

# PROJECT REPORT

**Project Name:** Clean Water Facilities Planning **Date:** December 22, 2011  
**Client:** City of Oak Harbor **Project Number:** 8549A00  
**Prepared By:** Brian Matson  
**Reviewed By:** Eric Johnston  
**Subject:** Response to questions raised at November 28, 2011 City Council Meeting  
**Distribution:** Oak Harbor City Council

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## 1.0 SUMMARY

This report was developed in response to questions received at a November 28, 2011 City Council meeting. At the meeting, the Oak Harbor Clean Water Facilities Planning Project team presented information regarding potential sites for a new wastewater treatment plant (WWTP). Many questions were raised and discussed during the meeting. This report provides additional information to help answer several of the questions.

## 2.0 QUESTIONS AND ANSWERS

- Q1 How does the cost of installing an outfall in Oak Harbor compare to the cost of installing an outfall in either Crescent Harbor or off of West Beach?
- A1 The Project team estimated cost components for constructing a new outfall in three locations: Oak Harbor, Crescent Harbor, and off of West Beach. Three primary components were included in the cost development:
1. The cost of constructing a new pipeline from the WWTP site to the ordinary high water mark at the outfall location.
  2. The cost of constructing “in-water work” at the outfall location (e.g. outfall pipeline and diffuser).
  3. The potential cost of payments to offset natural resource damages, which have been sought elsewhere when WWTP discharges interfere with commercial harvesting. An outfall located in Oak Harbor would not be subject to these potential costs, because commercial shellfishing is not viable within Oak Harbor.

When considering the above three cost components, installing an outfall in Oak Harbor is less expensive than the alternatives. Table 2.1 summarizes the cost information, using two potential sites (Beachview Farm and Crescent Harbor) as an illustration. For additional information, please refer to the September 2011 Project Report online at [www.oakharborcleanwater.org/project-documents](http://www.oakharborcleanwater.org/project-documents).

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<b>Table 2.1 Cost Comparison of Near-Shore Outfalls<sup>(1)</sup> Clean Water Facilities Planning City of Oak Harbor</b>				
<b>Potential WWTP Sites Potential Outfall Locations</b>	<b>Beachview Farm</b>		<b>Crescent Harbor</b>	
	<b>West Beach</b>	<b>Oak Harbor</b>	<b>Crescent Harbor</b>	<b>Oak Harbor</b>
Pipeline to Shoreline	\$2,100,000	\$5,200,000 <sup>(3)</sup>	\$4,900,000 <sup>(3)</sup>	\$4,900,000 <sup>(3)</sup>
In-Water Work <sup>(2)</sup>	\$3,700,000	\$2,900,000	\$3,700,000	\$2,900,000
Natural Resource Damage Fees	\$10,600,000	--	\$7,600,000	--
<b>Total Estimated Cost</b>	<b>\$16,400,000</b>	<b>\$8,100,000</b>	<b>\$16,200,000</b>	<b>\$7,800,000</b>
<b>Notes:</b>				
1. Costs include sales tax, contingency and soft costs.				
2. Estimated cost of a near-shore outfall.				
3. Includes the cost of an effluent pump station.				

Q2 Are there potential public health risks associated with siting a WWTP near residential areas?

A2 There is little evidence to suggest that working in or living nearby a well-operated WWTP creates an elevated health risk. Attachment 1 contains abstracts from professional papers and studies on the topic of health effects and wastewater treatment.

Community members have raised concerns regarding potential health risks associated with locating the City's new WWTP near populated areas, siting studies completed by the Cornell University Industry and Labor Relations School (1997) and the US Environmental Protection Agency (1978). One common concern is exposure to airborne hazards. If treatment process tanks are uncovered, mist arising from exposed wastewater surfaces can become airborne, and may travel outside the facility fence-line. This can be effectively mitigated by covering treatment tanks, and ventilating the exhaust air to a treatment process before it is discharged to atmosphere. Unlike the facilities included in studies referenced by the community, processes in the City of Oak Harbor's new WWTP would be covered, and the exhaust air would be treated. This approach has been taken by municipalities throughout the country.

Q3 Is it common for WWTPs to be located near residential areas?

A3 Urban development near WWTPs is not uncommon. Attachment 2 includes a short list of Northwest facilities that are located near to residential areas. The list is not all-inclusive, and not all listed facilities utilize the high level of air containment, odor control, and treatment that would be included at the City of Oak Harbor's facilities. Contact information is included in the reference list.

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Q4 How has the community responded to an alternative that would site a new WWTP at Beachview Farm?

A4 A survey was completed in early 2011 to collect community feedback regarding each of the five sites being considered: Windjammer Park; Old City Shops; Marina/Seaplane Base; Crescent Harbor; and Beachview Farm. The Community Feedback Report (Spring 2011) summarizes all survey responses, and is available on the Project Website at [www.oakharborcleanwater.org](http://www.oakharborcleanwater.org). Attachment 3 summarizes feedback collected specifically for the Beachview Farm site. While the survey was not intended to serve as a “vote”, respondents did express their opinions.

Q5 What is the cost difference associated with each of the five sites, based on the planning level information developed to date?

A5 Table 2.2 summarizes cost differences for each of the five alternatives developed to date. These costs represent total project cost for all components needed through the entire planning period (year 2030). This allows a true “apples-to-apples” comparison of costs at a conceptual level. However, it does not address differences in project phasing or funding from site to site.

Once the number of sites has been reduced, the Project team will develop more detailed cost information along with plans to phase project capacity and components that are specific to each site. This process will likely result in a wider spread in cost differences (and rate impacts) between the remaining alternatives.

