatory standard. All of the RPA Ratios in Table 2-3 are less than 1.0, indicating no exceedence of water quality standards. The higher the RPA Ratio, the closer the predicted contaminant concentration is to the standard.

**Table 2-3. Reasonable Potential Analysis Results Summary**

| Parameter | Ambient Conc. (µg/L) | Effluent Conc. (µg/L) | State Water Quality Standard | | Calculated Concentration at Mixing Zone Boundary | | RPA Ratio | | Reasonable Potential Limit Required? |
|---|---|---|---|---|---|---|---|---|---|
| | | | Acute (µg/L) | Chronic (µg/L) | Acute (µg/L) | Chronic (µg/L) | Acute (µg/L) | Chronic (µg/L) | |
| Chromium | 0.006 | 0.7 | 1,100 | 50 | 0.20 | 0.14 | 0.00 | 0.00 | NO |
| Copper | 0.43 | 9.4 | 4.8 | 3.1 | 0.82 | 0.70 | 0.17 | 0.22 | NO |
| Mercury | 0.00036 | 0.10 | 1.8 | 0.025 | 0.005 | 0.004 | 0.00 | 0.16 | NO |
| Nickel | 0.45 | 3.3 | 74 | 8.2 | 0.61 | 0.56 | 0.01 | 0.07 | NO |
| Silver | 0.06 | 0.20 | 1.9 | N/A | 0.07 | N/A | 0.04 | N/A | NO |
| Zinc | 0.52 | 41.1 | 90 | 81 | 2.54 | 1.88 | 0.03 | 0.02 | NO |
| Ammonia | 21.3 | 20,000 | 8,235 | 1,320 | 1,065 | 728 | 0.13 | 0.55 | NO |

## 2.4 Interrelated and Interdependent Actions

Interrelated Actions are those that are part of a larger action and depend upon the larger action for their justification (50 CFR 402.02). The abandonment and demolition of the existing RBC facility, mitigation for wetland impacts, is an interrelated action. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Construction of the new outfall would be considered an interdependent action. Each of these elements of the proposed project is fully analyzed in this BA.

## 2.5 Impact Avoidance and Minimization Measures

This section discusses impact avoidance and minimization measures that would be employed to minimize, reduce, or eliminate the potential for adverse effects of the proposed action upon listed species and baseline conditions within the project Action Area.

### 2.5.1 General Construction BMPs

- Comprehensive erosion and sediment control plans will be developed and implemented for each phase of construction in accordance with the 2012 Stormwater Management Manual for Western Washington (Ecology, 2012) or updated versions as they become available. The plans could include elements for site stabilization, slope protection, drainage way protection, and sediment retention. The proposed action would also comply with applicable erosion control standards for the City of Oak Harbor.
- Spill and erosion prevention and sediment control plans, as well as observance of all applicable safety and environmental regulations for handling chemicals, will be in place to minimize risks.
- Excavation and grading will be limited to pre-marked areas within the area proposed for the new MBR Plant.
- Construction activities will be scheduled soon after an area has been graded and prepared.
- Disturbed areas will be paved as part of facility expansion or hydroseeded as soon as possible after completion of construction.
- Straw bales or silt fences will be used to reduce runoff velocity in conjunction with collection, transport, and disposal of surface runoff generated in the construction zone.
- A silt/turbidity curtain would be used to confine turbidity within the immediate work area when constructing the in-water portion of the outfall.
- During construction, monitoring programs could be required to ensure compliance with the site erosion control plan and with local regulatory requirements. A Stormwater Pollution Prevention Plan (SWPPP) and Temporary Erosion and Sediment Control (TESC) plan will be included in project contract documents. The construction contractor and/or City staff would measure parameters such as turbidity, temperature, and pH of surface water discharge and visually monitor the site for signs of erosion and for correct implementation of control measures per these plans.

- Equipment will be stored and staged and minimum of 200 feet from surface waters when not in use.
- Refueling of equipment will take place a minimum of 200 feet from surface waters.
- In water work will be conducted in accordance with approved in-water work windows for tidal reference area 8, which typically corresponds to times when listed fish and forage species are least likely to be present (Corps, 2012). For the project area, this is July 16 through October 14. A hydraulic project approval (HPA) from WDFW has yet to be obtained for the proposed action; therefore, this is an approximate date.
- Wetland impacts will be mitigated in accordance with local, state, and federal guidelines.

### 2.5.2 Operational Conservation Measures for the Plant

- WWTP design will include source controls to minimize the risk of contamination from spills and leaks, in the rare event that a spill occurs. Spill containment provisions include double-walled storage facilities and emergency cleanup procedures. The site would be sloped to direct any drainage from spill-prone areas (i.e., sludge loading and chemical loading) back to the Plant for processing.
- All stormwater facilities will be designed in accordance with the 2005 Stormwater Management Manual for Western Washington (Ecology, 2005).
- Stormwater generated in areas of the MBR Plant site where it could potentially be exposed to contaminants will be collected and processed through the Plant.
- The new MBR facility will accommodate higher flow volumes and BOD loading.
- A new facility is necessary to meet future NPDES requirements.
- Relative to the City’s existing facility, the proposed MBR process will be capable of meeting more stringent permit limits on influent loading and effluent discharge concentrations.

## 3.0 ACTION AREA

The ESA requires that potential effects to listed and proposed endangered and threatened species be evaluated in relation to the complete range of area influenced by the proposed action (the Action Area) (50 CFR Part 402.02). The Action Area encompasses the complete extent where measurable direct and indirect effects resulting from the proposed action are foreseeable and are reasonably certain to occur (USFWS, 1998; NMFS, 1996).

For the purpose of this assessment, the Action Area generally includes the entire area within the wastewater service area, which includes the City and the entire UGA (Figure 8). This area defines the extent of the proposed future sewer collection system where indirect effects could occur related to future growth and the conversion of undeveloped land into impervious surface. All streams and surface water features within the UGA are also included due to anticipated growth and conversion of land to commercial, residential, or industrial land uses. It should be noted that there are no major streams in the service area.

The Action Area also includes an aquatic zone of effect. The aquatic zone of effect includes those portions of Oak Harbor within a radius of 215 feet of the outfall's 200-foot long diffuser, which constitutes the edge of the chronic mixing zone boundary and is subject to indirect effects related to effluent water quality and future growth in the service area (Figure 8). The aquatic zone of effect also includes a 150-foot radius around the entire outfall structure that would be subject to the direct effects associated with disturbance of bottom sediments and increased turbidity.

The Action Area also includes a terrestrial zone of effect, which includes the entire extent of the MBR facility footprint, and wetland mitigation area that will be subject to soil disturbing activities as well as areas within 9,976 feet (1.89 miles) of construction activities that will be subject to increased noise and disturbance during construction (Figure 8).

# 4.0 SPECIES AND CRITICAL HABITAT

## 4.1 Species List

NMFS and the USFWS indicate that the project will occur within the range of the federally-listed species and designated critical habitats shown in Table 4-1 below (NMFS, 2011; NMFS, 2013a; NMFS, 2013b; USFWS, 2012). Appendix D contains the complete NMFS and USFWS species lists. The WDFW Priority Habitat and Species (PHS) database and SalmonScape interactive mapping tool were also consulted to identify the known or presumed distribution of listed species within the immediate project vicinity (WDFW, 2013a; WDFW, 2013b).

**Table 4-1. Occurrence of Listed Species and Critical Habitat within the Project Action Area**

| Common Name | Scientific Name | ESA Status * | Jurisdiction | Critical Habitat |
|---|---|---|---|---|
| Coastal-Puget Sound DPS Bull Trout | *Salvelinus confluentus* | Threatened | USFWS | Yes |
| Puget Sound Evolutionarily Significant Unit (ESU) Chinook Salmon | *Oncorhynchus tshawytscha* | Threatened | NMFS | Yes |
| Puget Sound Distinct Population Segment (DPS) Steelhead | *Oncorhynchus mykiss* | Threatened | NMFS | No |
| Yelloweye Rockfish | *Sebastes ruberrimus* | Threatened | NMFS | No |
| Canary Rockfish | *Sebastes pinniger* | Threatened | NMFS | Proposed |
| Bocaccio Rockfish | *Sebastes paucispinis* | Endangered | NMFS | Proposed |
| Southern DPS Green Sturgeon | *Acipenser medirostris* | Threatened | NMFS | No |
| Humpback Whale | *Megaptera novaeangliae* | Endangered | NMFS | No |
| Southern Resident Killer Whale | *Orcinus orca* | Endangered | NMFS | Yes |
| Stellar Sea Lion | *Eumatopias jubatus* | Threatened | NMFS | No |
| Marbled Murrelet | *Brachyramphus marmoratus* | Threatened | USFWS | No |
| Golden Paintbrush | *Castilleja levisecta* | Threatened | USFWS | No |

*__Threatened:__ Species are likely to become endangered within the foreseeable future.
**Endangered:** A species that is in danger of extinction throughout all or a significant portion of its range.

## 4.2 Fish Species

This section outlines the distribution, listing and stock status, and critical habitat designations for listed fish species within the project Action Area.

### 4.2.1 Bull Trout

The Coastal-Puget Sound bull trout distinct population segment (DPS) is composed of 34 subpopulations (USFWS, 1998b; USFWS, 1999). In 1998, USFWS completed a status review of bull trout, identifying five DPSs in the continental U.S. (USFWS, 1998a). The Coastal-Puget Sound DPS Bull Trout was listed as threatened under the ESA on November 1, 1999 (USFWS, 1999).

#### *4.2.1.1 Life History*

The life history of the Coastal-Puget Sound DPS Bull Trout is described in the *Endangered and Threatened Wildlife and Plants: Determination of Threatened Status for Bull Trout in the Coterminous U.S.; Final Rule* (USFWS, 1999) and is included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

*4.2.1.2 Occurrence of Species in the Action Area*

Little information is available or known about the anadromous form of bull trout or their movements in estuarine waters of Puget Sound (King County DNR and R2 Resource Consultants, 2000). There has some been some limited data collected and anecdotal information available from larger stocks, such as those in the larger Snohomish and Skagit River Basins, which indicate that bull trout have annual migrations to marine areas beginning in late winter and peaking in spring to mid-summer (Pentec, 2000). It is believed that these larger sub-adult and adult bull trout migrate to marine areas occupying shallow nearshore habitats. It is thought that bull trout movements in the nearshore are closely correlated with forage fish spawning beaches. Most anadromous bull trout move back to fresh water by late summer.

No reproducing populations of bull trout are known to utilize streams on Whidbey Island. Whidbey Island streams lack the high elevation and cold temperatures necessary for spawning and early rearing. However, it is anticipated that anadromous life history forms of adult and subadult bull trout may be present within the Action Area foraging and migrating between spawning and overwintering areas. These bull trout likely originate from adjacent mainland watersheds including the Skagit River and Nooksack River.

*4.2.1.3 Critical Habitat*

Critical habitat for the Coastal-Puget Sound bull trout distinct population segment (DPS) was designated in September 2005 (70 Federal Register 185), and was revised on October 18, 2010 (75 Federal Register 200).USFWS has designated bull trout critical habitat along the eastern shore of Puget Sound extending from the border between the United States and Canada south to the mouth of the Nisqually River. Designated critical habitat within the project Action Area includes all marine waters extending offshore to the depth of 33 feet relative to the MLLW.

Primary Constituent Elements (PCEs) for bull trout in marine nearshore waters, as defined by USFWS (70 Federal Register 185) are:

- Water temperatures that support bull trout use;
- Migratory corridors with minimal physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows;
- An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish; and
- Permanent water of sufficient quality and quantity such that normal reproduction, growth, and survival are not inhibited.

### 4.2.2 Puget Sound ESU Chinook Salmon

NMFS issued a ruling in May 1999 listing the Puget Sound ESU as threatened (NMFS 1999a). Primary factors contributing to declines in Chinook salmon in the Puget Sound ESU include habitat blockages, hatchery introgression, urbanization, logging, hydropower development, harvests, and flood control (NMFS, 1998).

#### *4.2.2.1 Life History*

The life history of Puget Sound Chinook salmon is described in detail in the National Oceanic and Atmospheric Administration (NOAA) *Technical Memorandum NMFS-NWFSC-35 Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California* (Myers et al., 1998) and is included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.2.2.2 Occurrence of Species in the Action Area*

There are no streams in water resource inventory area (WRIA) 6 of sufficient size or flow to provide spawning habitat for adult Chinook; however, juveniles may use the lower stream reaches for rearing (WSCC, 2000). Juvenile Chinook salmon are presumed to use all nearshore habitats adjacent to Whidbey Island (Hayman et al., 1996; Beauchamp et al., 1985; RW Beck and Associates, 1986; Penttila, 1999). Juvenile Chinook presence within the marine nearshore of WRIA 6 is typically from late spring to early fall with a peak between mid-June and mid-July (Hayman et al., 1996) and typically within rocky kelp habitats, sand/eelgrass habitat, and less so in cobble habitat (Miller et al., 1977). Beamer et al. (2006) looked at wild juvenile salmon use of pocket estuaries on the Whidbey Bain and found that juvenile salmonids were collected in nearly every month from February through October with a peak in both nearshore captures and pocket estuary captures in the month of August (Beamer et al., 2006). Juvenile Chinook using the WRIA 6 nearshore could originate from many of the Puget Sound watersheds; however, it is assumed that most outmigrate from the Skagit River system (WSCC, 2000).

#### *4.2.2.3 Critical Habitat*

On April 30, 2002, the U.S. District Court for the District of Columbia approved a NMFS consent decree withdrawing a February 2000 critical habitat designation for this and 18 other ESUs. On December 14, 2004, NMFS proposed critical habitat for 13 Pacific Salmon ESUs, which includes the Puget Sound Chinook ESU (69 Federal Register 239).

On September 2, 2005, NMFS designated critical habitat for 12 salmon and steelhead ESUs in California and the Pacific Northwest (70 Federal Register 170). Critical habitat for Chinook includes all marine waters of Oak Harbor extending from the line of extreme high tide out to a depth of 30 meters (98 feet) and the upstream extent of all tidally influenced estuarine areas. No freshwater or estuarine PCEs are located within the project Action Area.

Specific PCEs, applicable to the proposed action, for Chinook salmon in nearshore marine areas, as defined by NMFS (70 Federal Register 170) include:

- Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

The only PCE that occurs within the Action Area include those associated with the nearshore marine areas of Oak Harbor and the lagoon associated with Windjammer Park. Due to the complex nature of marine ecosystems and lack of quantifiable information, it is difficult to determine whether or not the Action Area contains offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation of salmonids. Furthermore, it is also difficult to determine whether or not human activities have affected the offshore marine PCE. Therefore, an analysis of this PCE is not included. It is likely that this PCE has been degraded, but the extent of degradation is not measurable at this time.

### 4.2.3 Puget Sound DPS Steelhead

On May 7, 2007, NMFS announced the listing of the Puget Sound DPS of steelhead as a threatened species under the Endangered Species Act (72 Federal Register 91). Possible factors influencing the depletion of Puget Sound steelhead populations include habitat destruction and fragmentation, inadequate regulatory mechanisms of hatchery practices and land use activities, and potential genetic introgression between hatchery - and natural-origin steelhead.

#### *4.2.3.1 Life History*

The life history of Puget Sound Steelhead (*O. mykiss*) is described in the *Proposed Endangered Status for Five ESUs of Steelhead and Proposed Threatened Status for Five ESUs of Steelhead in Washington, Oregon, Idaho, and California* (61 Federal Register 155) and is included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.2.3.2 Occurrence of Species in the Action Area*

Steelhead do not occur in WRIA 6 streams (WSCC, 2000). In addition, wild juvenile steelhead typically spend two full years in freshwater before outmigrating during the spring. Because of the larger size at outmigration, steelhead do not typically spend a large amount of time in the nearshore, rather they tend to quickly outmigrate to open water. Therefore, the lagoon located adjacent to the proposed MBR facility and marine nearshore of Oak Harbor are unlikely to support juvenile steelhead. Steelhead, if present, would most likely occur in offshore waters, which would include waters in and around the proposed MBR facility's outfall in Oak Harbor.

#### *4.2.3.3 Critical Habitat*

Critical habitat for Puget Sound DPS steelhead was proposed on January 14, 2013 (78 Federal Register 9). The streams located on Whidbey Island, as well as the marine/estuarine areas adjacent to Whidbey Island, were not included within areas proposed as critical habitat for Puget Sound steelhead. Therefore, the project Action Area contains no proposed critical habitat for Puget Sound DPS steelhead.

### 4.2.4 Yelloweye Rockfish

The yelloweye rockfish DPS is listed as threatened under the Endangered Species Act. The primary factors influencing the decline of the Puget Sound/Georgia Basin DPS yelloweye rockfish are overutilization by commercial and recreational fisheries, habitat degradation, degraded water quality including low dissolved oxygen and elevated levels of contaminants, and inadequate regulatory mechanisms (75 Federal Register 81). Presently, the species distribution extends from northern Baja California to the Aleutian Islands in Alaska, but is most common from central California north to the Gulf of Alaska (Clemens and Wildby, 1961; Eschmeyer et al., 1983; Hart, 1973; Love, 1996). The Puget Sound/Georgia Basin DPS distribution includes Puget Sound and the Georgia Basin within the state of Washington and the province of British Columbia, Canada (75 Federal Register 81).

#### *4.2.4.1 Life History*

The life history of yelloweye rockfish is described in the *Proposed Endangered Threatened and Not Warranted Status for Distinct Population Segments of Rockfish in Puget Sound* (74 Federal Register 77) and the *Preliminary Scientific Conclusions of the Review of the Status of 5 Species of Rockfish: Bocaccio (Sebastes paucispinis), Canary Rockfish (Sebastes pinniger), Yelloweye Rockfish (Sebastes ruberrimus), Greenstriped Rockfish (Sebastes elongatus) and Redstripe Rockfish (Sebastes proriger) in Puget Sound, Washington* (NMFS, 2009) and are included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.2.4.2 Occurrence of Species in the Action Area*

There is little information on the frequency of occurrence or densities of yelloweye rockfish within Puget Sound/Strait of Georgia waters. Yelloweye rockfish are a sedentary, deepwater species that are associated with high relief rocky habitats and often near steep slopes (Miller and Borton, 1980). Yelloweye rockfish are found less frequently in South Puget Sound as opposed to North Puget Sound waters. Oak Harbor is a relatively shallow embayment characterized by mud and silt substrates. The slope of the beach extending from the shoreline out to the depth of the proposed diffuser is flat with little or no vertical relief. It is possible that larval rockfish may be present in the action area; however, adult and juvenile fish are less likely to occupy habitats in the project action area due to inadequate depth and lack of high relief rocky habitats or steep slopes. Yelloweye rockfish presence within the Action Area is considered extremely unlikely.

#### *4.2.4.3 Critical Habitat*

NMFS proposed critical habitat for yelloweye rockfish on August 6, 2013 (78 Federal Register 151). Critical habitat is proposed for adult and juvenile yelloweye rockfish within benthic habitats of deeper than 30 meters, which also contain complex bathymetry. No proposed critical habitat for yelloweye rockfish is located within or adjacent to the Action Area. The nearest proposed critical habit is located approximately 4 miles to the south of the project site, in the waters of Saratoga Passage.

### 4.2.5 Canary Rockfish

The canary rockfish DPS is listed as threatened under the Endangered Species Act. The primary factors influencing the decline of the Puget Sound/Georgia Basin DPS canary rockfish are overutilization by commercial and recreational fisheries, habitat degradation, degraded water quality including low dissolved oxygen and elevated levels of contaminants, and inadequate regulatory mechanism (75 Federal Register 81). Presently, the species distribution extends between Punta Colnett, Baja California and the western Gulf of Alaska (Boehlert, 1980; Mecklenberg et. al, 2002). The Puget Sound/Georgia Basin DPS distribution includes Puget Sound and the Georgia Basin within the state of Washington and the province of British Columbia, Canada (75 Federal Register 81).

#### *4.2.5.1 Life History*

The life history of canary rockfish is described in the *Proposed Endangered Threatened and Not Warranted Status for Distinct Population Segments of Rockfish in Puget Sound* (74 Federal Register 77) and the *Preliminary Scientific Conclusions of the Review of the Status of 5 Species of Rockfish: Bocaccio (Sebastes paucispinis), Canary Rockfish (Sebastes pinniger), Yelloweye Rockfish (Sebastes ruberrimus), Greenstriped Rockfish (Sebastes elongatus) and Redstripe Rockfish (Sebastes proriger) in Puget Sound, Washington* (NMFS, 2009) and are included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.2.5.2 Occurrence of Species in the Action Area*

There is little information on the frequency of occurrence or densities of canary rockfish within Puget Sound waters. Canary rockfish are a deepwater species that are associated with a variety of rocky and course substrate habitats throughout the Puget Sound basin (Miller and Borton, 1980). As with yelloweye rockfish, the larval form of canary rockfish may be present; however, juvenile and adults are not likely to utilize habitats in Oak Harbor on a regular basis due to the lack of suitable habitat. Substrate in Oak Harbor is a mixture of silt and mud with firmer substrates in the nearshore intertidal area and unconsolidated material in waters deeper than -5 MLLW. The presence of canary rockfish in Oak Harbor and the Action Area is considered extremely unlikely during construction or operation of the proposed action.

#### *4.2.5.3 Critical Habitat*

NMFS proposed critical habitat for canary rockfish on August 6, 2013(78 Federal Register 151). Critical habitat is proposed for juvenile canary rockfish within nearshore habitats of less than 98 feet relative to MLLW. The action area contains proposed critical habitat for canary rockfish from 0 to -98 MLLW in Oak and Crescent Harbors. NMFS has listed several attributes of rockfish habitat that relevant in the evaluation of the effects of a proposed action in a section 7 consultation if the specific area containing the site is designated as critical habitat. These attributes include:

1. Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities,
2. Water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities, and
3. The type and amount of structure and rugosity that supports feeding opportunities and predator avoidance.

### 4.2.6 Bocaccio Rockfish

The bocaccio DPS is listed as endangered under the Endangered Species Act. The primary factors influencing the decline of the Puget Sound/Georgia Basin DPS bocaccio are overutilization by commercial and recreational fisheries, habitat degradation, degraded water quality including low dissolved oxygen and elevated levels of contaminants, and inadequate regulatory mechanism (75 Federal Register 81). Presently, the species distribution extends from Punta Blanca, Baja California, to the Gulf of Alaska off Krozoff and Kodiak Islands, Alaska (Chen, 1971; Miller and Lea, 1972). Within this range, they are most common from Oregon to northern Baja, California (Love et. al, 2002). The Puget Sound/Georgia Basin DPS distribution includes Puget Sound and the Georgia Basin within the State of Washington and the Province of British Columbia, Canada (75 Federal Register 81).

#### *4.2.6.1 Life History*

The life history of bocaccio rockfish is described in the *Proposed Endangered Threatened and Not Warranted Status for Distinct Population Segments of Rockfish in Puget Sound* (74 Federal Register 77) and the *Preliminary Scientific Conclusions of the Review of the Status of 5 Species of Rockfish: Bocaccio (Sebastes paucispinis), Canary Rockfish (Sebastes pinniger), Yelloweye Rockfish (Sebastes ruberrimus), Greenstriped Rockfish (Sebastes elongatus) and Redstripe Rockfish (Sebastes proriger) in Puget Sound, Washington* (NMFS, 2009) and are included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.2.6.2 Occurrence of Species in the Action Area*

There is little information on the frequency of occurrence or densities of bocaccio rockfish within Puget Sound/Strait of Georgia waters. Bocaccio rockfish are a deepwater species that are most commonly associated with steep slopes of sand or rocky substrates (Miller and Borton, 1980). Similar to canary and yelloweye rockfish, shallow, muddy substrate habitats of Oak Harbor likely limit the potential for bocaccio rockfish presence in the Action Area.

#### *4.2.6.3 Critical Habitat*

NMFS proposed critical habitat for bocaccio rockfish on August 6, 2013(78 Federal Register 151). Critical habitat is proposed for juvenile canary rockfish within nearshore habitats of less than 98 feet relative to MLLW. The action area contains proposed critical habitat for bocaccio rockfish from 0 to -98 MLLW in Oak and Crescent Harbors.

NMFS has listed several attributes of rockfish habitat that relevant in the evaluation of the effects of a proposed action in a section 7 consultation if the specific area containing the site is designated as critical habitat. These attributes include:

1. Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities,
2. Water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities, and
3. The type and amount of structure and rugosity that supports feeding opportunities and predator avoidance.

### 4.2.7 Southern DPS Green Sturgeon

On April 7, 2006, NMFS announced the listing of the Southern DPS green sturgeon (*Acipenser medirostris*) as a threatened species under the Endangered Species Act (71 Federal Register 67). The primary factors responsible for the decline of the Southern DPS green sturgeon are the destruction, modification or curtailment of habitat and inadequacy of regulatory mechanisms (70 Federal Register 65); Adams et al., 2002; Adams et al., 2005).

#### *4.2.7.1 Life History*

The life history of the Southern DPS green sturgeon is described in the *Proposed Threatened Status for the Southern Distinct Population Segment Green Sturgeon* (70 Federal Register 65) and in the 2002 and 2005 Status Review for the North American Green Sturgeon, *Acipenser medirostris* (Adams et al., 2002; Adams et al., 2005) and is included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.2.7.2 Occurrence of Species in the Action Area*

Little is known about the distribution and abundance of green sturgeon in Puget Sound/Strait of Georgia, although they have been documented as occurring in the region (74 Federal Register 195). Most of the information that we do have comes from incidental by-catch in commercial fishing operations or the occasional documentation of individuals captured in gill nets (Randy McIntosh, NMFS, personal communication, 2010). While the occurrence of green sturgeon may be rare within the project Action Area, they are presumed to be present in Oak Harbor and Saratoga Passage.

#### *4.2.7.3 Critical Habitat*

NMFS designated critical habitat for the Southern DPS green sturgeon on October 9, 2009 (74 Federal Register 195). Included in this designation are all marine waters within 60 fathoms (360 feet) from Monterey Bay California north to Cape Flattery, Washington, including the Strait of Juan de Fuca to its international boundary with Canada. Puget Sound and the Strait of Georgia were excluded from this final designation because the economic benefits of exclusion outweigh the benefits of inclusion and will not result in the extinction of the species (74 Federal Register 195).

Therefore, there is no designated critical habitat for the Southern DPS green sturgeon in the project Action Area.

## 4.3 Marine Mammal Species

### 4.3.1 Humpback Whale

The humpback whale was listed as endangered by NMFS on June 2, 1970. It was one of the first species listed under the Endangered Species Act. The North Pacific population was considerably reduced as a result of intensive commercial exploitation during the 20th century, and recovery has been very slow.

#### *4.3.1.1 Life History*

The life history of the humpback whale (*Megaptera novaeangeliae*) is described in *The Final Recovery of the Humpback Whale* (NMFS, 1991), and is included herein by reference. Life history information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.3.1.2 Occurrence of Species in the Action Area*

Humpback whales are fairly common off the coast of Washington but not inside waters such as Puget Sound and the Strait of Juan de Fuca. The sightings of humpback whales in the Strait of Georgia and Puget Sound remained very infrequent through the late 1990's. There were two reported sightings of humpback whales in Puget Sound in May of 1976 and June of 1978 (Everitt et al., 1980); it was not until much later that a third sighting was documented in June of 1986 (Osborne et al., 1988). The movements of two individually identified juvenile humpback whales were documented in the waters of southern Puget Sound for several weeks in June and July of 1988 (Calambokidis and Steiger, 1990).

Due to their scarcity and seemingly low numbers within Puget Sound, Strait of Juan de Fuca, and Strait of Georgia, there have been few surveys that could be used to develop a data set and document their movements into and out of the region. In 2001 there were three reports of humpback whales; the number had risen to 30 reports by 2004. This increase in sightings is in part due to growth of the Orca Network and the accompanying increase in local awareness. Most reports of humpback whales were made by naturalists aboard whale watching vessels and can be considered reliable in terms of species identification. Inexperienced observers, particularly those that are shore-based, are most likely to misidentify a humpback as a gray whale, which are common in some areas during the late spring. In this case the number of humpbacks reported might actually be an underestimate.

While humpback whale abundance is rare within the inland waters of Puget Sound and the Straits of Georgia and Juan de Fuca, it is anticipated that individual whales could occur within the Action Area foraging or migrating to/from breeding and feeding areas, although in extremely low numbers. The inadequate depths of Oak Harbor may also deter humpbacks from entering the relatively shallow embayment. Therefore, the presence of humpback whales in Oak Harbor would be considered an extremely rare event and their presence within Oak Harbor during construction or during operation of the facility is not anticipated.

#### *4.3.1.3 Critical Habitat*

No critical habitat has been designated for the humpback whale.

### 4.3.2 Southern Resident Killer Whale

NOAA Fisheries listed the Southern Resident Population killer whale, a portion of the killer whale population that may be found in Washington waters, as endangered in 2005 (70 Federal Register 222). NOAA Fisheries listed the Southern Resident Population of killer whale as depleted under the Marine Mammal Protection Act in May 2003 (Marine Mammal Commission, 2004). Possible factors influencing the depletion of Southern Resident killer whale populations include high levels of contamination, reduced availability of prey, and increased whale-watching activities near the San Juan Islands (NOAA Fisheries, 2000).

#### *4.3.2.1 Life History*

The life history and habitat requirements of killer whales are described in the *Washington State Status Report for the Killer Whale* (Wiles, 2004) and are included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.3.2.2 Occurrence of Species in the Action Area*

The Southern Resident Population of killer whales is one of four populations known to occur in Washington: the Northern Resident, the Southern Resident, the transient, and the offshore (Wiles, 2004). Three of these populations, the Southern Resident Population, Northern Resident Population and the transient population, periodically use the region around the San Juan Islands. These three groups of whales do not interbreed and do not normally interact. The Southern Resident Population (Eastern North Pacific Southern Resident Population) consists of three pods totaling between 80 and 90 animals (NMFS, 2008a). They range widely between California and the Queen Charlotte Islands, but spend most of their time, especially from spring to fall, in northern Puget Sound, Georgia Strait, and the Strait of Juan de Fuca (Carretta et al., 2004). While in inland waters during the warmer summer months, all pods concentrate their activities in Haro Strait, Boundary Passage, the southern Gulf Islands, the eastern end of the Strait of Juan de Fuca, and several localities in the southern Georgia Strait (Heimlich-Boran, 1988; Fellemen et al., 1991; Olson, 1998; Ford et al., 2000). Less time is spent elsewhere including the areas surrounding the San Juan Islands, Admiralty Inlet west of Whidbey Island, and Puget Sound J pod is the only group known to regularly venture inside the San Juan Islands (Balcomb, unpublished data) and is comprised of 22 individuals.

Southern Resident Population, Northern Resident Population, and transient killer whales occasionally move into rarely visited areas and inlets, probably in response to locally abundant food sources. Transient sightings in the Georgia Basin are centered on southeastern Vancouver Island, the San Juan Islands, and the southern edge of the Gulf Islands, with less activity occurring in Puget Sound and elsewhere in the Strait of Juan de Fuca and Georgia Strait (Olson, 1998). Southern Resident killer whale use of Puget Sound in the vicinity of the Oak Harbor WWTP outfall is considered possible due to the fact that the area lies generally within the range of distribution; however, it would be considered rare or uncommon for Southern resident killer whales to occupy habitat in the vicinity on a regular basis. Southern Resident killer whale sightings are documented occasionally in Saratoga passage and from January 2010 to March 2013 there were two documented sightings of Southern Residents (December 2012 and December 2010) in Saratoga Passage (ORCA Network, 2013). During that same timeframe, several observations of transient killer whales were made, including a sighting of two transients in Oak Harbor in April of 2011 (ORCA Network, 2013). The fact that transients are more often spotted in and around Oak Harbor is likely due to the presence of marine mammals, the primary prey for transients; whereas, Southern Residents rely primarily on salmon and other fish as a source of food. The lack of large salmon producing rivers on Whidbey Island likely limits the presence of Southern Residents in its nearshore bays and estuaries.

#### *4.3.2.3 Critical Habitat*

Critical habitat was designated for the Southern Resident killer whale in November 2006 (71 Federal Register 229). Critical habitat includes three specific areas of Puget Sound, Washington within Clallam, Jefferson, King, Kitsap, Island, Mason, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom counties. These three specific areas include the summer core area, the Puget Sound area, and the Strait of Juan de Fuca area. The proposed action is located within the Puget Sound area adjacent to Island County. Critical habitat within each of these areas includes all marine waters relative to a contiguous shoreline delimited by the line at a depth of 20 feet (6.1 meters) relative to extreme high water.

Those physical and biological features that are essential to the conservation of the species or that may require special management considerations must be considered when designating critical habitat. The PCEs for the Southern Resident killer whale include the following:

1. Water quality to support growth and development;
2. Prey species of sufficient quantity, quality and availability to support individual growth, reproduction and development, as well as overall population growth; and
3. Passage conditions to allow for migration, resting, and foraging conditions.

All of the PCEs are found in the project area with the exception of prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth. There are no large river systems on Whidbey Island that produce salmon in numbers capable of supporting individual growth, much less to support population growth. The water quality PCE has been degraded by urban development and is often associated with areas of higher human population. Passage conditions are present and capable of supporting migration, foraging and resting.

### 4.3.3 Steller Sea Lion

The Steller sea lion (*Eumetopias jubatus*) was listed as a threatened species under the ESA on April 5, 1990 (55 Federal Register 233). Declines in Steller sea lion populations are due to substantial declines in the western portion of the range. Declines are attributed to direct and indirect interactions with fisheries, contaminants/pollutants, habitat degradation, illegal hunting/shooting, and offshore oil and gas exploration.

#### *4.3.3.1 Life History*

Life history information of the Steller sea lion is described in *Endangered and Threatened Species; Revised Recovery Plan for Distinct Population Segments of Steller Sea Lion* (NMFS, 2008b) and is included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.3.3.2 Occurrence of Species in the Action Area*

Sightings of Steller sea lions in Puget Sound number 50 or fewer per year (Jeffries, personal communication, 2005) and are most abundant from late fall to early spring when peak counts for the whole state have reached 1,000 animals (Jeffries et al., 2000). Steller sea lions are often observed with California sea lions and use their haulouts. No Steller sea lion haul out sites have been identified within several miles of the proposed action (WDFW, 2013a). A haul out site for harbor seals is located approximately 6,500 feet southeast of the project area and out of line of sight (WDFW, 2013a).

*4.3.3.3 Critical Habitat*

There is no designated critical habitat designated for Steller sea lions in Puget Sound. The nearest designated critical habitat is in Oregon and California, at specified haulout sites.

## 4.4 Avian Species Evaluation

### 4.4.1 Marbled Murrelet

The marbled murrelet was listed by the USFWS in 1992 as a federally threatened species in Washington, Oregon, and California. Marbled murrelet critical habitat was designated in May 1996 in 50 CFR Part 17.11.

*4.4.1.1 Life History*

The life history of the marbled murrelet is described in the *Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Marbled Murrelet; Final Rule* (61 Federal Register 102) and is included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

*4.4.1.2 Occurrence of Species in the Action Area*

Most of the project area is developed or developing. There are interspersed stands of coniferous and deciduous forest; however, the inadequate species composition, size, and age of the stands, in addition to the urbanized nature of the area, likely limits the use of the Action Area by marbled murrelet for nesting habitat. The project Action Area includes the nearshore and offshore areas of Oak Harbor, which contain habitat for forage fish species that comprise a portion of the marbled murrelet diet. While, no marbled murrelet use of the project Action Area has been documented (WDFW, 2013a), marbled murrelets are anticipated to use the marine areas of the project Action Area for foraging and may fly over the construction area while migrating between foraging and nesting areas.

*4.4.1.3 Critical Habitat*

The critical habitat designation includes 11 units in Washington State, including 1.2 million acres of federal land, 421,500 acres of state forest land, and 2,500 acres of private land. Not all suitable habitats are included in this designation, as only areas designated as most essential to murrelet survival in terms of quality, distribution, and ownership are included. The USFWS is currently proposing to revise the 1996 critical habitat designation for marbled murrelet (73 Federal Register 148). This revision to critical habitat would not affect current critical habitat designations in Washington State.

The closest designated critical habitat is located approximately 24 miles southwest of the WWTP site on the north side of the Olympic Mountain Range in Jefferson and Clallam Counties (USFWS, 2013).

### 4.5 Plant Species Evaluation

### 4.5.1 Golden Paintbrush

Golden paintbrush was listed by the USFWS in 1997 as a federally threatened species wherever it occurs. Threats to the species have been identified as competition with native and non-native plant species; habitat modification through succession in the absence of fire, and grazing by herbivores. Direct human-caused threats include conversion of habitat to agricultural land and residential/commercial development.

#### *4.5.1.1 Life History*

The life history of the golden paintrbrush is described in the *Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Castilleja levisecta (Golden Paintbrush)* (62 Federal Register 112) and is included herein by reference. This information has been summarized to assist in the discussion of effects related to the proposed action, and is included in Appendix E.

#### *4.5.1.2 Occurrence of Species in the Action Area*

Whidbey Island is home to five of the remaining 11 populations of golden paintbrush left in the world. The species once grew in prairie habitats from Vancouver Island, Canada south to Oregon's Willamette Valley (WCLT, 2004). Golden paintbrush grows primarily in upland prairies, on generally flat grasslands (USFWS, 2013). The largest of the Whidbey Island populations occurs near Forbes Point at Whidbey Island Naval Air Station immediately north of the project area. Whidbey Island populations also occur primarily along southwest and west facing grasslands (WCLT, 2004). The project area is located within developed commercial properties and portions of a 28-acre community park. The park contains maintained lawn grass and landscaping trees and shrubs. The developed nature of the site as well as regular maintenance (mowing) of park lawn likely limits the potential for establishment of golden paintbrush. Therefore, golden paintbrush is not anticipated to occur within the immediate project area.

#### *4.5.1.3 Critical Habitat*

No critical habitat has been designated or proposed at this time for the Golden Paintbrush.

