

PUBLIC MEETING

Dungeness Wastewater Feasibility Study

March 9, 2013 10:00 am
Old Dungeness Schoolhouse



Agenda

- Open house
- Introduce study
- Project alternatives
- Discussion
- Review next steps
- End

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Dungeness Wastewater Feasibility Study

March 9, 2013 10:00 am
Old Dungeness Schoolhouse



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Clallam County Environmental Health

Ann Soule, Project Manager

asoule@co.clallam.wa.us 360-417-2424

Parametrix

Damon McAlister; Jan Rosholt



This project primarily funded by a Centennial Clean Water Program grant from the Washington Department of Ecology.

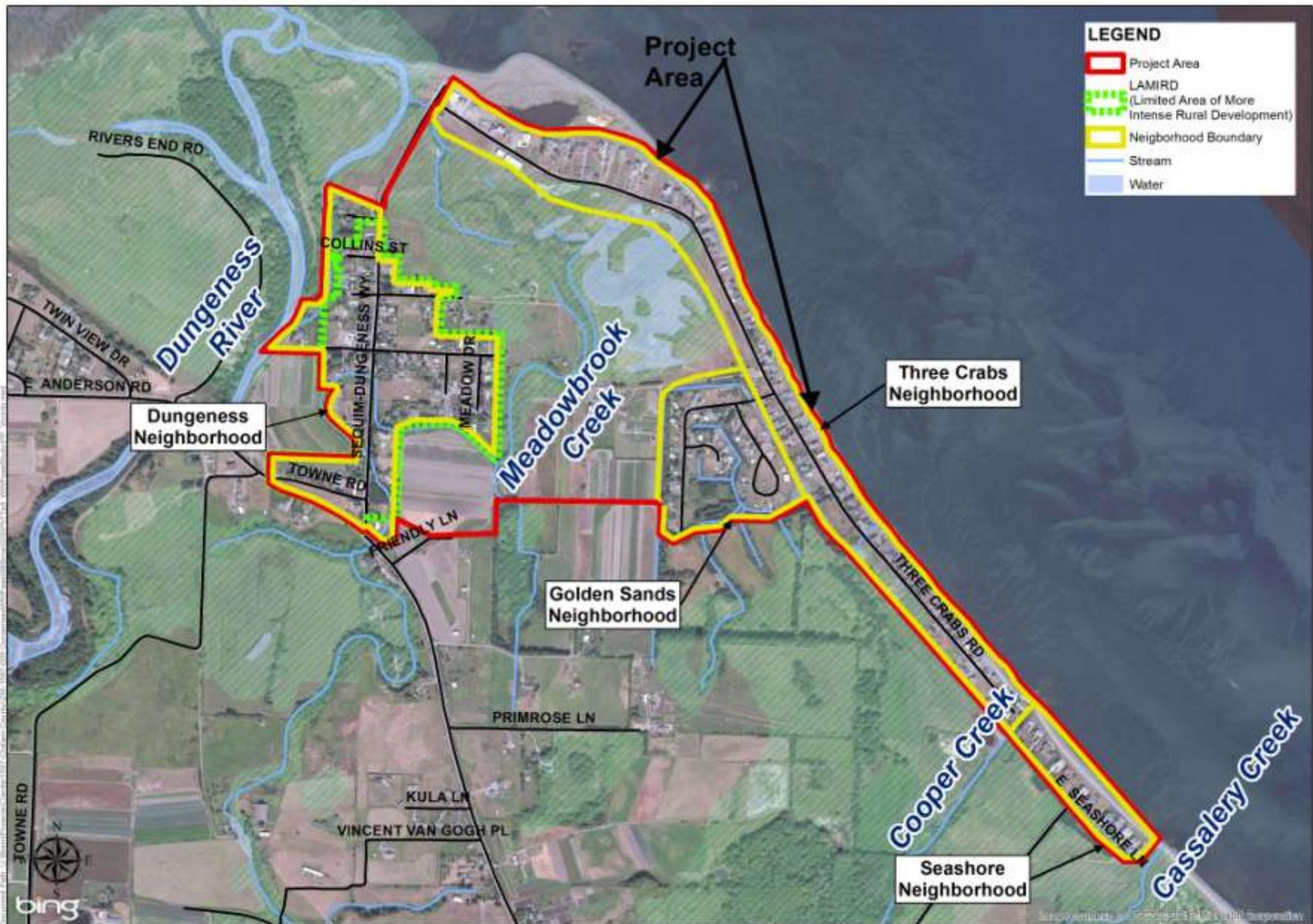
Goals for This Workshop

- Inform community about the study
- Describe components of each alternative
- Solicit community input



Project Outline

- Goals
 - Long-term solutions to septic system problems
 - Improved water quality
- Activities
 - Assess feasible technical solutions
 - Integrate community input into the selection of technical options → **Feasibility Study**
- Outcome
 - Recommended alternative w/ support from elected officials
 - A community equipped and mobilized to pursue the best alternative to improve water quality