Q6 What is the cost difference between membrane bioreactor (MBR) and activated sludge (AS) process?

A6 The MBR process option is approximately 8 to 10 percent more expensive than AS, on both a capital and life-cycle cost basis. A summary of the cost differences is summarized in Table 2.3.

Q7 Why is the MBR process recommended if it is more expensive?

A7 The MBR process is recommended as a basis for further analysis for the following reasons:

1. The MBR process is well matched to City objectives and community feedback collected to date. Specifically, the MBR process:
  - a. produces the highest level of treatment to protect surrounding surface water and Puget Sound;
  - b. the process is more easily covered, allowing air to be captured and treated to address concerns related to odor and/or health risk;
  - c. is well suited for reclaimed water applications; and
  - d. is best able to meet future water quality regulations.

<b>Table 2.2 Cost Comparison of Alternatives<sup>(1)</sup> Clean Water Facilities Planning City of Oak Harbor</b>					
	<b>Windjammer</b>	<b>Old City Shops</b>	<b>Crescent Harbor</b>	<b>Marina / Seaplane Base</b>	<b>Beachview Farm</b>
Wastewater Collection System Costs	\$4,300,000	\$5,900,000	\$6,300,000	\$6,500,000	\$8,700,000
WWTP Site-Specific Costs	\$45,500,000	\$44,500,000	\$43,600,000	\$44,800,000	\$43,600,000
Treated Effluent Outfall Costs	\$1,600,000	\$1,900,000	\$4,400,000	\$3,300,000	\$4,600,000
Sales Tax, Contingency, and Soft Costs for All Elements	\$39,400,000	\$39,700,000	\$41,300,000	\$41,100,000	\$42,900,000
<b>Total Project Cost</b>	<b>\$90,800,000</b>	<b>\$92,000,000</b>	<b>\$95,600,000</b>	<b>\$95,700,000</b>	<b>\$99,900,000</b>
<u>Notes:</u>					
1. Accuracy of estimates is +50 percent to -30 percent.					

<b>Table 2.3 WWTP Cost Backup Clean Water Facilities Planning City of Oak Harbor</b>			
<b>Unit Process</b>	<b>MBR</b>	<b>AS</b>	<b>Key Differences / Notes</b>
Headworks / Flow Equalization	\$5,500,000	\$3,200,000	MBR requires flow equalization and more extensive screening.
Primary Clarifiers	\$ -	\$1,200,000	MBR does not require separate primary clarifiers.
Secondary / Tertiary Treatment	\$10,100,000	\$8,200,000	AS requires a separate process (tertiary treatment) to produce Class A quality reclaimed water.
Disinfection	\$2,200,000	\$2,200,000	Disinfection facilities are the same for both processes.
Solids Handling	\$4,200,000	\$4,000,000	The cost of solids handling facilities is roughly the same for both processes.
Odor Control / Administration/ Maintenance / Site Work <sup>(1)</sup>	\$9,300,000	\$10,100,000	AS costs are slightly higher because the facilities occupy a larger footprint.
Indirect Costs (GCs, HOP)	\$11,200,000	\$10,300,000	15% general conditions, 18% overhead and profit
<b>Subtotal</b>	<b>\$42,500,000</b>	<b>\$39,200,000</b>	
Sales Tax, Contingency and Soft Costs	\$32,500,000	\$30,000,000	
<b>Project Cost</b>	<b>\$75,000,000</b>	<b>\$69,300,000</b>	
Annual Cost (Present Worth Basis) <sup>(2)</sup>	\$20,600,000	\$18,600,000	Costs include power, labor, fuel, equipment replacement and chemicals.
<b>Net Present Worth</b>	<b>\$95,600,000</b>	<b>\$87,900,000</b>	
<b>Notes:</b>			
1. Does not include the cost of land.			
2. Present worth costs calculated at a discount rate of 3% over a 20-year period.			

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2. Three of the five sites being considered have relatively small footprints. The MBR process is the only process option being considered that will fit on these sites.
3. Due to its small footprint, the MBR process is most easily designed to blend with the surrounding community.
4. The MBR process is scalable, and process capacity can be phased-in over time.

Depending on the characteristics of the final site, the City may wish to explore the option of constructing an AS plant instead of an MBR. This analysis will be included in the planning process, with direction from the City.

Q8 Why should the City continue to evaluate potential sites that do not appear to be favored by the community?

A8 The City's process to select a WWTP alternative must include an evaluation of multiple alternatives to meet the requirements of the Washington Administrative Code (WAC) 173-240-060 and National Environmental Policy Act (NEPA). In addition, funding agencies require analysis of least-cost alternatives to determine eligibility. Time and effort spent evaluating a range of alternatives is necessary to create a justifiable basis for the final decision, considering financial, social, environmental, and technical objectives established by the City Council.

To date, the Project team has followed a stepwise approach to develop a credible, defensible, and cost-effective process, generally summarized below:

1. Consider a wide range of alternatives for initial screening.
2. For a narrowed list of alternatives, develop a consistent comparison at a conceptual level. This comparison should be made using project objectives that are broad and well established at the onset.
3. For a final list of alternatives, develop a more detailed evaluation to justify a final recommendation. At this point in the process, project objectives are often refined to better illustrates key tradeoffs between remaining alternatives.
4. For the final recommended alternative, complete the environmental review process following State and Federal requirements.