## 5.0 ENVIRONMENTAL BASELINE

### 5.1 Terrestrial Environment

The exact location of the MBR facility has yet to be determined pending further design; however, the *Draft Facilities Plan* identified a 3 to 4 acre area in the vicinity of Windjammer Park as the preferred alternative site for the MBR facility (Carollo, 2013). In general, the selected site is comprised primarily of an existing developed commercial site and portions of Windjammer Park. These areas consist of existing buildings and asphalt parking (commercial area) or maintained grass/lawn areas within Windjammer Park (Figure 3). Only one landscaping tree lies within the proposed footprint and is associated with the park. A small wetland (drainage swale) is located between the commercial area and Windjammer Park and likely flows west to Freund Marsh located approximately 2,000 feet southwest of the proposed MBR Facility.

Due to the project lying within commercial and public open space near the central business district, the terrestrial environment provides little in the way of habitat for wildlife species.

## 5.2 Marine and Estuarine Environment

Within the Action Area, Oak Harbor is bordered by residential and commercial development and public open space (parks) associated with the City of Oak Harbor and the Navy Seaplane Base. The Oak Harbor marina and yacht club are located at the east terminus of Oak Harbor. The shoreline along the City of Oak Harbor is modified with riprap armoring, and wooden bulkheads are dominant along residential areas to the southwest where steep bluffs are located. The shoreline slopes gently waterward creating large mud flat areas as the tide moves out of the bay. Bottom substrates consist primarily of silt and mud with the material becoming more unconsolidated as you move farther offshore. The bay is fairly shallow (20 to 25 feet) and turbidity is prevalent during high winds due to the shallow nature of the bay as well as the mobility of bottom substrates.

The beaches are known to support spawning populations of sand lance and surf smelt and regular concentrations of Pacific herring are known to occur outside of the bay in Saratoga Passage (WDFW, 2013a). Pacific salmon, while not known to reproduce in any streams within the project area, are likely to utilize the nearshore zone for rearing and migration as juveniles (WSCC, 2000). No known seal or sea lion haulouts are located within inner Oak Harbor; however, marine mammals including harbor seals, sea lions, and killer whales may use the area for migration, foraging, resting (Orca Network, 2013, WDFW, 2013a). Eelgrass (*Zostera marina*) has not been documented within the vicinity of the proposed outfall and macro-algae presence is fairly limited due to the mud substrate and lack of structure for the algae to cling too (Grette Associates, 2012).

As with most waterbodies adjacent to urban centers, water quality is of primary concern. The waters of Oak Harbor, in the area proposed for the wastewater outfall, as well as the small lagoon swimming area within Windjammer Park, near the proposed MBR facility, are listed on the 303(d) list of impaired waterbodies for the bacteria parameter (Ecology, 2012). The existing RBC Plant outfall, which is currently abandoned, along with urban runoff, leaking septic systems and marina operations likely contributed to the 303(d) listing for bacteria. Shellfish harvest within Oak Harbor has been classified as prohibited (DOH, 2009).

NOAA Fisheries have prepared guidance on the evaluation of Properly Functioning Conditions (PFC) for salmonid fish in montane stream systems. A pathway-indicator matrix has not been published by the Services for marine or estuarine environments; however, marine and estuarine habitat requirements for salmonid stocks have been described by many authors (Fresh et al., 1981; Healy, 1982; Levy and Northcote, 1982; Shepherd, 1981; Weitkamp et al., 2000). Table

5-1 summarizes indicators for PFC elements that have been adapted from the available literature and provide the basis for the evaluation of PFC for this assessment.

**Table 5-1. Summary of Oak Harbor and Windjammer Park Lagoon PFC Indicators within the Action Area**

| Indicators | Summary | Pertinent Studies |
|---|---|---|
| **Water Quality** | | |
| Turbidity | Concentrations between 300 mg/l and 4,000 mg/l are at risk. Concentrations above 4,000 mg/l are not properly functioning. | Nightingale and Simenstad (2001a); Nightingale and Simenstad (2001b); Healy (1991); Beauchamp et al. (1983); Sandercock (1991) |
| Dissolved Oxygen | Concentrations below 4.0 mg/l are not properly functioning. Dissolved oxygen concentrations between 4.0 mg/l and 7.0 mg/l constitute at risk habitat. | Ecology (2001); Reiser and Bjorn (1979); Beauchamp et al. (1983) |
| Water Contamination | Section 303(d) of the Clean Water Act (CWA) listed water bodies are defined as not properly functioning for the purpose of this assessment. | Ecology (2008) |
| Sediment Contamination | Sediment contaminant concentrations established by Ecology are determined at risk. Contaminant levels at or above toxic levels are not properly functioning. | Ecology (1990); Chapter 173-204 WAC |
| **Physical Habitat** | | |
| Substrate/ Armoring | Shorelines with minor armoring by riprap and low-density shoreline development are considered at risk. Shoreline areas containing extensive armoring are not properly functioning. | Nightingale and Simenstad (2001a); Nightingale and Simenstad (2001b); Fresh et al. (1981); KCDNR (2001); Thom et al. (1994); Prinslow et al. (1979); Williams and Thom (2001) |
| Depth/Slope | Habitats that have been altered by wharves, bulkheads, and nearshore dredging to have steep side slopes, drop-offs, and nearshore deep-water habitats are considered not properly functioning. Areas that have naturally occurring steep slopes with narrow nearshore habitat areas are defined as at risk. | KCDNR (2001) |
| Tideland Condition | Habitat that has experienced loss of tidal areas through filling is considered not properly functioning. Areas where tidelands are fragmented by development are at risk. | Beechie and Wasserman (1994); Williams and Thom (2001); Shepard (1981) |
| Marsh Prevalence and Complexity | Habitat containing historical marshland that has been lost by filling and/or degradation is considered not properly functioning. Areas where marshes are fragmented by development are at risk. | Shepherd (1981); Simenstad et al. (1982); Healy (1991) |
| Refugia | At risk habitat consists of the presence of refugia insufficient in size, number and connectivity. A not properly functioning habitat condition exists when adequate habitat refugia do not exist. | NOAA Fisheries (1996) |

| Indicators | Summary | Pertinent Studies |
|---|---|---|
| Physical Barriers | An at-risk habitat is considered to contain a minimal amount and minimum sized overwater structures. A not properly functioning habitat is defined as habitat that contains a large number of structures along a shoreline that are likely a significant barrier to juvenile salmon. | Nightingale and Simenstad (2001b); Weitkamp et al. (2000) |
| Current Patterns | Areas that contain minor alterations are determined to be at risk. Areas where shoreline modifications and/or dredging are prevalent are determined to be not properly functioning. | Nightingale and Simenstad (2001b) |
| **Physical Habitat** | | |
| Salt/Fresh Water Mixing Patterns and Locations | An altered condition that changes the natural surface hydrology is an at-risk habitat. A not properly functioning habitat contains significant impervious surface or a high level of modification of estuarine habitats. | |
| **Biological Habitat** | | |
| Benthic Prey Availability | Sediments that have an impaired ability to support benthic invertebrates are not properly functioning. Sediments containing a benthic community that was altered from its natural state are considered at risk. | Healy (1991); Bax et al. (1978)<br>Kjelson et al. (1982); Fresh et al. (1981) |
| Forage Fish Community | An at risk habitat has limited forage fish resources or habitat. Not properly functioning habitats have depleted forage fish resources or habitat. | Myers et al. (1998); USFWS (1998) |
| Aquatic Vegetation | If an area historically contained vegetation but the vegetation is degraded by disturbance then the habitat is considered at risk. Habitat without previously occurring vegetation as a result of shoreline development is considered not properly functioning. | Shafer (2002); Nightingale and Simenstad (2001a); Nightingale and Simenstad (2001b); Simenstad (2000); Goforth et al. (1979); Garono et al. (2002); Peeling and Goforth (1975) |
| Exotic Species | Habitat containing exotics that may compete with, or prey on, salmonids, are considered not properly functioning. If exotic species are present, but do not present any adverse effects, an “at risk” condition is assumed. | |

Existing environmental conditions in Oak Harbor and the Windjammer Park Lagoon are evaluated according to the criteria established in the matrix of pathways and indicators outlined above. A rating of properly functioning, at risk, or not properly functioning has been applied to each estuarine habitat indicator for the proposed Action Area. The ratings are presented in Table 5-2 and summarized in Appendix F by principal indicator (Water Quality, Physical Habitat, and Biological Habitat).

**Table 5-2. Matrix of Pathways and Indicators in Oak Harbor and Windjammer Park Lagoon**

| Pathways and Indicators | Environmental Baseline | | | Long Term Effects of the Action(s) | | |
|---|---|---|---|---|---|---|
| | Properly Functioning | At Risk | Not Properly Functioning | Restore | Maintain | Degrade |
| **Water Quality** | | | | | | |
| Turbidity | | X | | | X | |
| Dissolved Oxygen | | X | | | X | |
| Water Contamination | | X | | | X | |
| Sediment Contamination | | X | | | X | |
| **Physical Habitat** | | | | | | |
| Substrate/Armoring | | | X | | X | |
| Depth/Slope | X | | | | X | |
| Tideland Condition | | | | X | X | |
| Marsh Prevalence and Complexity | | | X | | X | |
| Refugia | | | X | | X | |
| Physical Barriers | X | | | | X | |
| Current Patterns | | X | | | X | |
| Salt/Fresh Water Mixing Patterns and Locations | | X | | | X | |
| **Biological Habitat** | | | | | | |
| Benthic Prey Availability | | X | | | X | |
| Forage Fish Community | | X | | | X | |
| Aquatic Vegetation | | | X | | X | |
| Exotic Species | X | | | | X | |

# 6.0 EFFECTS OF THE ACTION

The ESA requires that where a discretionary federal action may adversely affect listed species or critical habitat, federal agencies must analyze the direct and indirect effects that actions will add to the environmental baseline, together with the effects of future state or private actions reasonably certain to occur in the Action Area (50 CFR 402.02, 402.03, 402.14).

Under the ESA "direct effects" result from an agency action and include the action's immediate effects on a species or its habitat (50 CFR 402.02; USFWS and NMFS, 1998, p. 4-25). The ESA's regulations define "indirect effects" as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (40 CFR 1508.8; 50 CFR 402.02). A federal action's indirect effects may include the stimulation or inducement of growth or development activities carried out by other persons or entities (*National Wildlife Federation v. Coleman*, 529 F.2d 359; 5th Cir. Miss. 1976).

The ESA's implementing regulations also require a federal agency to analyze certain environmental impacts caused by the actions of others, not by the agency's proposed action. ESA regulations define these "cumulative effects" as including only the effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the Action Area of the federal action subject to consultation (40 CFR 402.02). The ESA's regulations establish a separate category—the "environmental baseline"—for the past or present impacts of all federal, state or private actions and other human activities in the Action Area, the anticipated impacts of all proposed federal projects in the Action Area that have already undergone Section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

The impacts of future private, local, or state development are properly analyzed as cumulative effects if there is no causal relationship between the development and the federal action under consideration (see 40 CFR 1508.7; 50 CFR 402.02). If a causal relationship exists between a federal action and future private, local, or state development, the development's environmental impacts should be discussed as an indirect effect of the underlying federal action (see 40 CFR 1508.8; 50 CFR 402.02; *National Wildlife Federation v. Coleman*, above; and USFWS and NMFS, 1998, p. 4-28). Where future private, local, or state development is subject to federal discretion, it is not analyzed as part of an ongoing Section 7 consultation, because it will be addressed in a separate future Section 7 consultation (see 50 CFR 402.02 and USFWS and NMFS [1998], pp. 4-25, 4-28, 4-30).

## 6.1 Direct Effects

### 6.1.1 Construction

Activities necessary for construction of the proposed MBR facility and associated marine outfall will result in direct effects to the Action Area. In general, direct effects as a result of the construction of the MBR facility will be minimal due to the project being located within a developed commercial area and within an established City Park (Windjammer Park).

The most probable mechanisms to affect listed species during construction are anticipated to be the potential for turbidity and a small increase in local noise and disturbance as a result of the need to use heavy equipment to construct the MBR facility and outfall.

#### *6.1.1.1 Turbidity and Sedimentation*

The proposed action will include the temporary disturbance of soils during grading and excavating activities and potential construction dewatering activity necessary to construct the MBR facility, and associated conveyance lines and pump stations. Grading and excavating could result in erosion from disturbed upland soils and increase the sediment load in runoff potentially entering Oak Harbor, Windjammer Park Lagoon, and adjacent wetlands. Site-specific erosion control measures will not be specified until final design is complete; however, construction of the proposed action will be required to develop a TESC Plan and implement erosion and sediment control BMPs that meet City and Ecology standards for construction. Because of the implementation of BMPs, sedimentation and turbidity of surface waters as a result of construction activities is expected to be extremely unlikely.

The highest potential for increased turbidity will occur during excavation for the proposed 1,400-foot long outfall into Oak Harbor. The nearshore (80 feet) and portion of the intertidal (720 feet) excavation can be conducted with an excavator when the tides are out, thus minimizing turbidity to a one-time event as each tidal cycle inundates the excavation area. The areas within the lower intertidal and sub-tidal will be conducted from a barge with a crane and clamshell dredge. This activity will likely produce localized turbidity, especially given that bottom substrate is primarily unconsolidated silt and mud. It is likely that a turbidity (silt) curtain would be used to minimize turbidity within surrounding waters. Turbidity sampling would also be conducted at the edge of the mixing zone (150 feet from activity causing turbidity) to ensure that state water quality standards are met outside the mixing zone. If exceeded, all dredging would be discontinued until such point that compliance is reached at the edge of the mixing zone.

The potential for increased turbidity resulting from upland construction will be minimized by limiting the clearing, grading, and excavation to only those areas necessary to complete the action, conducting work during the drier summer months to minimize the potential for sediment laden runoff to reach surface waters, using TESC BMPs such as silt fencing, straw bales, and check dams. If these best management practices are applied, the potential for direct effect to listed fish species and their associated critical habitat is considered insignificant.

#### *6.1.1.2 Construction Noise and Disturbance*

The project would require the use of heavy equipment including excavators, front-end loaders, cranes, auger drill rigs, backhoes, dozers, forklifts, concrete mixers, concrete pump trucks, man lifts, air compressors, welding machines, hand tools, high cycle generators, and dump trucks. It is likely that sheet piles will be driven and removed with a vibratory hammer during excavation shoring activities.

To determine the combined noise level of all construction equipment operating together at the proposed MBR facility project area, the three loudest pieces of equipment were compared, using accepted methodology. A vibratory hammer has a maximum noise level ($L_{max}$) value of 101 A-weighted decibels (dBA) at a distance of 50 feet from the source; auger drill rigs have an $L_{max}$ value of 84 dBA at a distance of 50 feet from the source; and an dozer has an $L_{max}$ value of 82 dBA at a distance of 50 feet from the source (WSDOT, 2011). Using the accepted methodology for decibel addition, the noise level generated from the project area will be 101 dBA at a distance of fifty feet from the source. The use of the vibratory hammer will be limited to shoring of deep excavations located a minimum of 600 feet from the shoreline of Oak Harbor. While this activity would only be conducted for a fraction of the time required to construct the project, it was used as a conservative estimate and to maintain the highest level of protection for listed species.

Since there is no available site-specific noise level data for the proposed MBR facility site to characterize background noise levels, background noise levels were estimated based on population density. The City of Oak Harbor covers an area of approximately 5 square miles in the city with a population of 17,675 as of 2010 (Carollo, 2013). This equates to a population density of 3,535 people per square mile. Daytime noise levels for a population density between 3,000 and 10,000 people per square mile in the absence of traffic is 55 dBA (FTA, 2006). Therefore, 55 dBA was used to characterize background noise levels in the project Action Area.

To determine the distance construction noise will attenuate to the ambient baseline sound level, the following equation was used:

$$D = D_o * 10^{((\text{construction noise} - \text{ambient sound level in dBA})/\alpha)}$$

Where D = the distance from the noise source, $D_o$ = the reference measurement distance (50 feet in this case), and α = 25 for soft ground and 20 for hard ground.

For this project, the distance for construction related noise to attenuate to background noise levels would be 9,976 feet:

$$D = 50 * 10^{((101-55)/20)}$$

D = 9,976 feet

The only real potential receptors in the project area include marbled murrelets and Steller sea lions. However, since there are no documented haulout sites in the project Action Area, the in-air noise disturbance to Stellar sea lions in this instance was deemed insignificant and the remainder of the analysis focuses on marbled murrelet. To determine the effects of construction noise on marbled murrelet, the construction noise level at a specific distance was calculated using the following Base 10 log equation:

$$L_{max} = \text{Construction } L_{max} \text{ at 50 feet} - 20 * \text{Log } (D/D_o)$$

Where $L_{max}$ = highest A-weighted sound level occurring during a noise event during the time that the noise is being measured at a distance of 50 feet. D = the distance from the noise source. $D_o$ = the reference measurement distance (50 feet in this case). Since this is a soft site area (vegetated) a value of 25 is used. A value of 20 would be used if hard site conditions occurred.

Oak Harbor is located approximately 600 feet west of the closest construction activity during a normal high-tide event; therefore, the noise level generated from construction at this point was determined, which corresponds to the point where marbled murrelets could potentially occur. Therefore D = 600 for the equation identified above. The results indicate that noise will have attenuated to 79.42 dBA by the time it reaches the shoreline of Puget Sound.

$$L_{max} = 101 \text{ dBA at 50 feet} - 20 * \text{Log } (600/50)$$

$$L_{max =} 101 \text{ dBA at 50 feet} - 20* \text{Log } (12)$$

$$L_{max =} 101 \text{ dBA at 50 feet} - 21.58$$

$$L_{max =} \mathbf{79.42\ dBA}$$

Threshold distances have been identified and are defined as a known distance where noise at a given level elicits a response from a target species (marbled murrelet in this instance). This response can be visual, as in head turning or flushing from a nest, or the animal may show little reaction. Particularly for birds, little or no reaction does not mean that no effect has occurred.

Appendix 1 of the USFWS Biological Opinion (BO) for the Olympic National Forest program of activities (USDI, 2003) identifies four noise thresholds. These include: the noise-only detectability threshold, noise-only alert threshold, noise only disturbance threshold, and noise only injury threshold. These are described in more detail below. In providing this noise analysis, one must take into consideration the difference between the environmental conditions in Olympic National Park and that of the more urbanized setting in which the proposed project is located. The noise analysis presented in the USFWS Olympic National Forest BO focuses on habitats where nest sites may potentially occur. Nest sites are not likely to occur in the project area as discussed in this document. Murrelets, if they were to occur in the project area, would likely be foraging in Puget Sound. Birds in the project vicinity would likely be able to avoid the Action Area during construction activities, whereas marbled murrelets or young murrelets in nests would not necessarily be able to avoid the construction described in the cited BO.

As previously described, the USFWS Olympic National Forest BO established four noise-related thresholds for assessing potential impacts to marbled murrelets. The first threshold is called a noise only "detectability" threshold, which occurs when the noise is detectable but a murrelet does not show any reaction. The detectability threshold was identified as being 4 decibels (dB) above the baseline sound level. In the case of the proposed project area, the detectability threshold would be approximately 59 dBA, since background noise is estimated at 55 dBA. The second threshold discussed in the Olympic National Forest BO is the noise-only "alert" threshold; this threshold is reached when the murrelet shows apparent interest by turning the head or extending the neck. The alert threshold is fairly subjective, but was identified as 56 dBA for the Olympic National Forest. Background noise levels in the Action Area, at 55 dBA, are slightly below this threshold. It is likely that, due to acclimation of birds to more urbanized settings, this threshold may be higher for birds foraging in marine waters of Oak Harbor near the more developed shorelines. The noise-only "disturbance" threshold is reached when the murrelet undertakes avoidance behavior, by flying off, hiding, diving, defending itself, moving the wings or body, or postponing a feeding. This value was established at 70 dBA. Finally, the noise-only "injury" threshold is reached when actual injury occurs, defined as an adult being flushed from the nest or the young missing a feeding. This threshold was determined to be 92 dBA. This injury threshold was related to old growth forest nesting habitat; it does not directly apply to the proposed action since the project is located outside of suitable nesting habitat and the fact that noise will be reduced to 79.42 dBA by the time it reaches Oak Harbor and potential foraging murrelets.

As applied to the project area, noise thresholds discussed in the Olympic National Forest BO are summarized as follows:

- Detectability: 59 dBA (4 dB above baseline)
- Alert: 56 dBA for Olympic National Forest habitat (likely higher for Action Area)
- Disturbance: 70 dBA
- Injury: 92 dBA

The Washington State Department of Transportation (WSDOT) has developed a Terrestrial Noise Calculator to estimate noise levels at various distances from a noise source. This Terrestrial Noise Calculator was used to determine the distances from WWTP construction for noise to attenuate to: a) ambient noise levels of 55 dBA (9,976 feet); b) the behavioral disturbance threshold of 70 dBA (1,774 feet); and c) the injury/mortality threshold of 92 dBA (141feet).

Based on this information, the project will not reach the injury/mortality threshold because the closest construction to the water is 600 feet, and the construction noise will have attenuated to below the injury/mortality threshold at 141 feet. The project may result in behavioral effects ("disturbance") within 1,774 feet of construction activities (1,174 feet offshore). Marbled murrelets that may be present and foraging within 1,174 feet of the shoreline may fly away from the construction area and delay foraging. However, it is anticipated that any murrelets foraging in the project area will seek out other suitable foraging areas in surrounding waters and resume foraging. It is also likely that murrelets may avoid the immediate construction area due to the increased noise and human activity. There is no break in the line of sight between construction activities and Puget Sound. The project will not result in injury or mortality of marbled murrelets foraging in the project action area; therefore the effects of construction noise on marbled murrelets are considered insignificant.

Construction related noise is anticipated to have no effect on listed fish species since no pile driving or other highly intensive noise is proposed within habitats that support listed fish species (no in-water pile driving or blasting).

#### *6.1.1.3 Construction Activities*

Although not likely, accidents such as spills of hazardous materials (typically green cement or grout, fuel, oil, and hydraulic fluid) or other unanticipated construction accidents could occur which would degrade water quality and/or be toxic to fish, marine mammals, and birds. Direct effects to listed species or their associated critical habitat, related to spills of hazardous materials, is considered insignificant due to the fact that the majority of construction activities would occur in existing developed portions of the WWTP site, project construction will be performed in accordance with terms and conditions of state and federal permits that include protection of local water quality within the construction areas, construction equipment will be inspected daily for leaks and cleaned of debris (if working near surface waters), refueling of equipment will occur a minimum of 200 feet from surface waters, and equipment, when not in use, will be stored or staged a minimum of 200 feet from surface waters. In addition, a Spill Prevention Countermeasure and Control (SPCC) plan to address the potential release of hazardous materials will be developed and implemented as necessary for the proposed action.

## 6.2 Indirect Effects

Operation of the proposed MBR facility would have the potential to adversely affect protected species and their habitat through alteration or degradation of water quality conditions, resulting directly or indirectly through the discharge of potentially toxic contaminants. Stormwater discharges may also adversely affect water quality at stormwater discharge sites that would be developed and operated as a result of increased residential development or other changes in land use resulting from the operation of the proposed MBR facility. These indirect effects are discussed in more detail below.

While effluent discharge must be analyzed as an indirect effect of the action, the overarching purpose of the project would be to replace effluent that is currently discharged from two antiquated facilities (lagoons and RBCs, which are among the poorest performing technologies known to the industry) with membrane quality effluent, which is widely accepted as the highest quality effluent you can generate in a municipal WWTP application. Overall, water quality in effluent and within the receiving water (Oak Harbor) is anticipated to improve as a result of the proposed action.

### 6.2.1 Effluent Discharge

The potential effects to marine species associated with wastewater discharge are generally related to nutrients, metals and chemical contamination. To evaluate the potential adverse effects of the proposed MBR facilities discharge on receiving water quality, habitat conditions, and fish and wildlife resources, the existing NPDES permit was used as the technical foundation for the analysis included in this BA. The water quality impact analysis is based on the estimated changes in the concentrations and mass loading of pollutants of concern caused by the MBR Facility's discharge into Oak Harbor receiving waters.

#### *6.2.1.1 Mixing Zones*

The water quality standards allow Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The facility would discharge to Oak Harbor which is designated as a Class A (excellent) marine receiving water in the vicinity of the outfall. Other nearby point source outfalls include: urban stormwater outfalls. Significant nearby non-point sources of pollutants include stormwater street run-off from urban streets and the nearby Oak Harbor Marina and Yacht Club. Oak Harbor, in the vicinity of the outfall, is an area considered as excellent marine receiving water for aquatic life uses, shellfish harvest, primary contact recreational uses and other miscellaneous uses including wildlife habitat, harvesting, commerce navigation, boating, and aesthetics (WAC 173-201A-612). However, It should be noted that Oak Harbor is listed as an area where shellfish harvest if prohibited by the Washington State Department of Health (DOH) due to proximity stormwater outfalls, wastewater outfalls, and the marine (DOH, 2009). Corresponding water quality standards for Class A (excellent) waters for some of these uses are listed below in Table 6-1.

**Table 6-1. Summary of Water Quality Criteria for Use Designations in Excellent Marine Waters.**

| Use Designation for Excellent Marine Waters | Parameter | Criteria |
|---|---|---|
| Aquatic Life | Temperature | Highest 1-DMax – 16 ºC (60.8 º F) |
| | Dissolved Oxygen | Lowest 1-day minimum – 6.0 mg/L |
| | pH | Range 0f 7.0-8.5 with a human caused variation within the range of less than 0.5 units |
| | Turbidity | Human disturbance limited to a 5.0 NTUs increase above background if background is less than 50 NTUs or less. A 10% increase when background turbidity is more than 50 NTUs |
| Shellfish Harvest | Bacteria | Must not exceed a geometric mean of 14 colonies/100ml with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean exceeding 43 colonies/100ml. |
| Primary Contact Recreational Uses | Bacteria | Same as above |

The proposed MBR facility is not currently covered by an NPDES permit because the location of the outfall and parameters of the outfall would change under the proposed action. However, Cosmopolitan Marine Engineering (2012) conducted a dilution analysis and an RPA study for the proposed MBR facility as discussed previously in this document based upon existing and projected flow volumes as well as anticipated population growth within the service area over the next 20 years. Their findings suggest that there is no reasonable potential for the facility to exceed surface water quality standards for chemical constituents commonly found in MBR effluent in Puget Sound including metals and ammonia. It has also been determined that the proposed MBR facility would be capable of meeting existing NPDES permit limits through the year 2030 for BOD and TSS concentrations in the effluent, that chlorine residual would no longer be discharged from the proposed facility due to conversion from chlorine disinfection to UV disinfection, and that fecal coliform removal efficiency would be increased. The dilution factors and mixing zone analysis conducted by Cosmopolitan would be included within the new NPDES Permit, yet to be issued for the proposed MBR facility.

While there will be an increase in effluent volume discharged from the outfall, and the location of the outfall will change slightly, indirect effects related to a change in effluent dilution are considered insignificant on listed species. This finding is based on the fact that the proposed facility would still meet NPDES permit limitations for applicable surface water quality standards, the proposed facility is anticipated to improve effluent water quality over current conditions, and based on the excellent water quality conditions of Oak Harbor within the Action Area, which is capable of handling additional effluent volumes.

#### *6.2.1.2 Compliance with Water Quality Objectives*

Water quality criteria, evaluation methodologies, and permitting procedures have been established by the EPA and Ecology to prevent acute and chronic toxicity in the receiving water. For each permitted increase in discharge, an evaluation of the effluent data, mixing, and receiving water characteristics is required to determine whether the increase in effluent flow may have a reasonable potential to exceed water quality criteria. If a reasonable potential to exceed water quality criteria is found, NPDES permit limits would then be established by Ecology to limit pollutant loadings to assure that water quality criteria are not exceeded. The proposed action would result in an increase in effluent discharge from a current flow of 3.0 mgd to 3.9 mgd by the year 2030 based on current flow and load data and population growth statistics for the service area (Carollo, 2013).

### Metals

Metals, including copper, lead, mercury, and zinc, may be present in highly treated water. They do not break down and are considered persistent chemicals. In general, metals bind to sediment or particulates suspended in water, but they may also dissolve in water and accumulate in surface sediments or bioaccumulate in the tissues of aquatic life. Metals discharged to Oak Harbor may cause a variety of effects on biological resources. The types of effects would vary depending upon the particular metal and the level of exposure. At high enough exposures, metals may cause immediate health risks, including death, to plants and animals. At lower levels, long-term effects such as those associated with reproduction or growth may potentially occur. In general, the acute toxicity levels of most metals for aquatic organisms are considerably higher than the levels that would be allowed by state and federal water quality standards (Mason, 1991; World Health Organization, 1998). Exposure to concentrated effluent on fish and marine mammal species is highly dependent upon the species exposed and their movement patterns. Adverse effects to salmonids from certain metals can include habitat avoidance and reduced olfactory function, which can increase the vulnerability of affected individuals to predators, reduce feeding efficiency, and reduce the likelihood of successful migration (Hansen et al., 1999). However, the effects attributable to the proposed action primarily are expected to be chronic and sub-lethal because mobility of salmonids should limit their overall exposure to concentrated effluent from the outfall.

The toxicity of dissolved copper and dissolved zinc is species-specific and effects may be visible at various levels of biological organization (i.e., on a molecular, cellular, tissue, or whole-organism level). Very little research has been conducted on ESA-listed species and results must be extrapolated based on physiological and environmental similarities. Laboratory results are extremely useful because there is an ability to control multiple variables; thus providing the ability to determine cause-and-effect relationships. However, laboratory studies have not been verified with field studies. Currently, there is limited peer reviewed science on the effects of pollutants of concern on listed species in the natural environment and agreement has not been reached that identifies the best available science to use in analysis. Thus this report focuses on the changes the project is having on the baseline and to determine the potential for exposure for listed species.

Dissolved copper and zinc are considered “constituents of concern” due to their toxicities at low and environmentally relevant concentrations, assuming the species at risk is present and the constituents are biologically available. For these constituents, NMFS has defined biological thresholds above which biological effects to species may occur. These thresholds are as follows:

- A 0.0056 mg/L (5.6 microgram/liter) increase in dissolved zinc over the receiving water’s background concentration.

- A 0.002 mg/L (2.0 microgram/liter) increase in dissolved copper over the receiving water's background concentration.

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal. Default values used in the 2012 RPA analysis came from the effluent/ambient water quality values used by King County in their analysis of the Brightwater WWTP effluent (King County, 2003). King County developed effluent water quality assumptions for both conventional extended aeration and membrane treatment plants, and performed extensive ambient water quality testing to define background water quality within Puget Sound. Reasonable potential calculations were made for chromium, copper, mercury, nickel, silver, zinc, and ammonia using 90$^{th}$ percentile effluent and mean ambient values from that study. No reasonable potential to exceed water quality standards for any of the effluent constituents were observed for the effluent from the new MBR facility and its new outfall (Cosmopolitan, 2012).

#### *6.2.1.3 Nutrients*

Excess nutrients (nitrogen and phosphorus) can artificially stimulate plant growth, resulting in algal blooms which speed up the aging process of aquatic systems in addition to contributing to low dissolved oxygen levels, which can affect salmonids, particularly juveniles. Low dissolved oxygen levels are of particular concern in inland Puget Sound/Strait of Georgia waters. Because of the position of Puget Sound/Strait of Georgia within the landscape, terrain, and bathymetry, there is inadequate mixing with waters from the Pacific Ocean resulting in a longer residence time for contaminants. Low dissolved oxygen levels can impair the respiration of fishes and other aquatic organisms resulting in both behavioral and physiological responses, including death. In addition, ammonia is toxic to salmonids.

As described above, the proposed MBR facility is designed to accommodate higher influent flow over the course of the 20 year planning horizon (Year 2030), which will result in an increase in BOD loading to the MBR facility. This increase in BOD loading is commensurate with increased influent volume over the same time frame. Even as BOD loading increases from a 4,792 ppd to 6,849 ppd using maximum month flow, effluent limits are anticipated to decrease from current concentrations of 25 mg/L to 10 mg/L due to the improved treatment process provided by the MBR facility and improved removal efficiency.

The implementation of secondary treatment improvements will also provide the flexibility to achieve nitrogen removal in the future. In the near term, no reasonable potential to exceed surface water quality standards for ammonia or total nitrogen has been documented based on the RPA conducted for the proposed MBR facility.

#### *6.2.1.4 Unregulated Contaminants/Microconstituents*

Municipal wastewater contains numerous unregulated contaminants generated from the daily use of products disposed of via the sewer system and industrial process discharges. Wastewater effluent has been implicated as a source of endocrine disrupting chemicals (EDCs), pharmaceuticals and personal care products (PPCPs), persistent, bioaccumulative and toxic chemicals (PBTs), polybrominated diphenyl ethers (PBDE's), and other compounds of anthropogenic origin in surface waters of the United States, Europe and Washington State (Koplin et al., 2002; Lester et al., 2004; King County, 2007).

There are currently no requirements for measuring these contaminants; however, they have been documented in treated wastewater effluent. Consequently, listed species may be exposed to these contaminants. Importantly, while the chemical concentrations are in many cases quite low, discharges occur on a continuous basis and include mixtures of compounds that may interact with each other under certain conditions. The potential toxicity effects of these mixtures can thus be both complex and additive.

Wastewater treatment plants have been a focus of research because they represent a point-source target for investigation, and not because they have been implicated as the most important, or significant, source of these substances in the environment.

King County has an active monitoring program and has comprehensive information on presence of conventional pollutants and unregulated chemicals in Puget Sound. BPA, a plasticizer, was detected by King County in both marine and freshwaters, but at concentrations lower than any levels of effect reported in the literature. Nonylphenol was detected at relatively high concentrations in stormwater samples and was also detected at lower levels throughout King County lakes, streams, and marine waters at concentrations above some literature-based effect levels. Quantification of source loadings was not part of the study's design and is not possible with the available data. The limited data from marine waters suggests wastewater treatment plant outfalls may not be a significant source for these chemicals; however, the sampling in marine waters was spatially limited. Additional data would be required to provide more certainty regarding the spatial extent and concentrations of these chemicals in marine waters (King County, 2007). Other studies in Washington State have detected plasticizers and reproductive hormones, with the highest concentrations and greatest frequency found at stream stations (Lester et al, 2004).

Wastewater treatment plants are designed to remove conventional pollutants. These processes also remove many types of EDCs and PPCPs.

Several wastewater utilities participated in a study conducted by Ecology, EPA and the Puget Sound Partnership (Lubliner et al., 2010) to characterize PPCPs in municipal wastewater effluent, and the varying effectiveness of different types of wastewater treatment processes. In August 2008, a one-day screening was done at five municipal wastewater treatment facilities in the Pacific Northwest. Target analytes included 172 organic compounds (PPCPs, hormones, steroids, semi-volatile organics), as well as nutrients and TSS. PPCPs were routinely found in the wastewater samples. The results of the sampling were used to determine if removal of PPCPs differed between WWTPs that provides secondary treatment, and WWTPs that provide advanced treatment for nutrient removal.

In wastewater, approximately 21% of the 172 chemicals monitored in the Ecology study were reduced in treated effluents to below reporting limits by conventional secondary treatment. The highest levels of removal were found for those treatment technologies providing nutrient removal. Secondary treatment alone achieved high removal efficiencies for hormones and steroids (Lubliner et al., 2010).

With a solids retention time (SRT) of 12 days, the proposed Oak Harbor MBR facility would have a SRT in the middle of the range of the five WWTPs sampled in the Ecology study. The correlation between SRT and PPCP removal was observed in the results of the Ecology study. Other studies were cited in that report concluding that there is a strong correlation between better PPCP removals and the longer SRT routinely employed in biological nutrient processes (Lubliner et al., 2010). Increasing the SRT as part of the new MBR process is seen as an important step toward increased removal of PPCPs.

### Effects of Common Unregulated Contaminants/Microconstituents

The review of studies has shown that endocrine disruption is undoubtedly adversely affecting wild fish populations, including salmonids, all over the world through a variety of pathways including hormone receptor interactions, interference with biosynthesis of sex steroids, disruption of hormonal control by the pituitary or reproductive and adrenal processes. However, in most cases the exact process or mode of action are poorly understood and the data that has been collected is largely confined to a few select species. Chemical compounds responsible for the adverse effects may be due to both synthetic and natural compounds.

Fish have been observed to undergo changes believed to be caused by the introduction of PPCPs. Although numerous endpoints are possible, the feminization of male fish is a commonly reported effect (Folmar et al., 1996; Alfonso et al., 2002; USGS, 2006; Liney et al., 2006; Barber et al., 2007). Fish feminization has been reported in lab studies and in rivers downstream of wastewater discharges. Wastewater effluent dominated streams or rivers seem most susceptible to fish feminization (Kolpin, 2002; Woodling et al., 2006). In addition, lower levels of wastewater treatment appear to result in an effluent with greater estrogenic content. It should be noted that some studies showed no signs of feminization in waters downstream of wastewater discharges and some studies reported feminization in sampling locations upstream of discharges (Jobling et al., 1998; Nichols et al, 1999; Angus et al., 2002; Giesy et al., 2003). The causes and thresholds of the feminization of different species of fish vary and research is ongoing.

Recent research has continued to focus on the feminization effects of PPCPs in the aquatic environment, as well as other impacts from PPCPs that are occurring to fish species. Rahman et al., 2009 reviewed the current knowledge of the effects of EDCs and PPCPs on the aquatic environment. The most discussed effects were associated with development and growth. Adverse reproductive effects to several fish species are detailed, as investigated by Cheshenko et al., 2008 (for teleost fish, which include salmonids) and others. Specific effects documented in teleost fish (bony fishes) exposed to estrogens and androgens include the following: kidney, liver and gonadal cell death; intersex; altered breeding behavior; fibrosis and inhibition of testicular development; ovarian follicle growth; and changes in the timing of maturation.

There are a number of challenges associated with consistently analyzing EDC and PPCP levels in the environment, as the extremely low concentrations at which they are present are difficult to consistently and accurately determine. The EPA has not set standards for analyzing emergent chemical levels. Rahmen et al., (2009) notes sample analysis variation between institutions, and highlights papers which are examining successful sample methodology (Ramirez et al., 2007).

A study associated with the Orange County Sanitation District municipal wastewater outfall showed a number of impacts associated with EDCs on male flatfish (Rempel et al., 2006). Specimens of the English Sole and Hornyhead Turbot were taken at the location of the marine outfall; males from this location showed feminization and other development impacts compared to male flatfish from a control location. The study, however, did not show an overall impact on flatfish abundance at the sample location.