Parametrix



AERIAL MAP
Dungeness Wastewater Treatment Feasibility Study

Project Steps

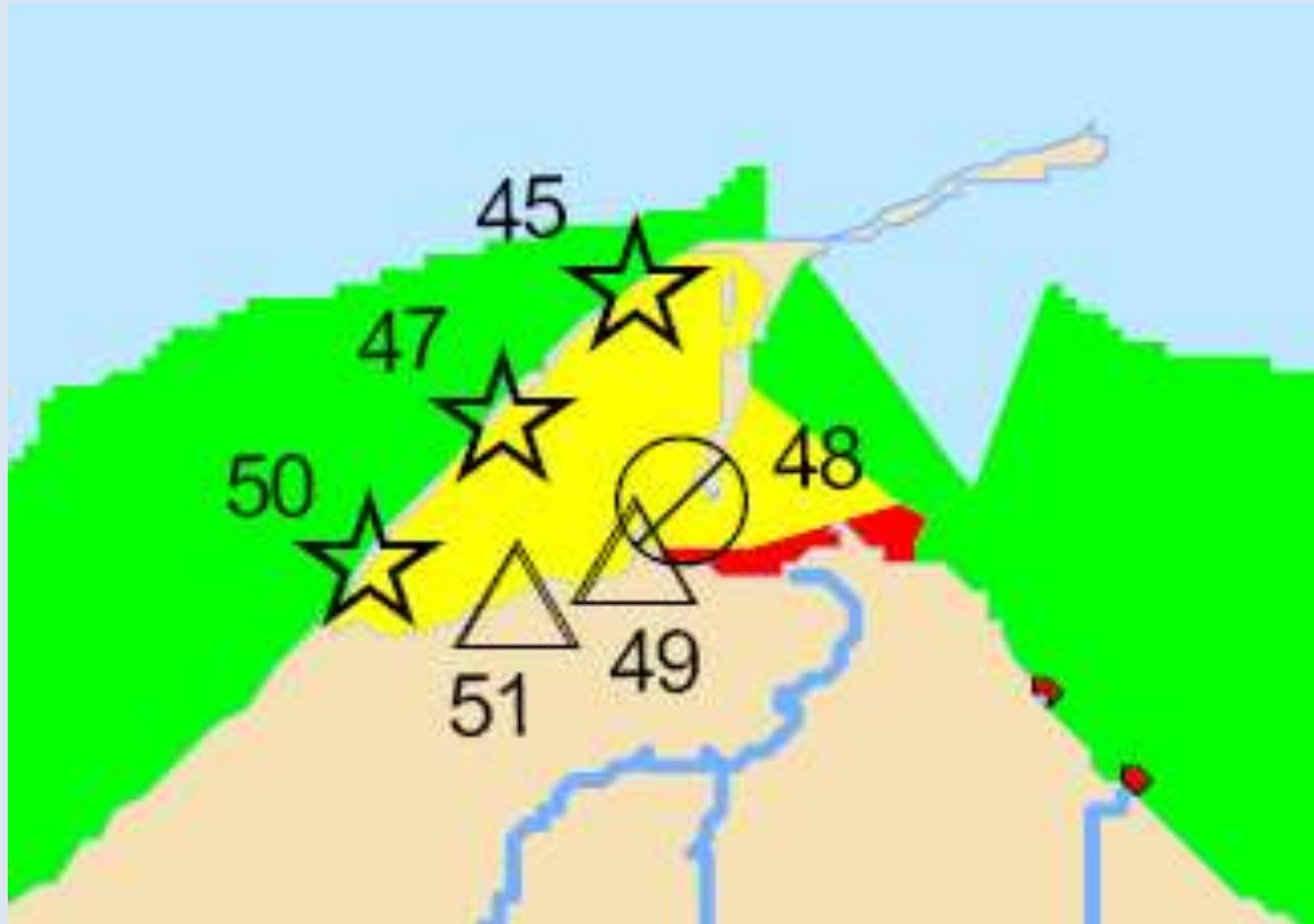
- 1) Community meeting #1 (May 24, 2012)
- 2) Community meeting #2 (June 23, 2012)
- 3) Workshops to discuss Draft Feasibility Study (February, March 2013)
- 4) Present and discuss Final Draft with Commissioners
- 5) Select recommended alternative
- 6) Finalize report (mid 2013)



Issues from County Perspective

- Onsite septic system function *long term*
- Water quality
- Possible habitat impacts
- Potential financial impact to property owners and community as a whole
- *How to balance these concerns*

Bacterial Contamination in Bay (as indicated by Commercial Shellfishing Closures)



Estimated Nitrogen Loading

- Assume 10 lbs N / person; 2 people / OSS
- Conventional OSS
 - 170 systems * N generated * 10% N reduction
 - 3060 lbs N / year
- Alternative OSS
 - 25 systems * N generated * 25% N reduction
 - 375 lbs N / year
- Nitrate-reducing OSS
 - 5 systems * N generated * 50% N reduction
 - 50 lbs N / year
- Total N loading = **1.7 tons N / year**