The City is now at Step 2 in this process. Council direction is required to proceed with Steps 3 and 4. The City's approach is designed to recognize and address community opposition to certain alternatives. At this stage in the process, the Windjammer Park and Old City Shop sites appear to be the lowest cost alternatives. Per WAC and the NEPA requirements, and to provide defensible justification for the recommended alternative, it is important to include apparent low-cost alternatives as a part of the City's evaluation process.

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As indicated in the resolution presented on November 28, the City may direct the Project team to evaluate other sites as appropriate. To maintain consistency and credibility, the Project team recommends vetting these additional sites through Step 2 prior to moving to Step 3.

**ATTACHMENT 1**

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***Professional Paper and Study Abstracts***



# *Health Hazard Manual*

## **WASTEWATER TREATMENT PLANT and SEWER WORKERS**

**Exposure to chemical hazards and biohazards**

**By Nellie J. Brown, M.S., C.I.H.**

**Cornell University  
Chemical Hazard Information Program  
Dr. James Platner, Toxicologist/Director  
New York State Department of Labor Grant #C005413  
Revision 12/01/97**

## HEALTH HAZARD MANUAL FOR WATER AND WASTEWATER TREATMENT WORKERS

### Introduction

Sewage is the used water of a community and can include domestic wastewater and industrial wastewater. Combined sewer systems will include storm water such as road runoff which carries oils, salts, metals, and asbestos. Many systems, especially older ones, will receive infiltration which can carry pesticides and herbicides from soil application.

For many years, work in the wastewater treatment field was considered the most hazardous, especially due to deaths involving confined space entry. This field is considered somewhat less hazardous today, but treatment plant workers still do experience health problems and deaths. These experiences occur in specific incidents involving chemicals in the sewer system and in regular work exposures throughout the plant and its processes.

Some chemically-related health complaints are acute in nature, involving short-term exposures and complaints such as irritations of the eyes, nose or throat. Other problems are chronic in which repeated exposures, sometimes over several years, have caused effects upon internal organs or have involved occupationally-related allergies.

Studies have shown that wastewater treatment may generate aerosols containing microbiological and chemical constituents. In fact, the primary route of exposure for workers is probably inhalation. The physical layouts of many sewage treatment plants involve open tanks and basins; plants typically are not designed to prevent aerial dispersion of wastewater during the treatment process. Volatile organics in wastewater may be vaporized or air-stripped during treatment. Many of the compounds are carcinogens and/or mutagens, so sewage workers may be at increased risk of cancer or adverse birth outcomes.

Infections from exposure to waterborne disease organisms may be subclinical or may appear as actual disease in wastewater workers.

Treatment personnel have reported nausea, vomiting, indigestion, diarrhea, and flu-like complaints. Studies of antibodies in the blood of workers have documented that disease exposures have occurred.

Although several years of exposure tends to produce eventual immunity for many workers to some organisms, new workers tend to be ill more often than experienced workers.

This manual examines how exposure occurs during the treatment processes; ways to reduce exposure by engineering controls, administrative controls, process control strategies, and protective equipment; and some suggested medical surveillance.

A single sewage treatment plant may service a hundred or more industries; therefore an enormous range of chemicals may be present in the influent and sludges. The presence of toxic chemicals and organisms in sewage, in sludge, and in the air at specific sites in sewage plants has raised suspicion regarding their possible effects on the health of the workers in these plants.

Wastewater treatment plant workers may be exposed to chemicals or organisms by direct contact with wastewater and sludges, or by inhalation of gases, particles, aerosols, vapors, or droplets. These hazards may enter the plant in soluble form or attached to suspended solids. Compounds reported from sludge analyses include chlorinated organic solvents and pesticides, PCBs, polycyclic aromatics, petroleum hydrocarbons, flame retardants, nitrosamines, heavy metals, asbestos, dioxins, and radioactive materials. The concentration of organics and metals in sludge is indicative of the areas' industries; for example, high concentrations of PCBs in Schenectady, NY, sludge was due to the manufacture of electrical equipment upstream from the treatment plant. There are also derivatives of chemicals formed by microbiological or other processes during the sewage treatment process; these may be more or less toxic than the original compound. Disease-causing organisms have been found in sewage sludge; therefore, sewage workers may be at increased risk of infection or diseases.

March 1978

# HEALTH IMPLICATIONS OF SEWAGE TREATMENT FACILITIES

by

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## ABSTRACT

It is known that aerosols containing microorganisms and trace metals are emitted from wastewater treatment facilities. Virtually nothing was known about the possible health effects on populations living near these operations. In this study, environmental monitoring, household health survey, and sampling for clinical specimens of human subjects were conducted within a 5 kilometer distance from a wastewater treatment plant near Chicago, Illinois. The residential area began 400 meters from the plant.

Although the treatment plant was a source of indicator bacteria, coliphage, pathogenic bacteria, enteroviruses, and mercury in the aerosols emanating from its aeration basins, the levels of microbiological and chemical agents of the air, water, and soil samples in the neighboring residential areas were not distinguishable from the background levels.

From the patterns observed in the household health survey, the increased incidence of skin disease, and the symptoms of nausea, vomiting, general weakness, diarrhea, and pain in chest on deep breathing may be associated with the nearby operation of the wastewater treatment plant.

Although of little practical health significance, alpha-and gamma-hemolytic streptococcus isolations in throat cultures of nearby residents may be related to plant operations. In contrast, 31 viral antibody tests and attempted isolations of many pathogenic bacteria, parasites, and viruses yielded no evidence of an adverse wastewater treatment plant effect.

Overall, the findings did not detect a health hazard for persons living beyond 400 meters from the well-operated wastewater treatment plant.