It has also been demonstrated that low concentrations (0.025 μg/L) of environmental estrogens can affect reproductive behavior (Martinovic et al., 2003). Abnormal breeding behavior is considered a sub-lethal effect of exposure to endocrine disrupting compounds. Clotfelter et al. (2004) compiled a summary of the variety of behavioral effects noted in numerous fish species exposed to endocrine disrupting chemical.

Other chemicals found in wastewater known to cause endocrine disruption in fish are more commonly detected in surface waters, including those in Washington State. These include plasticizers, fire retardants, and detergent metabolites such as nonylphenol (which has been banned in Canada). In general and with the exception of nonylphenol (Servos, 1999), the majority of toxicity testing focuses on reproductive steroids.

Listed fish are exposed intermittently in the mixing zone of numerous treated wastewater discharges in Puget Sound, including the existing and proposed discharge from Oak Harbor facilities. It is possible they are experiencing sub-lethal effects as noted above resulting in reduced reproductive success. Given that fish are exposed to mixtures of chemicals, many of which likely behave with a common mechanism of action, it is possible that fish in close proximity to an effluent discharge are exposed to higher EDC concentrations than those outside of the acute and chronic mixing zones. Exposure of salmonids to acute concentrations are not likely due to the fact that salmonids are typically not a sedentary species and would not spend extended amounts of time within the acute mixing zone. It’s also possible salmonids may experience other sub-lethal effects as a result of repeated exposure to municipal wastewater, but we are unable at this time to determine to what extent effects related to unregulated compounds would result in a significant impairment or disruption of behavioral patterns such as feeding, breeding, or sheltering. Of more concern are the listed rockfish species, which are generally more sedentary than salmonid species; however, the depths and substrates around the proposed outfall (-14 feet MLLW and unconsolidated silt/mud substrate) likely limit use of the project Action Area by listed rockfish species, which are all deepwater species.

It should be noted that the design of the proposed MBR facility would include the capacity for some expansion in the future, which is necessary to allow for planned growth within the UGA. While higher levels of treatment are not required at this time to meet existing NPDES permit limitations, the new facility will provide the ability to meet more stringent nitrogen limits, should regulatory requirements change.

#### *6.2.1.5 Flows*

Influent flows to the WWTP are anticipated to increase accompanying planned population growth within the service area, resulting in an incremental increase in effluent discharge through the 2030 design year. Currently, the maximum monthly flow is 3 mgd. It is projected that by 2030, the maximum monthly flow will increase to approximately 3.9 mgd. Although flows are anticipated to increase, the MBR facility is anticipated to produce effluent quality meeting existing and future NPDES permit limitations through the year 2030. Overall, the proposed new facility will result in higher influent BOD loading; however, with the improved MBR treatment technology, the removal efficiency of BOD and TSS is anticipated to increase from 85% to 95 percent resulting in lower concentrations of these primary constituents within the effluent. In addition, conversion from chlorine disinfection to a UV disinfection system will eliminate the presence of chlorine residuals within the effluent stream. Based on an RPA analysis that evaluated common constituents of wastewater effluent from MBR facilities and using projected flow rates for the MBR facility, it was determined that the MBR facilities effluent has no reasonable potential to exceed water quality standards for the elements, including metals and ammonia. Therefore, increased effluent volumes are not anticipated to have adverse effects on water quality conditions within the Action Area.

### 6.2.2 Impervious Surface and Land Cover Alteration Associated with Plant Upgrades and Expansion

Stream degradation has been associated with the quantity of impervious surface in a basin (Booth, 2000; May et al., 1997; Horner and May, 2000). Studies in Puget Sound lowland streams show that alteration can occur in basins with as little as 10 percent total impervious surface. However, dramatic effects can be seen relative to discharge in basins where impervious surface exceeds 40 percent (May et al., 1997).

Currently, more than half of the project area is covered by impervious surfaces. Upon project completion, approximately 91 percent of the site will be covered by impervious surface, which is a 64 percent increase in impervious surface area. Indirect effects from pollution-generating impervious surfaces are anticipated to be minimal with the implementation of best management practices and other stormwater management measures described in Section 2.5 above which will meet the requirements of Ecology's *2012 Stormwater Management Manual for Western Washington.*

The new impervious surface area includes both process areas and non-process areas such as parking areas and roads. Runoff from impervious surface area within process areas will be collected and conveyed to the WWTP for treatment and discharged via the new MBR facility's outfall to Oak Harbor. Oak Harbor is exempt from stormwater quantity treatment requirements. Non-process areas will be collected and conveyed in accordance with the *2012 Stormwater Management Manual for Western Washington*. The impervious surface areas within the treatment plant footprint would likely be excluded from treatment requirements due to the fact that affected areas receive low traffic volumes (parking and maintenance vehicles). In addition to treatment provided, the proposed WWTP footprint represents a very small portion of the watershed. The location of the WWTP adjacent to Oak Harbor is not anticipated to result in altered peak and base flows in the watershed.

### 6.2.3 Impervious Surface and Land Cover Alteration Associated with Future Population Growth

The changes in impervious surface and hydrological response that accompany population growth and development can and sometimes are considered to be indirect effects of proposed actions. In Oak Harbor's case, the population growth and development in the service area includes areas within the City limits and those areas identified as UGAs. These are areas identified as most suitable for urban density development, and are directed by the GMA to be served by urban services. Growth within these areas would not be considered to be indirect effects of the proposed action, but more appropriately cumulative effects. This is because

Washington's GMA eliminates any causal relationship between public infrastructure and future development. Figure 7 shows the existing and future service area.

Under the GMA (RCW Ch. 36.70A), Municipal and Non-Municipal areas are required to use the state's census-based 20-year population projections to develop comprehensive land use plans ("comprehensive plans") to preemptively prescribe where and what type of development is allowed, as well as where and what type of development is *not* allowed. Each jurisdiction's individual zoning and building codes further define the actual parameters of permissible development in that jurisdiction, subject to the comprehensive plan as well as state and federal law, including FEMA flood insurance requirements. (See RCW 36.70B.030, .040; WAC 365-195-800(1); WAC 365-195-855; see also *Moss v. City of Bellingham*, 109 Wn. App. 9, 19, — P.2d — Div. I, 2001, citing RCW 36.70B.040; see also 42 USC 4001; 44 CFR Ch. 60.) These comprehensive plans concentrate future development in a designated urban areas, and avoid conversion of undeveloped land into sprawling, low-density development (see RCW 36.70A.020 (1), (2)).

Under the GMA, the City was required to (and did) develop a comprehensive land use plan to designate where future population growth and development would occur (City of Oak Harbor, 2009). As reflected in the comprehensive plan, land within the city limits and UGA will undergo a certain increment of additional and more intensive development even if the existing WWTP is not upgraded or expanded, however, this development would ultimately be limited by the WWTP capacity or the availability and appropriateness of on-site sewage disposal systems. However, the GMA required the City to allow more intensive land use within its UGA than could be supported by on-site septic systems, in order to concentrate development there, to preserve rural areas and open space, and to avoid sprawl. Figure 5 shows current land use and current zoning designations within the service area.

The GMA also required the City to produce a comprehensive sewer plan to support the additional increment of development (see RCW 36.70A.070 (4)). As such, expansion of the WWTP is directly attributable to the City's comprehensive plan (City of Oak Harbor, 2009), and as such, it is correctly analyzed as a cumulative effect, not as an indirect effect of the action. Federal appellate courts have ruled consistent with this analysis (see, for example, *City of Carmel-by-the-Sea v. U.S. Dep't of Transportation*, 123 F.3d 1142, 1162-63 (9th Cir. Cal. 1997); *Laguna Greenbelt, Inc. v. U.S. Dep't of Transportation*, 42 F.3d 517, 525 (9th Cir. Cal. 1994)).

There are additional reasons why the impacts of future development in the service area are more properly analyzed as cumulative effects. The first is that the primary purpose of ESA Section 7 consultation is to avoid jeopardy, and in so doing, to avoid and minimize impacts to listed species and designated critical habitat (16 USC 1536(a)(2); 50 CFR 402.02; USFWS and NMFS 1998, p. 4-19). The Services can require the project proponent to minimize such impacts as may be within the proponent's control. They may legitimately require a project proponent to undertake reasonable and prudent alternatives to avoid jeopardy, as well as reasonable and prudent measures to minimize the direct and indirect effects of the action (16 USC 1536(b)(4)(ii); 50 CFR 402.02; USFWS and NMFS 1998, p. 4-50).

As described above, the proposed project is intended to serve population growth identified in the comprehensive land use plans of the City and its UGA. Residential, commercial, and industrial growth is expected to occur within the service area between 2010 and 2030. This growth will likely alter wet weather (e.g., stormwater) runoff water quality and quantity as land is converted. Urban runoff has been identified as a potentially significant source of some pollutants, including dissolved metals such as copper and zinc, petroleum-based products, fecal coliform bacteria and others.

In order to address these concerns, the City has developed comprehensive stormwater treatment requirements as well as critical areas regulations, which are intended to be protective of sensitive habitats and the species of plants and wildlife that occur in these areas. The City currently requires all stormwater related infrastructure to meet the requirements of Ecology's *2005 Stormwater Management Manual for Western Washington* (Ecology, 2005; Oak Harbor Municipal Code (OHMC) 12.30.310)  Proposed projects must be designed to comply with the manual in order to obtain a development permit  As part of the water quality treatment and flow control regulations, the City encourages the use of non-structural preventive actions and source reduction approaches, such as low impact development (LID) techniques and experimental BMPs.

#### *6.2.3.1 Drainage Basins within the Service Area*

There are no major streams located within the City of Oak Harbor or within its UGA. Furthermore, no listed salmonids are known to occur within small streams or drainages within these boundaries.

#### *6.2.3.2 Buildable Lands Analysis for Service Area*

The City of Oak Harbor accounts for approximately 35 percent of the entire population on Whidbey Island. The City conducted some preliminary investigations into the land use capacity of the City and UGA to support proposed amendments to the 2010 Oak Harbor Comprehensive Plan (Oak Harbor, 2010a). This preliminary data was used to conduct the analysis of buildable lands within the proposed MBR facility's service area, which includes all areas within the city limits and the extent of the UGA.

In summary, the City looked at population projections for the planning period ending in 2030 in addition to available land within each area to develop two metrics to assess potential for that land to be developed. These include the Improvement to Land Ratio (ILR) and Land to Total Value Ratio (LTR). Within the city limits there are approximately 2,764 acres of land and within the UGA there are approximately 1,127 acres. Of the land located within the City boundary, LTR and ILR ratios indicate that between 405 and 758 acres could be developable. Of the land available within the UGA, LTR and ILR ratios indicate that between 383 to 552 acres could be developable. Future land use designations within undeveloped land in the UGA includes planned industrial park, planned business park, low-density residential, and commercial uses (Oak Harbor, 2012).

It is anticipated that through the City's implementation of existing stormwater, critical areas, shoreline, and floodplain regulations, indirect effects associated with impervious surface and land use changes in response to growth are anticipated to have insignificant effect on water quality and listed species in the Action Area.

## 6.3 Analyses of Effects to Critical Habitat Primary Constituent Elements

### 6.3.1 Bull Trout Critical Habitat

*6.3.1.1 Water Temperature*

Wastewater effluent would be discharged from an approximate 1,400-foot outfall into Oak Harbor. Effluent would be discharged via evenly spaced ports along the 200-foot long diffuser at the terminus of the outfall. The diffusers are located at a depth of -14 feet relative to MLLW. Bull trout critical habitat extends offshore to a depth of 33 feet MLLW. Therefore, effluent discharged from the new MBR facility will occur within designated critical habitat for bull trout. It is reasonable to assume that there will be some temperature variation around the diffuser, which when taking into consideration the salinity and density profiles of the seawater, may extend outward from the diffusers some distance. The proposed facility is anticipated to meet all surface water quality standards at the edge of the regulatory mixing zone; however, it is likely that temperatures may exceed the 16 degree Celsius within the acute and chronic mixing zone boundaries. Given the relatively small area (215 foot radius around diffusers) that would potentially exceed water quality standards for temperature relative to the amount of critical habitat along the eastern shore of Puget Sound and the mobility of bull trout, the proposed action is anticipated to have a insignificant effect on the water temperature PCE within the Action Area.

*6.3.1.2 Migratory Corridors*

The project would require the use of a turbidity curtain during excavation of the outfall, which is located within designated critical habitat. However, these activities would not preclude bull trout from migrating through the project area, but would temporarily limit migration into the area where the turbidity curtain is in place. As construction moves waterward, the turbidity curtain will be move along with the construction. Direct effects to the migratory corridor PCE from outfall construction is considered insignificant.

The proposed action would not cause development, but may facilitate future development of the area by providing sewer service to currently un-serviced areas. These areas are already within areas designated for urban growth and as such are planned development. Additional residential/commercial/industrial development may result in additional recreational/ commercial dock construction along the marine shoreline, which may potentially result in migratory corridor obstructions. These types of developments are highly unlikely and could not be attributed to expansion of the sewer Service Area because the majority of the Service Area is already sewered along the marine shoreline. There are currently several regulatory mechanisms in-place to ensure that dock construction or other in-water work, if it were to occur, would be protective of the environment and minimize impacts to bull trout movements along the shoreline. These include the Oak Harbor Shoreline Master Program, Critical Area Ordinances, and the need for state and federal permits for in-water work. Projects requiring federal permits would undergo individual ESA consultation. No streams within the immediate project vicinity or the Service Area are known to support bull trout populations.

#### *6.3.1.3 Prey Base*

Pacific herring holding areas have been identified offshore of Oak Harbor, and sand lance and surf smelt spawning has been documented along the marine nearshore immediately south of the proposed MBR facility, within the corridor proposed for the new marine outfall, and within the Windjammer Park lagoon (WDFW, 2013a). These forage fish species are a prey species for anadromous life history forms of bull trout. Construction of the MBR facility has some limited potential to contribute to degraded water quality via sedimentation and turbidity of the marine nearshore; however, this is considered discountable due to the use of appropriate TESC measures and the distance from soil disturbing activities to the marine nearshore.

Installation of the marine outfall has the highest potential to result in direct effects to forage fish species since excavation may result in disturbance to spawning areas for sand lance and surf smelt. To minimize potential for disturbing forage fish spawning areas, all construction waterward of the extreme high water line will be conducted during the approved in-water work window, which is protective of forage fish spawn timing, and all material excavated will be returned following installation of the outfall pipe. In addition, increased turbidity may result in direct effects to prey species by interfering with respiration and impeding migration though areas of high turbidity. To minimize the potential for turbidity to interfere with respiration and movements of forage fish, all activities will be conducted during approved in-water work windows, work will be conducted in the dry to all extents practicable and as the tides allow (nearshore and intertidal excavation will be conducted in the dry), and a turbidity curtain will be used to minimize turbidity and maintain turbidity to a localized area near construction in the lower intertidal and subtidal areas.

Operation of the MBR facility will result in the discharge of highly treated wastewater, which although in compliance with all applicable water quality standards could potentially result in degraded localized water quality within the Action Area. It is not anticipated that forage fish would spend unusual amounts of time in and around the outfalls due to the fact that most species are highly mobile and not sedentary species thereby minimizing their exposure to highly treated effluent. The proposed action is anticipated to improve effluent water quality. The operation of the MBR facility does not create a reasonable potential to exceed any water quality standards, based on evaluations conducted by Cosmopolitan Marine Engineering (see Section 2.3.3.3).

#### *6.3.1.4 Water Quality/Quantity*

The proposed action will result in an incremental increase in effluent discharge volume from the proposed MBR facility over the 20-year planning horizon (2030), which would discharge to Oak Harbor via a new primary outfall located 1,400 feet offshore. This has the potential to degrade water quality conditions within Oak Harbor and the project Action Area. Under existing conditions, the lagoon facility discharges approximately 3 mgd of treated wastewater effluent to Puget Sound via the marine outfall in Crescent Harbor. Under the proposed action, flow will increase to approximately 3.9 mgd by the year 2030 and will be discharging to Oak Harbor. WWTP improvements were designed to accommodate additional flows due to anticipated growth and subsequently the BOD loading will increase in response to the additional volumes but remain within anticipated NPDES permit limitations, despite a projected 30 percent increase in flow. Concentration of metals and ammonia are expected to remain within marine surface water quality standards.

The outfall would be located at depths of -14 feet MLLW and the acute and chronic mixing zones would be 21.5 and 215 feet in all directions from the 200-foot long diffuser respectively. The extent of bull trout critical habitat extends only to a depth of 33 feet below MLLW, which is within the acute and chronic mixing zones for the MBR effluent outfall. Although flows are anticipated to increase over time, the MBR facility is anticipated to produce effluent quality meeting strict existing and future NPDES permit limitations designed to protect beneficial uses, including aquatic life criteria.

The potential for growth within the service area may result in an increase in population and pollution generating impervious surface area associated primarily with new roadways in areas that were previously undeveloped. All new development will be subject to pertinent municipal stormwater regulations as well as critical areas regulations, which will ensure that all new impervious surface areas will be treated for quantity and quality prior to discharge. Furthermore, bull trout are not known to occur or spawn within any streams in the service area and their distribution is likely limited to a few individual adult and sub-adult anadromous life history forms that likely stray into the area from the Skagit, Nooksack, or Stillaguamish basin for foraging and overwintering. Therefore, the effects of future growth within the service area upon the water quality/quantity PCE for bull trout are considered insignificant.

### 6.3.2 Chinook Salmon Critical Habitat

Designated critical habitat for Puget Sound ESU Chinook salmon occurs within the project Action Area and includes the marine nearshore of Oak Harbor and the Windjammer Park lagoon:

- Nearshore marine areas free of obstruction with water quality and quantity conditions and forage , including aquatic invertebrates and fishes supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

#### *6.3.2.1 Nearshore Marine Areas*

The nearshore marine areas adjacent to the proposed MBR facility have been severely altered by past and current land use practices. The altered shoreline has reduced sediment delivery to the nearshore due to extensive riprap armoring and bulkheads and has altered the substrate composition of the nearshore, aquatic vegetation communities of the nearshore, and virtually eliminated vegetation along the nearshore. As such, the composition and availability of forage fish and aquatic invertebrates have likely been reduced from historic levels.

The proposed action will require in-water work necessary to install the new outfall (that replaces the City's current RBC outfall) for the proposed MBR. The outfall will extend from the beach waterward a distance of approximately 1,400 feet. The entire length of the proposed outfall is within designated critical habitat for Puget Sound Chinook salmon. This activity will require excavation within nearshore and intertidal habitats as well as dredging in lower intertidal and sub-tidal elevations. These activities will result in temporary disturbance to substrates, loss/dispersal of benthic prey organisms, and localized increases in turbidity as a result of re-suspension of bottom substrates. To minimize the potential for disturbance, all materials excavated from the pipeline trench will be replaced immediately following construction, the work will take advantage of tides to allow much of the nearshore and intertidal excavation to occur in the dry, and a turbidity curtain will be used to localize turbidity within the immediate construction area. Furthermore, the project area is comprised primarily of semi-consolidated to unconsolidated mud/silt with little or no structure and no eelgrass beds or patchy eelgrass. Once completed, the affected areas are expected to return to approximate pre-construction contours. The entire pipeline will be buried with the exception of the 200-foot diffuser. The area occupied by the diffuser would result in permanent direct effects to designated critical habitat; however given the fact that this habitat is primarily mud/silt with little to no structure, no eelgrass, and limited macro-algae to provide cover, or overhanging vegetation these effects are considered insignificant in comparison to the overall amount of nearshore critical habitat within Puget Sound.

Upland construction would occur within 200 feet of the Windjammer Park Lagoon and 600 feet of the Oak Harbor shoreline. No vegetation that would provide cover to either feature will be removed, and erosion and sediment control BMPs will be in place to minimize the potential for sedimentation and turbidity of receiving waters. With the implementation of soil and erosion control best management practices, it is anticipated that the direct effects of upland project construction will have an insignificant effect of the nearshore marine PCEs within the Action Area.

The proposed action will result in an incremental increase in effluent discharge volume from the proposed MBR facility over the 20-year planning horizon (2030), which would discharge to Oak Harbor via a new primary outfall located 1,400 feet offshore. This has the potential to degrade water quality conditions within Oak Harbor and the project Action Area. Under existing conditions, the Lagoon Plant discharges approximately 3 mgd of treated wastewater effluent to Puget Sound via the marine outfall in Crescent Harbor. Under existing conditions, the lagoon facility discharges approximately 3 mgd of treated wastewater effluent to Puget Sound via the marine outfall in Crescent Harbor. Under the proposed action, flow will increase to approximately 3.9 mgd by the year 2030 and will be discharging to Oak Harbor. WWTP improvements were designed to accommodate additional flows due to anticipated growth and subsequently the BOD loading will increase in response to the additional volumes but remain within anticipated NPDES permit limitations, despite a projected 30 percent increase in flow. Concentration of metals and ammonia are expected to remain within marine surface water quality standards.

The outfall would be located at depths of -14 feet MLLW and the acute and chronic mixing zones would be 21.5 and 215 feet in all directions from the 200-foot long diffuser respectively. The extent of critical habitat for Chinook extends from the line of extreme high tide out to a depth of 30 meters (98 feet) in marine nearshore areas, which is within the acute and chronic mixing zones for the MBR effluent outfall. Although flows are anticipated to increase, the MBR facility is anticipated to produce effluent quality meeting strict existing and future NPDES permit limitations designed to protect beneficial uses, including aquatic life criteria.

The potential for growth within the service area may result in an increase in population and pollution generating impervious surface area associated primarily with new roadways in areas that were previously undeveloped. All new development will be subject to pertinent municipal stormwater regulations as well as critical areas regulations, which will ensure that all new impervious surface areas will be treated for quantity and quality prior to discharge. Furthermore, Chinook are not known to occur or spawn within any streams in the service area and their distribution is likely limited to juvenile rearing and migration along the marine nearshore. These juvenile fish likely originate from the Skagit River system. Therefore, the effects of future growth within the service area upon the nearshore marine PCE for Chinook is considered insignificant.

### 6.3.3 Southern Resident Killer Whale Critical Habitat

Critical habitat for the Southern Resident killer whale was designated on November 29, 2006. PCEs for Southern Resident killer whales include the following (NMFS, 2008c):

- Water quality to support growth and development;
- Prey species of sufficient quantity, quality and availability to support individual growth, reproduction and development, as well as overall population growth; and
- Passage conditions to allow for migration, resting, and foraging conditions.

*6.3.3.1 Water Quality*

Oak Harbor within the aquatic zone of effect is listed on the Ecology list of impaired waterbodies for bacteria (Ecology, 2012). The proposed action will result in an incremental increase in effluent discharge volume from the proposed MBR facility over the 20-year planning horizon (2030), which would discharge to Oak Harbor via a new primary outfall located 1,400 feet offshore. This has the potential to degrade water quality conditions within Oak Harbor and the project Action Area. Under existing conditions, the lagoon facility discharges approximately 3 mgd of treated wastewater effluent to Puget Sound via the marine outfall in Crescent Harbor. Under the proposed action, flow will increase to approximately 3.9 mgd by the year 2030 and will be discharging to Oak Harbor. WWTP improvements were designed to accommodate additional flows due to anticipated growth and subsequently the BOD loading will increase in response to the additional volumes but remain within anticipated NPDES permit limitations, despite a projected 30 percent increase in flow. Concentration of metals and ammonia are expected to remain within marine surface water quality standards.

The outfall would be located at depths of -14 feet MLLW and the acute and chronic mixing zones would be 21.5 and 215 feet in all directions from the 200-foot long diffuser respectively. The extent of Sothern Resident killer whale critical habitat includes all marine waters relative to a contiguous shoreline delimited by the line at a depth of 20 feet, which is within the acute and chronic mixing zones for the MBR effluent outfall. Although flows are anticipated to increase, the MBR facility is anticipated to produce effluent quality meeting strict existing and future NPDES permit limitations designed to protect beneficial uses, including aquatic life criteria.

The potential for growth within the service area may result in an increase in population and pollution generating impervious surface area associated primarily with new roadways in areas that were previously undeveloped. All new development will be subject to pertinent municipal stormwater regulations, floodplain regulations, as well as critical areas regulations, which will ensure that all new impervious surface areas will be treated for quantity and quality prior to discharge. Therefore, the effects of future growth within the service area upon the water quality PCE for killer whale are considered insignificant. The proposed action may also have indirect effects to water quality via growth in the service area of the WWTP. The stormwater treatment requirements and critical areas ordinances currently in place within the city of Oak Harbor and its UGA will minimize the potential for adverse effects to water quantity and quality within streams and municipal outfalls discharging to Oak Harbor to insignificant levels.

The proposed action will require in-water work within Oak Harbor. The majority of soil disturbing activities will occur within the proposed site footprint approximately 600 feet from Oak Harbor and within 200 feet of the Windjammer Park lagoon. However construction of the 1,400-foot long outfall into Oak Harbor will require work within the nearshore, intertidal, and sub-tidal zones of Oak Harbor. This activity will result in the temporary disturbance of bottom substrates along the alignment as the materials are excavated from the installation area. To minimize the potential for excess turbidity during construction, a turbidity curtain will be used to isolate turbidity within the immediate work area. With the implementation of soil and erosion control best management practices as well as adherence to the SPCC plan, it is anticipated that direct effect of project construction will have an insignificant effect on the water quality PCE within the Action Area.

#### *6.3.3.2 Prey*

Southern Resident killer whales have been sighted intermittently and in all months of the year in the Puget Sound/Strait of Georgia area. The reason for the sightings in Puget Sound and Strait of Georgia likely corresponds to the seasonal returns of Pacific salmon to streams with abundant salmon runs, particularly the Fraser River system in British Columbia. The low abundance of salmonids returning to watersheds draining to Oak Harbor is likely correlated to the low number of Southern Resident killer whale sightings in the Oak Harbor area. The prey abundance PCE is likely limited within the project Action Area.

The proposed action will maintain compliance with surface water quality standards in Oak Harbor and therefore is not anticipated to have an adverse affect on salmonids, a common prey species for Southern Resident killer whale. Therefore, the effects of the action upon the prey species PCE is considered insignificant.

#### *6.3.3.3 Passage*

Southern Resident killer whales range widely from Puget Sound to the Pacific Ocean and are occasionally observed in south Puget Sound waters. Southern Resident killer whales are more frequently in the Georgia Strait in response to seasonal movements of salmonids into the Fraser River system in British Columbia. Sightings in the Oak Harbor area would be extremely rare; however frequent sightings are made within Saratoga Passage for which Oak Harbor is a small embayment. The construction necessary to install the new outfall may temporarily prevent use of the area closed off by the turbidity curtain; however, killer whales would be able to swim around the area and passage would be restored following construction. The proposed actions direct and indirect effects on passage are considered insignificant.

### 6.3.4 Canary Rockfish Critical Habitat

Critical habitat for the canary rockfish was proposed on August 9, 2013. Relevant attributes of rockfish habitat that are relevant in the evaluation of the effects of a proposed action in a section 7 consultation if the specific area containing the site is designated as critical habitat have been identified by NMFS. These attributes include:

1. Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities,
2. Water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities, and
3. The type and amount of structure and rugosity that supports feeding opportunities and predator avoidance.

*6.3.4.1 Prey Species*

Larval and juvenile canary rockfish feed on very small organisms such as zooplankton, copepods and phytoplankton, small crustaceans, invertebrate eggs, krill, and other invertebrates (Moser and Boehlert, 1991; Love et al., 1991; Love et al., 2002). Larger juveniles also feed upon small fish (Love et al., 1991). Due to the diversity of prey items utilized by canary rockfish, prey abundance within the action area is likely relatively high. Although, installation of a new outfall will disturb the benthos and may temporarily displace some prey items, no large-scale or long-term effects on prey species with the action area are expected.

The proposed action will maintain compliance with surface water quality standards in Oak Harbor and therefore is not anticipated to have an adverse affect on canary rockfish prey items, including small fish. Therefore, the effects of the action upon the prey species habitat attribute is considered insignificant.

*6.3.4.2 Water Quality*

Oak Harbor within the aquatic zone of effect is listed on the Ecology list of impaired waterbodies for bacteria (Ecology, 2012). The proposed action will result in an incremental increase in effluent discharge volume from the proposed MBR facility over the 20-year planning horizon (2030), which would discharge to Oak Harbor via a new primary outfall located 1,400 feet offshore. This has the potential to degrade water quality conditions within Oak Harbor and the project Action Area. Under existing conditions, the lagoon facility discharges approximately 3 mgd of treated wastewater effluent to Puget Sound via the marine outfall in Crescent Harbor. Under the proposed action, flow will increase to approximately 3.9 mgd by the year 2030 and will be discharging to Oak Harbor. WWTP improvements were designed to accommodate additional flows due to anticipated growth and subsequently the BOD loading will increase in response to the additional volumes but remain within anticipated NPDES permit limitations, despite a projected 30 percent increase in flow. Concentration of metals and ammonia are expected to remain within marine surface water quality standards.

The outfall would be located at depths of -14 feet MLLW and the acute and chronic mixing zones would be 21.5 and 215 feet in all directions from the 200-foot long diffuser respectively. The extent of proposed Puget Sound/Georgia Basin habitat includes all marine waters relative to a contiguous shoreline delimited by the line at a depth of 30 meters, which is within the acute and chronic mixing zones for the MBR effluent outfall. Although flows are anticipated to increase, the MBR facility is anticipated to produce effluent quality meeting strict existing and future NPDES permit limitations designed to protect beneficial uses, including aquatic life criteria.

The potential for growth within the service area may result in an increase in population and pollution generating impervious surface area associated primarily with new roadways in areas that were previously undeveloped. All new development will be subject to pertinent municipal stormwater regulations, floodplain regulations, as well as critical areas regulations, which will ensure that all new impervious surface areas will be treated for quantity and quality prior to discharge. Therefore, the effects of future growth within the service area upon the water quality habitat attribute for canary rockfish are considered insignificant. The proposed action may also have indirect effects to water quality via growth in the service area of the WWTP. The stormwater treatment requirements and critical areas ordinances currently in place within the city of Oak Harbor and its UGA will minimize the potential for adverse effects to water quantity and quality within streams and municipal outfalls discharging to Oak Harbor to insignificant levels.

The proposed action will require in-water work within Oak Harbor. The majority of soil disturbing activities will occur within the proposed site footprint approximately 600 feet from Oak Harbor and within 200 feet of the Windjammer Park lagoon. However construction of the 1,400-foot long outfall into Oak Harbor will require work within the nearshore, intertidal, and sub-tidal zones of Oak Harbor. This activity will result in the temporary disturbance of bottom substrates along the alignment as the materials are excavated from the installation area. To minimize the potential for excess turbidity during construction, a turbidity curtain will be used to isolate turbidity within the immediate work area. With the implementation of soil and erosion control best management practices as well as adherence to the SPCC plan, it is anticipated that direct effect of project construction will have an insignificant effect on the water quality habitat attribute within the Action Area.

#### *6.3.4.3 <u>Habitat Structure</u>*

Juvenile canary rockfish that reach sizes of 1 to 3.5 inches (3 to 9 centimeters) or ages of 3 to 6 months generally utilitize shallow, intertidal, nearshore waters in rocky, cobble and sand substrates with or without kelp (Love et al., 1991; Love et al., 2002). This habitat feature offers a beneficial mix of warmer temperatures, food, and refuge from predators (Love et al., 1991). Areas with floating and submerged kelp species support the highest densities of juvenile canary rockfish, as well as many other rockfish species (Carr, 1983; Halderson and Richards, 1987; Matthews, 1989; Love et al., 2002). The inter-tidal and sub-tidal portions of the Action Area, including the location of the new outfall, generally lack rocky and cobble substrate and do not contain known kelp beds, rather the substrate is comprised of mud and sand. In addition, excavation associated with the new outfall is limited to approximately 2,000 feet of relatively heterogenous mud and silt substrate and the trench will refilled with to existing grade with native materials.  Therefore, any effects on habitat structure would be insignificant.

### 6.3.5 Bocaccio Rockfish Critical Habitat

Critical habitat for the bocaccio rockfish was proposed on August 9, 2013. Relevant attributes of rockfish habitat that are relevant in the evaluation of the effects of a proposed action in a section 7 consultation if the specific area containing the site is designated as critical habitat have been identified by NMFS. These attributes include:

1. Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities,
2. Water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities, and
3. The type and amount of structure and rugosity that supports feeding opportunities and predator avoidance.

*6.3.5.1 Prey Species*

Larval and juvenile bocaccio feed on very small organisms such as zooplankton, copepods and phytoplankton, small crustaceans, invertebrate eggs, krill, and other invertebrates (Moser and Boehlert, 1991; Love et al., 1991; Love et al., 2002). Larger juveniles also feed upon small fish (Love et al., 1991). Due to the diversity of prey items utilized by bocaccio, prey abundance within the action area is likely relatively high. Although, installation of a new outfall will disturb the benthos and may temporarily displace some prey items, no large-scale or long-term effects on prey species with the action area are expected.

The proposed action will maintain compliance with surface water quality standards in Oak Harbor and therefore is not anticipated to have an adverse affect on bocaccio prey items, including small fish. Therefore, the effects of the action upon the prey species habitat attribute are considered insignificant.

*6.3.5.2 Water Quality*

Oak Harbor within the aquatic zone of effect is listed on the Ecology list of impaired waterbodies for bacteria (Ecology, 2012). The proposed action will result in an incremental increase in effluent discharge volume from the proposed MBR facility over the 20-year planning horizon (2030), which would discharge to Oak Harbor via a new primary outfall located 1,400 feet offshore. This has the potential to degrade water quality conditions within Oak Harbor and the project Action Area. Under existing conditions, the lagoon facility discharges approximately 3 mgd of treated wastewater effluent to Puget Sound via the marine outfall in Crescent Harbor. Under the proposed action, flow will increase to approximately 3.9 mgd by the year 2030 and will be discharging to Oak Harbor. WWTP improvements were designed to accommodate additional flows due to anticipated growth and subsequently the BOD loading will increase in response to the additional volumes but remain within anticipated NPDES permit limitations, despite a projected 30 percent increase in flow. Concentration of metals and ammonia are expected to remain within marine surface water quality standards.

The outfall would be located at depths of -14 feet MLLW and the acute and chronic mixing zones would be 21.5 and 215 feet in all directions from the 200-foot long diffuser respectively. The extent of proposed Puget Sound/Georgia Basin habitat includes all marine waters relative to a contiguous shoreline delimited by the line at a depth of 30 meters, which is within the acute and chronic mixing zones for the MBR effluent outfall. Although flows are anticipated to increase, the MBR facility is anticipated to produce effluent quality meeting strict existing and future NPDES permit limitations designed to protect beneficial uses, including aquatic life criteria.

The potential for growth within the service area may result in an increase in population and pollution generating impervious surface area associated primarily with new roadways in areas that were previously undeveloped. All new development will be subject to pertinent municipal stormwater regulations, floodplain regulations, as well as critical areas regulations, which will ensure that all new impervious surface areas will be treated for quantity and quality prior to discharge. Therefore, the effects of future growth within the service area upon the water quality habitat attribute for bocaccio are considered insignificant. The proposed action may also have indirect effects to water quality via growth in the service area of the WWTP. The stormwater treatment requirements and critical areas ordinances currently in place within the city of Oak Harbor and its UGA will minimize the potential for adverse effects to water quantity and quality within streams and municipal outfalls discharging to Oak Harbor to insignificant levels.

The proposed action will require in-water work within Oak Harbor. The majority of soil disturbing activities will occur within the proposed site footprint approximately 600 feet from Oak Harbor and within 200 feet of the Windjammer Park lagoon. However construction of the 1,400-foot long outfall into Oak Harbor will require work within the nearshore, intertidal, and sub-tidal zones of Oak Harbor. This activity will result in the temporary disturbance of bottom substrates along the alignment as the materials are excavated from the installation area. To minimize the potential for excess turbidity during construction, a turbidity curtain will be used to isolate turbidity within the immediate work area. With the implementation of soil and erosion control best management practices as well as adherence to the SPCC plan, it is anticipated that direct effect of project construction will have an insignificant effect on the water quality habitat attribute within the Action Area.

#### *6.3.5.3 Habitat Structure*

Juvenile bocaccio that reach sizes of 1 to 3.5 inches (3 to 9 centimeters) or ages of 3 to 6 months generally utilize shallow, intertidal, nearshore waters in rocky, cobble and sand substrates with or without kelp (Love et al., 1991; Love et al., 2002). This habitat feature offers a beneficial mix of warmer temperatures, food, and refuge from predators (Love et al., 1991). Areas with floating and submerged kelp species support the highest densities of juvenile bocaccio, as well as many other rockfish species (Carr, 1983; Halderson and Richards, 1987; Matthews, 1989; Love et al., 2002). The inter-tidal and sub-tidal portions of the Action Area, including the location of the new outfall, generally lack rocky and cobble substrate and do not contain known kelp beds, rather the substrate is comprised of mud and sand. In addition, excavation associated with the new outfall is limited to approximately 2,000 feet of relatively heterogenous mud and silt substrate and the trench will refilled with to existing grade with native materials. Therefore, any effects on habitat structure would be insignificant.

### 6.4 Beneficial Effects

NMFS and USFWS (1998) identify beneficial effects as those that "are contemporaneous positive effects without any adverse effects." The proposed action would provide a new MBR facility capable of producing a higher quality effluent in comparison to existing conditions, which could be considered beneficial; however, other aspects of the proposed action include direct and indirect effects are not considered beneficial. Therefore, project as a whole would not be considered as having "beneficial effects" as defined in relation to the ESA.

## 7.0 EFFECT DETERMINATIONS

Provided that the construction techniques and conservation measures summarized herein are properly implemented, this project is anticipated to have the following effects on ESA regulated species and critical habitat:

### 7.1 Threatened and Endangered Species

#### 7.1.1 Coastal-Puget Sound DPS Bull Trout

The overall effect determination for Coastal-Puget Sound DPS bull trout as a result of the proposed action is "may affect, not likely to adversely affect."

A "may affect" determination for Coastal-Puget Sound DPS bull trout is warranted based on the following rationale:

- Anadromous life history forms of bull trout, primarily adults and sub-adults, potentially occur along the marine shoreline of Oak Harbor within the Action Area.
- The project will include excavation during construction of the proposed MBR facility and new marine outfall, which may result in localized turbidity within Oak Harbor and Windjammer Park lagoon. Excess turbidity resulting from construction could occur if not properly controlled.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action would facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity within the WWTP's service area.