Changing Shoreline

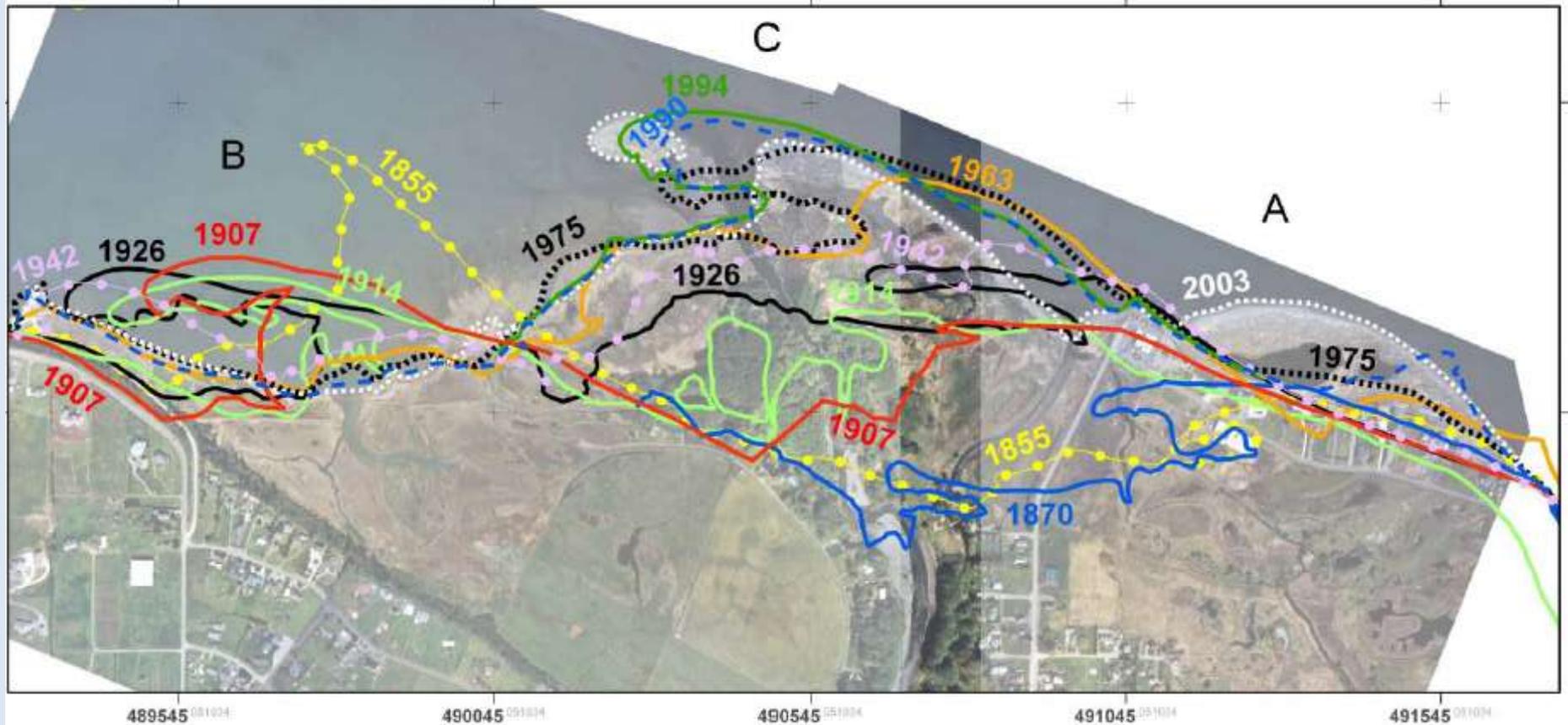


Figure 6 - Shoreline Changes since 1855 (Collins, 2006)

Survey Results from May & June

- OSS: 17 of 27 are gravity and >15 years old
- O&M: 24 of 27 inspected and/or pumped within past 5 years
- Operational Issues: 1 of 27 (high water table)
- Top Concerns (half or more votes):
 - Water quality of the Bay, streams, and drinking water
 - Safe shellfish harvesting
 - Beach erosion
 - Eelgrass habitat (and macroalgae/ulvoids)
 - Having a community wastewater system

Regulatory Considerations

- Growth Management Act (GMA)
- General Permitting –
 - County: Health Department (OSS), right-of-way, grading, critical areas review
 - State: Department of Health (DOH) LOSS, SEPA, NPDES (Construction and/or Discharge), WWTP Operator
 - Federal: NEPA, Endangered Species Act (ESA)

Estimated Existing Wastewater Flow by Neighborhood

Neighborhood	Total Lots	Flowrate
Three Crabs	105	28,350
Golden Sands	38	10,260
Dungeness*	74	19,980
Seashore	14	3,780
Total	231	62,370

Flow computed by multiplying number of occupied lots by 270 gallons per day (gpd) for residential lots.

*Includes seven business lots with a total flow of 1,600 gallons per day.

Potential Future Wastewater Flow by Neighborhood

Neighborhood	Total Lots	Flowrate
Three Crabs	122	32,940
Golden Sands	58	15,660
Dungeness*	99	26,730
Seashore	14	3,780
Total	293	79,110

Flow computed by multiplying number of occupied lots by 270 gallons per day (gpd) for residential lots.

*Includes seven business lots with a total flow of 1,600 gallons per day.