This report was submitted in fulfillment of Contract No. 68-02-1746 by Southwest Research Institute under the sponsorship of the U.S. Environmental Protection Agency. This report covers the period July 1974 to October 1976, and work was completed as of October 1977.

## **Health Effects from Wastewater Aerosols at a New Activated Sludge Plant: John Egan Plant, Schaumburg, Illinois**

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David E. Camann  
Kay T. Kimball  
R. John Prevost  
and Richard E. Thomas**

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Southwest Research Institute  
San Antonio, Texas*

### **ABSTRACT**

A study was performed to identify public health hazards of aerosols from operating sewage treatment plants by examining a new activated sludge facility. Environmental monitoring, a household health survey, and assays of clinical specimens from human subjects were conducted during four baseline and operational sampling periods within a 5 km radius of the plant. The residential area began 350 m from the plant.

The wastewater aerosol from the aeration basins was a statistically significant source of indicator bacteria and a presumed source of coliphage, pathogenic bacteria, enteroviruses, and mercury. However, the levels of microorganisms and trace metals in the air in neighboring residential areas were not distinguishable from the background levels.

The nearby residents reported a higher incidence of skin disease and several gastrointestinal symptoms after the treatment plant became operational. Antibody tests for 31 human enteric viruses and attempted isolations of many pathogenic bacteria, parasites, and viruses yielded virtually no clinical evidence of infectious disease effects associated with the sewage treatment aerosol.

At the exposure levels investigated, the sewage treatment aerosols from well-operated American plants do not appear to be a significant health hazard to residential populations. The current evidence is insufficient to determine whether effects of lesser consequence, such as gastrointestinal symptoms and skin conditions, are associated with moderate aerosol exposure.

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### **INTRODUCTION**

#### **Background**

The United States Environmental Protection Agency, through its construction grants program to the states and municipalities, is funding a multibillion dollar effort to construct new wastewater treatment facilities throughout the United States. These new facilities are required to reduce sewage pollution of the waterways of the nation.

In the past, many wastewater treatment plants have been constructed in relatively unpopulated areas. From an engineering standpoint, how-

## **Wastewater Aerosol and School Attendance Monitoring at an Advanced Wastewater Treatment Facility: Durham Plant, Tigard, Oregon**

**David E. Camann,  
H. Jac Harding,  
Donald E. Johnson**

*Southwest Research Institute  
San Antonio, Texas*

### **ABSTRACT**

As the first stage of a potential health hazard investigation, wastewater aerosols and school attendance were monitored at an advanced wastewater treatment plant using the activated sludge process. An elementary school is located next to the new treatment plant. Wastewater aerosols are generated by the aeration basin (within 400 m of the classrooms) and by an aerated surge basin (within 50 m of the school playground).

The aeration basin was observed to be a much stronger source of aerosolized microorganisms than the surge basin. The geometric mean concentrations monitored in air at 30 to 50 m downwind of the aeration basin were 12 cfu/m<sup>3</sup> of total coliforms, 4.2 cfu/m<sup>3</sup> of fecal streptococci, 19 cfu/m<sup>3</sup> of mycobacteria, and 1.5 pfu/m<sup>3</sup> of coliphage. Enteroviruses were not detected in air (<0.0002 pfu/m<sup>3</sup>).

After sewage treatment commenced, attendance at the nearby school generally improved, relative both to the baseline school years and to five control schools. The students probably received a peak dose from the aerosol on the order of 2 cfu of mycobacteria and 0.8 cfu of fecal streptococci. At this level of exposure, the sewage treatment aerosol had no adverse effect on communicable disease incidence as discerned from total school absenteeism.

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### **INTRODUCTION**

#### **Background**

To improve the quality of surface waters, the U.S. Environmental Protection Agency is sponsoring a large program of local construction grants for new wastewater treatment plants. Siting requirements and urban sprawl often dictate that the new wastewater treatment units be located near residential areas.

The Durham Advanced Wastewater Treatment Plant (DAWTP) in Tigard, Oregon, is a modern activated sludge plant funded by the construction grants program that processes 9 to 13 mgd of sewage (3 to 5 × 10<sup>7</sup> l/day). It was built next to the six-classroom Durham Elementary School (DES). The school buildings are located 370 to 470 m from the aeration basin, while the school playground extends to within 50 m of the nearest aerator in one of the surge basins. Local public health officials were concerned that operation of the DAWTP so near the school

## **Health Effects of Aerosols Emitted from an Activated Sludge Plant**

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L. Sheaff, J. Holden, S. Meyer, and P. Scheff**

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Chicago, Illinois*

### **ABSTRACT**

An 8-month environmental health study was carried out in a 1.6 km area surrounding a 202 mgd activated sludge plant. A cross-sectional demographic and health survey of a random sample of persons residing within the study area revealed that they were relatively homogeneous, predominately white, upper middle class, and with no remarkable prevalence of health problems. Seven hundred and twenty-four people (246 families) volunteered to record self-reported illnesses at biweekly intervals. Throat and stool specimens were collected from a selected subsample of 161 persons providing a total of 1,298 specimens analyzed for pathogenic bacteria and viruses. Three hundred and eighteen persons submitted paired blood samples at the beginning and end of the study period to determine prevalence and incidence of infections to five-coxsackie- and four-echovirus types. No remarkable correlations were found between the exposure indices and rate of self-reported illnesses or of bacterial or viral infection rates determined by laboratory analysis. However, the plant was identified as a source of viable particles and total coliforms. The overall conclusion that this activated-sludge treatment plant had no obvious adverse health effect on residents potentially exposed to aerosol emissions must be tempered by the very small number of people who were exposed to the highest pollution levels. This plant was not a source of high concentrations of viable particles, gases, or metals, and the plant levels of the aerosolized pollutants were much lower than those reported by other investigators for similar plants.