A "not likely to adversely affect" determination for Coastal-Puget Sound DPS bull trout is warranted based on the following rationale:

- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable

potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.

- Bull trout are not known to occur within any streams in the vicinity of Oak Harbor or within its UGA.
- Adult and sub-adult bull trout are highly mobile and are not anticipated to spend long periods of time around the outfall diffusers and therefore their risk of exposure to concentrated effluent is insignificant.
- While some new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will be collected and conveyed to the WWTP for processing.
- In-water construction would occur during approved in-water work windows to minimize the potential for overlap of construction with bull trout presence.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.
- Spill prevention plans and other construction related BMP's will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No discharge of construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.
- All equipment and materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a SPCC plan will be prepared specifically for this project.
- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with work in regulated critical areas that are protective of aquatic resources. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.
- The proposed action will allow for the facility to be expanded in the future, and is anticipated to meet future, more stringent NPDES limitations.

### 7.1.2 Puget Sound ESU Chinook Salmon

The overall effect determination for Puget Sound ESU Chinook salmon as a result of the proposed action is “may affect, not likely to adversely affect.”

A “may affect” determination for Puget Sound ESU Chinook salmon is warranted based on the following rationale:

- Adult Chinook are likely to occur in Oak Harbor and likely migrate through the Action Area to streams outside the Whidbey Basin and other adjacent drainages. Juvenile Chinook area anticipated to be present and rearing in the marine nearshore environment of Oak Harbor.
- The project will include excavation during construction of the proposed MBR facility and new marine outfall, which may result in localized turbidity within Oak Harbor and Windjammer Park lagoon. Excess turbidity resulting from construction could occur if not properly controlled.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action would facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity within the WWTP’s service area.

A “not likely to adversely affect” determination for Puget Sound ESU Chinook salmon is warranted because:

- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- Chinook salmon are not known to occur within any streams in the vicinity of Oak Harbor or within its UGA.
- Adult and juvenile Chinook are highly mobile and are not anticipated to spend long periods of time around the outfall diffusers and therefore their risk of exposure to concentrated effluent is insignificant.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology’s *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will be collected and conveyed to the WWTP for processing.

- In-water construction would occur during approved in-water work windows to minimize the potential for overlap of construction with juvenile and adult Chinook presence.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.
- Spill prevention plans and other construction related BMP's will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No discharge of construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.
- All equipment and materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a SPCC plan will be prepared specifically for this project.
- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with work in regulated critical areas that are protective of aquatic resources. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.
- The proposed action will allow for the facility to be expanded in the future, and is anticipated to meet future, more stringent NPDES limitations.

### 7.1.3 Puget Sound DPS Steelhead

The overall effect determination for Puget Sound DPS steelhead as a result of the proposed action is "may affect, not likely to adversely affect."

A "may affect" determination for Puget Sound DPS steelhead is warranted based on the following rationale:

- Adult steelhead are likely to occur in Oak Harbor and likely migrate through the Action Area to streams outside the Whidbey Basin and other adjacent drainages. Juvenile steelhead may be present in the marine waters of Oak Harbor; however, after leaving their natal streams, they spend little time in the marine nearshore and generally move quickly to deeper offshore waters.

- The project will include excavation during construction of the proposed MBR facility and new marine outfall, which may result in localized turbidity within Oak Harbor and Windjammer Park lagoon. Excess turbidity resulting from construction could occur if not properly controlled.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action would facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity within the WWTP's service area.

A "not likely to adversely affect" determination for Puget Sound DPS steelhead is warranted based on the following rationale:

- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- Steelhead are not known to occur within any streams in the vicinity of Oak Harbor or within its UGA; thus minimizing the potential for adults or juveniles to occur in the project Action Area during construction.
- Adult steelhead are highly mobile and are not anticipated to spend long periods of time around the outfall diffusers and therefore their risk of exposure to concentrated effluent is insignificant.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will be collected and conveyed to the WWTP for processing.
- In-water construction would occur during approved in-water work windows to minimize the potential for overlap of construction with steelhead presence.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.
- Spill prevention plans and other construction related BMP's will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No discharge of construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.

- All equipment and materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a SPCC plan will be prepared specifically for this project.
- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with work in regulated critical areas that are protective of aquatic resources. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.
- The proposed action will allow for the facility to be expanded in the future, and is anticipated to meet future, more stringent NPDES limitations.

### 7.1.4 Yelloweye, Canary, and Bocaccio Rockfish

The overall effect determination for rockfish as a result of the proposed action is “may affect, not likely to adversely affect.”

A “may affect” determination for rockfish is warranted based on the following rationale:

- Larval rockfish could be present within Oak Harbor, while juvenile and adult rockfish are less likely to be present.
- The project will include excavation during construction of the proposed MBR facility and new marine outfall, which may result in localized turbidity within Oak Harbor and Windjammer Park lagoon. Excess turbidity resulting from construction could occur if not properly controlled.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action would facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity within the WWTP’s service area.

A “not likely to adversely affect” determination for rockfish is warranted for the proposed action because:

- Adult and juvenile rockfish are not likely to occur within Oak Harbor due to a lack of suitable habitat. Oak Harbor is a fairly shallow embayment with maximum depths averaging between 20 and 25 feet. Juvenile yelloweye rockfish prefer shallow, high relief zones while adults are generally found at depths ranging from 300 to 590 feet. Juvenile canary rockfish prefer shallow, high relief zones while adults are generally found at depths ranging from 160 to 820 feet. Juvenile bocaccio rockfish prefer floating kelp bed associations and then eventually settle to depths ranging from 60 to 100 feet in rock reefs. Adults migrate to deeper waters and can be found 100 feet above unhardened sea floor in the water column
- Rockfish are not as mobile as salmonids and could be present at the depths of the outfall diffusers. The proposed improvements will result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the proposed due to MBR process efficiencies. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will be collected and conveyed to the WWTP for processing.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.
- Spill prevention plans and other construction related BMP's will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No discharge of construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.
- All equipment and materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a SPCC plan will be prepared specifically for this project.
- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with

work in regulated critical areas that are protective of aquatic resources. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.

- The proposed action will allow for the facility to be expanded in the future, and is anticipated to meet future, more stringent NPDES limitations.

### 7.1.5 Southern DPS Green Sturgeon

The overall effect determination for Southern DPS green sturgeon as a result of the proposed action is "may affect, not likely to adversely affect."

A "may affect" determination for Southern DPS green sturgeon is warranted based on the following rationale:

- Adult and sub-adult green sturgeon are presumed to occur in the marine waters of the Puget Sound, including Oak Harbor.
- The project will include excavation during construction of the proposed MBR facility and new marine outfall, which may result in localized turbidity within Oak Harbor and Windjammer Park lagoon. Excess turbidity resulting from construction could occur if not properly controlled.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action would facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity within the WWTP's service area.

A "not likely to adversely affect" determination for Southern DPS green sturgeon is warranted for this proposed action because:

- Green sturgeon are not as mobile as salmonids and could be present at the depths of the outfall diffusers. The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will be collected and conveyed to the WWTP for processing.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.

- Spill prevention plans and other construction related BMP’s will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No discharge of construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.
- All equipment and materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a SPCC plan will be prepared specifically for this project.
- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with work in regulated critical areas that are protective of aquatic resources. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.
- The proposed action will allow for the facility to be expanded in the future, and is anticipated to meet future, more stringent NPDES limitations.

### 7.1.6 Humpback Whale

The overall effect determination for humpback whale as a result of the proposed action is “may affect, not likely to adversely affect.”

A “may affect” determination is warranted based on the following rationale:

- Humpback whales are very rare in the vicinity of Oak Harbor; however, it is possible, although highly unlikely that they may be present at times during the construction and operation of the facility.
- The project will include excavation during construction of the proposed MBR facility and new marine outfall, which may result in localized turbidity within Oak Harbor and Windjammer Park lagoon. Excess turbidity resulting from construction could occur if not properly controlled.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.

- The proposed action would facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity within the WWTP's service area.

A "not likely to adversely affect" determination is warranted for this proposed action for humpback whale because:

- The project is not likely to have a significant effect on forage species within the area.
- The proposed action will require some in-water work: however, activities causing highly intensive noise such as impact pile driving or other highly intensive construction noise will not occur within marine waters. Humpback whale use of the Oak Harbor is highly unlikely given shallow depths, and the relative proximity to the WWTP and other development.
- Vibratory pile driving will be restricted to upland sites necessary to shore deep excavations. This work will be within 200 feet of Windjammer Park Lagoon and 600 feet of Oak Harbor.
- The proposed improvements would result in additional discharge volumes; however, BOD loading and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will be collected and conveyed to the WWTP for processing.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.
- Humpback whales are highly mobile and would not be anticipated to spend extended amounts of time around the outfall diffusers; thus minimizing exposure to effluent.
- Spill prevention plans and other construction related BMP's will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No discharge of construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.
- All equipment and materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a SPCC plan will be prepared specifically for this project.

- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with work in regulated critical areas that are protective of aquatic resources. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.
- The proposed action will allow for the facility to be expanded in the future, and is anticipated to meet future, more stringent NPDES limitations.

### 7.1.7 Southern Resident Killer Whale

The overall effect determination for as a result of the proposed action is “may affect, not likely to adversely affect.”

A “may affect” determination for Southern Resident killer whale is warranted based on the following rationale:

- Oak Harbor is within the range occupied by the Southern Resident killer whale and the proposed action will require in-water work necessary to install a new outfall for the MBR facility approximately 1,400 feet offshore.
- Forage species for Southern Resident killer whale, such as Pacific salmon, use Puget Sound within the Action Area for rearing, foraging and migration.
- The proposed action will result in a temporary increase of noise levels above ambient conditions and will also result in an increase in human activity during construction activities adjacent to Oak Harbor.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action would facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity within the WWTP’s service area.

A “not likely to adversely affect” determination is warranted for this proposed action for Southern Resident killer whales because:

- The project is not likely to have a significant effect on salmon populations or other forage species within the Action Area.
- Oak Harbor is a relatively shallow embayment with average depths ranging from 20-25 feet relative to the extreme high water elevation. Killer whale use, while possible,

would be considered extremely rare within the relatively shallow and confined portion of Oak Harbor where in-water construction would occur.

- Installation of the new outfall will require in-water work from both the mainland and from a barge. To the extent possible and as tides allow, outfall installation in the nearshore intertidal zone will be conducted in the dry and when the tides are out. Work within the lower intertidal and subtidal elevations will require excavation with a clam shell dredge operated from a barge with assistance from divers using hand tools. No highly intensive noise activities are anticipated, such as use of an impact pile driving, vibratory hammers, or blasting.
- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will be collected and conveyed to the WWTP for processing.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.
- Spill prevention plans and other construction related BMP's will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No discharge of construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.
- All equipment and materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a SPCC plan will be prepared specifically for this project.
- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with work in regulated critical areas that are protective of aquatic resources. Future

development requiring a federal permit or federal funding will undergo separate ESA consultation.

- The proposed action will allow for the facility to be expanded in the future, and is anticipated to meet future, more stringent NPDES limitations
- Killer whales are highly mobile and are not anticipated to spend large amounts of time foraging or migrating through the Action Area.

### 7.1.8 Steller Sea Lion

The overall effect determination for Steller sea lion as a result of the proposed action is "may affect, not likely to adversely affect."

A "may affect" determination for Steller sea lion is warranted based on the following rationale:

- Steller sea lion may occasionally use the project Action Area for foraging and migration.
- The proposed action will result in a temporary increase of noise levels above ambient conditions and will also result in an increase in human activity during construction activities adjacent to Oak Harbor.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action would facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity within the WWTP's service area.

A "not likely to adversely affect" determination for Steller sea lion is warranted for this proposed action because:

- There are no documented haulout sites for Steller sea lion within several miles of the project Action Area.
- Installation of the new outfall will require in-water work from both the mainland and from a barge. To the extent possible and as tides allow, outfall installation in the nearshore intertidal zone will be conducted in the dry and when the tides are out. Work within the lower intertidal and subtidal elevations will require excavation with a clam shell dredge operated from a barge with assistance from divers using hand tools. No highly intensive noise activities are anticipated, such as use of an impact pile driving, vibratory hammers, or blasting.
- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable

potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.

- While some new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will be collected and conveyed to the WWTP for processing.
- TESC measures will be in place to minimize the potential for turbidity and sedimentation of Oak Harbor and Windjammer Park lagoon.
- Spill prevention plans and other construction related BMP's will also be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- No discharge of construction dewatering water will occur to surface waters and appropriate BMPs such as silt fencing, straw bales, check dams or others will be in place to protect discharge areas from erosive flows and potential for sediment laden water delivery to surface waters.
- All equipment and materials will be stored and staged within the construction footprint located greater than 200 feet from surface waters.
- Refueling will occur farther than 200 feet from any surface water feature, including on-site wetlands, Oak Harbor, and Windjammer Park lagoon. All equipment operators will be trained in spill response and a Spill Prevention Countermeasure and Control (SPCC) plan will be prepared specifically for this project.
- Future development within the service area will require the strict adherence to development regulations including local critical area ordinances, stormwater management regulations, floodplain development regulations and shoreline regulations, which require protective buffers around streams and wetlands as well as appropriate treatment methodologies for stormwater, mitigation for impacts, and limited use of variances and exceptions to these regulations. The requirement for the use of low impact development technologies is also present within many of the development regulations. There are also other state and federal permit requirements associated with work in regulated critical areas that are protective of aquatic resources. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.
- The proposed action will allow for the facility to be expanded in the future, and is anticipated to meet future, more stringent NPDES limitations
- Steller sea lions are highly mobile and are not anticipated to spend large amounts of time foraging or migrating through the Action Area.

### 7.1.9 Marbled Murrelet

The overall effect determination for marbled murrelet as a result of the proposed action is "may affect, not likely to adversely affect."

A "may affect" determination for marbled murrelet is warranted based on the following rationale:

- Marbled murrelets may forage within the marine waters Oak Harbor, including the Action Area.
- The proposed action will result in a temporary increase of noise levels above ambient conditions and will also result in an increase in human activity during construction activities. Construction is anticipated to create noise within the disturbance threshold for marbled murrelets extending 1,774 feet offshore that may be foraging in the marine waters of Oak Harbor south of the existing WWTP.
- The proposed action may affect prey species within the Action Area.
- The proposed action will include in-water work necessary to install a new outfall for the MBR facility.

A "not likely to adversely affect" determination for marbled murrelet is warranted based on the following rationale:

- No suitable nesting habitat for marbled murrelet exists within the Action Area. The project area is within the City limits and is surrounded by residential and commercial development. Forested area, where present, are fragmented by human development.
- Installation of the new outfall will require in-water work from both the mainland and from a barge. To the extent possible and as tides allow, outfall installation in the nearshore intertidal zone will be conducted in the dry and when the tides are out. Work within the lower intertidal and subtidal elevations will require excavation with a clam shell dredge operated from a barge with assistance from divers using hand tools. No highly intensive noise activities are anticipated, such as use of an impact pile driving, vibratory hammers, or blasting.
- Tree removal will be restricted to landscaping trees within the existing site perimeter. These trees provide no suitable nesting habitat for murrelets.
- The proposed action will result in improved water quality being discharged to Oak Harbor and therefore should be beneficial to forage species.
- Direct impacts to forage species will be minimized by conducting work during the approved in-water work window, which is protective of forage fish spawning areas.
- Marbled murrelets would likely avoid the Action Area during construction. Suitable foraging habitat is available elsewhere and in adjacent habitats outside the construction area.

### 7.1.10 Golden Paintbrush

The proposed action is anticipated to result in an overall effect determination of "no effect" for golden paintbrush based on the following rationale:

- There are only five populations of golden paintbrush known to occur on Whidbey Island. The golden paintbrush occupies upland prairie habitats on Whidbey Island on west and southwest facing slopes. The project area contains no upland prairie habitat suitable for golden paintbrush and is furthermore located in a developed/developing urban center on the east side of Whidbey Island.

- The project Action Area, and the immediate construction area in particular, consists primarily of developed commercial area and portions of a public park. Maintained lawn and landscape trees characterize the portion of the proposed facility within the park. Habitat for Golden Paintbrush is not present.
- The project will result in soil disturbing activities; however, these will not occur within prairie type habitats.

## 7.2 Critical Habitat

### 7.2.1 Critical Habitat for Coastal-Puget Sound DPS Bull Trout

The overall effect determination for critical habitat for Coastal Puget Sound DPS bull trout as a result of the proposed action is “may affect, not likely to adversely affect.”

A “may affect” determination for Coastal-Puget Sound DPS bull trout critical habitat is warranted based on the following rationale:

- Water temperature, water quality/quantity, prey base, and migratory PCEs are present within the Action Area.
- The proposed action will result in discharge of higher quality effluent in the vicinity of designated critical habitat.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action will require in-water work within areas designated as critical habitat. These areas will be subject to excavation and temporary disturbance of bottom sediments during installation of the MBR facility outfall into Oak Harbor. The outfall diffuser will permanently occupy designated critical habitat for bull trout.
- Prey species for bull trout are available within the marine nearshore environment.
- The proposed action will facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity adjacent to the marine nearshore environment.

A “not likely to adversely affect” determination is warranted for this proposed action for Coastal-Puget DPS bull trout critical habitat because:

- Areas of existing critical habitat to be occupied by the diffuser provide little in the way of habitat. The substrates are typically mud/silt, there is little structure to provide cover for prey species.
- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable

potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.

- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will continue to be collected and conveyed to the WWTP for processing.
- TESC measures and a Stormwater Pollution Prevention Plan will be in place to minimize the potential for turbidity and sedimentation Puget Sound and subsequently the estuary and marine nearshore environment during construction of the proposed action. Spill prevention plans and other construction related BMP's will be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- The proposed action is not likely to have an adverse affect on species that may provide forage for bull trout.
- Future development within the Service Area will be required to meet existing regulatory requirements such as local critical area ordinances, stormwater regulations and shoreline regulations as well as other state and federal permit requirements associated with work in regulated critical areas. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.

### 7.2.2 Critical Habitat for Puget Sound ESU Chinook Salmon

The overall effect determination for designated critical habitat for Puget Sound ESU Chinook salmon as a result of the proposed action is "may affect, not likely to adversely affect."

A "may affect" determination for Puget Sound ESU Chinook salmon critical habitat is warranted based on the following rationale:

- The project lies within designated critical habitat along the marine nearshore environment of Oak Harbor
- Nearshore PCEs are present within the Action Area.
- The proposed action would discharge highly treated wastewater effluent into designated critical habitat.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action will require in-water work within areas designated as critical habitat. These areas will be subject to excavation and temporary disturbance of bottom sediments during installation of the MBR facility outfall into Oak Harbor. The outfall diffuser will permanently occupy designated critical habitat for bull trout.
- Prey species for Chinook are available within the marine nearshore environment.

- The proposed action will facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity adjacent to the marine nearshore environment.

A "not likely to adversely affect" determination is warranted for this proposed action for Puget Sound ESU Chinook salmon critical habitat because:

- Areas of existing critical habitat to be occupied by the diffuser provide little in the way of habitat. The substrates are typically mud/silt, there is little structure to provide cover for prey species.
- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will continue to be collected and conveyed to the WWTP for processing.
- TESC measures and a Stormwater Pollution Prevention Plan will be in place to minimize the potential for turbidity and sedimentation Puget Sound and subsequently the estuary and marine nearshore environment during construction of the proposed action. Spill prevention plans and other construction related BMP's will be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- The proposed action is not likely to have an adverse affect on species that may provide forage for Chinook salmon.
- Future development within the Service Area will be required to meet existing regulatory requirements such as local critical area ordinances, stormwater regulations and shoreline regulations as well as other state and federal permit requirements associated with work in regulated critical areas. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.

### 7.2.3 Critical Habitat for Southern Resident Killer Whale

The overall effect determination for critical habitat for the Southern Resident killer whale as a result of the proposed action is "may affect, not likely to adversely affect."

A "may affect" determination for Southern Resident killer whale critical habitat is warranted based on the following rationale:

- The project lies within designated critical habitat.
- The Action Area contains PCEs essential to the conservation of the Southern Resident killer whale in South Puget Sound. PCEs include passage conditions to allow for migration, resting, and foraging, and water quality to support growth and development.

- The proposed action would discharge of highly treated wastewater effluent in designated critical habitat.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action will require in-water work within areas designated as critical habitat. These areas will be subject to excavation and temporary disturbance of bottom sediments during installation of the MBR facility outfall into Oak Harbor. The outfall diffuser will permanently occupy designated critical habitat for bull trout.
- Prey species for Southern Resident killer whale are available within the marine nearshore environment.
- The proposed action will facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity adjacent to the marine nearshore environment.

A "not likely to adversely affect" determination is warranted for this proposed action for Southern Resident killer whale critical habitat because:

- The proposed action will require work within marine habitats. However, these activities will include measures to minimize turbidity resulting from dredging excavation activities, will not create permanent barriers to migration, and should not prevent migration, feeding, or resting over the long term.
- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will continue to be collected and conveyed to the WWTP for processing.
- TESC measures and a Stormwater Pollution Prevention Plan will be in place to minimize the potential for turbidity and sedimentation Oak Harbor during construction of the proposed action. Spill prevention plans and other construction related BMP's will be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- The proposed action is not likely to have an adverse affect on aquatic fish species that may provide forage for Southern Resident killer whale. The existing low numbers of salmon returning to Oak Harbor tributaries likely limits movements of killer whales into this area on a regular basis.

- Future development within the Service Area will be required to meet existing regulatory requirements such as local critical area ordinances, floodplain regulations, stormwater regulations and shoreline regulations as well as other state and federal permit requirements associated with work in regulated critical areas. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.

### 7.2.4 Critical Habitat for Canary Rockfish

Based on the information provided herein, it was determined that the project “will not destroy or adversely modify” proposed Puget Sound/Georgia Basin canary rockfish critical habitat. If canary rockfish critical habitat is designated prior to completion of this project, a provisional effect determination of “may affect, not likely to adversely affect” would apply.

A “may affect” determination for canary rockfish critical habitat is warranted based on the following rationale:

- The project lies within proposed critical habitat.
- The Action Area contains attributes essential to the conservation of the canary rockfish, including quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities, and water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities.
- The proposed action would discharge highly treated wastewater effluent in designated critical habitat.
- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action will require in-water work within areas designated as critical habitat. These areas will be subject to excavation and temporary disturbance of bottom sediments during installation of the MBR facility outfall into Oak Harbor. The outfall diffuser will permanently occupy designated critical habitat for bull trout.
- Prey species for canary rockfish may be present within the marine nearshore environment.
- The proposed action will facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity adjacent to the marine nearshore environment.

A “not likely to adversely affect” determination is warranted for this proposed action for canary rockfish critical habitat because:

- The proposed action will require work within marine habitats. However, these activities will include measures to minimize turbidity resulting from dredging excavation activities, will not create permanent barriers to migration, and should not prevent migration, feeding, or resting over the long term.

- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will continue to be collected and conveyed to the WWTP for processing.
- TESC measures and a Stormwater Pollution Prevention Plan will be in place to minimize the potential for turbidity and sedimentation Oak Harbor during construction of the proposed action. Spill prevention plans and other construction related BMP's will be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- The proposed action is not likely to have an adverse affect on aquatic organisms they provide prey for canary rockfish.
- Future development within the Service Area will be required to meet existing regulatory requirements such as local critical area ordinances, floodplain regulations, stormwater regulations and shoreline regulations as well as other state and federal permit requirements associated with work in regulated critical areas. Future development requiring a federal permit or federal funding will undergo separate ESA consultation.

### 7.2.5 Critical Habitat for Boccacio Rockfish

Based on the information provided herein, it was determined that the project "will not destroy or adversely modify" proposed Puget Sound/ Georgia Basin boccacio rockfish critical habitat. If boccacio rockfish critical habitat is designated prior to completion of this project, a provisional effect determination of "may affect, not likely to adversely affect" would apply.

A "may affect" determination for boccacio rockfish critical habitat is warranted based on the following rationale:

- The project lies within proposed critical habitat.
- The Action Area contains attributes essential to the conservation of the boccacio rockfish, including quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities, and water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities.
- The proposed action would discharge highly treated wastewater effluent in designated critical habitat.

- The proposed action will allow for an incremental increase in effluent discharge volumes. Effluent flows discharged via the primary marine outfall located 1,400 feet offshore at a depth of 14 feet is anticipated to increase from a current maximum monthly volume of 3 mgd to 3.9 mgd by the year 2030.
- The proposed action will add new impervious surface area to the basin.
- The proposed action will require in-water work within areas designated as critical habitat. These areas will be subject to excavation and temporary disturbance of bottom sediments during installation of the MBR facility outfall into Oak Harbor. The outfall diffuser will permanently occupy designated critical habitat for bull trout.
- Prey species for boccacio rockfish may be present within the marine nearshore environment.
- The proposed action will facilitate future development within the Action Area indirectly resulting in an increase in impervious surface area and increased human activity adjacent to the marine nearshore environment.

A "not likely to adversely affect" determination is warranted for this proposed action for canary rockfish critical habitat because:

- The proposed action will require work within marine habitats. However, these activities will include measures to minimize turbidity resulting from dredging excavation activities, will not create permanent barriers to migration, and should not prevent migration, feeding, or resting over the long term.
- The proposed improvements would result in additional discharge volumes; however, BOD and TSS loading will not be commensurate with volume increases due to the improved treatment processes and would maintain NPDES permit limits for these constituents. The proposed MBR facility is not anticipated to result in any reasonable potential to exceed surface water quality standards. The proposed MBR facility is designed to meet stringent NPDES permit discharge requirements.
- While new impervious surface will be added to the basin, all stormwater generated from construction and operation of the facility will be treated in accordance with Ecology's *2012 Stormwater Management Manual for Western Washington.* Stormwater generated from process areas will continue to be collected and conveyed to the WWTP for processing.
- TESC measures and a Stormwater Pollution Prevention Plan will be in place to minimize the potential for turbidity and sedimentation Oak Harbor during construction of the proposed action. Spill prevention plans and other construction related BMP's will be in place to prevent spills of oils, hydraulic fluids, or other contaminants into surface waters.
- The proposed action is not likely to have an adverse affect on aquatic organisms they provide prey for boccacio rockfish.
- Future development within the Service Area will be required to meet existing regulatory requirements such as local critical area ordinances, floodplain regulations, stormwater regulations and shoreline regulations as well as other state and federal permit requirements associated with work in regulated critical areas. Future

development requiring a federal permit or federal funding will undergo separate ESA consultation.

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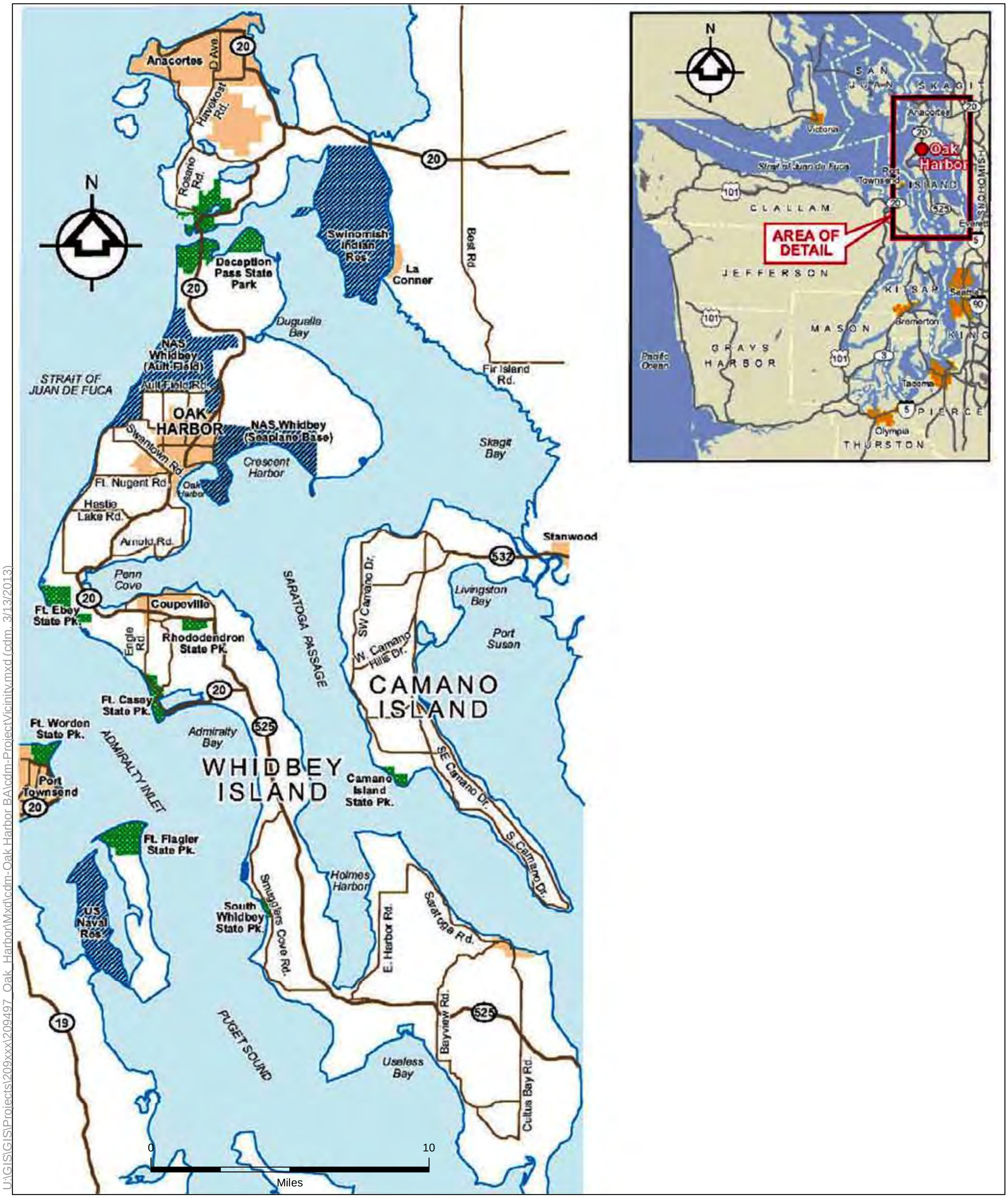
# FIGURES

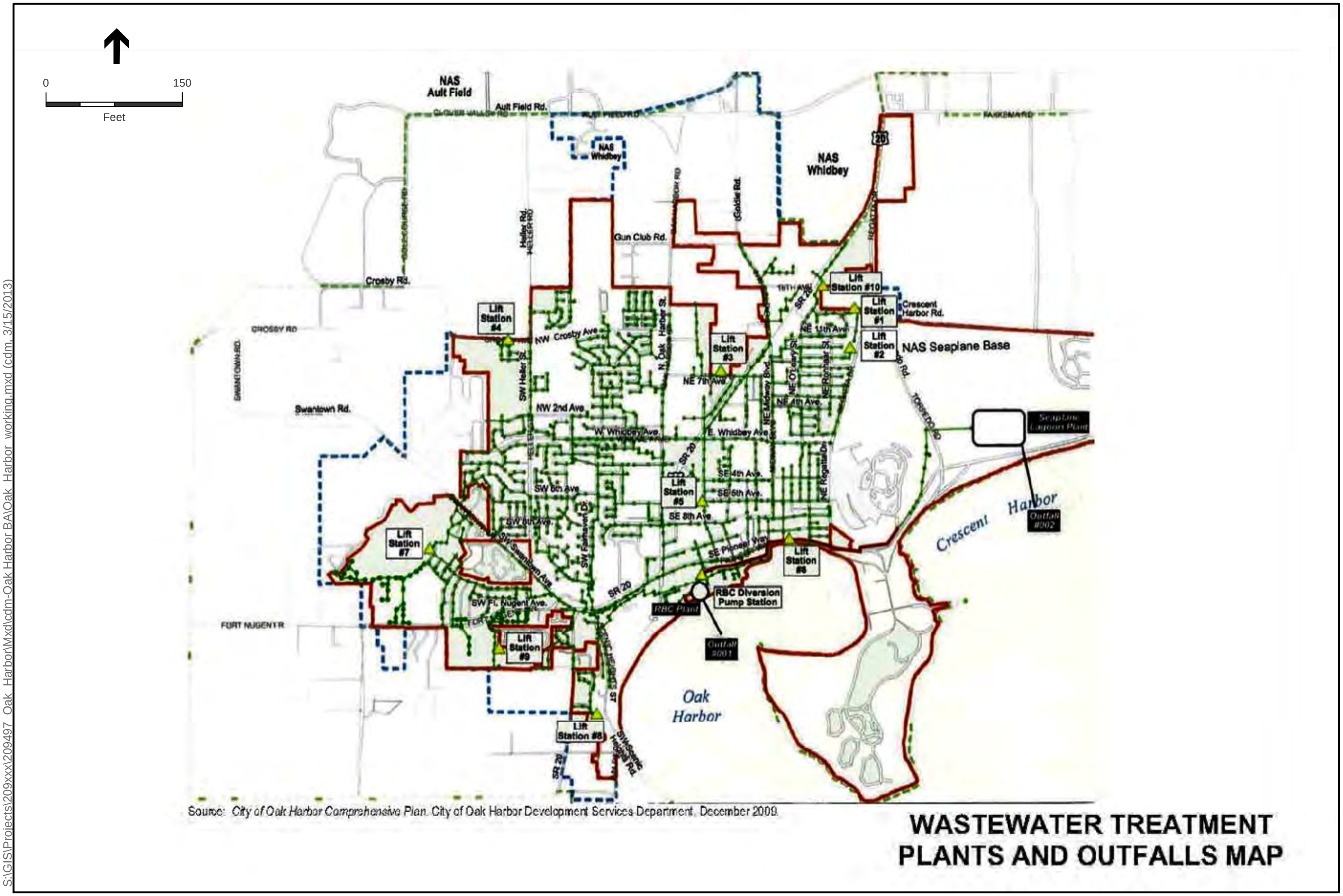





SOURCE: City of Oak Harbor Comprehensive Plan,
City of Oak Harbor Development Services Department,
December 2009

Oak Harbor Wastewater Treatment Facilities Biological Evaluation**.** 209497

**Figure 1**
Project Vicinity
Oak Harbor, Washington




SOURCE: City of Oak Harbor 2009

Oak Harbor Wasterwater Treament Facilities Biologial Evaluation. 209497

**Figure 2**
Outfall Locations
Oak Harbor WWTP Facility
Oak Harbor, Washington


**WINDJAMMER VICINITY**



SOURCE: City of Oak Harbor 2009

Oak Harbor Wasterwater Treament Facilities Biologial Evaluation. 209497

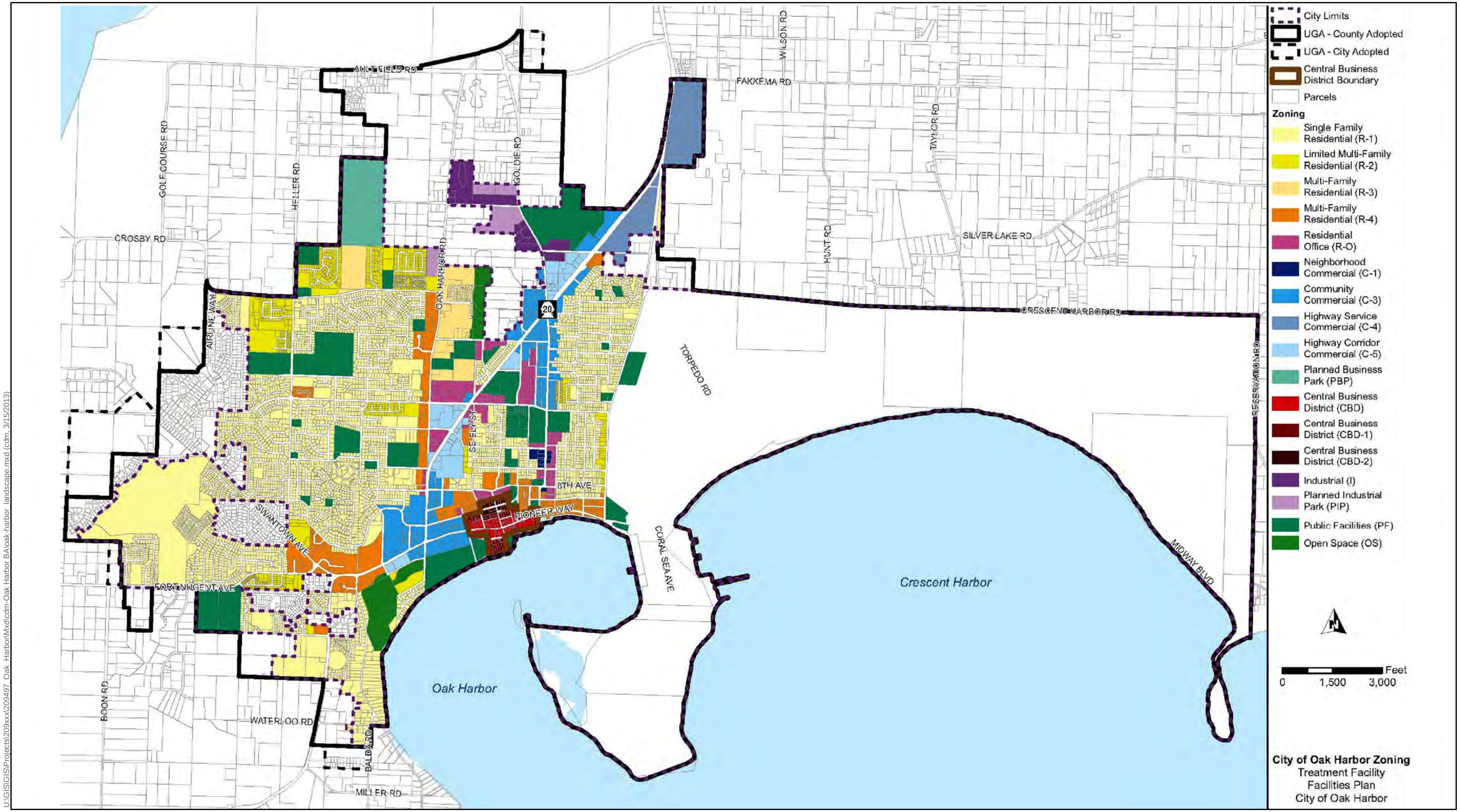
**Figure 3**
Windjammer Vicinity
Oak Harbor WWTP Facility
Oak Harbor, Washington


S:\GIS\Projects\209xxx\209497 Oak Harbor\Mxd\cdm-Oak Harbor BA\OakHarbor Windjammer Park.mxd (cdm, 3/15/2013)

SOURCE: Island County, 2010; Aerials Express (2009) (Aerial).