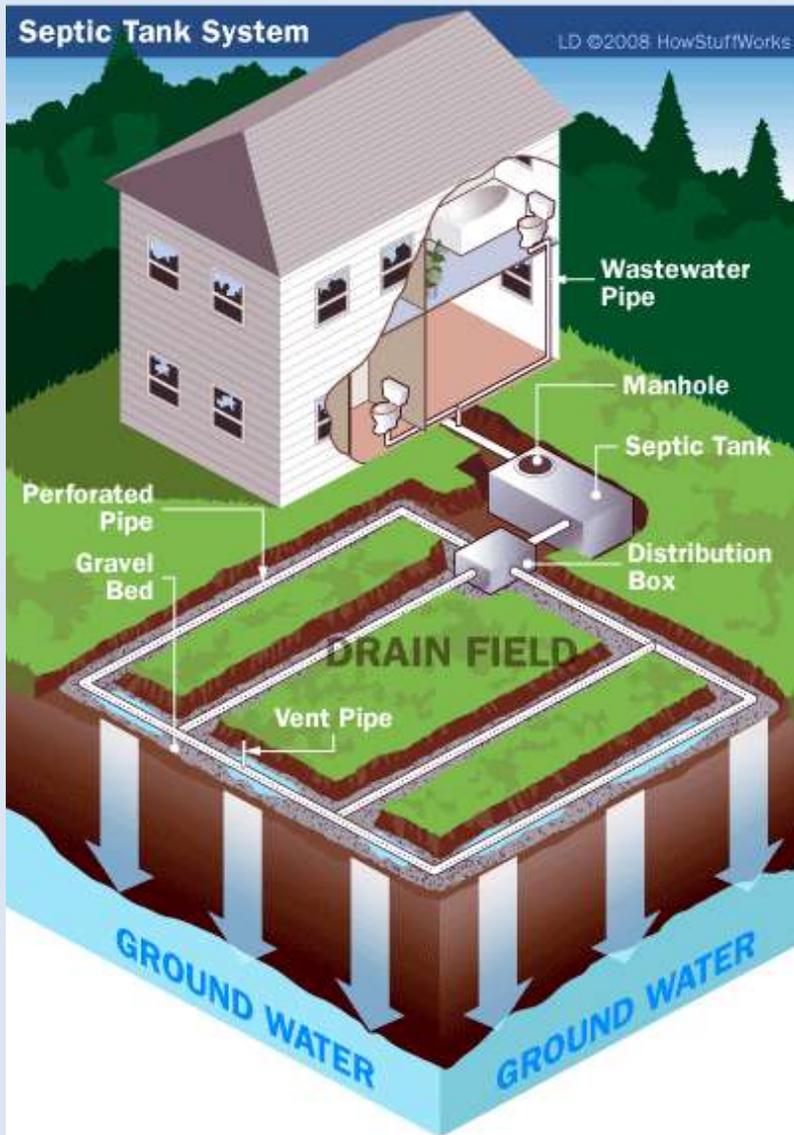
Wastewater Collection and Treatment Alternatives

1. Individual On-site septic systems (OSS)
2. Clustered Large On-site Sewage Systems (LOSS)
 - Collection System with Drainfield Disposal
3. Centralized Collection, Treatment and Disposal
4. Centralized Collection and Conveyance to Existing Wastewater Treatment Plant

Wastewater Collection and Treatment Alternatives

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On-site Septic Systems (OSS)



- Septic systems under 3,500 gallons per day
- Regulated by Clallam County

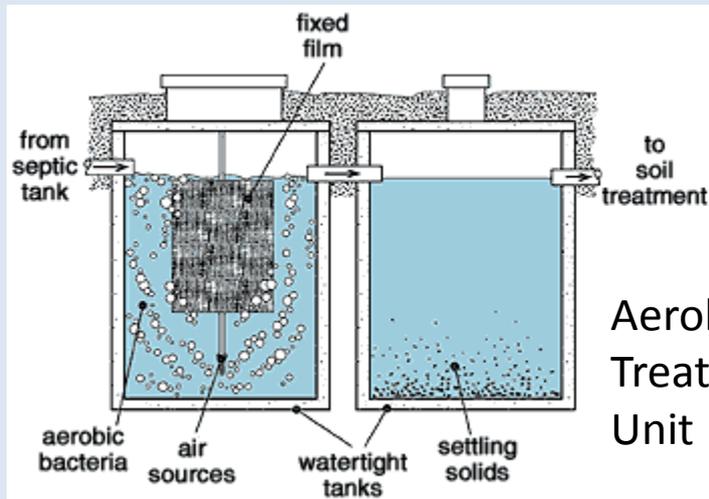
Types of OSS Systems



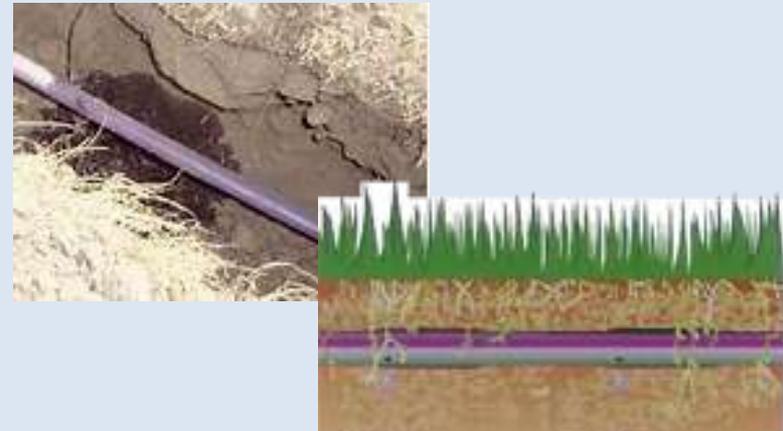
Sand Filter



Mound System



Aerobic Treatment Unit



Subsurface Drip System

Individual OSS System Cost Estimate

Item		Cost Range
Enhanced Treatment Unit:	\$5,000	\$20,000
Abandon Existing System:	\$1,000	\$1,000
Subtotal:	\$6,000	\$21,000
Engineering, Permitting and Construction Administration (25%):	\$1,500	\$5,300
Sales Tax (8.4%):	\$600	\$1,800
Contingency (20%):	\$1,200	\$4,200
TOTAL:	\$9,300	\$32,300