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### **Objectives of Study**

This study was designed to determine whether or not the health of persons exposed to aerosols emitted by a sewage treatment plant is significantly different from that of persons living in less exposed areas around the plant site. Field and laboratory studies to evaluate the environmental and health status include:

- assessment of microorganisms and metal and gaseous constituents in sewage with emphasis on those components considered to be hazardous to human health
- assessment of the quality, quantity, and distribution of viable particles, nonviable particles, and gases in the air originating from the sewage treatment plant and in the community
- assessment of the health, particularly with reference to infectious diseases, of persons living in areas exposed to different concentrations of viable and nonviable pollutants originating from the plant



**ATTACHMENT 2**

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***Select Examples of Northwest WWTPs***

<b>WWTP Locations</b>					
<b>Facility</b>	<b>Location</b>	<b>Secondary Treatment Process</b>	<b>Facility Contact Information</b>	<b>Approx. Distance to Nearest Residence</b>	<b>Comments</b>
Edmonds WWTP	Edmonds, WA	Covered AS	Pam Randolph Plant Manager (425) 275-4700	150 ft (46 m)	All processes fully covered. Facility designed with a high level of exhaust air treatment, and integrates a public gathering spot.
Redondo WWTP	Federal Way, WA	Covered TF	Chris McCalib Waste Water Treatment Plant Manager (253) 945-2621	210 ft (64m)	--
Post Point WWTP	Bellingham, WA	Covered AS	Heather Higgins, M.Ed. Education and Communications Coordinator (360) 778-7905	390 ft (119 m)	Aeration basin covered, other processes uncovered. Facility is overlooked by homes on an adjacent bluff. Includes a modest level of exhaust air treatment.
Rock Creek WPCF	Hillsboro, OR	Uncovered AS	Sheri Wantland Public Affairs (503) 681-5111	400 ft (122 m)	--
Carnation WWTP	Carnation, WA	Covered MBR	Jo Sullivan Project Program Manager III (206) 296-8361	450 ft (137 m)	All processes fully covered. Facility is designed with a high level of exhaust air treatment.
Lakota WWTP	Federal Way, WA	Covered AS	Chris McCalib Waste Water Treatment Plant Manager (253) 945-2621	750 ft (229 m)	--
Martin Way RWP	Lacey, WA	Covered MBR	Karla Fowler Community and Environmental Policy Director (360) 528-5712	580 ft (177 m)	All processes fully covered. Facility is designed with a high level of exhaust air treatment.