Oak Harbor Wasterwater Treament Facilities Biologial Evaluation. 209497

**Figure 4**
Onsite Wetlands
Oak Harbor WWTP Facility
Oak Harbor, Washington




SOURCE: City of Oak Harbor 2009

Oak Harbor Wastewater Treament Facilities Biologial Evaluation. 209497

**Figure 5**
Land Use and Zoning
Oak Harbor WWTP Facility
Oak Harbor, Washington

S:\GIS\Projects\209xxx\209497_Oak_Harbor\Mxd\cdm-Oak Harbor BA\Oak_Harbor_working.mxd (cdm, 3/15/2013)


## Building Key

1. Potential Community Building (cost not included)
2. Administration Building
3. Maintenance Shop
4. Headworks
5. Aeration Basins (buried beneath road)
6. Membrane Bioreactor (MBR) Building
7. Mechanical Building
8. Electrical Building
9. Chemical Building
10. Solids Building
11. Odor Control Building

North

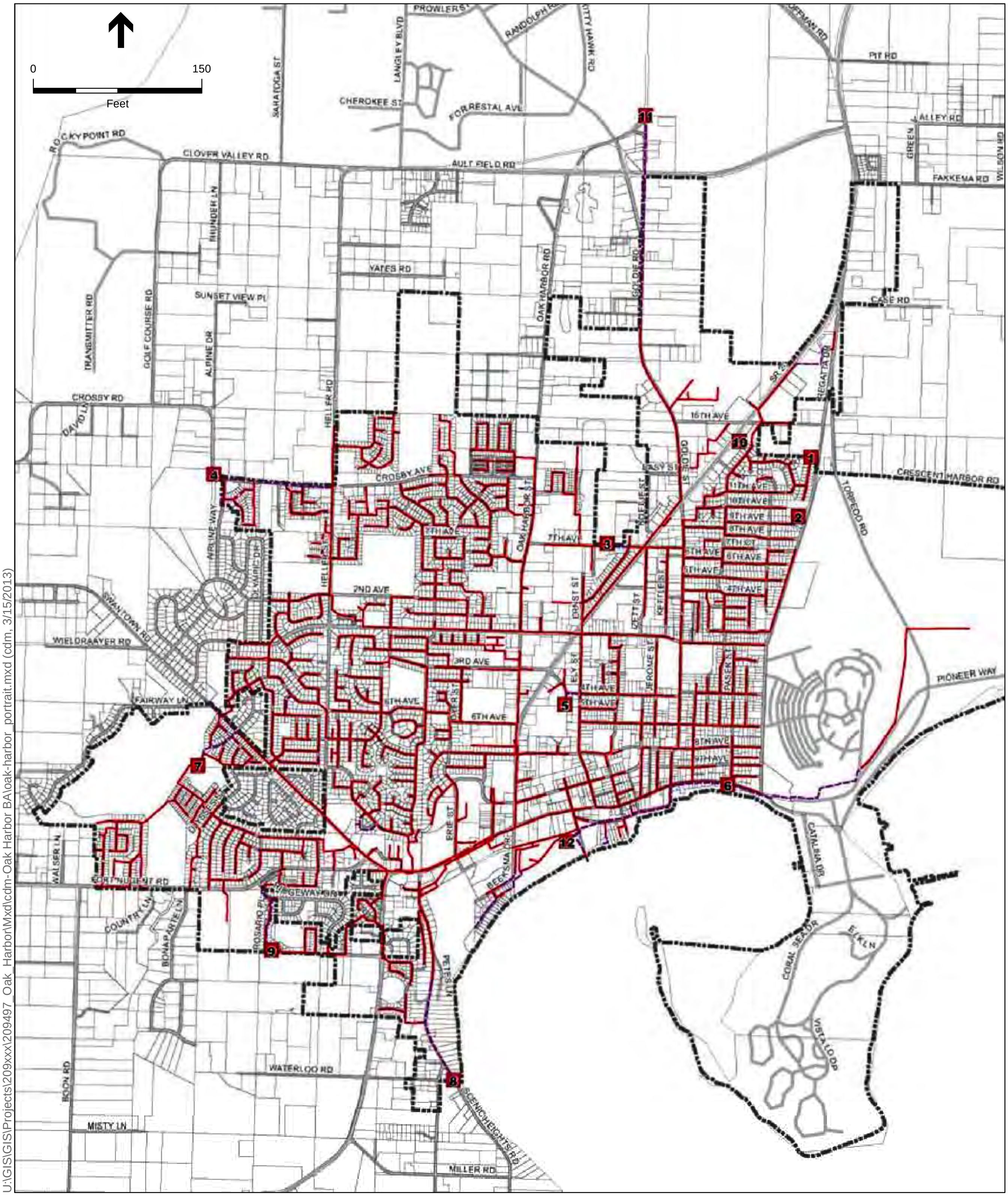
0 100
Feet

**WINDJAMMER VICINITY CONCEPTUAL SITE PLAN**

SOURCE: City of Oak Harbor 2009



**Figure 6**
Conceptual Site Layout
Oak Harbor WWTP Facility
Oak Harbor, Washington

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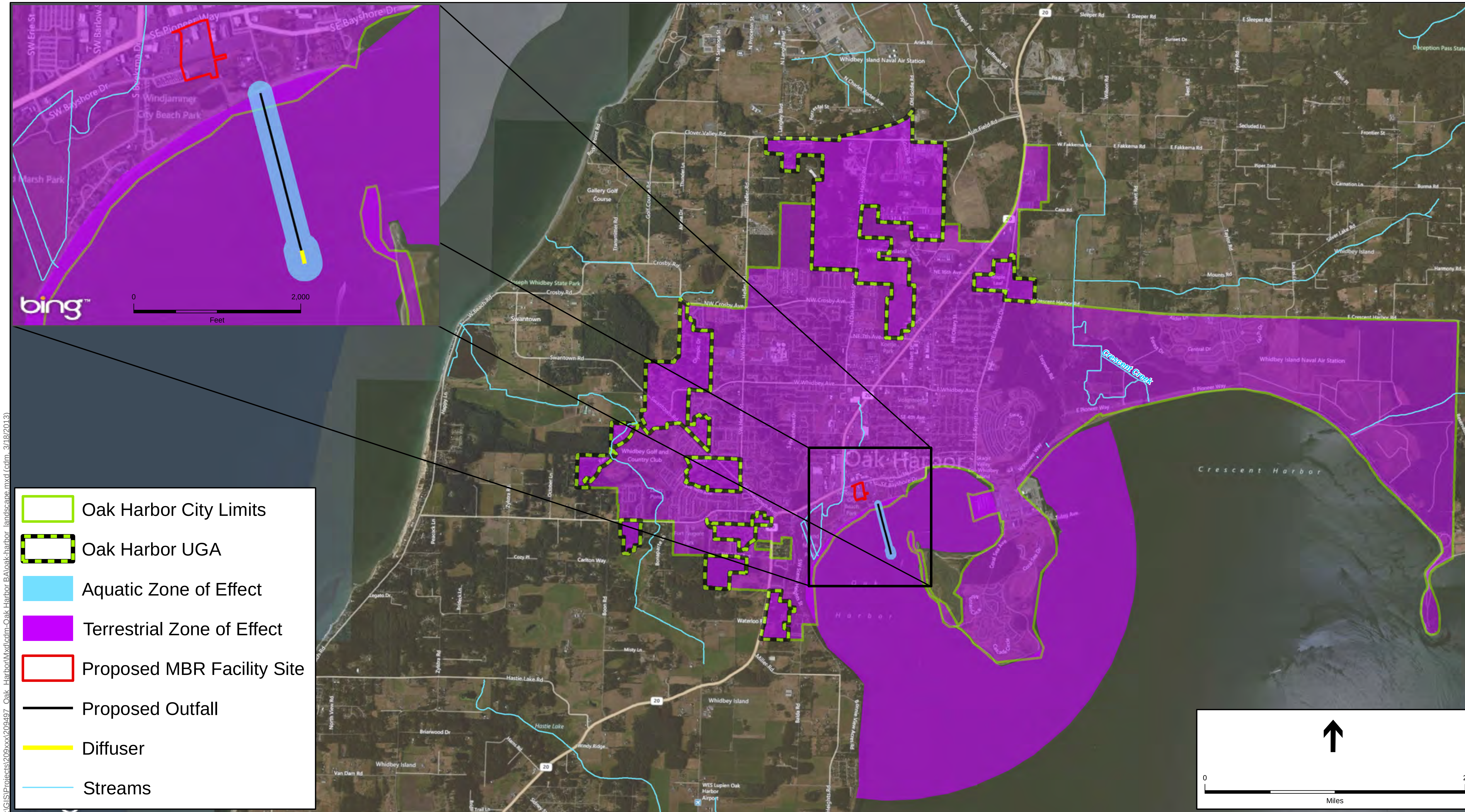
SOURCE: City of Oak Harbor 2009

Oak Harbor Wasterwater Treament Facilities Biologial Evaluation. 209497

**Figure 7**

Existing and Proposed Service Area
Oak Harbor WWTP Facility
Oak Harbor, Washington




SOURCE: City of Oak Harbor 2009; USGS © 2013 Microsoft Corporation © 2010

Oak Harbor Wasterwater Treament Facilities Biologial Evaluation. 209497

**Figure 8**

Project Action Area

Oak Harbor WWTP Facility

Oak Harbor, Washington

# APPENDIX A: OAK HARBOR WWTP NPDES PERMIT

| | |
|---|---|
| Issuance Date: | August 29, 2011 |
| Effective Date: | September 1, 2011 |
| Expiration Date: | August 29, 2016 |
| Modification Date: | December 4, 2012 |

# National Pollutant Discharge Elimination System
# Waste Discharge Permit No. WA0020567

State of Washington
DEPARTMENT OF ECOLOGY
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1342 et seq.

**City of Oak Harbor**
865 SE Barrington Drive
Oak Harbor, Washington 98277

is authorized to discharge in accordance with the Special and General Conditions that follow.

| | | |
|---|---|---|
| Plant Location: | Oak Harbor RBC Plant<br>1501 SE Beach Street<br>Oak Harbor, WA 98277 | Seaplane Base Lagoon Facility<br>60 East Pioneer Avenue<br>Oak Harbor, WA 98277 |
| Treatment Type: | Rotating Biological Contactor | Aerated Facultative Lagoon with Anaerobic Pretreatment |
| Receiving Water: | Discharges to Seaplane Base Lagoon Facility via RBC Diversion Pump Station | Crescent Harbor Via Outfall #002<br>Latitude: 48.288333º N<br>Longitude: 122.604722º W |

Kevin C. Fitzpatrick
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology

# Table of Contents

# Summary of Permit Report Submittals

Refer to the Special and General Conditions of this permit for additional submittal requirements.

| Permit Section | Submittal | Frequency | First Submittal Date |
|---|---|---|---|
| S3.A.6 | Discharge Monitoring Report | Monthly | October 15, 2011 |
| S3.A.7 | Groundwater Monitoring Annual Report | Annually | December 31, 2011 |
| S3.E | Reporting Permit Violations | As necessary | |
| S4.B | Plans for Maintaining Adequate Capacity | As necessary | |
| S4.D | Notification of New or Altered Sources | As necessary | |
| S6.E | Industrial User Survey Submittal | 1/permit cycle | September 1, 2015 |
| S8.A | Engineering Report/Facility Plan | 1/permit cycle | June 30, 2013 |
| S8.B | Design Documents | 1/permit cycle | December 31, 2014 |
| S9.C | Acute Toxicity Compliance Monitoring Reports | Quarterly | November 15, 2011 |
| S9.D | Acute Toxicity: "Causes and Preventative Measures for Transient Events" | As necessary | |
| S9.D | Acute Toxicity TI/TRE Plan | As necessary | |
| S10.A | Chronic Toxicity Effluent Test Results with Permit Renewal Application | 2/permit cycle | Submit Reports with Renewal Application for testing conducted in June and December 2015. |
| S11 | Application for Permit Renewal | 1/permit cycle | March 1, 2016 |
| G1 | Notice of Change in Authorization | As necessary | |
| G4 | Reporting Planned Changes | As necessary | |
| G5 | Engineering Report for Construction or Modification Activities | As necessary | |
| G7 | Notice of Permit Transfer | As necessary | |
| G10 | Duty to Provide Information | As necessary | |
| G13 | Payment of Fees | As assessed | |
| G20 | Compliance Schedules | As necessary | |
| G21 | Contract Submittal | As necessary | |

# Special Conditions

## S1. Discharge limits

### S1.A. Effluent limits

All discharges and activities authorized by this permit must comply with the terms and conditions of this permit. The discharge of any of the following pollutants more frequently than, or at a level in excess of, that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit and lasting through the expiration date, the Permittee may discharge municipal wastewater to Crescent Harbor at the permitted location subject to compliance with the following limits:

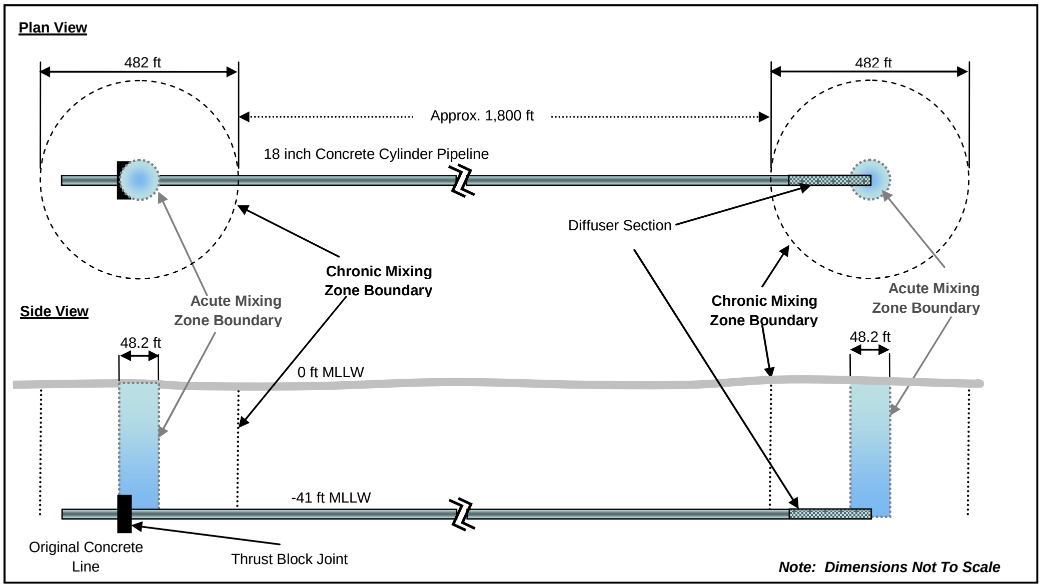
| **Effluent Limits: Outfall # 002<br>Latitude: 48.288333º N Longitude: 122.604722º W** | | |
|---|---|---|
| **Parameter** | **Average Monthly** [a] | **Average Weekly** [b] |
| Carbonaceous Biochemical Oxygen Demand (5-day) ($CBOD_5$) | 25 milligrams/liter (mg/L)<br>521 pounds/day (lbs/day)<br>85% removal of influent $CBOD_5$ | 40 mg/L<br>834 lbs/day |
| Total Suspended Solids (TSS) | 75 mg/L<br>1564 lbs/day<br>65% removal of influent TSS | 110 mg/L<br>2294 lbs/day |
| Total Residual Chlorine | 0.5 mg/L | 0.75 mg/L |
| **Parameter** | **Daily Minimum** | **Daily Maximum** |
| pH [c] | 6.0 standard units | 9.0 standard units |
| **Parameter** | **Monthly Geometric Mean** | **7-day Geometric Mean** |
| Fecal Coliform Bacteria [d] | 200/100 milliliter (mL) | 400/100 mL |
| **Acute Toxicity** | | |
| The effluent Acute Toxicity limit is: **No acute toxicity detected in a test concentration equal to the acute critical effluent concentration (ACEC).**<br>The ACEC means the maximum concentration of effluent during critical conditions at the boundary of the acute mixing zone, defined in Section S9 of this permit. The ACEC equals 1.2 % effluent. | | |

| | |
|---|---|
| a | *Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured. See footnote d for fecal coliform calculations.* |
| b | *Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week. See footnote d for fecal coliform calculations.* |
| c | *Indicates the range of permitted values. The Permittee must report the instantaneous maximum and minimum pH monthly. Do not average pH values.* |
| d | *Ecology provides directions to calculate the monthly and the 7-day geometric mean in publication No. 04-10-020, Information Manual for Treatment Plant Operators available at: http://www.ecy.wa.gov/pubs/0410020.pdf* |

## S1.B. Mixing zone authorization

### Mixing zone for outfall no. 002

The following paragraphs define the maximum boundaries of the mixing zones illustrated in Figure 1 below:




### Chronic mixing zone

WAC 173-201A-400(7)(b)(i) specifies mixing zones must not extend in any horizontal direction from the discharge port(s) for a distance greater than 200 feet plus the depth of water over the discharge ports, as measured during mean lower low water (MLLW). The mixing zones consist of two circular regions located approximately 1,800 feet apart. Each region has a radius of 241 feet and extends from the discharge ports to the water surface. Chronic aquatic life criteria and human health criteria must be met at the edge of the chronic zone. The CCEC equals 0.5% effluent.

### Acute mixing zone

WAC 173-201A-400(8)(b) specifies that in estuarine waters a zone where acute criteria may be exceeded must not extend beyond 10% of the distance established for the maximum or chronic zone as measured independently from the discharge ports. The acute mixing zones are circular regions around each discharge point that extends no more than 24.1 feet measured from the center of each discharge point. The mixing zone extends from the seabed to the top of the water surface. Acute aquatic life criteria must be met at the edge of the acute zone. The ACEC equals 1.2% effluent.

| Available Dilution (dilution factor) | |
|---|---|
| Acute Aquatic Life Criteria | 86 |
| Chronic Aquatic Life Criteria | 202 |
| Human Health Criteria | 202 |

# S2. Monitoring requirements

## S2.A.1 Wastewater monitoring schedule

The Permittee must monitor in accordance with the following schedule and must use the laboratory method, detection level (DL), and quantitation level (QL) specified in Appendix A. Alternative methods from 40 CFR, Part 136, are acceptable if the DL and QL are equivalent to those specified in Appendix A.

| Parameter | Units & Speciation | Minimum Sampling Frequency | Sample Type |
|---|---|---|---|
| **(1) Wastewater Influent** | | | |
| Wastewater Influent means the raw sewage flow into the treatment facility. Sample the wastewater entering the headworks of the treatment plant excluding any side-stream returns from inside the plant. | | | |
| Flow | MGD | Daily | Continuous [1] |
| Biochemical Oxygen Demand ($BOD_5$) | mg/L | 2/month | 24-hr Composite [2] |
| $BOD_5$ | lbs/day | 2/month | Calculated [3] |
| $CBOD_5$ | mg/L | 2/week | 24-hr Composite |
| TSS | mg/L | 2/week | 24-hr Composite |
| TSS | lbs/day | 2/week | Calculated |
| **(2) Final Wastewater Effluent** | | | |
| Final Wastewater Effluent means wastewater exiting the last treatment process or operation. Typically, this is after or at the exit from the chlorine contact chamber or other disinfection process. The Permittee may take effluent samples for the $BOD_5$ analysis before or after the disinfection process. If taken after, the Permittee must dechlorinate and reseed the sample. | | | |
| Flow | MGD | Daily | Continuous |
| $CBOD_5$ | mg/L | 2/week | 24-hr Composite |
| $CBOD_5$ | lbs/day | 2/week | Calculated |
| $CBOD_5$ | % removal | 1/month | Calculated [4] |
| TSS | mg/L | 2/week | 24-hr Composite |
| TSS | lbs/day | 2/week | Calculated |
| TSS | % removal | 1/month | Calculated |
| Total Residual Chlorine | mg/L | Daily | Grab [5] |
| Fecal Coliform [6] | #Organisms /100 ml | 2/week | Grab |
| pH [7] | Standard Units | Daily | Grab |
| Temperature [8] | Degrees centigrade (°C) | Daily | Grab |
| Total Ammonia | mg/L as N | 1/ Month | 24-hr Composite |
| Nitrate-Nitrite Nitrogen | mg/L as N | 1/ Month | 24-hr Composite |
| Total Kjeldahl Nitrogen (TKN) | mg/L as N | 1/ Month | 24-hr Composite |
| Total Phosphorus | mg/L as P | 1/ Month | 24-hr Composite |
| OrthoPhosphorus ($PO_4$) | mg/L as P | 1/ Month | 24-hr Composite |
| **(3) Whole Effluent Toxicity Testing – Final Wastewater Effluent** | | | |
| Acute Toxicity Testing | See Condition S9 | Quarterly | 24-hr Composite |
| Chronic Toxicity Testing | See Condition S10 | 2/permit cycle | 24-hr Composite |

| Parameter | Units & Speciation | Minimum Sampling Frequency | Sample Type |
|---|---|---|---|
| **(4) Effluent Characterization for Permit Renewal Application – *Conduct testing once per calendar quarter during the 12 months prior to reapplication; report in next NPDES Permit application*[9]** | | | |
| The Permittee must record and report the wastewater treatment plant flow discharged on the day it collects the sample for priority pollutant testing with the discharge monitoring report. | | | |
| Dissolved Oxygen | mg/L | Quarterly during 12 months prior to reapplication | Grab |
| Oil and Grease | mg/L | " | Grab |
| Total Dissolved Solids | mg/L | " | 24-hr Composite |
| Total Hardness | mg/L | " | 24-hr Composite |
| Cyanide | micrograms/liter (µg/L) | " | Grab |
| Total Phenolic Compounds | µg/L | " | Grab |
| Priority Pollutants (PP) – Total Metals | µg/L; nanograms(ng/L) for mercury | " | 24-hr Composite<br>Grab for mercury |
| PP – Volatile Organic Compounds | µg/L | " | Grab |
| PP – Acid-extractable Compounds | µg/L | " | 24-hr Composite |
| PP – Base-neutral Compounds | µg/L | " | 24-hr Composite |

| **Footnotes for wastewater monitoring tables** | |
|---|---|
| 1 | *Continuous means uninterrupted except for brief lengths of time for calibration, for power failure, or for unanticipated equipment repair or maintenance.* |
| 2 | *24-hour composite means a series of individual samples collected over a 24-hour period into a single container, and analyzed as one sample.* |
| 3 | *Calculate mass loading and discharge values concurrently with the respective samples, using the following formula: Concentration (in mg/L) X Flow (in MGD) X Conversion Factor (8.34) = lbs/day.* |
| 4 | *Calculate the percent (%) removal of $CBOD_5$ and TSS based on the average daily concentration and average daily flow for the month using the following equation:*<br>$\%\ removal = \frac{\text{Influent concentration (mg/L)} - \text{Effluent concentration (mg/L)}}{\text{Influent concentration (mg/L)}} \times 100$ |
| 5 | *Grab means an individual sample collected over a fifteen (15)-minute, or less, period.* |
| 6 | *Report a numerical value for fecal coliforms following the procedures in Ecology's Information Manual for Wastewater Treatment Plant Operators, Publication Number 04-10-020 available at: http://www.ecy.wa.gov/programs/wq/permits/guidance.html . Do not report a result as too numerous to count (TNTC).* |
| 7 | *Report the daily pH and the minimum and maximum for the monitoring period.* |
| 8 | *Temperature grab sampling must occur when the effluent is at or near its daily maximum temperature, which usually occurs in the late afternoon.* |
| 9 | *See Appendix A for the required detection (DL) or quantitation (QL) levels. Report single analytical values below detection as "less than (detection level)" where (detection level) is the numeric value specified in Appendix A. Report single analytical values between the agency-required detection and quantitation levels with qualifier code of j following the value.*<br>*To calculate the average value (monthly average):*<br>• *Use the reported numeric value for all parameters measured between the agency-required detection value and the agency-required quantitation value.*<br>• *For values reported below detection, use one-half the detection value if the lab detected the parameter in another sample for the reporting period.*<br>• *For values reported below detection, use zero if the lab did not detect the parameter in another sample for the reporting period.*<br>*If the Permittee is unable to obtain the required DL and QL in its effluent due to matrix effects, the Permittee must submit a matrix-specific detection limit (MDL) and a quantitation limit (QL) to Ecology with appropriate laboratory documentation.* |

### S2.A.2 Groundwater monitoring schedule

Beginning on October 1, 2011, and lasting through the expiration of this permit, the Permittee must analyze groundwater samples from monitoring wells at the Seaplane Lagoon Facility with the following Well Tag ID Numbers: APN869, APN871 and APN872. Monitoring must be in accordance with the following schedule and the requirements specified in Appendix A. In addition to parameters listed below, Permittee must record and report the tide stage in Crescent Harbor at the time of each sampling event.

By March 1, 2012, Permittee must reestablish a monitoring well on the south side of the Seaplane Lagoon Facility. Permittee may restore access to an existing buried well (Tag # APN870) or install a new well. Once monitoring point is reestablished, Permittee must include this well in the monitoring required above.

Permittee must also identify an appropriate up-gradient well to use for background groundwater conditions in the vicinity of the Seaplane Lagoon Facility. Permittee must submit details for a proposed background well to Ecology no later than March 1, 2012. The background well may be an existing well up-gradient to the facility or may be a new well installed specifically for this monitoring. Once Ecology approves a well for use as a background well, the Permittee must include that well in the quarterly monitoring required above.

| Parameter | Units & Speciation | Minimum Sampling Frequency | Sample Type |
|---|---|---|---|
| **Groundwater Monitoring** | | | |
| Measured Depth to Ground Water | Feet (nearest 0.01 ft) | Quarterly | Field Measurement |
| pH | Standard Units | Quarterly | Grab |
| Salinity | Parts per thousand (ppt) | Quarterly | Grab |
| Nitrate-Nitrogen | mg/L as N | Quarterly | Grab |
| Ammonia | mg/L as N | Quarterly | Grab |
| Fecal Coliform | #/100 ml | Quarterly | Grab |

### S2.B. Sampling and analytical procedures

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters. Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136. The Permittee must conduct representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions that may affect effluent quality.

Ecology considers any emergency discharges from the RBC Plant to Oak Harbor to be a plant “bypass” or unusual discharge that requires representative sampling. Permittee must monitor such discharges, if they occur, using the “Final Wastewater Effluent” section of the monitoring schedule in Condition S2.A.1.

## S2.C. Flow measurement, field measurement and continuous monitoring devices

The Permittee must:

1. Select and use appropriate flow measurement devices and methods consistent with accepted scientific practices.
2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard and the manufacturer’s recommendation for that type of device.
3. Calibrate continuous monitoring instruments weekly unless it can demonstrate a longer period is sufficient based on monitoring records. The Permittee:
   a. May calibrate apparatus for continuous monitoring of dissolved oxygen by air calibration.
   b. Must calibrate continuous pH measurement instruments using a grab sample analyzed in the lab with a pH meter calibrated with standard buffers and analyzed within 15 minutes of sampling.
   c. Must calibrate continuous chlorine measurement instruments using a grab sample analyzed in the laboratory within 15 minutes of sampling.
4. Calibrate flow monitoring devices at a minimum frequency of at least one calibration per year, or as specified by the device manufacturer.
5. Maintain calibration records for at least three years.

## S2.D. Laboratory accreditation

The Permittee must ensure that all monitoring data required by Ecology is prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories. Flow, temperature, pH, and internal process control parameters are exempt from this requirement.

## S2.E. Request for reduction in monitoring

The Permittee may request a reduction of the sampling frequency after twelve (12) months of monitoring. Ecology will review each request and at its discretion grant the request when it reissues the permit or by a permit modification.

The Permittee must:

1. Provide a written request.
2. Clearly state the parameters for which it is requesting reduced monitoring.
3. Clearly state the justification for the reduction.

## S3. Reporting and recording requirements

The Permittee must monitor and report in accordance with the following conditions. Falsification of information submitted to Ecology is a violation of the terms and conditions of this permit.

### S3.A. Reporting

The first monitoring period begins on the effective date of the permit. The Permittee must:

1. Summarize, report, and submit monitoring data obtained during each monitoring period on a Discharge Monitoring Report (DMR) form provided, or otherwise approved, by Ecology. Include a summary listing daily results for the parameters tabulated in Special Condition S2, including MDLs and QLs (when applicable). If submitting DMRs electronically, report a value for each day sampling occurred and for the summary values (when applicable) included on the form.
2. Submit the form as required with the words "no discharge" entered in place of the monitoring results, if the facility did not discharge during a given monitoring period. If submitting DMRs electronically, you must enter “no discharge” for an entire DMR, for a specific monitoring point, or for a specific parameter as appropriate.
3. Report the test method, the DL, and the QL on the discharge monitoring report or in the required report, if the Permittee used an alternative method not specified in the permit and as allowed in Appendix A.
4. Include the following information (for priority pollutant organic and metal parameters lab reports): sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), laboratory practical quantitation limit (PQL), reporting units, and concentration detected. The Permittee must submit a copy of the contract laboratory report to provide this information. Analytical results from samples sent to a contract laboratory must also include information on the chain of custody, QA/QC results, and documentation of accreditation for the parameter. If the Permittee submits electronic DMRs, then it must attach an electronic file of the lab report to the electronic DMR.
5. Ensure that DMR forms are postmarked or received by Ecology no later than the dates specified below, unless otherwise specified in this permit. If submitting DMRs electronically, submit the DMR no later than the dates specified below, unless otherwise specified in this permit.
6. Submit DMRs **monthly** by the $15^{th}$ day of the month immediately following the completed monitoring period.
7. Summarize, report, and submit monitoring data from quarterly groundwater monitoring to Ecology by December 31, 2011, and annually thereafter. The groundwater monitoring report must include all data collected from all wells during the quarterly monitoring events for the calendar year. Permittee must

include data from a monitoring well on the south side of the facility and from the background well starting with the 2012 annual report and only for those quarters after which Ecology has approved the use of specific well locations.

8. Submit reports to Ecology online using Ecology's electronic DMR submittal forms or send reports to Ecology at:

   Water Quality Permit Coordinator
   Department of Ecology
   Northwest Regional Office
   3190 160th Avenue SE
   Bellevue, WA 98008-5452

**S3.B. Records retention**

The Permittee must retain records of all monitoring information for a minimum of three (3) years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

**S3.C. Recording of results**

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

**S3.D. Additional monitoring by the Permittee**

If the Permittee monitors any pollutant more frequently than required by Condition S2 of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's DMR.

**S3.E. Reporting permit violations**

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.
2. If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within thirty (30) days of sampling.

**a. Immediate reporting**

The Permittee must immediately report to Ecology and the Department of Health, Shellfish Program, and Island County Health Department (at the numbers listed below), all:

- Failures of the disinfection system.
- Collection system overflows.
- Plant bypasses discharging to marine surface waters. "Bypasses" include any emergency discharge of treated and disinfected wastewater from the RBC plant to Oak Harbor.
- Any other failures of the sewage system (pipe breaks, etc.)

| | |
|---|---|
| Ecology Northwest Regional Office | 425-649-7000 |
| Department of Health, Shellfish Program | 360-236-3330 (business hours) |
| | 360-789-8962 (after business hours) |
| Island County Health Department | 360-679-7350 (business hours) |
| | 360-679-9567 (after-hours) |

**b. Twenty-four-hour reporting**

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at the telephone numbers listed above, within 24 hours from the time the Permittee becomes aware of any of the following circumstances:

1. Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.
2. Any unanticipated bypass that causes an exceedance of an effluent limit in the permit (See Part S5.F, "Bypass Procedures").
3. Any upset that causes an exceedance of an effluent limit in the permit (See G.15, "Upset").
4. Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Section S1.A of this permit.
5. Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limit in the permit.

**c. Report within five days**

The Permittee must also provide a written submission within five days of the time that the Permittee becomes aware of any reportable event under subparts a or b, above. The written submission must contain:

1. A description of the noncompliance and its cause.
2. The period of noncompliance, including exact dates and times.
3. The estimated time the Permittee expects the noncompliance to continue if not yet corrected.

4. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
5. If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

**d. Waiver of written reports**

Ecology may waive the written report required in subpart c, above, on a case-by-case basis upon request if the Permittee has submitted a timely oral report.

**e. All other permit violation reporting**

The Permittee must report all permit violations, which do not require immediate or within 24 hours reporting, when it submits monitoring reports for S3.A ("Reporting"). The reports must contain the information listed in subpart c, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

**f. Report submittal**

The Permittee must submit reports to the address listed in S3.A.

### S3.F. Other reporting

The Permittee must report a spill of oil or hazardous materials in accordance with the requirements of RCW 90.56.280 and chapter 173-303-145. You can obtain further instructions at the following website: http://www.ecy.wa.gov/programs/spills/other/reportaspill.htm.

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to Ecology, it must submit such facts or information promptly.

### S3.G. Maintaining a copy of this permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

## S4. Facility loading

### S4.A. Design criteria

The flows or waste loads for the permitted facility must not exceed the following design criteria:

| | |
|---|---|
| Maximum Month Design Flow (MMDF) | 2.5 MGD |
| $BOD_5$ Influent Loading for Maximum Month | 4,580 lb/day |
| TSS Influent Loading for Maximum Month | 5,130 lb/day |

*Criteria reflect only flows and loading as monitored at the headworks for the Seaplane Lagoon Facility.*

**S4.B. Plans for maintaining adequate capacity**

**a. Conditions triggering planning update submittal**

The Permittee must continue long-term facility planning and submit engineering documents as specified in Condition S8 of this permit. The Permittee must also provide a written status update on facility planning and design efforts when:

1. Actual flow or waste load reaches 85 percent of any one of the design criteria in S4.A for three consecutive months.
2. Actual flow or waste load exceeds 100% of any of the design criteria in S4.A in any reporting month.

Include status updates, when necessary, with monthly discharge monitoring reports.

**b. Planning update content**

The planning update must describe the progress made towards completing engineering documents identified in Condition S8, including completed planning milestones and upcoming tasks.

When appropriate, the Permittee should identify short-term measures it is implementing to minimize facility overloading. Short-term measures may include, but are not limited to:

1. Refining treatment strategies or modify procedures to maximize use of the RBC facility as a side-stream treatment facility.
2. Reduction or elimination of excessive infiltration and inflow of uncontaminated ground and surface water into the sewer system.
3. Limits on future sewer extensions or connections or additional waste loads.
4. Reduction of industrial or commercial flows or waste loads.

**S4.C. Duty to mitigate**

The Permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

**S4.D. Notification of new or altered sources**

1. The Permittee must submit written notice to Ecology whenever any new discharge or a substantial change in volume or character of an existing discharge into the wastewater treatment plant is proposed which:
   a. Would interfere with the operation of, or exceed the design capacity of, any portion of the wastewater treatment plant.

b. Is not part of an approved general sewer plan or approved plans and specifications.

c. Is subject to pretreatment standards under 40 CFR Part 403 and Section 307(b) of the Clean Water Act.

2. This notice must include an evaluation of the wastewater treatment plant's ability to adequately transport and treat the added flow and/or waste load, the quality and volume of effluent to be discharged to the treatment plant, and the anticipated impact on the Permittee's effluent [40 CFR 122.42(b)].

## S5. Operation and maintenance

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes keeping a daily operation logbook (paper or electronic), adequate laboratory controls, and appropriate quality assurance procedures. This provision of the permit requires the Permittee to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this permit.

### S5.A. Certified operator

This permitted facility must be operated by an operator certified by the state of Washington for at least a Class II plant. This operator must be in responsible charge of the day-to-day operation of the wastewater treatment plant. An operator certified for at least a Class I plant must be in charge during all regularly scheduled shifts.

### S5.B. Operation and maintenance program

The Permittee must:

1. Institute an adequate operation and maintenance program for the entire sewage system.
2. Keep maintenance records on all major electrical and mechanical components of the treatment plant, as well as the sewage system and pumping stations. Such records must clearly specify the frequency and type of maintenance recommended by the manufacturer and must show the frequency and type of maintenance performed.
3. Make maintenance records available for inspection at all times.

### S5.C. Short-term reduction

The Permittee must schedule any facility maintenance, which might require interruption of wastewater treatment and degrade effluent quality, during non-critical water quality periods and carry this maintenance out in a manner approved by Ecology.

If a Permittee contemplates a reduction in the level of treatment that would cause a violation of permit discharge limits on a short-term basis for any reason, and such reduction cannot be avoided, the Permittee must:

1. Give written notification to Ecology, if possible, thirty (30) days prior to such activities.
2. Detail the reasons for, length of time of, and the potential effects of the reduced level of treatment.

This notification does not relieve the Permittee of its obligations under this permit.

**S5.D. Electrical power failure**

The Permittee must ensure that adequate safeguards prevent the discharge of untreated wastes or wastes not treated in accordance with the requirements of this permit during electrical power failure at the treatment plant and/or sewage lift stations. Adequate safeguards include, but are not limited to, alternate power sources, standby generator(s), or retention of inadequately treated wastes.

The Permittee must maintain Reliability Class II (EPA 430/9-74-001) at the wastewater treatment plant. Reliability Class II requires a backup power source sufficient to operate all vital components and critical lighting and ventilation during peak wastewater flow conditions. Vital components used to support the secondary processes (i.e., mechanical aerators or aeration basin air compressors) need not be operable to full levels of treatment, but must be sufficient to maintain the biota.

**S5.E. Prevent connection of inflow**

The Permittee must strictly enforce its sewer ordinances and not allow the connection of inflow (roof drains, foundation drains, etc.) to the sanitary sewer system.

**S5.F. Bypass procedures**

This permit prohibits a bypass, which is the intentional diversion of waste streams from any portion of a treatment facility. Ecology may take enforcement action against a Permittee for a bypass unless one of the following circumstances (1, 2, or 3) applies.

1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

   This permit authorizes a bypass if it allows for essential maintenance and does not have the potential to cause violations of limits or other conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. The Permittee must submit prior notice, if possible, at least ten (10) days before the date of the bypass.