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Individual OSS “Bottom Line”

- Cost can range \$9,300 to \$32,300 per lot, depending on site/system conditions
- Maintenance, repairs or upgrade future costs will be borne solely by property owner (\$300 to \$400 per year)
- Generally does not treat nutrients
- Drainfield failures can result in release of fecal coliforms to surface waters
- Drainfield failures may occur due to plugging or high groundwater

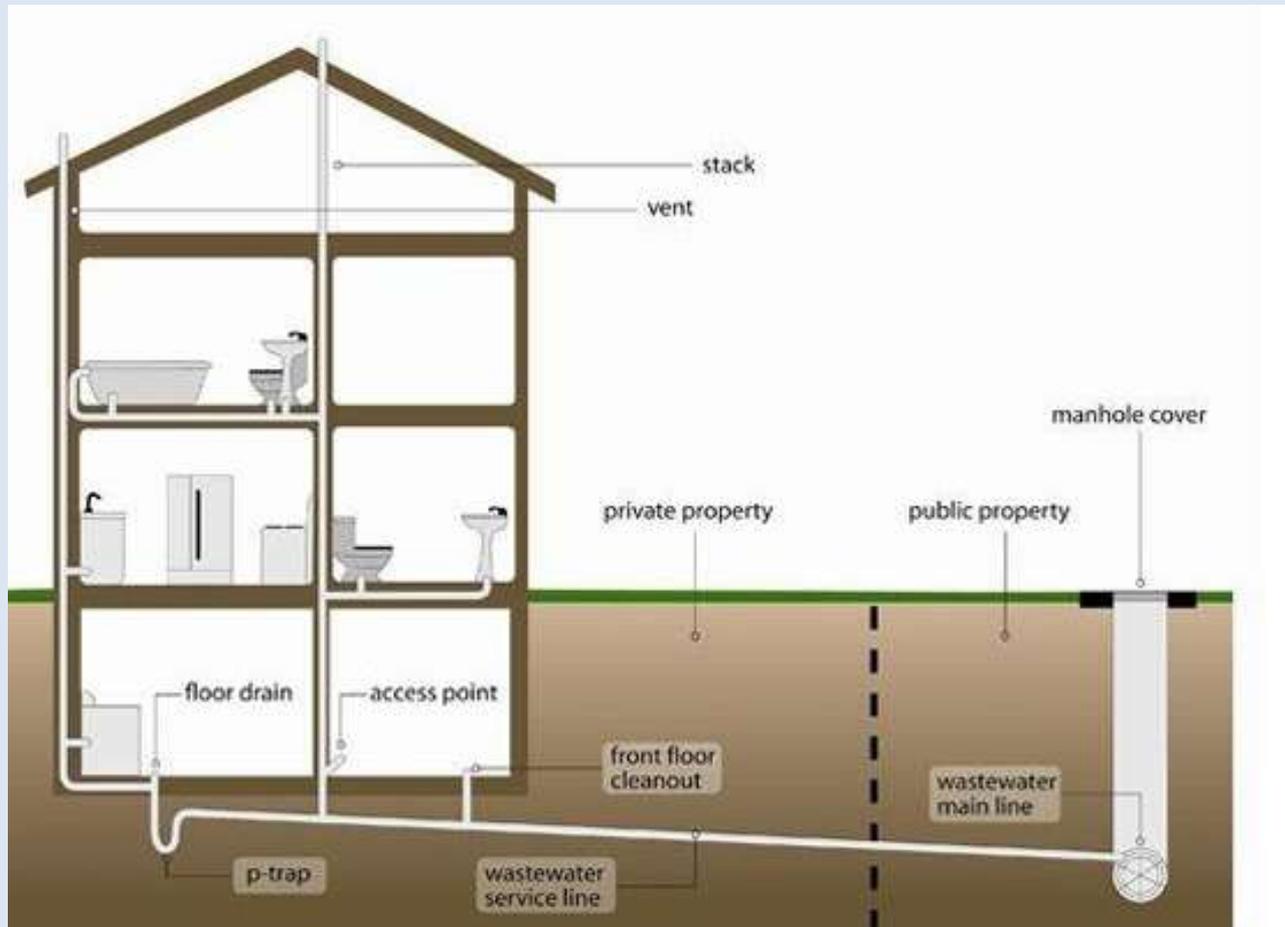
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Clustered Large On-site Sewage (LOSS) Systems

- 3,500 gallons to 100,000 gallons per day
- Regulated by Washington State Department of Health
- Requires wastewater collection system to convey flow to large drainfield
- System would serve partial or single neighborhood
- Requires operator(s) to oversee and maintain system
- Requires entity for billing and administration (oversight) of system

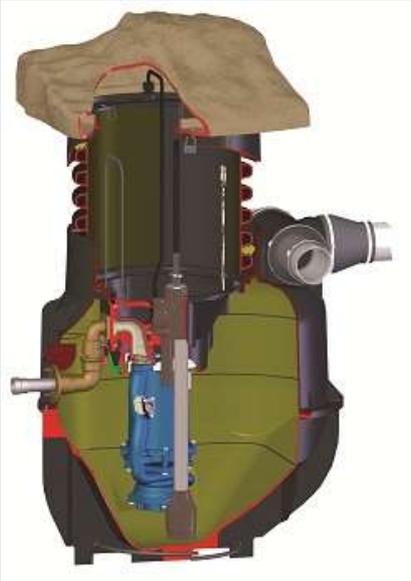
Clustered System Gravity Sewer Collection