## Edmonds Wastewater Treatment Plant, Edmonds, WA



1 Nearest residential area is 150 feet (46 meters).

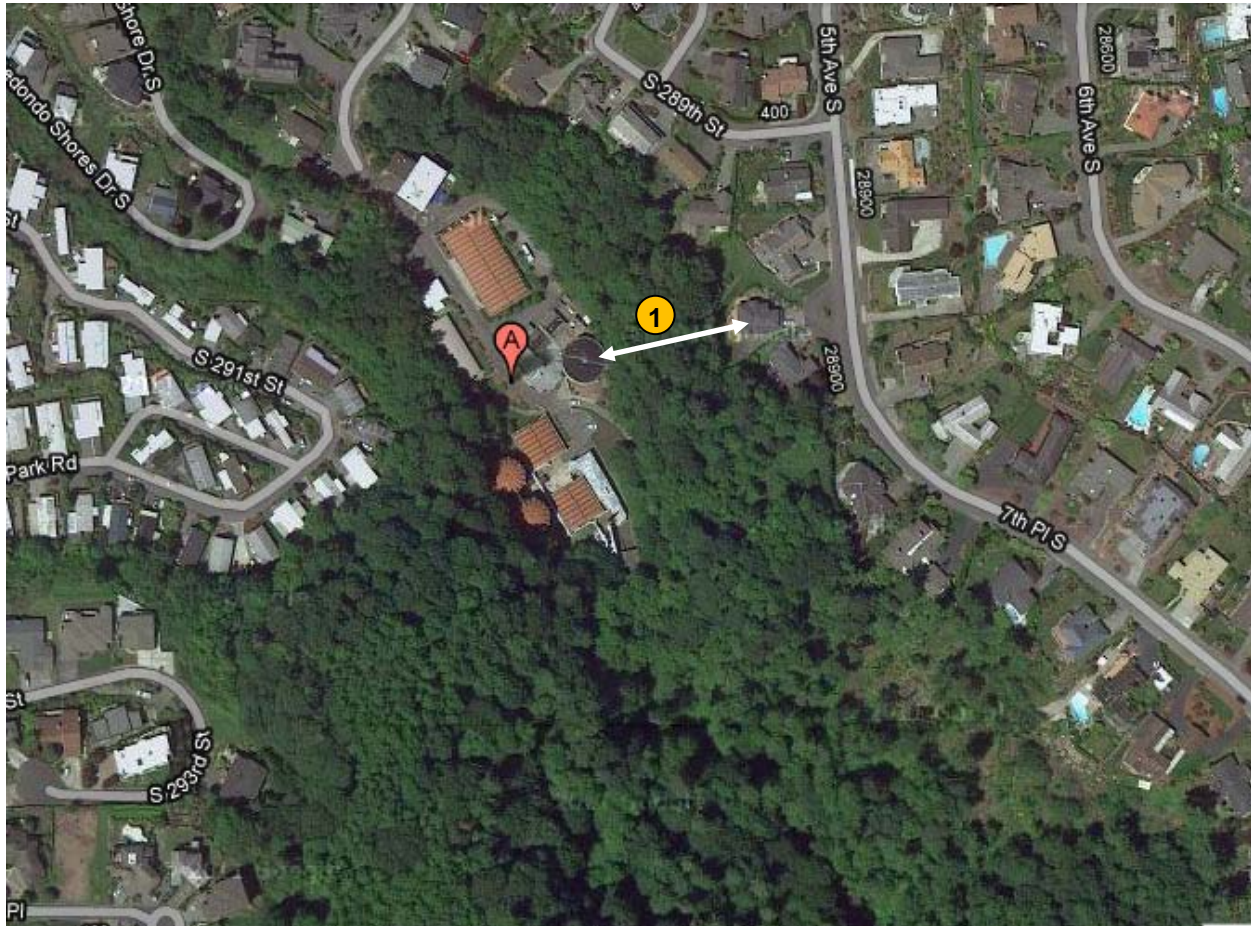


View looking north from the WWTP entrance.



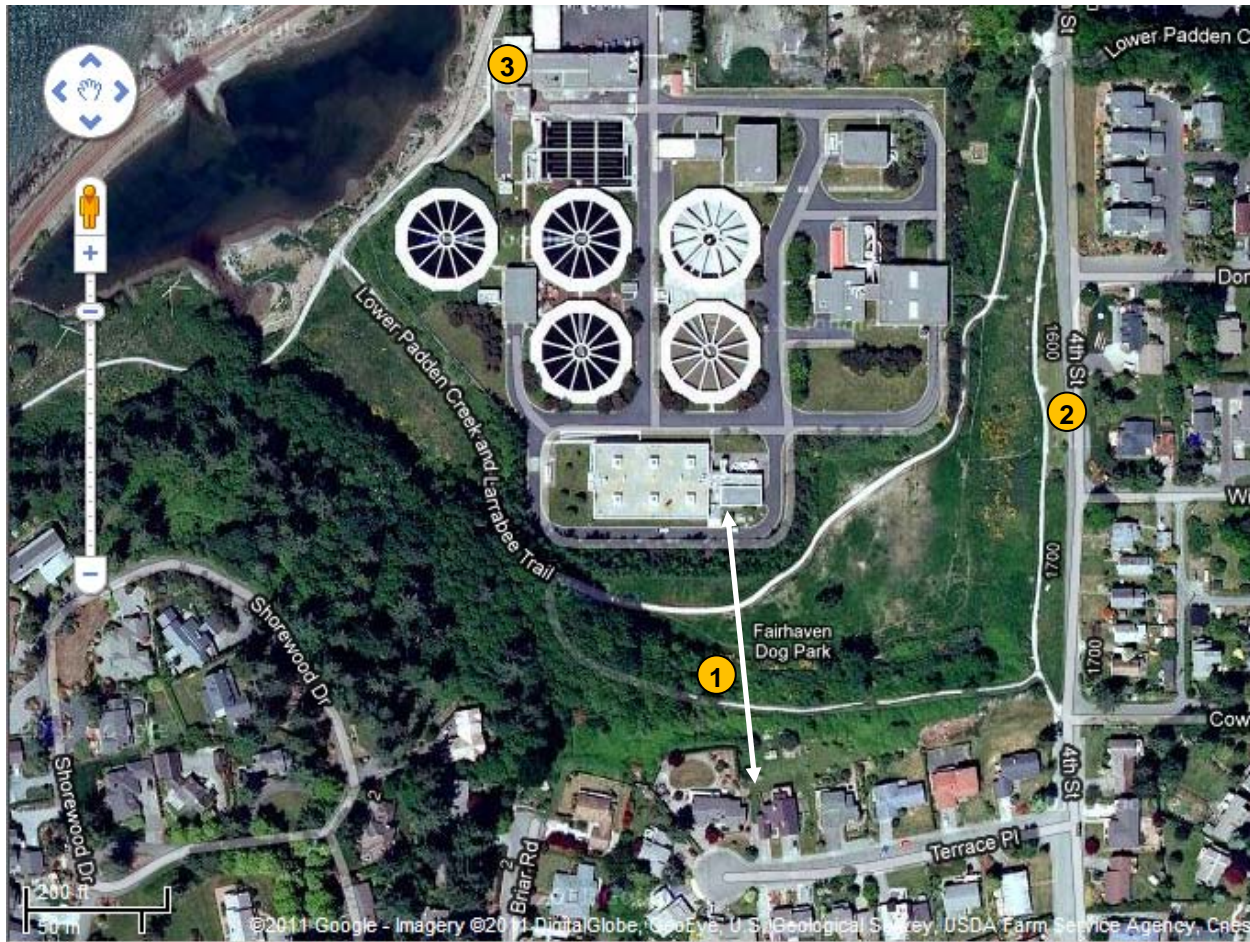
The facility is designed with a high-level of exhaust air treatment and integrates a public gathering spot.

**Redondo Wastewater Treatment Plant, Federal Way, WA**



**1** Nearest residential area is approximately 210 feet (64 meters).

## Post Point Wastewater Treatment Plant, Bellingham, WA



① Nearest residential area is approximately 390 feet (119 meters).



② Public open spaces and interpretive trails surround the facility.

③ View looking south across the facility, with residential neighborhoods shown in the background.