2. Bypass which is unavoidable, unanticipated, and results in noncompliance of this permit.

   This permit authorizes such a bypass only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.
   b. No feasible alternatives to the bypass exist, such as:
      - The use of auxiliary treatment facilities.
      - Retention of untreated wastes.
      - Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass.
      - Transport of untreated wastes to another treatment facility or preventative maintenance), or transport of untreated wastes to another treatment facility.
   c. Ecology is properly notified of the bypass as required in Condition S3.E of this permit.
3. If bypass is anticipated and has the potential to result in noncompliance of this permit.
   a. The Permittee must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:
      - A description of the bypass and its cause.
      - An analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.
      - A cost-effectiveness analysis of alternatives including comparative resource damage assessment.
      - The minimum and maximum duration of bypass under each alternative.
      - A recommendation as to the preferred alternative for conducting the bypass.
      - The projected date of bypass initiation.
      - A statement of compliance with SEPA.
      - A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
      - Details of the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during preparation of the engineering report or facilities plan and plans and specifications and must include these to the extent practical. In cases where the Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.

c. Ecology will consider the following prior to issuing an administrative order for this type of bypass:

- If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.
- If feasible alternatives to bypass exist, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.
- If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve or deny the request. Ecology will give the public an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Ecology will approve a request to bypass by issuing an administrative order under RCW 90.48.120.

## S6. Pretreatment

### S6.A. General requirements

The Permittee must work with Ecology to ensure that all commercial and industrial users of the publicly owned treatment works (POTW) comply with the pretreatment regulations in 40 CFR Part 403 and any additional regulations that the Environmental Protection Agency (U.S. EPA) may promulgate under Section 307(b) (pretreatment) and 308 (reporting) of the Federal Clean Water Act.

### S6.B. Duty to enforce discharge prohibitions

1. Under federal regulations [40 CFR 403.5(a) and (b)], the Permittee must not authorize or knowingly allow the discharge of any pollutants into its POTW which may be reasonably expected to cause pass-through or interference, or which otherwise violate general or specific discharge prohibitions contained in 40 CFR Part 403.5 or WAC-173-216-060.

2. The Permittee must not authorize or knowingly allow the introduction of any of the following into their treatment works:

a. Pollutants which create a fire or explosion hazard in the POTW (including, but not limited to waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21).

b. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, or greater than 11.0 standard units, unless the works are specifically designed to accommodate such discharges.

c. Solid or viscous pollutants in amounts that could cause obstruction to the flow in sewers or otherwise interfere with the operation of the POTW.

d. Any pollutant, including oxygen-demanding pollutants, ($BOD_5$, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

e. Petroleum oil, non-biodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass-through.

f. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity which may cause acute worker health and safety problems.

g. Heat in amounts that will inhibit biological activity in the POTW resulting in interference but in no case heat in such quantities such that the temperature at the POTW headworks exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless Ecology, upon request of the Permittee, approves, in writing, alternate temperature limits.

h. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.

i. Wastewaters prohibited to be discharged to the POTW by the Dangerous Waste Regulations (chapter 173-303 WAC), unless authorized under the Domestic Sewage Exclusion (WAC 173-303-071).

3. The Permittee must also not allow the following discharges to the POTW unless approved in writing by Ecology:

   a. Noncontact cooling water in significant volumes.

   b. Stormwater and other direct inflow sources.

   c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment, or would not be afforded a significant degree of treatment by the system.

4. The Permittee must notify Ecology if any industrial user violates the prohibitions listed in this section (S6.B), and initiate enforcement action to promptly curtail any such discharge.

**S6.C. Wastewater discharge permit required**

The Permittee must

1. Establish a process for authorizing non-domestic wastewater discharges that ensures all SIUs in all tributary areas meet the applicable state waste discharge permit (SWDP) requirements in accordance with chapter 90.48 RCW and chapter 173-216 WAC.
2. Immediately notify Ecology of any proposed discharge of wastewater from a source, which may be a significant industrial user (SIU) [see fact sheet definitions or refer to 40 CFR 403.3(t)(i)(ii)].
3. Require all SIUs to obtain a SWDP from Ecology prior to accepting their non-domestic wastewater, or require proof that Ecology has determined they do not require a permit.
4. Require the documentation as described in S6.C.3 at the earliest practicable date as a condition of continuing to accept non-domestic wastewater discharges from a previously undiscovered, currently discharging and unpermitted SIU.
5. Require sources of non-domestic wastewater, which do not qualify as SIUs but merit a degree of oversight, to apply for a SWDP and provide it a copy of the application and any Ecology responses.
6. Keep all records documenting that its users have met the requirements of S6.C.

**S6.D. Identification and reporting of existing, new, and proposed industrial users**

1. The Permittee must take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging or proposing to discharge to the Permittee's sewer system (see Appendix B of the fact sheet for definitions).
2. Within 30 days of becoming aware of an unpermitted existing, new, or proposed industrial user who may be a significant industrial user (SIU), the Permittee must notify such user by registered mail that, if classified as an SIU, they must apply to Ecology and obtain a State Waste Discharge Permit. The Permittee must send a copy of this notification letter to Ecology within this same 30-day period.
3. The Permittee must also notify all Potential SIUs (PSIUs), as they are identified, that if their classification should change to an SIU, they must apply to Ecology for a State Waste Discharge Permit within 30 days of such change.

**S6.E. Industrial user survey**

The Permittee must complete an industrial user survey listing all SIUs and potential significant industrial users (PSIUs) discharging to the POTW. The Permittee must submit the survey to Ecology by September 1, 2015. At a minimum, the Permittee must develop the list of SIUs and PSIUs by means of a telephone book search, a water utility billing records search, and a physical reconnaissance of the service area. Information on PSIUs must include, at a minimum, the business name, telephone number, address, description of the industrial process(s), and the known wastewater volumes and characteristics.

## S7. Solid wastes

### S7.A. Solid waste handling

The Permittee must handle and dispose of all solid waste material in such a manner as to prevent its entry into state ground or surface water.

### S7.B. Leachate

The Permittee must not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of the State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC. The Permittee must apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

## S8. Engineering documents

### S8.A. Engineering report or facility plan submittal

The Permittee must prepare and submit two copies of an engineering report or facility plan to Ecology for review and approval by June 30, 2013.

1. Engineering reports and facility plans must comply with the requirements of chapter 173-240 WAC. Documents submitted as a “Facility Plan,” as defined by chapter 173-98 WAC, must also include complete supplementary environmental review material as required by the State Environmental Review Process (SERP) or by the National Environmental Policy Act (NEPA).
2. As required by RCW 90.48.112, the engineering report must address the feasibility of using reclaimed water as defined in RCW 90.46.010.
3. The report must contain any appropriate requirements as described in the following guidance:
    a. *Criteria for Sewage Works Design* (Washington State Department of Ecology, Publication No. 98-37 WQ, 2008).
    b. Design Criteria for Municipal Wastewater Land Treatment Systems for Public Health Protection (Washington State Department of Health, 1994).
    c. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems (Washington State Department of Ecology, Publication No. 93-36, 1993).
    d. *Water Reclamation and Reuse Standards* (Washington State Department of Ecology and Department of Health Publication No. 97-23, 1997).

4. The report must include an analysis and recommendation for repair or replacement of existing outfalls to accommodate future disposal needs. Analysis of the preferred outfall alternative must use computer models to provide preliminary predictions of mixing at critical design conditions for the proposed new facility. The mixing zone analysis must conform to Ecology's mixing zone guidance document: *Guidance for Conducting Mixing Zone Analyses* (Ecology, 2008).
5. The report must provide a preliminary assessment of the impact the proposed facility will have on water quality in the receiving water to support Tier II Antidegradation evaluation. Data must indicate whether the proposed facility is predicted to cause "Measurable Change," as defined in WAC 173-201A-320(3), at the edge of the chronic mixing zone. Additional information regarding Tier II analysis is available in Ecology's supplementary guidance document *Implementing the Tier II Antidegradation Rules*, which is available at the following web site: http://www.ecy.wa.gov/programs/wq/swqs/antideg-tier2-guidance.pdf.

### S8.B. Design documents submittal

The Permittee must prepare and submit two copies of approvable plans and specifications to Ecology for review and approval in accordance with chapter 173-240 WAC by December 31, 2014.

## S9. Acute toxicity

### S9.A. Effluent limit for acute toxicity

**The effluent limit for acute toxicity is no acute toxicity detected in a test concentration representing the acute critical effluent concentration (ACEC).**

The ACEC means the maximum concentration of effluent during critical conditions at the boundary of the acute mixing zone, defined in Section S1.B of this permit. The ACEC equals 1.2% effluent.

### S9.B. Compliance with the effluent limit for acute toxicity

Compliance with the effluent limit for acute toxicity means the results of the testing specified in Section D show no statistically significant difference in survival between the control and the ACEC.

If the test results show a statistically significant difference in survival between the control and the ACEC, the test does not comply with the effluent limit for acute toxicity. The Permittee must then immediately conduct the additional testing described in Section E. The Permittee will comply with the requirements of this section by meeting the requirements of Section E.

The Permittee must determine the statistical significance by conducting a hypothesis test at the 0.05 level of significance (Appendix H, EPA/600/4-89/001). If the difference in survival between the control and the ACEC is less than 10%, the Permittee must conduct the hypothesis test at the 0.01 level of significance.

## S9.C. Compliance testing for acute toxicity

The Permittee must:

1. Perform the acute toxicity tests with 100% effluent, the ACEC, and a control, or with a full dilution series.
2. Conduct quarterly acute toxicity testing on the final effluent. Permittee must initiate first quarterly testing prior to September 30, 2011, and repeat quarterly thereafter. Quarters are defined as follows: 1st quarter is January 1 through March 31; 2nd quarter is April 1 through June 30; 3rd quarter is July 1 through September 30; 4th quarter is October 1 through December 31.
3. Submit a quarterly written report to Ecology within 45 days of sampling. Permittee must submit the first quarterly report no later than November 15, 2011. Refer to Section E below for further instructions on testing conditions and test report content.
4. The Permittee must perform compliance tests using each of the species and protocols listed below on a rotating basis:

| Acute Toxicity Tests | Species | Method |
|---|---|---|
| Fathead minnow 96-hour static-renewal test | *Pimephales promelas* | EPA-821-R-02-012 |
| Daphnid 48-hour static test | *Ceriodaphnia dubia, Daphnia pulex,* or *Daphnia magna* | EPA-821-R-02-012 |

## S9.D. Response to noncompliance with the effluent limit for acute toxicity

If a toxicity test conducted under Section C determines a statistically significant difference in response between the ACEC and the control, using the statistical test described in Section B, the Permittee must begin additional testing within one week from the time of receiving the test results. The Permittee must:

1. Conduct one additional test each week for four consecutive weeks, using the same test and species as the failed compliance test.
2. Test at least five effluent concentrations and a control to determine appropriate point estimates. One of these effluent concentrations must equal the ACEC. The results of the test at the ACEC will determine compliance with the effluent limit for acute toxicity as described in Section B.
3. Return to the original monitoring frequency in Section C after completion of the additional compliance monitoring.

**Anomalous test results:** If a toxicity test conducted under Section C indicates noncompliance with the acute toxicity limit and the Permittee believes that the test result is anomalous, the Permittee may notify Ecology that the compliance test result may be anomalous. The Permittee may take one additional sample for toxicity testing and wait for notification from Ecology before completing the additional testing. The Permittee must submit the notification with the report of the compliance test result and identify the reason for considering the compliance test result to be anomalous.

If Ecology determines that the test result was not anomalous, the Permittee must complete all of the additional monitoring required in this section. Or,

If the one additional sample fails to comply with the effluent limit for acute toxicity, then the Permittee must complete all of the additional monitoring required in this section. Or,

If Ecology determines that the test result was anomalous, the one additional test result will replace the anomalous test result.

If all of the additional testing in this section complies with the permit limit, the Permittee must submit a report to Ecology on possible causes and preventive measures for the transient toxicity event, which triggered the additional compliance monitoring. This report must include a search of all pertinent and recent facility records, including:

- Operating records
- Monitoring results
- Inspection records
- Spill reports
- Weather records
- Production records
- Raw material purchases
- Pretreatment records, etc.

If the additional testing in this section shows another violation of the acute toxicity limit, the Permittee must submit a Toxicity Identification/Reduction Evaluation (TI/RE) plan to Ecology within sixty (60) days after the sample date [WAC 173-205-100(2)].

**S9.E. Sampling and reporting requirements**

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports must contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology's database, then the Permittee must send the data to Ecology along with the test report, bench sheets, and reference toxicant results.
2. The Permittee must collect 24-hour composite effluent samples or grab samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.
3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.

4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Subsection C and the Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.
5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Section A or pristine natural water of sufficient quality for good control performance.
6. The Permittee must collect effluent samples for whole effluent toxicity testing just prior to the chlorination step in the treatment process.
7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the acute critical effluent concentration (ACEC). The ACEC equals 1.2% effluent.
8. All whole effluent toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing must comply with the acute statistical power standard of 29% as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

## S10. Chronic toxicity

### S10.A. Testing when there is no permit limit for chronic toxicity

The Permittee must:

1. Conduct chronic toxicity testing on final effluent during June 2015 and December 2015.
2. Submit the results to Ecology with the permit renewal application.
3. Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the acute critical effluent concentration (ACEC). The ACEC equals 1.2% effluent. The series of dilutions should also contain the CCEC of 0.5% effluent.
4. Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89/001.
5. Perform chronic toxicity tests with all of the following species and the most recent version of the following protocols:

| Saltwater Chronic Test | Species | Method |
|---|---|---|
| Topsmelt survival and growth | *Atherinops affinis* | EPA/600/R-95/136 |
| Mysid shrimp survival and growth | *Americamysis bahia* (formerly *Mysidopsis bahia*) | EPA-821-R-02-014 |

**S10.B. Sampling and reporting requirements**

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports must contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology's database, then the Permittee must send the data to Ecology along with the test report, bench sheets, and reference toxicant results.
2. The Permittee must collect 24-hour composite effluent samples or grab samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.
3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.
4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Section C and the Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.
5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Subsection C or pristine natural water of sufficient quality for good control performance.
6. The Permittee must collect effluent samples for whole effluent toxicity testing just prior to the chlorination step in the treatment process.
7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the CCEC and the ACEC. The CCEC and the ACEC may either substitute for the effluent concentrations that are closest to them in the dilution series or be extra effluent concentrations. The CCEC equals 0.5% effluent. The ACEC equals 1.2% effluent.
8. All whole effluent toxicity tests that involve hypothesis testing must comply with the chronic statistical power standard of 39% as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

## S11. Application for permit renewal or modification for facility changes

The Permittee must submit an application for renewal of this permit by March 1, 2016. The Permittee must submit a paper copy and an electronic copy (preferably as a PDF).

The Permittee must also submit a new application or supplement at least one hundred eighty (180) days prior to commencement of discharges, resulting from the activities listed below, which may result in permit violations. These activities include any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility.

# GENERAL CONDITIONS

## G1. Signatory requirements

1. All applications, reports, or information submitted to Ecology must be signed and certified.

    a. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

    - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or
    - The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
    - In the case of a partnership, by a general partner.
    - In the case of sole proprietorship, by the proprietor.
    - In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

    Applications for permits for domestic wastewater facilities that are either owned or operated by, or under contract to, a public entity shall be submitted by the public entity.

2. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

    a. The authorization is made in writing by a person described above and submitted to Ecology.

    b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to authorization. If an authorization under paragraph B.2, above, is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph B.2, above, must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section must make the following certification:

   "I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

## G2. Right of inspection and entry

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

1. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.
2. To have access to and copy, at reasonable times and at reasonable cost, any records required to be kept under the terms and conditions of this permit.
3. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.
4. To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

## G3. Permit actions

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the Permittee) or upon Ecology's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 40 CFR 122.64 or WAC 173-220-150 according to the procedures of 40 CFR 124.5.

1. The following are causes for terminating this permit during its term, or for denying a permit renewal application:
   a. Violation of any permit term or condition.

b. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.

c. A material change in quantity or type of waste disposal.

d. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination.

e. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit.

f. Nonpayment of fees assessed pursuant to RCW 90.48.465.

g. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

2. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:

   a. A material change in the condition of the waters of the state.

   b. New information not available at the time of permit issuance that would have justified the application of different permit conditions.

   c. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.

   d. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.

   e. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.

   f. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.

   g. Incorporation of an approved local pretreatment program into a municipality’s permit.

3. The following are causes for modification or alternatively revocation and reissuance:

   a. When cause exists for termination for reasons listed in A1 through A7 of this section, and Ecology determines that modification or revocation and reissuance is appropriate.

   b. When Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G7) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

## G4. Reporting planned changes

The Permittee must, as soon as possible, but no later than sixty (60) days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:

1. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b)
2. A significant change in the nature or an increase in quantity of pollutants discharged.
3. A significant change in the Permittee's sludge use or disposal practices. Following such notice, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

## G5. Plan review required

Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications must be submitted to Ecology for approval in accordance with chapter 173-240 WAC. Engineering reports, plans, and specifications must be submitted at least one hundred eighty (180) days prior to the planned start of construction unless a shorter time is approved by Ecology. Facilities must be constructed and operated in accordance with the approved plans.

## G6. Compliance with other laws and statutes

Nothing in this permit excuses the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

## G7. Transfer of this permit

In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, a copy of which must be forwarded to Ecology.

1. Transfers by Modification
   Except as provided in paragraph (B) below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR 122.62(b)(2), or a minor modification made under 40 CFR 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.
2. Automatic Transfers
   This permit may be automatically transferred to a new Permittee if:
   a. The Permittee notifies Ecology at least thirty (30) days in advance of the proposed transfer date.

b. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.

c. Ecology does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

## G8. Reduced production for compliance

The Permittee, in order to maintain compliance with its permit, must control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

## G9. Removed substances

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

## G10. Duty to provide information

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

## G11. Other requirements of 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

## G12. Additional monitoring

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

## G13. Payment of fees

The Permittee must submit payment of fees associated with this permit as assessed by Ecology.

## G14. Penalties for violating permit conditions

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof must be punished by a fine of up to ten thousand dollars ($10,000) and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

## G15. Upset

Definition – “Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limits if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that the Permittee can identify the cause(s) of the upset.
2. The permitted facility was being properly operated at the time of the upset.
3. The Permittee submitted notice of the upset as required in Condition S3.E.
4. The Permittee complied with any remedial measures required under S4.C of this permit.

In any enforcement action the Permittee seeking to establish the occurrence of an upset has the burden of proof.

## G16. Property rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

## G17. Duty to comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

## G18. Toxic pollutants

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

## G19. Penalties for tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit must, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two (2) years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment must be a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or by both.

## G20. Compliance schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than fourteen (14) days following each schedule date.

## G21. Contract review

The Permittee must submit to Ecology any proposed contract for the operation of any wastewater treatment facility covered by this permit.  The review is to ensure consistency with chapters 90.46 and 90.48 RCW.  In the event that Ecology does not comment within a thirty (30)-day period, the Permittee may assume consistency and proceed with the contract.

# APPENDIX A

## *LIST OF POLLUTANTS WITH ANALYTICAL METHODS, DETECTION LIMITS, AND QUANTITATION LEVELS*

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for permit and application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136.

If the Permittee uses an alternative method, not specified in the permit and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

When the permit requires the Permittee to measure the base neutral compounds in the list of priority pollutants, it must measure all of the base neutral pollutants listed in the table below. The list includes EPA required base neutral priority pollutants and several additional polynuclear aromatic hydrocarbons (PAHs). The Water Quality Program added several PAHs to the list of base neutrals below from Ecology's Persistent Bioaccumulative Toxics (PBT) List. It only added those PBT parameters of interest to Appendix A that did not increase the overall cost of analysis unreasonably.

Ecology added this appendix to the permit in order to reduce the number of analytical "non-detects" in permit-required monitoring and to measure effluent concentrations near or below criteria values where possible at a reasonable cost.

### *CONVENTIONAL PARAMETERS*

| **Pollutant & CAS No.** ***(if available)*** | **Recommended Analytical Protocol** | **Detection (DL)**[1] ***µg/L unless specified*** | **Quantitation Level (QL)**[2] ***µg/L unless specified*** |
|---|---|---|---|
| Biochemical Oxygen Demand | SM5210-B | | 2 mg/L |
| Chemical Oxygen Demand | SM5220-D | | 10 mg/L |
| Total Organic Carbon | SM5310-B/C/D | | 1 mg/L |
| Total Suspended Solids | SM2540-D | | 5 mg/L |
| Total Ammonia (as N) | SM4500-NH3- GH | | 0.3 mg/L |
| Flow | Calibrated device | | |
| Dissolved oxygen | SM4500-OC/OG | | 0.2 mg/L |
| Temperature (max. 7-day avg.) | Analog recorder or use micro-recording devices known as thermistors | | 0.2º C |
| pH | SM4500-$H^+$ B | N/A | N/A |

### *NONCONVENTIONAL PARAMETERS*

| **Pollutant & CAS No.** ***(if available)*** | **Recommended Analytical Protocol** | **Detection (DL)**[1] ***µg/L unless specified*** | **Quantitation Level (QL)**[2] ***µg/L unless specified*** |
|---|---|---|---|
| Total Alkalinity | SM2320-B | | 5 mg/L as CaCO3 |
| Chlorine, Total Residual | SM4500 Cl G | | 50.0 |
| Color | SM2120 B/C/E | | 10 color units |
| Fecal Coliform | SM 9221D/E,9222 | N/A | N/A |
| Fluoride (16984-48-8) | SM4500-F E | 25 | 100 |
| Nitrate-Nitrite (as N) | SM4500-NO3- E/F/H | | 100 |
| Nitrogen, Total Kjeldahl (as N) | SM4500-NH3-C/E/FG | | 300 |
| Ortho-Phosphate ($PO_4$ as P) | SM4500- PE/PF | 3 | 10 |
| Phosphorus, Total (as P) | SM4500-PE/PF | 3 | 10 |
| Oil and Grease (HEM) | 1664A | 1,400 | 5,000 |
| Salinity | SM2520-B | | 3 PSS |
| Settleable Solids | SM2540 -F | | 100 |
| Sulfate (as mg/L $SO_4$) | SM4110-B | | 200 |
| Sulfide (as mg/L S) | SM4500-$S^2$F/D/E/G | | 200 |
| Sulfite (as mg/L $SO_3$) | SM4500-SO3B | | 2000 |
| Total Coliform | SM 9221B, 9222B, 9223B | N/A | N/A |
| Total dissolved solids | SM2540 C | | 20 mg/L |
| Total Hardness | SM2340B | | 200 as CaCO3 |
| Aluminum, Total (7429-90-5) | 200.8 | 2.0 | 10 |
| Barium Total (7440-39-3) | 200.8 | 0.5 | 2.0 |
| BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes) | EPA SW 846 8021/8260 | 1 | 2 |
| Boron Total (7440-42-8) | 200.8 | 2.0 | 10.0 |
| Cobalt, Total (7440-48-4) | 200.8 | 0.05 | 0.25 |
| Iron, Total (7439-89-6) | 200.7 | 12.5 | 50 |
| Magnesium, Total (7439-95-4) | 200.7 | 10 | 50 |
| Molybdenum, Total (7439-98-7) | 200.8 | 0.1 | 0.5 |
| Manganese, Total (7439-96-5) | 200.8 | 0.1 | 0.5 |
| NWTPH Dx | Ecology NWTPH Dx | 250 | 250 |
| NWTPH Gx | Ecology NWTPH Gx | 250 | 250 |
| Tin, Total (7440-31-5) | 200.8 | 0.3 | 1.5 |
| Titanium, Total (7440-32-6) | 200.8 | 0.5 | 2.5 |

### *PRIORITY POLLUTANTS*

| Pollutant & CAS No. *(if available)* | Recommended Analytical Protocol | Detection (DL)[1] *µg/L unless specified* | Quantitation Level (QL)[2] *µg/L unless specified* |
|---|---|---|---|
| **METALS, CYANIDE & TOTAL PHENOLS** | | | |
| Antimony, Total (7440-36-0) | 200.8 | 0.3 | 1.0 |
| Arsenic, Total (7440-38-2) | 200.8 | 0.1 | 0.5 |
| Beryllium, Total (7440-41-7) | 200.8 | 0.1 | 0.5 |
| Cadmium, Total (7440-43-9) | 200.8 | 0.05 | 0.25 |
| Chromium (hex) dissolved (18540-29-9) | SM3500-Cr EC | 0.3 | 1.2 |
| Chromium, Total (7440-47-3) | 200.8 | 0.2 | 1.0 |
| Copper, Total (7440-50-8) | 200.8 | 0.4 | 2.0 |
| Lead, Total (7439-92-1) | 200.8 | 0.1 | 0.5 |
| Mercury, Total (7439-97-6) | 1631E | 0.0002 | 0.0005 |
| Nickel, Total (7440-02-0) | 200.8 | 0.1 | 0.5 |
| Selenium, Total (7782-49-2) | 200.8 | 1.0 | 1.0 |
| Silver, Total (7440-22-4) | 200.8 | 0.04 | 0.2 |
| Thallium, Total (7440-28-0) | 200.8 | 0.09 | 0.36 |
| Zinc, Total (7440-66-6) | 200.8 | 0.5 | 2.5 |
| Cyanide, Total (57-12-5) | 335.4 | 5 | 10 |
| Cyanide, Weak Acid Dissociable | SM4500-CN I | 5 | 10 |
| Phenols, Total | EPA 420.1 | | 50 |

| Pollutant & CAS No. *(if available)* | Recommended Analytical Protocol | Detection (DL)[1] *µg/L unless specified* | Quantitation Level (QL)[2] *µg/L unless specified* |
|---|---|---|---|
| **ACID COMPOUNDS** | | | |
| 2-Chlorophenol (95-57-8) | 625 | 1.0 | 2.0 |
| 2,4-Dichlorophenol (120-83-2) | 625 | 0.5 | 1.0 |
| 2,4-Dimethylphenol (105-67-9) | 625 | 0.5 | 1.0 |
| 4,6-dinitro-o-cresol (534-52-1) (2-methyl-4,6,-dinitrophenol) | 625/1625B | 1.0 | 2.0 |
| 2,4 dinitrophenol (51-28-5) | 625 | 1.0 | 2.0 |
| 2-Nitrophenol (88-75-5) | 625 | 0.5 | 1.0 |
| 4-nitrophenol (100-02-7) | 625 | 0.5 | 1.0 |
| Parachlorometa cresol (59-50-7) (4-chloro-3-methylphenol) | 625 | 1.0 | 2.0 |
| Pentachlorophenol (87-86-5) | 625 | 0.5 | 1.0 |
| Phenol (108-95-2) | 625 | 2.0 | 4.0 |
| 2,4,6-Trichlorophenol (88-06-2) | 625 | 2.0 | 4.0 |

### *PRIORITY POLLUTANTS (continued)*

| **Pollutant & CAS No.** ***(if available)*** | **Recommended Analytical Protocol** | **Detection (DL)**[1] ***µg/L unless specified*** | **Quantitation Level (QL)**[2] ***µg/L unless specified*** |
|---|---|---|---|
| **VOLATILE COMPOUNDS** | | | |
| Acrolein (107-02-8) | 624 | 5 | 10 |
| Acrylonitrile (107-13-1) | 624 | 1.0 | 2.0 |
| Benzene (71-43-2) | 624 | 1.0 | 2.0 |
| Bromoform (75-25-2) | 624 | 1.0 | 2.0 |
| Carbon tetrachloride (56-23-5) | 624/601 or SM6230B | 1.0 | 2.0 |
| Chlorobenzene (108-90-7) | 624 | 1.0 | 2.0 |
| Chloroethane (75-00-3) | 624/601 | 1.0 | 2.0 |
| 2-Chloroethylvinyl Ether (110-75-8) | 624 | 1.0 | 2.0 |
| Chloroform (67-66-3) | 624 or SM6210B | 1.0 | 2.0 |
| Dibromochloromethane (124-48-1) | 624 | 1.0 | 2.0 |
| 1,2-Dichlorobenzene (95-50-1) | 624 | 1.9 | 7.6 |
| 1,3-Dichlorobenzene (541-73-1) | 624 | 1.9 | 7.6 |
| 1,4-Dichlorobenzene (106-46-7) | 624 | 4.4 | 17.6 |
| Dichlorobromomethane (75-27-4) | 624 | 1.0 | 2.0 |
| 1,1-Dichloroethane (75-34-3) | 624 | 1.0 | 2.0 |
| 1,2-Dichloroethane (107-06-2) | 624 | 1.0 | 2.0 |
| 1,1-Dichloroethylene (75-35-4) | 624 | 1.0 | 2.0 |
| 1,2-Dichloropropane (78-87-5) | 624 | 1.0 | 2.0 |
| 1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene) (542-75-6) [3] | 624 | 1.0 | 2.0 |
| Ethylbenzene (100-41-4) | 624 | 1.0 | 2.0 |
| Methyl bromide (74-83-9) (Bromomethane) | 624/601 | 5.0 | 10.0 |
| Methyl chloride (74-87-3) (Chloromethane) | 624 | 1.0 | 2.0 |
| Methylene chloride (75-09-2) | 624 | 5.0 | 10.0 |
| 1,1,2,2-Tetrachloroethane (79-34-5) | 624 | 1.9 | 2.0 |
| Tetrachloroethylene (127-18-4) | 624 | 1.0 | 2.0 |
| Toluene (108-88-3) | 624 | 1.0 | 2.0 |
| 1,2-Trans-Dichloroethylene (156-60-5) (Ethylene dichloride) | 624 | 1.0 | 2.0 |
| 1,1,1-Trichloroethane (71-55-6) | 624 | 1.0 | 2.0 |
| 1,1,2-Trichloroethane (79-00-5) | 624 | 1.0 | 2.0 |
| Trichloroethylene (79-01-6) | 624 | 1.0 | 2.0 |
| Vinyl chloride (75-01-4) | 624/SM6200B | 1.0 | 2.0 |

## *PRIORITY POLLUTANTS (continued)*

| Pollutant & CAS No. *(if available)* | Recommended Analytical Protocol | Detection (DL)[1] *µg/L unless specified* | Quantitation Level (QL)[2] *µg/L unless specified* |
|---|---|---|---|
| **BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)** | | | |
| Acenaphthene (83-32-9) | 625 | 0.2 | 0.4 |
| Acenaphthylene (208-96-8) | 625 | 0.3 | 0.6 |
| Anthracene (120-12-7) | 625 | 0.3 | 0.6 |
| Benzidine (92-87-5) | 625 | 12 | 24 |
| Benzyl butyl phthalate (85-68-7) | 625 | 0.3 | 0.6 |
| Benzo(*a*)anthracene (56-55-3) | 625 | 0.3 | 0.6 |
| Benzo(b)fluoranthene (3,4-benzofluoranthene) (205-99-2) [4] | 610/625 | 0.8 | 1.6 |
| **Benzo(j)fluoranthene (205-82-3)** [4] | 625 | 0.5 | 1.0 |
| Benzo(k)fluoranthene (11,12-benzofluoranthene) (207-08-9) [4] | 610/625 | 0.8 | 1.6 |
| **Benzo(r,s,t)pentaphene (189-55-9)** | 625 | 0.5 | 1.0 |
| Benzo(*a*)pyrene (50-32-8) | 610/625 | 0.5 | 1.0 |
| Benzo(*ghi*)Perylene (191-24-2) | 610/625 | 0.5 | 1.0 |
| Bis(*2-chloroethoxy)*methane (111-91-1) | 625 | 5.3 | 21.2 |
| Bis(*2-chloroethyl*)ether (111-44-4) | 611/625 | 0.3 | 1.0 |
| Bis(*2-chloroisopropyl*)ether (39638-32-9) | 625 | 0.3 | 0.6 |
| Bis(*2-ethylhexyl*)phthalate (117-81-7) | 625 | 0.1 | 0.5 |
| 4-Bromophenyl phenyl ether (101-55-3) | 625 | 0.2 | 0.4 |
| 2-Chloronaphthalene (91-58-7) | 625 | 0.3 | 0.6 |
| 4-Chlorophenyl phenyl ether (7005-72-3) | 625 | 0.3 | 0.5 |
| Chrysene (218-01-9) | 610/625 | 0.3 | 0.6 |
| **Dibenzo (a,j)acridine (224-42-0)** | 610M/625M | 2.5 | 10.0 |
| **Dibenzo (a,h)acridine (226-36-8)** | 610M/625M | 2.5 | 10.0 |
| Dibenzo(a-*h*)anthracene (53-70-3)(1,2,5,6-dibenzanthracene) | 625 | 0.8 | 1.6 |
| Dibenzo(a,e)pyrene (192-65-4) | 610M/625M | 2.5 | 10.0 |
| Dibenzo(a,h)pyrene (189-64-0) | 625M | 2.5 | 10.0 |
| 3,3-Dichlorobenzidine (91-94-1) | 605/625 | 0.5 | 1.0 |
| Diethyl phthalate (84-66-2) | 625 | 1.9 | 7.6 |
| Dimethyl phthalate (131-11-3) | 625 | 1.6 | 6.4 |
| Di-n-butyl phthalate (84-74-2) | 625 | 0.5 | 1.0 |
| 2,4-dinitrotoluene (121-14-2) | 609/625 | 0.2 | 0.4 |
| 2,6-dinitrotoluene (606-20-2) | 609/625 | 0.2 | 0.4 |

### *PRIORITY POLLUTANTS (continued)*

| **Pollutant & CAS No.** ***(if available)*** | **Recommended Analytical Protocol** | **Detection (DL)**[1] ***µg/L unless specified*** | **Quantitation Level (QL)**[2] ***µg/L unless specified*** |
|---|---|---|---|
| **BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)** | | | |
| Di-n-octyl phthalate (117-84-0) | 625 | 0.3 | 0.6 |
| 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | 1625B | 5.0 | 20 |
| Fluoranthene (206-44-0) | 625 | 0.3 | 0.6 |
| Fluorene (86-73-7) | 625 | 0.3 | 0.6 |
| Hexachlorobenzene (118-74-1) | 612/625 | 0.3 | 0.6 |
| Hexachlorobutadiene (87-68-3) | 625 | 0.5 | 1.0 |
| Hexachlorocyclopentadiene (77-47-4) | 1625B/625 | 0.5 | 1.0 |
| Hexachloroethane (67-72-1) | 625 | 0.5 | 1.0 |
| Indeno(*1,2,3-cd*)Pyrene (193-39-5) | 610/625 | 0.5 | 1.0 |
| Isophorone (78-59-1) | 625 | 0.5 | 1.0 |
| **3-Methyl cholanthrene (56-49-5)** | 625 | 2.0 | 8.0 |
| Naphthalene (91-20-3) | 625 | 0.3 | 0.6 |
| Nitrobenzene (98-95-3) | 625 | 0.5 | 1.0 |
| N-Nitrosodimethylamine (62-75-9) | 607/625 | 2.0 | 4.0 |
| N-Nitrosodi-n-propylamine (621-64-7) | 607/625 | 0.5 | 1.0 |
| N-Nitrosodiphenylamine (86-30-6) | 625 | 0.5 | 1.0 |
| **Perylene (198-55-0)** | 625 | 1.9 | 7.6 |
| Phenanthrene (85-01-8) | 625 | 0.3 | 0.6 |
| Pyrene (129-00-0) | 625 | 0.3 | 0.6 |
| 1,2,4-Trichlorobenzene (120-82-1) | 625 | 0.3 | 0.6 |

| **Pollutant & CAS No.** ***(if available)*** | **Recommended Analytical Protocol** | **Detection (DL)**[1] ***µg/L unless specified*** | **Quantitation Level (QL)**[2] ***µg/L unless specified*** |
|---|---|---|---|
| **DIOXIN** | | | |
| 2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (176-40-16) | 1613B | 1.3 pg/L | 5 pg/L |

### *PRIORITY POLLUTANTS (continued)*

| Pollutant & CAS No. *(if available)* | Recommended Analytical Protocol | Detection (DL)[1] *µg/L unless specified* | Quantitation Level (QL)[2] *µg/L unless specified* |
|---|---|---|---|
| **PESTICIDES/PCBs** | | | |
| Aldrin (309-00-2) | 608 | 0.025 | 0.05 |
| alpha-BHC (319-84-6) | 608 | 0.025 | 0.05 |
| beta-BHC (319-85-7) | 608 | 0.025 | 0.05 |
| gamma-BHC (58-89-9) | 608 | 0.025 | 0.05 |
| delta-BHC (319-86-8) | 608 | 0.025 | 0.05 |
| Chlordane (57-74-9) [5] | 608 | 0.025 | 0.05 |
| 4,4'-DDT (50-29-3) | 608 | 0.025 | 0.05 |
| 4,4'-DDE (72-55-9) | 608 | 0.025 | 0.05[10] |
| 4,4' DDD (72-54-8) | 608 | 0.025 | 0.05 |
| Dieldrin (60-57-1) | 608 | 0.025 | 0.05 |
| alpha-Endosulfan (959-98-8) | 608 | 0.025 | 0.05 |
| beta-Endosulfan (33213-65-9) | 608 | 0.025 | 0.05 |
| Endosulfan Sulfate (1031-07-8) | 608 | 0.025 | 0.05 |
| Endrin (72-20-8) | 608 | 0.025 | 0.05 |
| Endrin Aldehyde (7421-93-4) | 608 | 0.025 | 0.05 |
| Heptachlor (76-44-8) | 608 | 0.025 | 0.05 |
| Heptachlor Epoxide (1024-57-3) | 608 | 0.025 | 0.05 |
| PCB-1242 (53469-21-9) [6] | 608 | 0.25 | 0.5 |
| PCB-1254 (11097-69-1) | 608 | 0.25 | 0.5 |
| PCB-1221 (11104-28-2) | 608 | 0.25 | 0.5 |
| PCB-1232 (11141-16-5) | 608 | 0.25 | 0.5 |
| PCB-1248 (12672-29-6) | 608 | 0.25 | 0.5 |
| PCB-1260 (11096-82-5) | 608 | 0.13 | 0.5 |
| PCB-1016 (12674-11-2) [6] | 608 | 0.13 | 0.5 |
| Toxaphene (8001-35-2) | 608 | 0.24 | 0.5 |

1. Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR Part 136, Appendix B.
2. Quantitation Level (QL) also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x $10^n$, where n is an integer. (64 FR 30417).
   ALSO GIVEN AS:
   The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency, December 2007).