Gravity Sewer Collection System (Not Considered)

- Pipes run deep (minimum 4 feet burial depth) and must be sloped 5 inches per 100 feet of pipe length
- Area is too flat for sloped pipes, requiring more lift stations due to pipe depth
- Infiltration and inflow (I/I) from groundwater entering pipe can increase flowrates

Clustered Grinder Collection System



Crane Pumps & Systems

Clustered Grinder Collection System Cost Estimate

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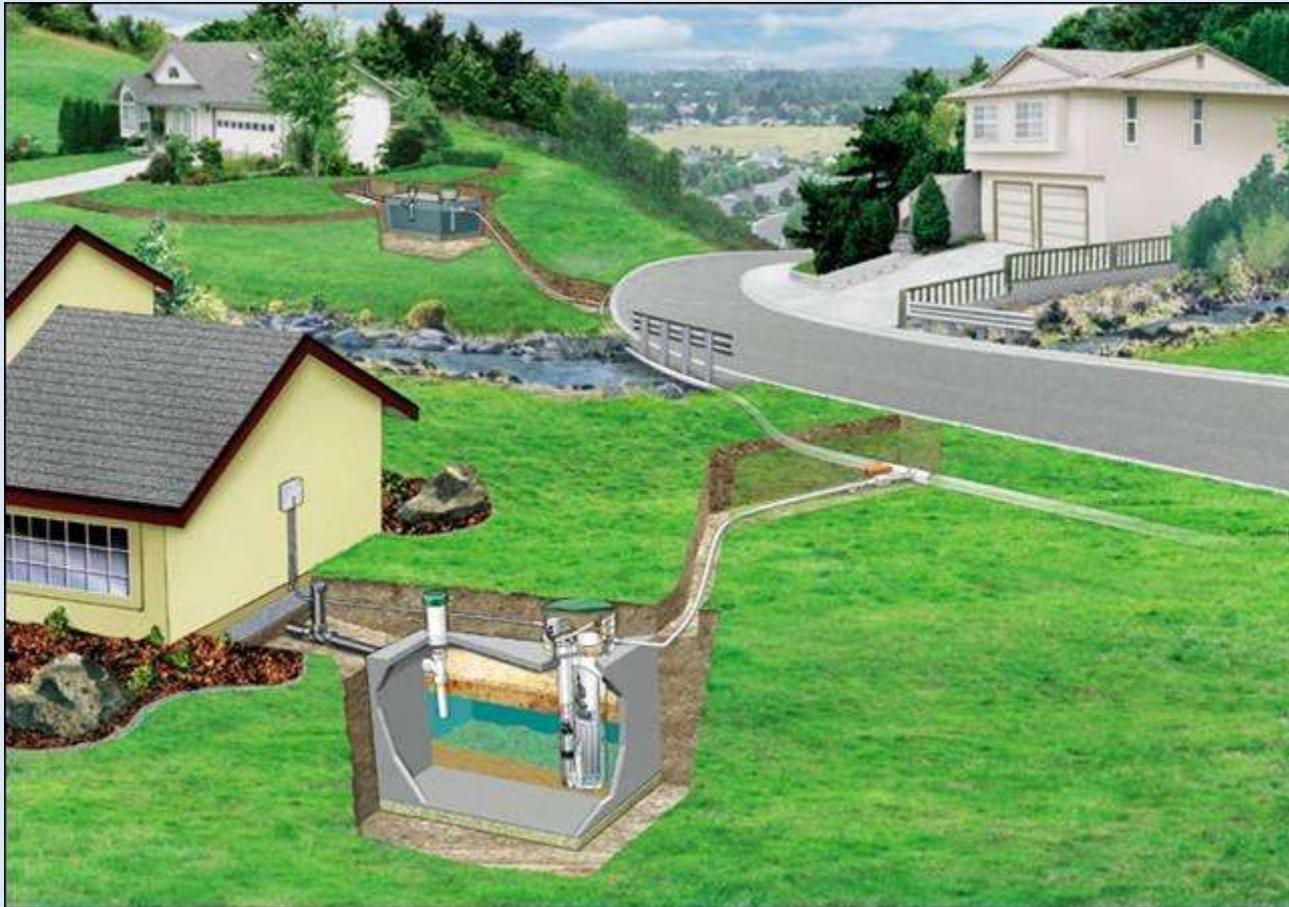
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Item	Dungeness	Three Crabs	Golden Sands	Seashore	Project Total
Contractor General Costs ^a (10%)	\$126,000	\$145,000	\$70,000	\$24,000	
Grinder Pump Assembly	\$684,000	\$842,000	\$401,000	\$97,000	
2" to 4" Low Pressure Collection Piping	\$206,000	\$219,000	\$96,000	\$35,000	
Pavement Trenching/Restoration	\$316,000	\$335,000	\$147,000	\$59,000	
Piping to Disposal Facility	<u>\$52,000</u>	<u>\$52,000</u>	<u>\$52,000</u>	<u>\$52,000</u>	
Subtotal	\$1,384,000	\$1,593,000	\$766,000	\$262,000	\$4,005,000
Engineering ^b (25%)	\$346,000	\$399,000	\$192,000	\$66,000	
Sales Tax (8.4%)	\$117,000	\$134,000	\$65,000	\$23,000	
Contingency (35%)	<u>\$485,000</u>	<u>\$558,000</u>	<u>\$269,000</u>	<u>\$92,000</u>	
TOTAL:	\$2,332,000	\$2,684,000	\$1,292,000	\$443,000	\$6,751,000

^a Includes mobilization, demobilization, and traffic control

^b Includes project design, permits, surveying, and construction management.