**Rock Creek Water Pollution Control Facility, Hillsboro, OR**



① Nearest residential area is approximately 400 feet (122 meters).

## Carnation Treatment Plant, Carnation, WA



① Nearest residential area is approximately 450 feet (137 meters).



The buildings facing residential areas are designed to fit with the surrounding environment.

**Lakota Wastewater Treatment Plant, Federal Way, WA**



**1** Nearest residential area is approximately 750 feet (229 meters).



**Martin Way RWP, Lacey, WA**



**1** Nearest residential area is approximately 580 feet (177 meters).

***Beachview Farm Feedback***

**Page 6, Q9. My suggestion to make a new facility located at Beachview Farm more appealing is:**

1	Again this area needs to be as attractive as possible for the surround area. Park like area.	Apr 27, 2011 11:23 AM
2	No suggestions	Apr 25, 2011 1:50 PM
3	Don't.	Apr 22, 2011 4:42 PM
4	Again protection of the Sound and local waters is paramount	Apr 21, 2011 9:35 PM
5	Do not locate the facility at Beachview Farm - it endangers the Swan Lake Habitat of Local Importance.	Apr 21, 2011 10:17 AM
6	Should not be an option! Too expensive Will ruin the pristine environment and wildlife habitat	Apr 21, 2011 9:19 AM
7	DON'T PLACE IT HERE!	Apr 21, 2011 8:01 AM
8	Cost extra piping back and forth to discharge.	Apr 17, 2011 5:04 PM
9	This is a very bad site too far out of town which will cost too much to pump the sewage out there. And we don't want to lose the farmland or natural habitat.	Apr 17, 2011 4:59 PM
10	#2 Choice	Apr 17, 2011 4:53 PM
11	Incorporating the rolling hills into design possibly less farmy and more wetland like.	Apr 17, 2011 4:47 PM
12	This is the worst option as it seems to invade (or has the potential at least to be invasive) on the beauty and atmosphere enjoyed at various points at west beach	Apr 17, 2011 4:39 PM
13	ABSOLUTELY N O T	Apr 16, 2011 5:58 PM
14	not use this site at all	Apr 16, 2011 2:49 PM
15	If money were no object and the county was cooperative (doubtful) this would be the easy choice. But as a ratepayer I can't support a site that will raise the cost of the project by 20-30 million(?) more? With the county's recent refusal to annex the farm property into the city a sustantial delay could be expected if this site were chosen.	Apr 15, 2011 8:39 AM
16	Guarantee clean effluent to Swan Lake watershed without obnoxious odor emmissions.	Apr 14, 2011 12:44 PM
17	Probably not the best area. Costs are a concern.	Apr 14, 2011 11:43 AM
18	if you even try to do this you will face the biggest law suit you have ever seen -- get real you idiots !!! you will ruin Swan Lake and all the property around it - where do you people get your outragious ideas	Apr 13, 2011 7:11 PM
19	Don't do it! This is a ploy by the good old boys and gals who run Oak Harbor to make the public pay for a sewage plant needed by the owners of this property to turn it into a housing development. It's corrupt to even consider it.	Apr 13, 2011 6:17 PM

**Page 6, Q9. My suggestion to make a new facility located at Beachview Farm more appealing is:**

20	same as above; avoids impacting Swantown Lake , hopefully would be located closer to the Swantown Road in lieu of pasture and valley below. Preserve the wetland area	Apr 13, 2011 4:56 PM
21	Who owns this property? Beachview Farm and a colocated biosolid facility. Make treated waste water available to farms, parks (Ft Nugent) and golf courses.	Apr 13, 2011 4:48 PM
22	This is the worst possible location for the facility. It is currently undeveloped(other than for farming). It	Apr 13, 2011 4:41 PM
23	Do not discharge into Swan Lake without reconnecting the lake to Puget Sound.	Apr 13, 2011 4:22 PM
24	This location may not effect so many property owners, except for the beautiful view of the owners on the surrounding hills. I wonder though, how it would change my impression of the magnificent view each time I drive out that way?	Apr 13, 2011 12:44 PM
25	This site would obviously be the less intrusive for neighbors and the surrounding residential areas. The cost factor needs to be the biggest concern for this site. Cost of piping the water outfall either Back to Windjammer Park? Or to West Beach!	Apr 12, 2011 8:26 PM
26	Don't build it here. We can't afford to lose more farm land or natural habitat. It's too far out of town and will require too much unnecessary infrastructure. The environmental impact alone will not allow this site to work.	Apr 12, 2011 6:13 PM
27	Seems way out of the way . . . seems to small an area . . . seems like there'd be extra costs involved for the out of the way location and that it's private property. But I'd need to learn more.	Apr 12, 2011 5:28 PM
28	This site would be okay, but I will leave it to the designers and city to plan the amenities to make it more appealing.	Apr 12, 2011 2:14 PM
29	have extra land to plan for expansion	Apr 12, 2011 1:57 PM
30	Not an option - keep effluent lines away from Swantown lake and West Beach	Apr 12, 2011 1:29 PM
31	Do not locate here!	Apr 12, 2011 12:43 PM
32	DO NOT USE!	Apr 12, 2011 12:28 PM
33	Will devalue property in the surrounding area. Westward winds will spread the odor over a gerater populus of people	Apr 12, 2011 10:34 AM
34	Not sure about remote site.	Apr 12, 2011 10:00 AM
35	Not a great choice. Expensive to plumb/pump. City will be expanding in that area in the future.	Apr 12, 2011 8:58 AM
36	Have an upscale building with fountains of the reclaimed water. A charming village in Switzerland has fountains throughout town that the horses that pull the horse-drawn carriages drink out of. The people are very proud of their water treatment and it is a tourist attraction.	Apr 12, 2011 7:41 AM