3. 1, 3-dichloroproylene (mixed isomers) – You may report this parameter as two separate parameters: cis-1, 3-dichlorpropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).

4. Total Benzofluoranthenes – Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzofluoranthenes.

5. Chlordane – You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 0.025/0.050.

6. PCB 1016 & PCB 1242 – You may report these two PCB compounds as one parameter called PCB 1016/1242.

# APPENDIX B: FUTURE PERMITTING CONSIDERATIONS

treatment plants qualify for exceptions to this regulation; they are regulated by alternative secondary treatment effluent limits.

The alternative effluent limits for the RBC Plant require the monthly average effluent CBOD to be 25 mg/L or less and the TSS to be 30 mg/L or less. Due to the RBC outfall failure, the RBC outfall is no longer in use. The alternative effluent limits for the Lagoon Plant require monthly average CBOD to be 25 mg/L or less and the TSS to be 75 mg/L or less.

CBOD limits are used rather than BOD limits because lagoons and RBCs generally remove less nitrogenous oxygen demand than standard secondary plants, which causes the treatment plants to exceed the standard 30-mg/L limit for BOD. Alternative TSS limits are used because lagoons remove less TSS than standard secondary treatment.

Alternative TSS limits are typically only allowed for average flows up to 2 mgd from lagoons (see WAC 173-221-050(2)); however, the NPDES permit for the Lagoon Plant allows average discharges up to 2.5 mgd at the alternative secondary treatment limits. The 2.5 mgd limit appears to have been set when Ecology approved the Engineering Report for the lagoon upgrade in 1987, months before the 2 mgd limit was formally established in the WAC (11/12/87). As long as the lagoon-based system is not expanded to treat more flow, the alternative limits will remain in place. If the lagoon-based system is expanded, then the entire system would be required to meet standard secondary limits.

## 5.5 FUTURE NPDES PERMIT CONSIDERATIONS

Although alternatives to expand capacity are evaluated largely on their ability to meet current NPDES permit limits, their flexibility to adapt to future regulatory requirements is an important planning consideration for the City. Potential future NPDES permit limits are considered in this analysis, including an assessment of nutrient limits. The ability to meet potential future trace organic chemical (TOrC) limits is also discussed, although there are insufficient data to fully quantify the impact of TOrC limits on the alternatives being evaluated at this time.

### 5.5.1 Conventional Pollutants

Recognizing that the City is connected to the waters of Puget Sound via Oak Harbor Bay and Crescent Harbor, the City's goal is to obtain the highest level of water quality practical while recognizing the limitations of the rate payers of the City to fund improvements. A primary goal of the City is the continued protection of the water quality of the waters in and around Oak Harbor to meet the goals outlined in the Puget Sound Action Plan developed by Puget Sound Partnership for the Cleanup and Protection of Puget Sound. In light of these goals, the City has established the effluent quality goals for conventional pollutants that are more stringent than the City's current NPDES permit limits. These effluent goals are summarized in Table 5.3.

| Table 5.3 Effluent Quality Goals Wastewater Facilities Plan City of Oak Harbor | | | |
|---|---|---|---|
| | **RBC Plant NPDES Permit Limit** | **Lagoon Plant NPDES Permit Limit** | **New Facilities Target / Goal** |
| TSS | 30 mg/L<br>85% removal | 75 mg/L<br>85% removal | 10 mg/L<br>95% removal |
| CBOD5 | 25 mg/L<br>85% removal | 25 mg/L<br>85% removal | 10 mg/L<br>95% removal |
| Turbidity | Not applicable | Not applicable | 1 NTU |
| Chlorine Residual | 0.114 mg/L | 0.5 mg/L | No discharge |
| Fecal Coliform | 200/100 mL | 200/100 mL | <100/100 mL |

### 5.5.2 Nutrients

In the last few years, there has been increasing interest amongst environmentalists and federal and state regulators to reduce the amount of nutrient discharged from municipal WWTPs and to limit the total addition of nutrients to surface waters. In 2007, the Natural Resources Defense Council (NRDC) along with other environmental groups submitted a petition to the EPA requesting that first the EPA "publish updated information on the degree of nutrient removal attainable through secondary treatment" and the second to establish new "generally applicable technology-based nitrogen and phosphorus (nutrients) limitations as a part of the secondary treatment regulations for POTWs [publically owned treatment works]".

EPA responded to the petition in December of 2012 (NACW 2012). In response to the first request "the EPA is publishing the most current data available on the degree of effluent reduction attainable through the application of secondary treatment. With respect to nutrients in particular, the EPA notes that secondary treatment technology is not designed for nutrient removal…" In the December 2012 letter, the EPA decided to deny the NRDC's second request to set uniform technology-based nutrient limits for secondary treatment. The EPA stated that "an effort to set such uniform national limits would require POTWs to incur high costs even when such cost are not necessary to protect water quality…Instead of pursuing national rulemaking to establish uniform technology-based requirements, the EPA is effectively pursuing the control of nutrient discharges at POTWs by means of site-specific, water-quality-based permitting."

In a related action, in July 2008 five environmental organizations sued the EPA, requesting that the agency establish numeric nutrient criteria for the State of Florida. In 2009, EPA committed to establish numeric nutrient limits for lakes and flowing waters within the state of Florida. In December 2010, the EPA finalized nutrient regulations for lakes and flowing waters outside South Florida. This rule was challenged in the U.S. District Court. The lawsuit, by the Florida Department of Agriculture and Consumer Services, stated that EPA's actions in promulgating the rule are not based on a scientifically sound methodology. But most of the controversy has surrounded the cost estimates. EPA estimates the Florida nutrient criteria rules would cost communities and businesses between $135 and $206 million, while other cost estimates are upwards of $1 billion. The final decision in February 2012, struck down the EPAs criteria for streams but upheld their criteria for lakes and springs. In June of 2012, the State of Florida submitted to the EPA its own nutrient criteria. In November of 2012, the EPA approved the State of Florida's nutrient criteria along with addressing criteria previously established for streams and unimpaired lakes (EPA 2012), and establishing nutrient numeric criteria for estuaries, coastal waters and South Florida waters (EPA 2012). Although the status of this rule is still in flux, the finalized rule, may require many treatment plants to reduce nutrients in their effluent to below what is attainable through advanced biological treatment. While EPA has only proposed numeric nutrient criteria for Florida to date, environmental groups have already sued the EPA to establish numeric nutrient limits for an unspecified number of states within the Mississippi River watershed. There is the potential that the approach used in Florida may become a model for establishing numeric nutrient criteria across the country.

At the state level, Ecology has determined that portions of South Puget Sound do not meet Washington State water quality standards for dissolved oxygen (DO) (Ecology 2008). Ecology has expressed concern that nitrogen loadings to Puget Sound have stimulated algal growth and resulted in the DO depression in near-bottom regions. Of greatest interest to Ecology is dissolved inorganic nitrogen (DIN) in the form of nitrate, nitrite, and ammonium.

In 2006, Ecology began a study to determine the causes and extent of low DO levels in South Puget Sound. The first work product from this study was a report on data sources in South and Central Puget Sound south of Edmonds (Ecology 2009). This initial report stated that the goal of the overall study was "to determine how nitrogen from a variety of sources affects dissolved oxygen in South Puget Sound." The focus on nitrogen was explained as follows: "When significant quantities of nitrogen enter Puget Sound and stimulate extensive algae growth, near-bottom DO levels decrease." This initial work product found that in the late summer season, when the lowest DO levels are found in South Puget Sound, "WWTPs contributed over 90% of the watershed DIN". The initial plan for the study was to include "collecting and analyzing data, developing hydrodynamic and water quality models, and assessing alternative management scenarios."

In 2009 Ecology released the second major report in this study which presented "calibration and confirmation of the South and Central Puget Sound circulation model" . In this draft document, Ecology promised a third major study to include a water quality model which used the circulation model as its hydrodynamic base. Instead, in 2009, Ecology expanded the study area to include the Straits of Juan de Fuca up to the boundary of the Pacific Ocean at Neah Bay and into the Strait of Georgia as far as Campbell River, British Columbia. Ecology updated its earlier data report for South and Central Puget Sound (Ecology 2011) and then released a data summary for the expanded study area (Ecology 2011). This expanded data report suggests that, during the summer season, WWTP loads contribute 81 percent of the DIN loads into Puget Sound, with rivers contributing most of the remainder.

Finally, a draft report on initial development of the water quality and circulation model for the expanded area of Puget Sound and the Northwest Straits has been released (PNNL 2012). Goals of the effort are summarized as follows:

> *"The water quality model simulates algae growth, dissolved oxygen, (DO) and nutrient dynamics in Puget Sound to inform potential Puget Sound-wide nutrient management strategies. Specifically, the project is expected to help determine 1) if current and potential future nitrogen loadings from point and non-point sources are significantly impairing water quality at a large scale and 2) what level of nutrient reductions are necessary to reduce or control human impacts to DO levels in the sensitive areas."*

This report describes a three-dimensional computational model predicting hydrodynamics for the expanded Puget Sound and Northwest Straits water body. The report says that it is "sufficiently calibrated for application to a series of scenarios" and that "the model could be used to evaluate whether current human sources of nutrients cause violations of the state water quality standards for dissolved oxygen." Ecology's website for the expanded study (http://www.ecy.wa.gov/programs/wq/PugetSound/DOModel.html) says of this draft report that "Comments are due to Ecology by September 4, 2012" but does not give any indication when final work products will be available.

At present, the LOTT Treatment Plant in Olympia (South Puget Sound) is the only treatment plant discharging directly to the sound that has a nitrogen limit. This plant is limited to an average summer (April through October) total inorganic nitrogen (TIN) concentration of 3 mg/L.

While it is not clear how Ecology will use the results of its studies to establish future regulatory limits, a number of municipalities have begun to evaluate potential impacts of future nitrogen removal requirements for their respective treatment plants in the Puget Sound. In evaluating alternatives for Oak Harbor, the City is considering the need to meet a TIN level of 8 mg/L in the future, should these limits be enforced in subsequent permit cycles.

### 5.5.3 Trace Organic Chemicals

Wastewater contains a diverse group of TOrCs widely used in society, including pharmaceuticals and their metabolites, personal care products, household chemicals, synthetic and natural hormones, industrial chemicals, and pesticides. Although not present in high concentrations, many of these compounds were designed to be biologically active at very low concentrations, and if discharged, may affect aquatic life. Furthermore, many of these TOrCs are refractory, i.e. they do not easily degrade in the environment and are not removed by traditional biological wastewater treatment processes.

TOrCs are not currently regulated, but there is accumulating scientific evidence that even very low concentrations of some of these compounds may impact aquatic biota. Scientific research has discovered that some of these refractory TOrCs are endocrine disruptors that can induce feminization in fish, usually characterized by an increase in vitellogenin, alterations in sex hormone levels, development of the intersex condition, or skewed sex ratios. Such disruptions may adversely impact successful reproduction in some aquatic species.

Understanding of the fate and transport of TOrCs during wastewater treatment and in the environment is improving but considerable additional research is needed to identify the best approaches to removing these compounds. TOrCs represent a wide range of chemicals with widely varying physical and chemical properties. Depending on their physical and chemical properties, TOrCs may be removed in varying degrees through any treatment process. Aqueous solubility and hydrophobicity determine whether compounds are physically removed during primary treatment. However, for the majority of more polar TOrCs, adsorption onto primary sludge is negligible.

In the biological environment of secondary treatment processes, TOrCs differ widely in their susceptibility to microbial transformation. For degradable compounds, solids retention time (SRT) seems to be correlated with removal, resulting in lower effluent TOrC concentrations for longer SRTs. But there are a number of operational factors which are likely to influence the biological removal of TOrC in activated sludge systems such as BOD, TSS, hydraulic residence time (HRT), SRT, food-microorganism ratio (F/M ratio), mixed liquor suspended solids (MLSS) concentration, pH, and temperature.

A recent WERF study (Salveson 2012) serves as the first systematic and comprehensive research work to describe the dimensions of TOrC issues in wastewater treatment, including origins, distributions, fate and transport. The efficiency and mechanisms of TOrC removal were evaluated during full-scale activated sludge treatment under steady-state process conditions. TOrCs were sorted into bins by compound type and the factors affecting the removal efficiency of 22 TorC indicators (through biotransformation and sorption) were evaluated. Removal efficiencies varied from negligible to almost 100 percent as a function of TOrC type and treatment process characteristics. These study data could be used to help define and quantify synergies between specific process upgrades that could improve nutrient removal and benefit TOrC removal should that become a treatment goal in the future.

Permit limitations for TOrCs are not anticipated to arise during the planning period, but as more information becomes available, there may be opportunities to consider the relative effectiveness of different treatment options in reducing TOrCs as future process selection and operational decisions are made.

## 5.6 BIOSOLIDS REQUIREMENTS

The federal document that regulates the use and disposal of sewage sludge is the CFR, Part 503 (40 CFR §503, EPA 1993). These regulations address three main sludge disposal options:

- Land application.
- Surface disposal.
- Incineration.

Land-applied sludge must meet requirements in the Part 503 regulations for reducing pathogens and vector attraction. The rule establishes two basic classes for pathogen reduction: sludge distributed in bagged form must meet Class A requirements, and sludge applied to the land in bulk form must meet Class B requirements.

### 5.6.1 Pathogen Reduction

Class A sludge must have less than 1,000 fecal coliform organisms per gram of total solids and meet other time and temperature requirements, or the sludge must have been treated with an EPA-defined "process to further reduce pathogens." These processes include composting, heat drying, heat treatment, thermophilic aerobic digestion, irradiation, and pasteurization.

Class B sludge must have levels of fecal coliform organisms less than 2 million per gram of total solids, or meet other requirements, or the sludge must have been treated with an EPA-defined "process to significantly reduce pathogens." These processes include aerobic digestion for a mean cell residence time greater than 40 days at 20ºC or 60 days at 15ºC, air drying, anaerobic digestion, composting, or lime stabilization.

### 5.6.2 Vector Attraction Reduction

Land-applied sludge must be processed to reduce its "vector attraction." This means that the sludge should be stabilized sufficiently to not be an attraction to rodents or birds that could spread pathogens contained in the solids, thereby increasing the risk of human exposure. The basic measure of the adequacy of sludge stabilization required is that the volatile solids concentration in the sludge be reduced through processing by at least 38

# APPENDIX C: EFH ASSESSMENT

## EFH Background

The Pacific Fisheries Management Council (PFMC) has designated EFH for the Pacific salmon fishery, federally managed ground fishes, and coastal pelagic fisheries (NOAA Fisheries, 1999; PFMC, 1999).

The EFH designation for the Pacific salmon fishery includes all those streams, lakes, ponds, wetlands, and other water bodies, currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except above the impassable barriers indentified by PFMC (1999). In estuarine and marine environments, proposed designated EFH extends from near-shore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone offshore of Washington, Oregon, and California north of Pint Conception (PFMC, 1999).

The Pacific salmon management unit includes Chinook, coho, and pink salmon. All three species use likely occur within the project area, including juvenile use the nearshore environment of Oak Harbor for rearing and adult use of Oak Harbor for migration and foraging. Adult and juvenile salmonid use of Oak Harbor is likely limited by the fact that Whidbey Island contains few streams that produce large numbers of salmon; however, use is presumed primarily from fish originating from other Puget Sound basins.

In addition to Pacific salmon, EFH has been designated for groundfish and coastal pelagic species. EFH for Pacific coast groundfish is generally defined as the aquatic habitat from the mean higher high water line, and the upriver extent of saltwater intrusion in river mouths seaward. The west coast groundfish management unit includes 83 species that typically live on or near the bottom of the ocean. Species groups include sharks and skates, rockfishes (55 species), flatfishes (12 species) and ground fishes.

The *Coastal Pelagic Species Fishery Management Plan* describes the habitat requirements of five pelagic species: Northern anchovy, Pacific sardine, Pacific (chub) mackerel, jack mackerel and market squid (PFMC, 1998). These four finfish and market squid are treated as a single species complex because of similarities in their life histories and habitat requirements. EFH for coastal pelagic species is generally defined all marine and estuarine waters from the shoreline offshore above the thermocline. Coastal pelagics are schooling fish not associated with the ocean bottom that migrate in coastal waters. These fishes are primarily associated with the open ocean and coastal waters (PFMC, 1998), and are not likely to occur within the project area.

The objective of this EFH assessment is to determine whether or not the proposed action “may adversely affect” designated EFH for relevant commercially, federally-managed fisheries species within the proposed Action Area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed action.

## Description of the Proposed Action

For the purpose of this assessment, the proposed action for the EFH assessment and BA incorporate the same project elements. The City of Oak Harbor is proposing to construct a new MBR wastewater treatment facility to replace their aging secondary treatment facility and to maintain compliance with existing NPDES permit requirements, and to have the capacity to meet future flow and load projections. A detailed description of the proposed action is included in Section 2.0 of the BA. Table A-1 below indicates the federally managed Pacific salmon and life history forms that are potentially present within the project Action Area.

**Table C-1. Fish species and life-stages with essential fish habitat in the Action Area**

| Salmon Species | Eggs | Larvae | Young Juvenile | Juvenile | Adult | Spawning |
|---|---|---|---|---|---|---|
| Chinook | | | | X | X | |
| Coho | X | | X | X | X | X |
| Pink | | | | X | X | |

## Potential Adverse Effects of the Proposed Action

Potential impacts of the proposed action to ESA listed fish species and habitats are discussed in Section 6.0 of this BA and are expected to be similar for all federally managed Pacific salmon that occur within the Action Area.

*Adverse Effects on Essential Fish Habitat for Salmonids*

The proposed action will include soil disturbing activities necessary to construct the proposed MBR facility within the proposed 3 to 4 acre site in the Windjammer Park vicinity. The majority of construction activity will occur within 100 feet of Windjammer Park Lagoon and 600 feet from Oak Harbor; however, the proposed action will include in-water work necessary to install a new outfall into Oak Harbor for the MBR facilities effluent. The potential to adversely affect EFH through increased turbidity is extremely unlikely for the upland construction given the distance from EFH and the implementation of impact avoidance and minimization measures discussed further below. The potential for high turbidity during in-water work will be minimized by installing a turbidity curtain around the in-water work areas.

The highest potential for adverse affects to EFH is related to the increase in effluent discharge volumes proposed over the 20-year planning horizon (through 2030). Currently the existing RBC Plant and Lagoon Plant produce a maximum month flow of 3.0 mgd. By the year 2030, that number is expected to rise to 3.9 mgd. Overall, the new MBR facility is designed to meet current NPDES limitations for effluent water quality and no reasonable potential for the facility to exceed surface water quality standards has been identified.

The MBR facility under the proposed action would provide sufficient wastewater capacity to service anticipated population growth within the service area. Development associated with the planned population growth would likely result in additional impervious surface in the basin and potential for degradation of water quality and habitat in these areas, thereby indirectly affecting EFH in streams containing pink, coho, and Chinook salmon.

There are no major streams in Oak Harbor's service area that support large salmon populations; however, Crescent Creek likely supports some use by coho salmon. All species could be anticipated within the marine environment that borders the service area. The vast majority of fish distribution is within the lower portions of the watersheds, which have primarily been develop and sewer service is already provided to these areas. Changes in land use in the more undeveloped portions of these watersheds may result in additional impervious surface in the basin and potential for degradation of water quality and habitat in these areas. Potential impacts to riparian habitat from development in the service area is limited given existing shoreline regulations, critical areas regulations, and stormwater management requirements enforced by the City of Oak Harbor.

*Adverse Effects on Essential Fish Habitat for Ground Fishes*

Adverse effects on EFH for ground fish would be similar to that for federally managed Pacific salmon

*Adverse Effects on Essential Fish Habitat for Coastal Pelagic Species*

No areas of EFH for coastal pelagic species occur within the Action Area.

**Essential Fish Habitat Conservation Measures**

The following measures will be implemented to minimize the potential adverse effects on designated EFH described above:

- The proposed action will incorporate TESC measures including silt fencing, straw bales/wattles, and mulch to minimize the potential for sedimentation and turbidity to nearby surface waters.
- All construction will comply with adopted City of Oak Harbor and Ecology erosion control standards.
- In-water work will only occur during the approved in-water work window.
- A spill prevention and pollution control plan will be in place prior to construction.
- All equipment will be staged and stored a minimum of 200 feet from surface waters when not in use.
- The majority of the outfall will be buried and original sediments used as backfill. Only the 200-foot diffuser would be exposed.
- All equipment will be refueled a minimum of 200 feet from surface waters.
- All disturbed areas will be promptly hydroseeded or paved following construction.
- The new MBR facility will meet the anticipated new NPDES discharge permit. The plant was also determined to have no reasonable potential to exceed state water quality standards for constituents most commonly found in MBR effluent.
- Future development in the service area will be required to meet regulatory requirements such as local critical area ordinance and shoreline regulations as well as other state and federal permit requirements associated with work in regulated critical areas. Future development requiring a federal permit or federal funding will undergo separate ESA and EFH consultation.

**Conclusion and Effect Determination**

EFH for Pacific salmon and ground fish are present in the project Action Area. The proposed action is expected to result in the temporary soil disturbance adjacent to designated EFH for federally managed Pacific salmon, including Chinook, coho, and pink salmon and ground fish, which could potentially result in sedimentation and turbidity of these areas if not properly controlled. All other potential effects of the action upon Pacific salmon and ground fish EFH, including soil disturbing activities, are expected to be short-term effects and will be further minimized by the conservation measures listed above.

The discharge water from the new MBR facility would be required to meet surface water quality standards included in the existing and future NPDES permit. Therefore, the proposed action would have *no adverse effect* on EFH for Pacific salmon or ground fish.

**EFH References**

Pacific Fisheries Management Council (PFMC). 1998. *The Coastal Pelagic Fishery Management Plan: Amendment 8*. Pacific Fishery Management Council.

Pacific Fisheries Management Council (PFMC). 1999. *Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts, and Recommended Conservation Measures for Salmon*. Pacific Fisheries Management Council.

# APPENDIX D: SPECIES LISTS

# Endangered Species Act Status of West Coast Salmon & Steelhead

*(Updated Aug. 11, 2011)*

| Species[1] | | | *Current Endangered Species Act Listing Status*[2] | *ESA Listing Actions Under Review* |
|---|---|---|---|---|
| Sockeye Salmon (*Oncorhynchus nerka*) | 1 | Snake River | ***Endangered*** | |
| | 2 | Ozette Lake | ***Threatened*** | |
| | 3 | Baker River | *Not Warranted* | |
| | 4 | Okanogan River | *Not Warranted* | |
| | 5 | Lake Wenatchee | *Not Warranted* | |
| | 6 | Quinalt Lake | *Not Warranted* | |
| | 7 | Lake Pleasant | *Not Warranted* | |
| Chinook Salmon (*O. tshawytscha*) | 8 | Sacramento River Winter-run | ***Endangered*** | |
| | 9 | Upper Columbia River Spring-run | ***Endangered*** | |
| | 10 | Snake River Spring/Summer-run | ***Threatened*** | |
| | 11 | Snake River Fall-run | ***Threatened*** | |
| | 12 | Puget Sound | ***Threatened*** | |
| | 13 | Lower Columbia River | ***Threatened*** | |
| | 14 | Upper Willamette River | ***Threatened*** | |
| | 15 | Central Valley Spring-run | ***Threatened*** | |
| | 16 | California Coastal | ***Threatened*** | |
| | 17 | Central Valley Fall and Late Fall-run | ***Species of Concern*** | |
| | 18 | Upper Klamath-Trinity Rivers | *Not Warranted* | |
| | 19 | Oregon Coast | *Not Warranted* | |
| | 20 | Washington Coast | *Not Warranted* | |
| | 21 | Middle Columbia River spring-run | *Not Warranted* | |
| | 22 | Upper Columbia River summer/fall-run | *Not Warranted* | |
| | 23 | Southern Oregon and Northern California Coast | *Not Warranted* | |
| | 24 | Deschutes River summer/fall-run | *Not Warranted* | |
| Coho Salmon (*O. kisutch*) | 25 | Central California Coast | ***Endangered*** | |
| | 26 | Southern Oregon/Northern California | ***Threatened*** | |
| | 27 | Lower Columbia River | ***Threatened*** | • Critical habitat |
| | 28 | Oregon Coast | ***Threatened*** | |
| | 29 | Southwest Washington | *Undetermined* | |
| | 30 | Puget Sound/Strait of Georgia | ***Species of Concern*** | |
| | 31 | Olympic Peninsula | *Not Warranted* | |
| Chum Salmon (*O. keta*) | 32 | Hood Canal Summer-run | ***Threatened*** | |
| | 33 | Columbia River | ***Threatened*** | |
| | 34 | Puget Sound/Strait of Georgia | *Not Warranted* | |
| | 35 | Pacific Coast | *Not Warranted* | |
| Steelhead (*O. mykiss*) | 36 | Southern California | ***Endangered*** | |
| | 37 | Upper Columbia River | ***Threatened*** | |
| | 38 | Central California Coast | ***Threatened*** | |
| | 39 | South Central California Coast | ***Threatened*** | |
| | 40 | Snake River Basin | ***Threatened*** | |
| | 41 | Lower Columbia River | ***Threatened*** | |
| | 42 | California Central Valley | ***Threatened*** | |
| | 43 | Upper Willamette River | ***Threatened*** | |
| | 44 | Middle Columbia River | ***Threatened*** | |
| | 45 | Northern California | ***Threatened*** | |
| | 46 | Oregon Coast | ***Species of Concern*** | |
| | 47 | Southwest Washington | *Not Warranted* | |
| | 48 | Olympic Peninsula | *Not Warranted* | |
| | 49 | Puget Sound | ***Threatened*** | • Critical habitat |
| | 50 | Klamath Mountains Province | *Not Warranted* | |
| Pink Salmon (*O. gorbuscha*) | 51 | Even-year | *Not Warranted* | |
| | 52 | Odd-year | *Not Warranted* | |

**1** The ESA defines a "species" to include any distinct population segment of any species of vertebrate fish or wildlife. For Pacific salmon, NOAA Fisheries Service considers an evolutionarily significant unit, or "ESU," a "species" under the ESA. For Pacific steelhead, NOAA Fisheries Service has delineated distinct population segments (DPSs) for consideration as "species" under the ESA.

## ESA-Listed Marine Mammals

Under the jurisdiction of NOAA Fisheries that may occur:

**off Washington & Oregon**

- Southern Resident killer whale (*Orcinus orca*) (E); critical habitat
- humpback whale *(Megaptera novaeangliae)* (E)
- blue whale *(Balaenoptera musculus)* (E)
- fin whale (*Balaenoptera physalus)* (E)
- sei whale (*Balaenoptera borealis)* (E)
- sperm whale (*Physeter macrocephalus)* (E)
- Steller sea lion *(Eumetopias jubatus)* (T); critical habitat

**in Puget Sound**

- Southern Resident killer whale (*Orcinus orca*) (E); critical habitat
- humpback whale *(Megaptera novaeangliae)* (E)
- Steller sea lion *(Eumetopias jubatus)* (T); critical habitat

(E) = Endangered
(T) = Threatened

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# Other ESA-Listed Species

Under the jurisdiction of NOAA Fisheries that may occur off Washington & Oregon:

- distinct population segment, or DPS, of bocaccio *(Sebastes paucispinis)* (E) in Puget Sound
- distinct population segment, or DPS, of canary rockfish *(Sebastes pinniger)* (T) in Puget Sound
- distinct population segment, or DPS, of yelloweye rockfish *(Sebastes ruberrimus)* (T) in Puget Sound
- southern distinct population segment, or DPS, of eulachon (Columbia River smelt) *(Thaleichthys pacificus)* (T)
- southern distinct population segment, or DPS, of north American green sturgeon *(Acipenser medirostris)* (T), listed in the NOAA Fisheries Southwest Region

(E) = Endangered
(T) = Threatened

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*Page last updated: December 17, 2012*

**LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITAT; CANDIDATE SPECIES; AND SPECIES OF CONCERN**
**IN ISLAND COUNTY**
**AS PREPARED BY**
**THE U.S. FISH AND WILDLIFE SERVICE**
**WASHINGTON FISH AND WILDLIFE OFFICE**

**(Revised December 11, 2012)**

## LISTED

Bull trout *(Salvelinus confluentus)* – Coastal-Puget Sound DPS [marine waters]
Marbled murrelet *(Brachyramphus marmoratus)* [marine waters]

Major concerns that should be addressed in your Biological Assessment of project impacts to listed animal species include:

1. Level of use of the project area by listed species.

2. Effect of the project on listed species' primary food stocks, prey species, and foraging areas in all areas influenced by the project.

3. Impacts from project activities and implementation (e.g., increased noise levels, increased human activity and/or access, loss or degradation of habitat) that may result in disturbance to listed species and/or their avoidance of the project area.

*Castilleja levisecta* (golden paintbrush)

Major concerns that should be addressed in your Biological Assessment of project impacts to listed plant species include:

1. Distribution of taxon in project vicinity.

2. Disturbance (trampling, uprooting, collecting, etc.) of individual plants and loss of habitat.

3. Changes in hydrology where taxon is found.

## DESIGNATED

Critical habitat for bull trout

## PROPOSED

Critical habitat for Taylor's checkerspot butterfly

## CANDIDATE

None

## SPECIES OF CONCERN

Bald eagle *(Haliaeetus leucocephalus)*
Long-eared myotis *(Myotis evotis)*
Long-legged myotis *(Myotis volans)*
Northern goshawk *(Accipiter gentilis)*
Northern sea otter *(Enhydra lutris kenyoni)*
Olive-sided flycatcher *(Contopus cooperi)*
Pacific lamprey *(Lampetra tridentata)*
Pacific Townsend's big-eared bat *(Corynorhinus townsendii townsendii)*
Peregrine falcon *(Falco peregrinus)*
River lamprey *(Lampetra ayresi)*
Western toad *(Bufo boreas)*
*Aster curtus* (white-top aster)

# APPENDIX E: SPECIES LIFE HISTORY INFORMATION

## Coastal – Puget Sound Bull Trout Life History

In 1998, USFWS completed a status review of bull trout, identifying five distinct population segments (DPSs) in the continental U.S. (USFWS, 1998a). The Coastal-Puget Sound bull trout DPS is composed of 34 subpopulations (USFWS, 1998b; USFWS, 1999). USFWS listed bull trout in the Coastal-Puget Sound DPS as threatened under the ESA on November 1, 1999 (USFWS, 1999).

Bull trout have a complex life history that includes a resident form and a migratory form. The individuals of the migratory form may be stream dwelling (fluvial), lake dwelling (adfluvial), or ocean/estuarine dwelling (anadromous) (USFWS, 1998). Individuals of each form may be represented in a single population; however, migratory populations may dominate where migration corridors and subadult rearing habitats are in good condition (USFWS, 1998). Most inland populations of bull trout are either fluvial or adfluvial, migrating from larger rivers and lakes to spawn in smaller tributary streams in September through October (Wydoski and Whitney, 1979). Bull trout spawn in streams with clean gravel substrates and cold water temperatures (less than 9ºC/48ºF) (USFWS, 1998). Spawn timing is relatively short, spanning from late October through early November. Redds are dug by females in water 8 to 24 inches deep, in substrate gravels 0.2 to 2 inches in diameter (Wydoski and Whitney, 1979). Emergence generally occurs in the spring. Bull trout are opportunistic feeders, consuming fish in the water column and insects on the bottom (WDW, 1991). Low stream temperatures and clean substrates are key features of bull trout habitat. This species is most commonly associated with pristine or only slightly disturbed basins (USFWS, 1998).

The Coastal-Puget Sound DPS of bull trout, which includes the Nooksack subpopulation, is unique because it is thought to contain the only anadromous forms of bull trout within the continental U.S. (USFWS, 1998a). The status of the migratory (fluvial, adfluvial, and anadromous) forms is of greatest concern throughout most of their range. The majority of the remaining populations in some areas may be largely composed of resident bull trout (Leary et al., 1991; Williams and Mullan, 1992).

Separate bull trout stocks have been identified in the Lower Nooksack River, Canyon Creek, and the upper middle Fork Nooksack River. All bull trout stocks in the Nooksack basin are native and maintained by wild production (USFWS, 2004a). The status of all of the stocks is unknown.

## Puget Sound ESU Chinook Salmon Life History

NMFS completed an ESA status review of Chinook salmon populations from Washington, Oregon, Idaho, and California and defined 15 evolutionarily significant units (ESUs) within the region. Naturally spawned spring, summer/fall, and fall Chinook salmon runs from the Puget Sound ESU were considered likely to become endangered in the foreseeable future (Myers et al., 1998). NMFS issued a ruling in May 1999 listing the Puget Sound ESU as threatened (NMFS, 1999).

Chinook salmon have a historic range from the Ventura River in California to Point Hope, Alaska in North America; and from Hokkaido, Japan to Anadyr River in Russia (63 Federal Register 45; Myers et al., 1998). The abundance of Chinook salmon in the Puget Sound ESU has declined substantially from historic levels, and there is concern over the effects of hatchery supplementation on genetic fitness of stocks, as well as severely degraded spawning and rearing habitats throughout the area (Myers et al., 1998). In addition, harvest exploitation rates in excess of 90 percent were estimated to occur on some Puget Sound Chinook salmon stocks. Subsequent to this status review, primary factors contributing to declines in Chinook salmon in the Puget Sound ESU were identified as habitat blockages, hatchery introgression, urbanization, logging, hydropower development, harvests, and flood control (NMFS, 1998).

Chinook require varied habitats during different phases of their life. Spawning habitat typically consists of riffles and the tailouts of pools with clean substrates dominated by cobbles. These habitats are located in the mainstem of rivers and large tributaries. Adult Chinook salmon spawn in freshwater streams in the late summer and fall. Fry emerge in the late winter and early spring. Juvenile Chinook rear in the lower mainstem of rivers and tributaries before entering the estuary and salt marshes (Myers et al., 1998). Typically, fall Chinook fry (also termed "ocean type Chinook") feed for a short period after emergence (a few days to several months) and then migrate to the ocean or remain in the lower river for a year (Wydoski and Whitney, 1979; Healey, 1991). Spring Chinook fry ("stream type") Chinook may rear in fresh water over the summer and may migrate to the ocean in the fall, or may overwinter in fresh water and outmigrate the following spring. Most juvenile Chinook in the Puget Sound Basin are expected to smolt within the first year after emergence. During the summer and autumn, stream type Chinook juveniles commonly rear in habitats with cover provided by brush and woody debris. In winter, juvenile Chinook frequently use boulder pockets along stream margins for cover (Hillman et al., 1989). Juvenile Chinook may rear in freshwater from three months to two years (63 Federal Register 45; Weitkamp et al., 1995); however, Chinook generally migrate to salt water in the spring and summer. After outmigration to estuarine and saltwater habitats, Chinook tend to utilize estuaries and coastal areas for rearing, where they feed on small crustaceans and insects (Wydoski and Whitney, 1979; Healey, 1991). As juveniles grow, they tend to eat more larval and juvenile fishes, including herring, anchovies, pilchard, and rockfish. Most Chinook spend from two to four years feeding in the North Pacific before returning to spawn. Adult Chinook salmon return to spawn in their natal streams from mid-May through October (Myers et al., 1998). Chinook salmon die after spawning.

## Puget Sound DPS Steelhead Life History

On May 7, 2007, NMFS announced the listing of the Puget Sound distinct population segment (DPS) of steelhead as a threatened species under the Endangered Species Act (72 Federal Register 91).

The DPS distribution extends from the United States/Canada border and includes all naturally spawned anadromous winter-run and summer-run populations in streams and river basins of the Strait of Juan de Fuca (east of and including the Elwha River), Puget Sound (north to include the Nooksack River), and Hood Canal. Possible factors influencing the depletion of Puget Sound steelhead populations include habitat destruction and fragmentation, inadequate regulatory mechanisms of hatchery practices and land use activities, and potential genetic introgression between hatchery - and natural-origin steelhead.

Steelhead exhibit one of the most complex suite of life history traits of any salmonid species. Steelhead may be anadromous or freshwater residents (which are usually referred to as rainbow or redband trout). Biologically, steelhead can be divided into two reproductive ecotypes: “stream maturing” and “ocean maturing.” Stream maturing, or summer run steelhead enter fresh water in a sexually immature condition and require several months to mature and spawn. Ocean maturing, or winter run steelhead enter fresh water with well-developed gonads and spawn shortly after river entry. Steelhead adults typically spawn between December and June. Depending on water temperature, steelhead eggs may incubate in redds for 1.5 to 4 months before hatching. Puget Sound DPS steelhead typically smolt after 2 years, though they may spend 1 to 4 years in fresh water. They then reside in marine waters for typically 2 or 3 years prior to returning to their natal stream to spawn. Steelhead are iteroparous, but rarely spawn more than twice before dying; most that do so are females (64 CFR 222).

### Yelloweye Rockfish

Rockfish comprise a diverse group of marine fishes including 102 species worldwide and 72 species in the northeastern Pacific Ocean (Kendall, 1991). Rockfish are among the most common mid-water and bottom dwelling fish species on the Pacific coast of North America (Love et. al, 2002). Adult rockfish can be one of the most abundant fish species associated with coastal benthic habitats such as kelp forests, rocky reefs, and rocky outcroppings in submarine canyons at depths greater than 980 feet (Yoklavich, 1998). The life history of rockfish is different than most other bony fishes in that rockfish fertilization and embryo development is internal as opposed to external egg fertilization in other species. Females give birth to live larval young, which disperse to open waters extending several hundred miles offshore (Love et. al, 2002).

Yelloweye rockfish primarily inhabit waters between 25 and 474 meters (m) (80 and 1,560 feet) in depth, but are most common between 91 and 180 m (300 to 590 feet) (Love et. al, 2002). Yelloweye rockfish are one of the largest (up to 25 pounds) and longest lived (up to 118 years) species of rockfish (Love, 1996; Love et. al, 2002; O’Connell and Funk, 1987).