Clustered STEP Collection System



Orengo

Clustered STEP Collection System Cost Estimate

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Item	Dungeness	Three Crabs	Golden Sands	Seashore	Project Total
Contractor General Costs ^a (10%)	\$122,000	\$112,000	\$68,000	\$24,000	
Grinder Pump Assembly	\$644,000	\$793,000	\$377,000	\$91,000	
2" to 4" Low Pressure Collection Piping	\$206,000	\$219,000	\$96,000	\$35,000	
Pavement Trenching/ Restoration	\$316,000	\$335,000	\$147,000	\$54,000	
Piping to Disposal Facility	<u>\$52,000</u>	<u>\$52,000</u>	<u>\$52,000</u>	<u>\$52,000</u>	
Subtotal	\$1,340,000	\$1,511,000	\$740,000	\$256,000	\$3,847,000
Engineering ^b (25%)	\$335,000	\$378,000	\$185,000	\$64,000	
Sales Tax (8.4%)	\$112,000	\$127,000	\$63,000	\$22,000	
Contingency (35%)	<u>\$469,000</u>	<u>\$529,000</u>	<u>\$259,000</u>	<u>\$90,000</u>	
TOTAL:	\$2,256,000	\$2,545,000	\$1,247,000	\$432,000	\$6,480,000

^a Includes mobilization, demobilization, and traffic control

^b Includes project design, permits, surveying, and construction management.

Clustered LOSS Drainfield



Infiltrator Systems Inc



LOSS Drainfield Size

NEIGHBORHOOD	FLOW RATE (GPD)	DRAINFIELD SIZE*	
Dungeness	26,730	367,538 ft ²	8.4 acres
Three Crabs	32,940	452,925 ft ²	10.4 acres
Golden Sands	15,660	215,325 ft ²	4.9 acres
Seashore	3,780	51,975 ft ²	1.2 acres

*Drainfield area likely to be split into more than one site to keep flow rate per drainfield below 14,000 gpd and avoid CARA impacts.

Clustered Drainfield System Cost Estimate

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Item	Dungeness	Three Crabs	Golden Sands	Seashore
Contractor General Costs ^a (10%)	\$70,000	\$85,000	\$43,000	\$12,000
Land Acquisition	\$84,000	\$104,000	\$49,000	\$12,000
Site Grading	\$9,000	\$11,000	\$5,000	\$2,000
Drainfield Piping System	\$294,000	\$364,000	\$172,000	\$42,000
Dosing Facility/ Emergency Storage	\$75,000	\$88,000	\$45,000	\$10,000
Nutrient Treatment ^c	\$270,000	\$330,000	\$160,000	\$40,000
Electrical/I&C	<u>\$50,000</u>	<u>\$50,000</u>	<u>\$40,000</u>	<u>\$20,000</u>
Subtotal:	\$852,000	\$1,032,000	\$514,000	\$138,000
Engineering ^b (25%)	\$213,000	\$258,000	\$129,000	\$35,000
Sales Tax (8.4%)	\$72,000	\$87,000	\$44,000	\$12,000
Contingency (35%)	<u>\$299,000</u>	<u>\$362,000</u>	<u>\$180,000</u>	<u>\$49,000</u>
TOTAL:	\$1,436,000	\$1,739,000	\$867,000	\$234,000

^a Includes mobilization, demobilization, and traffic control.

^b Includes project design, permits, surveying, and construction management.

^c Systems above 14,000 gallons per day flowrates will require additional treatment due to aquifer recharge critical area.

Clustered Drainfield System Annual O&M Cost Estimate

Item	Dungeness	Three Crabs	Golden Sands	Seashore
Pump Out Septic/Dosing Tank	\$5,000	\$5,000	\$3,000	\$1,000
Operation and Maintenance Staff	\$7,000	\$8,000	\$4,000	\$1,000
Billing/Collection Administration	\$5,000	\$6,000	\$2,000	\$1,000
Drainfield Equipment Repair/Replace	\$25,000	\$29,000	\$14,000	\$4,000
Drainfield Electrical Usage	\$1,000	\$1,000	\$1,000	\$1,000
STEP Maintenance	<u>\$30,000</u>	<u>\$36,000</u>	<u>\$17,000</u>	<u>\$5,000</u>
Subtotal:	\$73,000	\$85,000	\$42,000	\$13,000
Sales Tax (8.4%)	\$7,000	\$8,000	\$4,000	\$2,000
Contingency (35%)	<u>\$8,000</u>	<u>\$9,000</u>	<u>\$5,000</u>	<u>\$2,000</u>
TOTAL:	\$88,000	\$102,000	\$51,000	\$17,000

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Clustered System Cost Estimate Summary