**Page 6, Q9. My suggestion to make a new facility located at Beachview Farm more appealing is:**

37	It's the best spot in town for this waste site	Apr 12, 2011 12:09 AM
38	Use walls to reduce noise and landscape with berms that include mature trees.	Apr 11, 2011 9:06 PM
39	Water and solid use and expansion possibility. Doesn't need to be pretty	Apr 11, 2011 12:46 PM
40	Same suggestions as others.	Apr 11, 2011 11:54 AM
41	This appears to be the best site. Water could be discharged to the west of the Island with much greater influx of water from the sea.	Apr 11, 2011 8:47 AM
42	1\$ extended lease of the property	Apr 10, 2011 4:35 PM
43	that is a long way from the center of town... and a lot of uphill problems is it not?	Apr 10, 2011 11:48 AM
44	Drop this idea. Too expensive overall. Would threaten the beautiful Whidbey Golf and Country Club with summer wind smell from the facility.	Apr 10, 2011 8:22 AM
45	This site could be OK. There is lots of space there and the facility could be blended into the farm. This is an area that was hotly contested when they attempted to annex a part of it. Maybe you can leave it in the County and change your ordinances to allow you to sell sewer hook-ups in the County. You'd get more hook-ups and more hook-ups mean more \$\$\$\$ which means the whole thing could be sustainable.	Apr 8, 2011 8:49 PM
46	This location should not be considered due to on going feasibility study of Swan Lake to restore salmon habitat and has been designated a Habitat of Local Importance.	Apr 8, 2011 3:22 PM
47	Just don't do it. This is the wrong place.	Apr 8, 2011 10:40 AM
48	This is the best location of the five, but with discharge out to the west into the sound. In spite of what the County Commissioners say, this is in the direction of growth for Oak Harbor over the next 50 years.	Apr 7, 2011 9:30 PM
49	It shouldn't be too close to neighboring residents' homes.	Apr 7, 2011 8:01 PM
50	With regard I prefer this site.	Apr 7, 2011 4:33 PM
51	Use a system that produces the best possible water quality.	Apr 7, 2011 11:04 AM
52	Municipal golf course watered with reuse water. Combine with a land conservency group to preserve the open space which could become a park or working display farm. This site is the most forward thinking and visionary option, also probably costly.	Apr 7, 2011 9:42 AM
53	MBR in an attractive building.	Apr 7, 2011 8:52 AM
54	Build as far away from the water as possible. Use methods let the water be used to irrigate golf courses or the like.Keep the water moving. Don't make it look like a waste water holding pond.	Apr 6, 2011 8:35 PM

**Page 6, Q9. My suggestion to make a new facility located at Beachview Farm more appealing is:**

55	This site seems expensive to operate as the cost of infrastructure and distance to pump does not seem logical. I am also concerned on its impact to future annexation and potential residential growth. I may be wrong.	Apr 6, 2011 8:56 AM
56	not to build it there	Apr 5, 2011 9:21 PM
57	Since it is a farm, why not enclose the treatment plant in a barn.	Apr 5, 2011 4:14 PM
58	I thing this is the 2nd best option, need to ensure there is roome for future growthe/capability to handle more should the city grow. Seems to be the most logical place. If it would initially cost more due to it being further away, need to explain the potential cost SAVINGS over the long run and the minimal impact on the waterfront/marina/seaplane base	Apr 5, 2011 3:34 PM
59	THIS IS BEST	Apr 5, 2011 3:21 PM
60	Make it look like it belong there	Apr 5, 2011 12:26 PM
61	Somehow make it look like a farm so it blends into the rest of the community.	Apr 5, 2011 10:39 AM
62	No comment.	Apr 5, 2011 10:08 AM
63	No thoughts.	Apr 5, 2011 7:09 AM
64	restore the old barn and have it look like a farm	Apr 4, 2011 9:29 PM
65	A surrounding park.	Apr 4, 2011 9:17 PM
66	Probably not a good idea...have consideration for all of the local property owners out there.	Apr 4, 2011 9:13 PM
67	I'm not familiar with this area.	Apr 4, 2011 8:59 PM
68	Not to even consider it	Apr 4, 2011 7:50 PM
69	Not put it there	Apr 4, 2011 4:50 PM
70	The facility should be visually inconspicuous, odor or noise should not be noticable off site.	Apr 4, 2011 4:47 PM
71	I don't like this option. It seems expensive to pump all that sewer stuff out there.... But otherwise, I guess make it look like a barn...or something that fits with the natural surroundings.	Apr 4, 2011 4:45 PM
72	Incorporate trails/green space.	Apr 4, 2011 4:21 PM
73	I would like to see the design retain the farm like look. I suspect that over time this area will be developed. With that, I think the theme should be subtle enough to fit the current surroundings, but not so much that it looks out of place in a development.	Apr 4, 2011 4:12 PM
74	Nice idea but terribly expensive when compared to others	Apr 4, 2011 4:11 PM

Page 6, Q9. My suggestion to make a new facility located at Beachview Farm more appealing is:

75	Farm building look to exterior - blend in	Apr 4, 2011 3:47 PM
76	surround it by parks, trails	Apr 4, 2011 3:39 PM
77	Not a good option.	Apr 4, 2011 12:46 PM
78	reduce the smell. seems very far away from the city and most residents. seems like that would cost a lot for new piping? not a good choice.	Apr 2, 2011 12:57 PM