Yelloweye rockfish sexually mature at about the age of six (Love, 1996). Fertilization generally occurs between September and April, though fertilized individuals may be seen during any month of the year (Wyllie-Echeverria, 1987). Female yelloweye rockfish can produce between 1.2 and 2.7 million eggs, which is considerably more than most rockfish species (Love et. al, 2002). Although thought to only spawn once per year (MacGregor, 1970), there is evidence from studies in Puget Sound that spawning may occur up to twice per year (Washington et. al, 1978). Estimates of pelagic larval dispersion duration are not available for yelloweye rockfish; however, the pelagic larval duration is thought to be similar to that of canary rockfish and bocaccio (116-155 days) (Varanasi, 2007). Parturition is thought to occur during late spring and early summer (Washington et. al, 1978). Following the pelagic larval stage, juvenile yelloweye rockfish settle primarily in shallow, high relief zones, crevices, and sponge gardens (Love et. al, 1991; Richards et, al, 1985). As the juveniles grow and mature they move to deeper water, but maintain an association with rocky, high relief areas (Carlson and Straty, 1981; Love et. al, 1991; O’Connell and Carlisle, 1993; Richards et. al, 1985). Therefore, yelloweye rockfish are less frequently observed in South Puget Sound and are more commonly found in North Puget Sound (Miller and Borton,

1980) such as the Strait of Georgia and Canadian Gulf Islands, which exhibit more complex, high relief, rocky habitats (Yamanaka et. al, 2006).

Yelloweye rockfish are opportunistic feeders, and due to their larger size, adults can feed on larger prey including smaller yelloweye rockfish and are preyed upon less frequently (Rosenthal et. al, 1982). Typical adult forage includes sand lance, gadids, flatfish, shrimp, crabs and gastropods (Love et. al, 2002; Yamanaka et. al, 2006). Juveniles and larval life history forms of yelloweye rockfish feed on species similar to that of canary rockfish and bocaccio. Predators of yelloweye rockfish include salmon and orcas (Ford et. al, 1998; Love et. al, 2002)

### Canary Rockfish

Canary rockfish primarily inhabit waters between 50 and 250 meters (m) (160 and 820 feet) in depth, but may be found in waters as deep as 425 m (1,400 feet) (Boehlert, 1980) and can live up to 84 years (Drake et. al, 2008). Canary rockfish were at one time considered fairly common in the greater Puget Sound area (Holmberg, 1967).

Canary rockfish spawn once per year (Guillemot, 1985). Female canary rockfish can produce between 280,000 and 1.9 million eggs per year with larger females producing even more. Fertilization can occur as early as September off central California (Lea, 1999), but peaks in December (Phillips, 1960; Wyllie-Echeverria, 1987). Birth or parturition generally occurs between January and April with the peak occurring in April (Phillips, 1960). Parturition off the Washington and Oregon coasts occurs between September and March, with peaks in December and January (Barss, 1989; Wyllie- Echeverria, 1987). In British Columbia, parturition occurs a little later than other areas with a peak in February (Hart, 1973; Westrheim, 1975). Canary rockfish larvae are readily dispersed with a pelagic larval duration of approximately 116 days (Shanks and Eckert, 2005).

Canary rockfish larvae feed primarily on plankton including crustacean larvae, invertebrate eggs, and copepods (Love, 2002). Juveniles feed primarily on zooplankton such as harpacticoids (an order of copepods), barnacle cyprids (final larval stage), and euphasiid eggs and larvae. Predators of juvenile canary rockfish include other fishes (cabezon, lingcod, other rockfishes, salmon), birds, and porpoises (Love, 1991; Morejohn, 1978; Roberts, 1979). Adult canary rockfish are planktivores/carnivore, foraging on euphasiids and other crustaceans and small fish (Cailliet, 2000; Love, 2002). Predators of adult canary rockfish include yelloweye rockfish, salmon, sharks, dolphins, seals, and possibly river otters (Merkel, 1957; Morejohn, 1978; Rosenthal, 1982).

Canary rockfish are generally associated with course and rocky habitats that occur throughout the Puget Sound basin (Miller and Borton, 1980) and are broadly distributed throughout the Strait of Georgia (COSEWIC, 2007).

### Bocaccio Rockfish

Bocaccio primarily inhabits waters between 50 and 250 meters (m) (160 and 820 feet) in depth, but may be found in waters as deep as 475 m (1,560 feet) (Orr et. al, 2000) and are suspected to live as long as 54 years (Drake et. al, 2008). Bocaccio were at one time considered fairly common in the greater Puget Sound area (Holmberg, 1967). In the Georgia Basin and based upon available information, bocaccio are generally not associated with areas containing hard substrates. This may be due to their pelagic behavior or availability or prey items.

Reproduction (copulation and fertilization) generally occurs in the fall between August and November. Female bocaccio rockfish can produce 20,000 to over 2 million eggs, which is more than many other rockfish species (Love et. al, 2002). Bocaccio larvae are readily dispersed with a pelagic larval duration of approximately 155 days (Shanks and Eckert, 2005). Larvae and pelagic juveniles tend to be associated with floating kelp mats and are therefore generally near the surface. Most bocaccio remain pelagic between 3.5 And 5.5 months before settling to shallower areas. Several weeks after settlement, juveniles move to deeper water 18-30 m (60-100 feet) where they are found on rock reefs (Carr, 1983; Feder, 1974; Johnson, 2006; Love, 2008). As bocaccio mature into adults, generally between four and six years (MBC, 1987), they move into deeper water habitats (typically found at least 98 feet off the bottom) and associated hard substrata (Love et. al, 2002). In the Georgia Basin, and based upon available information, bocaccio are generally not associated with areas containing hard substrates. This may be due to their pelagic behavior or availability or prey items (74 Federal Register 77). Bocaccio are also known to stray into mud flats (Love et. al, 2002).

Bocaccio larvae feed primarily on plankton larval krill, diatoms, and dinoflagellates. Pelagic juveniles are opportunistic, feeding on fish larvae, copepods, krill, and other prey. Larger juveniles and adults are generally picivorous, eating other rockfish, sablefish, hake, anchovies, lanternfish, and squid. Predators of juvenile bocaccio include Chinook salmon, terns, and harbor seals (Love et. al, 2002). The primary predators of adult bocaccio are marine mammals (COSEWIC, 2002).

### Southern DPS Green Sturgeon

Green sturgeon have a complex anadromous life history (Adams et al., 2002). The green sturgeon spends more time in the ocean than any other species of sturgeon. The Southern DPS green sturgeon is only known to spawn in the Sacramento River (Adams et al., 2002; Adams et al., 2005; 74 Federal Register 195). Males are sexually mature at age 15, while females become sexually mature at age 17. Green sturgeon are thought to spawn every three to five years (Tracy, 1990). In the Sacramento River, spawning typically occurs in the late spring and early summer as far upstream as Keswick Dam (CDFG, 2002). Juvenile green sturgeon appear to spend between one and three years in freshwater before they migrate to marine habitats (Nakamoto et al., 2005). The green sturgeon disperses widely into the ocean following their out-migration and prior to returning to their natal streams to spawn (Moyle et al., 1992). Tagged fish from the Sacramento River were generally captured to the north in coastal and estuarine waters (CDFG, 2002). Green sturgeon, as well as all sturgeon species, are long-lived and slow growing (Farr et al., 2002).

### Southern Resident Population Killer Whale Life History

Southern Resident killer whales, which are present in Puget Sound, prey on fish of many species but predominantly feed on salmon (Wiles 2004). Transient killer whales, which occasionally enter Puget Sound, prey primarily on marine mammals, primarily harbor seals in Washington (Wiles 2004). There are no known predators of killer whales.

Male killer whales average about 26 feet (8 m) in length; females are about 23 feet (7 m) in length (Heyning and Dahlheim 1988). Males live about 50 to 60 years and females 80 to 90 years (Reeves et al., 2002). Females reach sexual maturity when they are about 16 feet (5 m) in length and give birth every 3 to 8 years after that (Heyning and Dahlheim, 1988). Calves are about 6.5 feet (2 m) long when born and, although weaned at about 12 months, they remain closely tied to their mother until they are about 2 years old (Heyning and Dahlheim,1988). There is no specific breeding season for killer whales, although most breeding behavior in Puget Sound is observed in summer and fall (Osborne et al., 1988).

Resident whales live in small groups called matrilines in which all the whales are linked by maternal descent (Wiles, 2004). Several matrilines make up a pod. For instance the Southern Resident L pod is made up of 12 matrilines consisting of 41 individual whales. Most pods have only 1 to 4 matrilines (Wiles, 2004). Transient whales live in smaller groups than residents, usually up to about 10 animals.

Habitat use by resident and transient killer whales differs, and much of the information known about habitat use is preliminary. Killer whales use a wide variety of habitats throughout the year. Distribution of resident whales while in the inland waters of Washington and British Columbia is strongly correlated with areas of greater salmon abundance. Resident killer whales rarely enter water less than about 15 feet (5 m) deep. Transient whales often enter small inlets and shallow areas while hunting for harbor seals (Wiles, 2004).

### Humpback Whale

The humpback whale is distributed worldwide in a wide range of ocean habitats in all ocean basins, from the waters surrounding tropical islands to shallow waters off continental coasts, though in the North Pacific it does not occur in Arctic waters. In the winter, most humpback whales occur in the subtropical and tropical waters of the Northern and Southern Hemispheres. In the summer, they inhabit waters from southern California throughout the Gulf of Alaska to the southern Chukchi Sea.

Most humpbacks migrate considerable distances to high latitude summering areas, where they feed intensively on krill and schooling fish. Summer ranges are often relatively close to shore, including major coastal embayments and channels. They build up body fat reserves in the summer and then migrate to warmer subtropical areas during the winter breeding season. They frequently employ an interesting feeding behavior called bubble net feeding in which they surround a school of schooling fish with a curtain of bubbles, created by releasing air bubbles while swimming in circles beneath their prey. Some individuals feed in the same areas year after year.

Humpback whales mate and give birth while on the wintering areas. They are also known to mate during their winter migration to warmer waters. It is thought that little feeding occurs on the wintering grounds. They reach sexual maturity at 5-8 years of age or when both sexes reach a length of approximately 37 feet. Adult males are typically about 45 feet long and adult females are slightly larger at about 48 feet long. Females normally reproduce every two or three years, giving birth to a calf that is 14 to 15 feet long and that weighs up to 4,400 pounds. The gestation period is 12 months. The mother must feed her newborn about 100 pounds of milk each day for a period of approximately seven months until it is weaned. After weaning, the length of the calf is nearly twice as long (~ 25 feet) and its weight has increased five fold (2,000 pounds). Calves may stay with the mother up to one year. Humpbacks typically travel in pods numbering about two to three individuals. Scientists estimate the average life span of humpbacks in the wild to be between 30 to 40 years, although no one knows for certain.

Humpbacks have become renowned for their various acrobatic displays and complex vocal patterns. The name "humpback" refers to the high arch of their backs when they dive. One of the humpback's more spectacular behaviors is the *breach*. Breaching is a true leap where a whale generates enough upward force with its powerful flukes to lift approximately 2/3 of its body out of the water. Researchers are not certain why whales breach, but believe that it may be related to courtship or play activity. The "songs" of humpbacks are made up of complex vocal patterns. All whales within a given area and season seem to use the same songs. However, the songs appear to change from one breeding season to the next. Scientists believe that only male humpbacks sing. While the purpose of the songs is not known, many scientists think that males sing to attract mates, or to communicate among other males of the pod.

### Stellar Sea Lion Life History

The species is divided into two distinct stocks, the eastern and western, at 144 degrees west latitude. The western stock, which encompasses the Aleutian Islands, Commander Islands, Japan and Siberia, have seen dramatic declines over the past quarter century (Angliss and Outlaw, 2005).

The Steller sea lion ranges from the Channel Islands off the southern California coast north to the Bering Sea. Although they occur regularly in Puget Sound, populations of this species are largest in waters off of British Columbia and Alaska (NOAA Fisheries, 1992). Steller sea lions are more common on the outer coast of Washington than in inland waters such as Puget Sound (Pat Gearin, National Marine Fisheries Service, Marine Mammal Research, personal communication, 2002).

Large breeding colonies (rookeries) are present on islands off of the Oregon coast, the Scott Islands (north of Vancouver Island), and on British Columbia and Alaska coastal islands; none occur in Washington. Males mature between 3-8 years of age, while females begin to reproduce at ages 4 to 6 (Angliss and Outlaw, 2005). Pupping and breeding occur in May and July. Their terrestrial habitat also includes haul-outs that may include sand beaches, rocky shores, and marine buoys. Sightings of Steller sea lions in Puget Sound number 50 or fewer per year (Jeffries, personal communication, 2005) and are most abundant from late fall to early spring when peak counts for the whole state have reached 1,000 animals (Jeffries et al., 2000). Steller sea lions are often observed with California sea lions and use their haul outs. Steller sea lion feed primarily on hake (*Merluccius productus*), herring, octopus (*Octopus* sp.), Pacific cod (*Gadus macrocephalus*), rockfish (*Sebastes* sp.), and salmon (NOAA Fisheries, 1992.)

## Marbled Murrelet Life History

Marbled murrelets are found from the Aleutian Islands of Alaska south to central California, and individual birds may winter as far south as southern California. In Washington, marbled murrelets are year-round residents on coastal waters. Murrelets feed within 500 feet (152 m) of the shore (Ehrlich et al., 1988) to 1.2 miles (1.93 km) from the shore (WDW, 1991), at depths of less than 100 feet (30.5 m). Their preferred prey includes small fish and crustaceans (WDW, 1991; Ehrlich et al., 1988). However, nestlings are usually fed larger second year fish (USFWS, 1997).

Historical data are limited, but murrelets are currently rare and uncommon in areas where they were common or abundant in the early 1900s, especially along the southern coast of Washington, northern coast of Oregon, and coast of California south of Humboldt County (Sealy and Carter, 1984; Marshall, 1988; Carter and Erickson, 1992; Nelson et al., 1992; and Ralph ,1994). An estimate for the number of individuals in Washington is 5,000 to 6,000 birds (Speich et al., 1992 and Speich and Wahl, 1995). The breeding population in Washington is estimated to be 1,900 to 3,500 pairs (Speich et al., 1992).

Marbled murrelets nest and roost in mature and old growth forest areas of western Washington (WDW 1991). The nesting period extends from April 1 to September 15. Although they do not nest in colonies like many other seabirds, they may nest in clusters, and tend to nest in the same forest stand in successive years (USFWS, 1997). Nest trees are typically greater than 32 inches (81 cm) (dbh). Murrelets prefer large flat conifer branches, often covered with moss (WDW, 1991). These branches can range from four to 25 inches (10 to 63 cm) in diameter. Nesting branches are usually located in the upper third of the tree canopy layer (USFWS, 1997).

Marbled murrelet population decline has been attributed primarily to the loss and fragmentation of old-growth nesting habitat caused by logging and development (Ralph and Miller, 1995). It is believed that forest fragmentation may be making nests near forest edges vulnerable to predation by other birds, such as jays, crows, ravens, and great-horned owls. In addition, this species is vulnerable to fishing nets and oil spills (Marshall, 1988).

The USFWS conducted a 5-year review of marbled murrelet status in 2003 (USFWS 2004b). Based on available information in the Washington, Oregon, and California, the status review estimated there are currently 2,223,048 acres of suitable murrelet nesting habitat. The status review found that the marbled murrelet population is not stable through reproduction due to low fecundity levels across the 3-state area, as determined through nest success values (i.e., the number of fledglings per breeding pair of murrelets per year). In general, both radio telemetry and at-sea survey methods indicate that murrelet breeding success appears to decline from north to south. Predation has consistently been the most significant cause of nest failure. Murrelets appear to select platforms that provide protection from predation (USFWS, 2006). The factors affecting rates of predation on murrelet nests are not fully clear, yet key elements seem to be proximity to humans, abundance of avian predators, and proximity and type of forest edge to the nest. The status review did not find that a change in classification from threatened was warranted.

# APPENDIX F: PFC ASSESSMENT FOR OAK HARBOR

## Properly Functioning Conditions for Estuarine and Marine Environment

### *Water Quality*

*Turbidity*

No information is available on turbidity, but it is assumed that there is some seasonal variation in turbidity. During the wet months, runoff from urban and agricultural areas are discharged to Oak Harbor; thus increasing overall turbidity. There are no major sediment delivery systems in the immediate project Action Area such as large river systems; however, turbidity may be influenced by current and tidal patterns as well as vessel traffic. The bottom sediments of Oak Harbor are primarily silts and mud and are generally unconsolidated, making turbidity an issue if agitated. It is anticipated that the project Action Area is likely “at risk” for the turbidity indicator. The proposed action is anticipated to maintain these conditions if appropriate BMPs are in place to minimize turbidity during construction.

*Dissolved Oxygen*

Dissolved oxygen (DO) is currently a high priority water quality issue throughout Puget Sound and the Strait of Georgia and especially in Hood Canal and the Central and Southern Puget Sound regions. Oak Harbor waters meet the criteria for excellent quality and DO levels should not fall below 6.0 mg/L. Currently, Oak Harbor is not listed on the Ecology 303(d) list of impaired waterbodies for the dissolved oxygen parameter, nor has it been identified as a water of concern for that parameter (Ecology, 2012). However, given the proximity to urban development, historic wastewater discharge, and urban runoff, and relatively flat slope (shallow) of the bay, it is likely that DO concentrations vary seasonally. Therefore, the project Action Area is anticipated to be “at risk” for the DO indicator. The proposed action is expected to maintain this condition within the action area through meeting NPDES permit limitations and using advanced treatment technologies including nutrient removal.

*Water Contamination*

A mixture of residential and commercial activities surrounds the marine waters of the project Action Area. Oak Harbor continues to be affected by a variety of point and non-point pollution sources, including municipal wastewater treatment plant effluent (up until 2010), leaking septic tanks, and stormwater runoff. The project Action Area is listed on the Ecology 2012 303(d) list of impaired water bodies for the bacteria parameter. It appears that Oak Harbor within the Action Area is “at risk” for the water contamination indicator. The proposed action is anticipated to result in an increase in flows and loads from the WWTP to Oak Harbor as a result of the new plant; however, it is anticipated that the proposed improvements will continue to meet existing NPDES permit limitations, future NPDES effluent limitations, and surface water quality standards. The proposed action is anticipated to “maintain” the water contamination element within the project Action Area.

*Sediment Contamination*

As with water contamination, the marine environment of Oak Harbor is surrounded by a mixture of residential and commercial activities. Oak Harbor continues to be affected by a variety of point and non-point pollution sources, including municipal wastewater treatment plant effluent (historic), leaking septic tanks, stormwater runoff, marina operations, and fuel spills, which can all contribute to degraded sediment quality. Therefore, the project Action Area is “at risk” for the sediment contamination element. The proposed action is expected to maintain these conditions.

### *Physical Habitat*

*Substrate/Armoring*

The shorelines around the vast majority of the project Action Area are modified with large angular riprap or wooden bulkeads or extensively armored. This is primarily due to the presence of public facilities and residential development immediately adjacent to the shoreline. Due to the extensive shoreline armoring, including riprap, the Action Area is “not properly functioning” for the substrate/armoring indicator. The proposed action is expected to maintain these conditions.

*Depth/Slope*

The slope of the shoreline is very gradual within the project vicinity with little or no steep drop-offs, natural or otherwise. Even though there is extensive shoreline armoring, the position of the shoreline within a protected bay has likely contributed to minimal shoreline erosion due to wave and/or current action. Therefore, the project Action Area is considered “properly functioning” for the depth/slope indicator. The proposed action will not result in alterations that would influence depth and slope in the Action Area. Therefore, the proposed action will maintain the depth/slope conditions within the action area.

*Tideland Condition and Marsh Prevalence and Complexity*

Freund Marsh is located approximately 2,000 feet southwest of the proposed MBR facility. Freund marsh was historically a saltwater marsh; however, a berm was constructed across the marsh and tide gates were installed within the berm (levee) to prevent saltwater intrusion into the landward side of berm. While some salinity likely remains in the soil within the marsh, today the area is primarily a freshwater wetland with hydrology provided via precipitation, groundwater, and stormwater runoff from developed areas within the City. Tidal action within Oak Harbor exposes large areas of mudflat, primarily due to the gentle slope of the shoreline. The lagoon within Windjammer Park was constructed to serve as a public swimming area. This are may provide some limited habitat for forage fish and juvenile salmon using the marine nearshore. Based on the developed and developing nature of the shoreline, lack of tidally influenced salt marsh habitat, and the presence of some large mudflat areas in Oak Harbor, the project Action Area is considered “not properly functioning” for the tideland condition and marsh prevalence and complexity indicator. The proposed action is anticipated to maintain this condition within the Action Area.

*Refugia*

The substantial armoring along the majority of the shoreline along Oak Harbor has limited available refugia. Windjammer Park Lagoon provides some limited refugia; however, the small size, lack of cover and structure, and narrow opening to Oak Harbor minimizes the function and value of the area as refugia. While there are some refugia available in the project Action Area, the extensive armoring along the shoreline within the project Action Area has eliminated the vast majority of refugia. Therefore, the Action Area is considered "not properly functioning" for the refugia indicator. The proposed action is expected to maintain these conditions.

*Physical Barriers*

Currently, there are no physical barriers that would prevent migration of fish or wildlife within the marine waters of the Action Area; therefore, the Action Area is "properly functioning" for the physical barrier indicator. The proposed action is expected to maintain these conditions.

*Current Patterns*

Due to the presence of riprap armoring and bulkheading across much of the shoreline adjacent to Oak Harbor, it appears that the current pattern element is likely "at risk". The proposed action will result in no further additional shoreline armoring/modification; therefore, current patters are anticipated to be maintained.

*Salt/Freshwater Mixing Patterns and Locations*

There are only two natural drainage systems remaining within the City of Oak Harbor. This includes a small drainage associated with Freund Marsh and Crescent Creek. The stream within Freund Marsh is primarily a stormwater conveyance feature and exits the marsh via an existing tide gate. Crescent Creek is also associated with Crescent Marsh. Historically, this system was also modified with dikes and tide gates; however, salt marsh habitat is currently being re-established at this site. While many of the historic salt/freshwater mixing areas were modified to support agriculture and development, efforts are underway to re-establish some of the salt/freshwater mixing patterns to their historic condition. This, in combination with the highly modified shoreline and existing impervious surfaces within estuarine habitat, likely creates an "at risk" condition for the salt/freshwater mixing patters and locations element. The proposed action is expected to maintain these conditions.

***Biological Habitat***

*Benthic Prey Availability*

The presence of shoreline armoring has altered the delivery of sediments to the marine nearshore and likely caused a shift in the benthic species composition within the Action Area. The Action Area is anticipated to be "at risk" for the benthic prey availability indicator. The proposed action is expected to maintain these conditions.

*Forage Fish Community*

Sand land and surf smelt spawning has been documented along the shoreline immediately along the majority of the north shoreline within Oak Harbor (WDFW, 2013a). Eelgrass beds and eelgrass itself is fairly uncommon in Oak Harbor; therefore, herring spawning is likely limited. However, regular concentrations of herring are document outside of Oak Harbor within Saratoga Passage. The availability of forage fish habitat has been altered by shoreline armoring, specifically related to the riprap armoring and wooden bulkhead construction to protect Windjammer Park, commercial properties, and residential development. Therefore, the project Action Area is "at risk" for the forage fish community element. The proposed action includes no additional armoring or modifications to nearshore habitat, other than increasing the area of salt marsh habitat within the Windjammer Park Lagoon as mitigation for wetland impacts elsewhere on the site. Therefore, the proposed action is anticipated to “maintain” the forage fish community element within the project Action Area.

*Aquatic Vegetation*

Eelgrass, macro-algae, and other aquatic plants are uncommon in Oak Harbor. This is likely due to the gentle slope and the fact that the mudflats are exposed for longer periods of time than in other areas. Also, the lack of structure (rocks) limits the ability for macro-algae attachment. The project action area is “not properly functioning” for the aquatic vegetation element.

The proposed action will require some excavation to install the new outfall; however, no eelgrass was documented within the proposed excavation area during a 2012 survey (Grette Associates, 2012). Macroalgal coverage is sparse in the proposed sewer outfall alignment. One species, *Saccharina latissima*, was identified in the survey and was only observed in one data plot (Grette Associates, 2012).Therefore, the proposed action is anticipated to “maintain” the aquatic vegetation element within the project Action Area.

*Exotic Species*

No exotic species have been identified that would pose a risk, either through predation or competition within the marine waters of Oak Harbor. Therefore, the project Action Area is assumed to be “properly functioning” for the exotic species element. The proposed action is anticipated to “maintain” the exotic species element within the project Action Area.

# Plans to Comply with Section 106 of NHPA

ESA Paragon

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# memorandum

date March 26, 2013

to Brian Matson, Carollo Engineers

from Chris Lockwood

subject Cultural Resources for City of Oak Harbor Wastewater Treatment Plant - Windjammer Vicinity

ESA Paragon (formerly Paragon Research Associates, LLC) has been retained by Carollo Engineers on behalf of the City of Oak Harbor, Washington to provide cultural resources permitting assistance for a new wastewater treatment plant (WWTP). Due to the anticipated requirement for a permit from the US Army Corps of Engineers (USACE), the project is expected to be subject to Section 106 of the National Historic Preservation Act.

## PROJECT BACKGROUND

In February 2011, Paragon conducted a preliminary cultural resources screen of eight site alternatives to identify known cultural resources concerns (Lockwood 2011a); in June 2011, Paragon screened one additional site alternative (Lockwood 2011b). As part of screening, Paragon reviewed maps, site forms, and survey reports on file with the Department of Archaeology and Historic Preservation (DAHP), standard ethnographic sources, and online historical web pages. The screening included no field verification and made no attempt to compile property ownership records for any of site alternatives. Each site alternative was assessed regarding the likelihood of encountering cultural resources, the types of cultural resources that could be encountered, the level of effort required to mitigate, and regulatory parameters. Each alternative was then assigned a relative score (1 = potentially very problematic; 2 = moderately problematic; 3 = minimally or not problematic). This score was one of many environmental and permitting factors used to evaluate the various alternatives.

As part of the February 2011 screening, Paragon evaluated an alternative located at Windjammer Park (then "Site 1" alternative). As configured at the time, the alternative was an "irregularly shaped parcel fronting Oak Harbor, encompassing the existing RBC Treatment Facility, as well as large portions of the eastern half of Windjammer Park, including playfields, open areas, and infrastructure" (Lockwood 2011a). Paragon noted the presence of probably disturbed shell and charcoal midden remains within the park (Wessen 1988), as well as an intact, precontact, shell midden archaeological site (45-IS-298) within the western portion of Windjammer Park (Rinck 2011) beyond the boundaries of the February 2011 site alternative. Based on information available at that time, Paragon assigned a score of 2 (moderately problematic) to the Windjammer site alternative.

Subsequently, the Oak Harbor City Council has selected an approximately 52-acre Windjammer Vicinity alternative as the preferred location for the new wastewater treatment plant. As the project progresses, the City anticipates indentifying three to four siting alternatives within the approximately 52-acre Windjammer Vicinity site; each siting alternative is expected to be 3 to 4 acres in area. The final location of the WWTP is expected to be selected from these siting alternatives.

Modifications to the “Site 1” alternative footprint since February 2011, place archaeological site 45-IS-298 within the current Windjammer Vicinity alternative boundaries. Furthermore, the Windjammer Vicinity alternative now fronts Pioneer Way, along which intact archaeological resources, including tribal ancestral remains, were discovered in April 2011. In light of the modifications to the Windjammer Vicinity site alternative footprint since February 2011, as well as the archaeological discoveries along Pioneer Way, ESA Paragon recommends there is a high probability for intact archaeological resources within the current Windjammer Vicinity site.

# NEXT STEPS

The following steps are recommended as the WWTP project proceeds.

1. **Additional Cultural Resources Research and Map Preparation**. Prior to formulation of the specific siting alternatives, ESA Paragon will conduct supplemental background historic and environmental research focused on the Windjammer site alternative and its immediate vicinity. This research will use archival resources to identify additional cultural resource concerns for the Windjammer Vicinity site. The goal of this research will be to identify specific areas of higher and lower cultural resource sensitivity within the 52 acre location to aid in formulation of the siting alternatives. Because it is critical to incorporate cultural resources concerns into the development of siting locations, ESA Paragon will prepare maps for use by Carollo during the siting evaluation process.

2. **Request Pre-Application Meeting and Early Consultation with USACE**. Concurrently with additional research above, Section 106 consultation should be initiated. Because of the sensitivity of the project area and the high degree of interest by the Tribes who are working with the City to address cultural resources on Pioneer Way, the City should request a pre-application meeting with the Corps so that Section 106 consultation can begin before any cultural resources fieldwork related to siting alternatives is conducted.

3. **Develop Archaeological Field Methods for Approval by Consulting Parties**. Once siting alternatives have been selected at the Windjammer Vicinity site, ESA Paragon will then formulate cultural resources field methods for evaluating each alternative. The field methods will be developed for the specific conditions of each siting alternative. For example, paved areas will be assessed using different methods than unpaved areas. The field methods will be reviewed by the Corps, DAHP, Tribes and other consulting parties to address the concerns of each party and to outline protocols to be followed if cultural resources are identified.

4. **Conduct Field Assessment**. Once the field methods have been finalized, ESA Paragon will then conduct the field survey and produce a comprehensive report of results, including interpretations and recommendations for siting selection, modification, and/or avoidance. If cultural resources are identified, additional tasks may be scoped as necessary, depending upon the nature of the discovery.

## General Considerations

Any ground disturbance within the Windjammer Vicinity alternative related to the WWTP design (such as geotechnical or utility work) should be monitored by an archaeologist. Information derived during monitored activities should be incorporated into the cultural resources maps to update expectations for cultural resources discovery. For example, if a geotechnical core does not contain archaeological deposits that information will aid with alternative analysis.

As the WWTP project proceeds, the City is expected to develop several cultural resources documents that may influence the cultural resources protocol requirements for the WWTP project. A cultural resources management plan (CRMP) specifically for Pioneer Way is currently under review, and a broader CRMP for the City of Oak Harbor is under development. As the WWTP project progresses, cultural resources permitting efforts will need to coordinate with City of Oak Harbor CRMP, and possibly the Pioneer Way CRMP.  It is also expected that the City will be hiring a City archaeologist.

# REFERENCES


Lockwood, Chris

2011a *Oak Harbor Wastewater, Preliminary Cultural Resources Screen of 8 Proposed Sites.* Memorandum to Anne Conklin, Carollo Engineers, dated February 10, 2011. On file at ESA Paragon, Seattle.

2011b *Oak Harbor Wastewater, Preliminary Cultural Resources Screen of 1 Additional Proposed Site – Crescent Harbor.* Memorandum to Anne Conklin, Carollo Engineers, dated June 14, 2011. On file at ESA Paragon, Seattle.

Rinck, Brandy

2011 *Washington Archaeological Site Form: 45IS298.* On file at DAHP, Olympia.

Wessen, Gary

1988 *Washington Archaeological Site Form: 45IS45.* On file at DAHP, Olympia.

# Outfall Memo

# CULTURAL RESOURCES REPORT COVER SHEET

Author: Kelly R Bush M. A. and Sarah E Johnson M. A.

Title of Report: Archaeological Monitoring Letter Report: The Oak Harbor Wastewater Treatment Plant Outfall Replacement Project Geological Testing, Oak Harbor, Washington

Date of Report: August 5, 2013

County(ies): Island Section: 34 Township: 32N Range: 01E

Quad: Oak Harbor, Washington Acres: <1.0

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☒ Yes ☐ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☒ Yes ☐ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ______ ☒ No

DAHP Archaeological Site #:

45IS298

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

ERCI

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August 5, 2013

Joe Stowell
City of Oak Harbor, City Engineer
865 SE Barrington Drive
Oak Harbor, WA 98277

Re: Archaeological Monitoring Letter Report: The Oak Harbor Wastewater Treatment Plant Outfall Replacement Project Geo-Testing, Oak Harbor, Washington

Dear Mr. Stowell:

Kelly R. Bush of ERCI was contacted by Joe Stowell of the City of Oak Harbor in May of 2013 to conduct professional archaeological monitoring of geological testing for the Oak Harbor Wastewater Treatment Plant Outfall Replacement Project at the end of SE City Beach Street (geographic ID R13202-106-0750) in Oak Harbor, Washington (Figure 1-Figure 4). The proposed development includes replacing the failed existing wastewater outfall which runs from the city's water treatment plant out in to Oak Harbor.

**Property Address:** SE City Beach Street, Oak Harbor, Washington
**Geographic ID:** R13202-106-0750
**Property ID:** 10785
**Acreage:** 25.72
**County:** Island
**Quad Map:** Oak Harbor
**Township:** 32 N, **Range:** 1 E, **Sections:** 34
**Elevation:** < 12 feet (3 meters)
**Latitude and Longitude:** 48°17'8"N 122°39'5"W
**UTM:** Zone 10 525854E 5348090N
**Nearest water body:** Oak Harbor
**Archaeological Site:** None

The professional archaeological monitoring for this project was carried out by Sarah Johnson, M.A. of ERCI on June 24, 2013. The geologic testing was conducted by Aaron Hartvigsen of GeoEngineers. The monitored geo-testing documented in this report included hand driving six geologic probes in the intertidal zone and hand digging one small test pit adjacent to each probe (Figure 5). **All of the probe/test pits were negative for culture resources.** All six of the probe/ test pits were described, photo documented and backfilled. No samples were removed from the project area. All digital photos and field notes are stored at the offices of ERCI in Concrete, Washington.

Due to the location of the probes and test pits in the intertidal zone, it was not possible to record the profiles of the test pits in detail. The sediments where described as they were excavated, but the holes filled with water as they were dug. The probe/test pits were consistent throughout the project area. Probe 1 was excavated to approximately 90 cm depth below surface (dbs) and showed gray beach sand and gravels. Probes 2-6 were excavated to approximately 60 cm (dbs) and showed gray silty sand (Figure 6 - Figure 10).

A pedestrian survey was conducted of the intertidal zone and beach. Visibility was excellent due to a very low tide. No fish traps, stone alignments, or historic artifacts were encountered during the intertidal pedestrian survey.


Figure 1: Island County assessor map with subject property shaded in red.

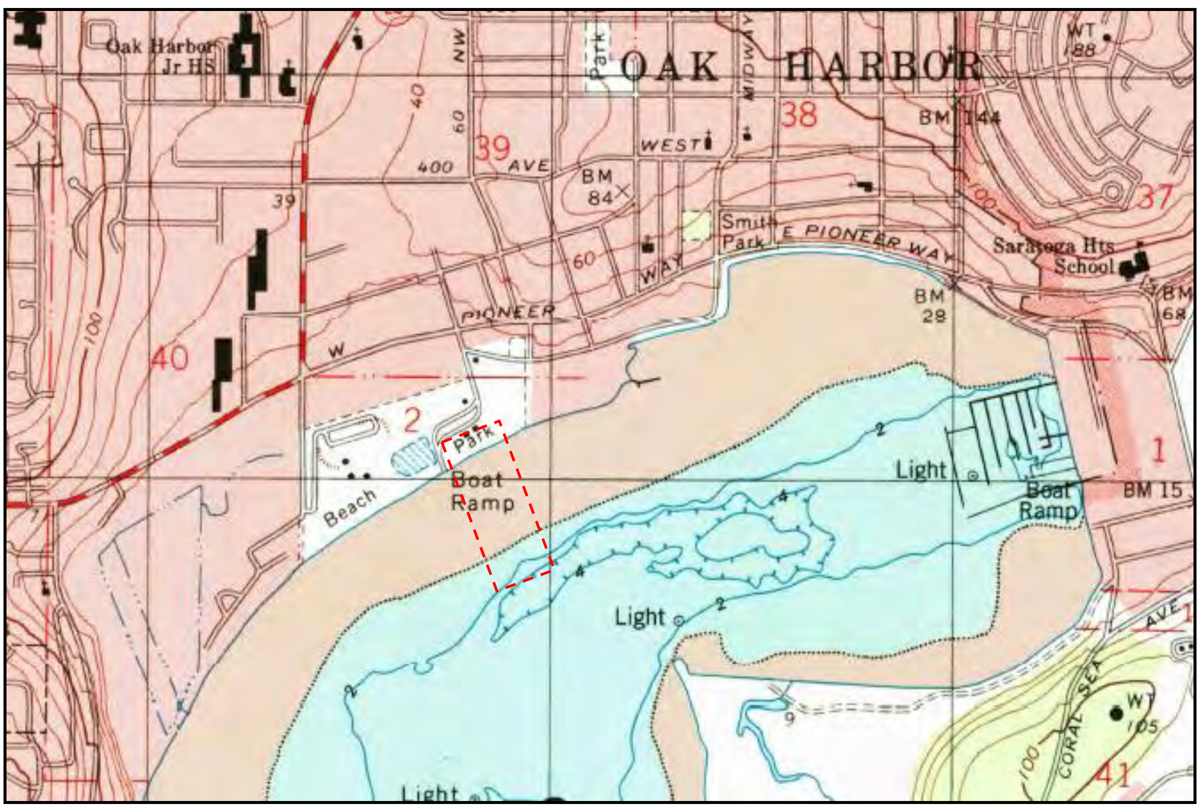


Figure 2: Oak harbor Quad Map, showing the subject property shaded in red.


Figure 3: Survey map provided by the City of Oak Harbor.


Figure 4: View north, the geo-testing area.


Figure 5: Approximate location of the geological probes.

Figure 6: Geologic Probe and test pit #2 showing gray silty sand.

Figure 7: View west, geologic probe and test pit # 5 marked with wood stake.

Figure 8: View southeast, geologic probe and test pit # 1 showing beach sand and gravels.

Figure 9: View east, geologic probe being driven in to the ground by hand.

Figure 10: View south, geological testing area with Oak Harbor in the back ground.

Although no protected cultural resources were observed during the monitoring of this intertidal geologic testing, this subject property is in close vicinity to Oak Harbor and a number of recorded archaeological sites. We believe that an archaeological survey should be conducted on the remaining portion of the subject property prior to the replacement of the wastewater outfall.

**Management Recommendations**

**NO Protected cultural resources were encountered** during excavation of geological probes. The management recommendations that we are now providing are based on the monitoring carried out during this project. We recommend that:

1. The outfall replacement project proceed with professional archaeological monitoring during any field activities including but not limited to silt fence installation, grubbing and grading, asphalt removal and any other activities.
2. That a monitoring plan be developed and approved prior to implementation of the outfall replacement project and that a brief Unanticipated Discoveries Protocol training be provided to the construction crew to familiarize them with the monitoring plan and the type of archaeological material that may be encountered during project activities.

Thank you for the opportunity to provide cultural resource management services for this project.

Regards,

Kelly R. Bush
Equinox Research and Consulting International Inc. (ERCI)

# WWTP Memo

***To be inserted at a later date.***