Item	Dungeness	Three Crabs	Golden Sands	Seashore	Project Total
STEP Pump Collection System	\$2,256,000	\$2,545,000	\$1,247,000	\$432,000	\$6,480,000
Drainfield	<u>\$1,436,000</u>	<u>\$1,739,000</u>	<u>\$867,000</u>	<u>\$234,000</u>	<u>\$4,276,000</u>
Total Capital Cost:	\$3,692,000	\$4,284,000	\$2,114,000	\$666,000	\$10,756,000
Total O&M Cost:	\$88,000	\$102,000	\$51,000	\$17,000	\$258,000
Number of Lots	99	122	58	14	293
Total Capital Cost per Lot	<u>\$37,290</u>	<u>\$35,120</u>	<u>\$36,450</u>	<u>\$47,570</u>	<u>\$36,710</u>
20 Yr Capital Funding Retirement per Lot	\$1,120	\$1,060	\$1,100	\$1,430	\$1,100
Annual O&M per Lot	\$890	\$840	\$880	\$1,220	\$880
TOTAL ANNUAL COST PER LOT :	\$2,010	\$1,900	\$1,980	\$2,650	\$1,980

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Clustered LOSS “Bottom Line”

- System maintenance not performed by individual property owners but by LOSS operator(s)
- Maintenance, repairs or upgrade future costs will be shared by property owners
- Will require creation of entity for billing and administration (oversight) of system
- Some removal of nutrients (nutrient treatment)
- Drainfield failure can result in release of fecal coliforms to surface waters
- Drainfield failure may occur due to plugging or high groundwater

Clustered LOSS “Bottom Line” (Cont.)

- Drainfield failures less common than for Individual OSS
- Systems over 14,000 gpd need additional treatment due to aquifer recharge area (CARA)
- Requires acres of suitable land for drainfield
- Regulated by State Department of Health (DOH) – LOSS Operating permit

Wastewater Collection and Treatment Alternatives

1. Individual On-site septic systems (OSS)
2. Clustered Large On-site Sewage Systems (LOSS)
 - Collection System with Drainfield Disposal
3. **Centralized Collection, Treatment and Disposal**
4. Centralized Collection and Conveyance to Existing Wastewater Treatment Plant

Centralized Collection, Treatment and Disposal

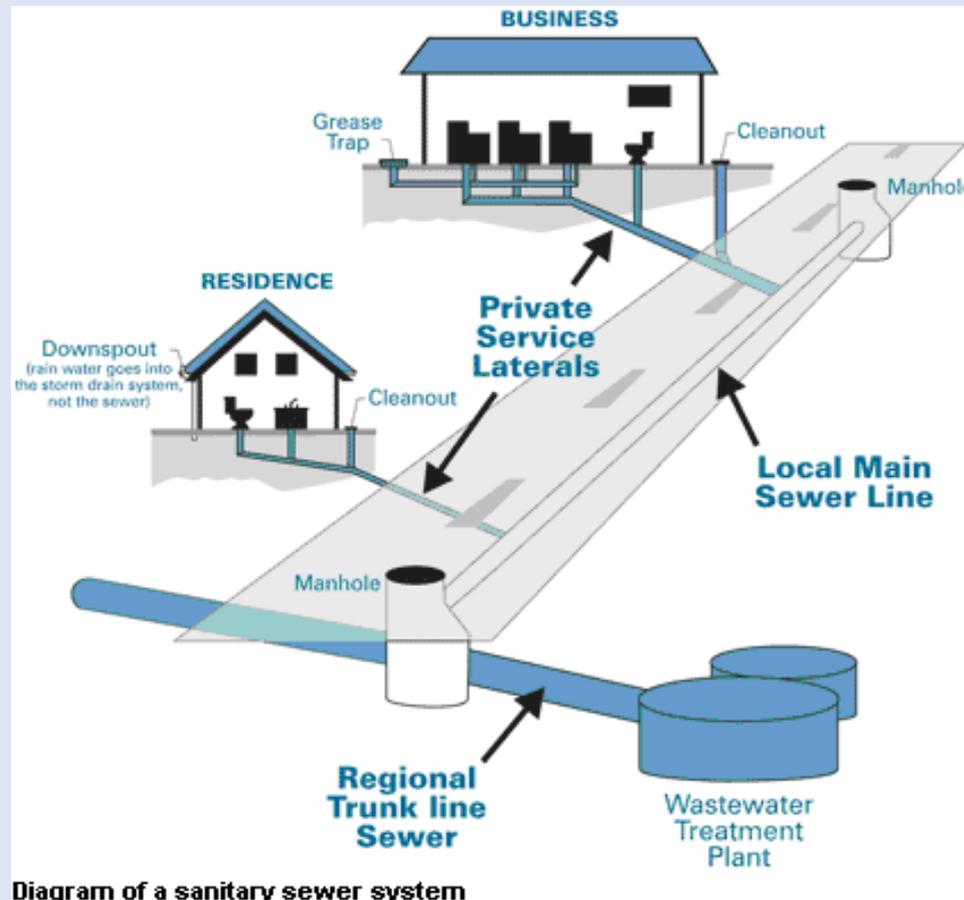


Diagram of a sanitary sewer system

Baton Rouge Projects

Centralized Collection System

- Types are:
 - STEP System (as described for Clustered Systems)
 - Grinder Pump System (as described for Clustered Systems)
 - Vacuum System

Vacuum Collection System

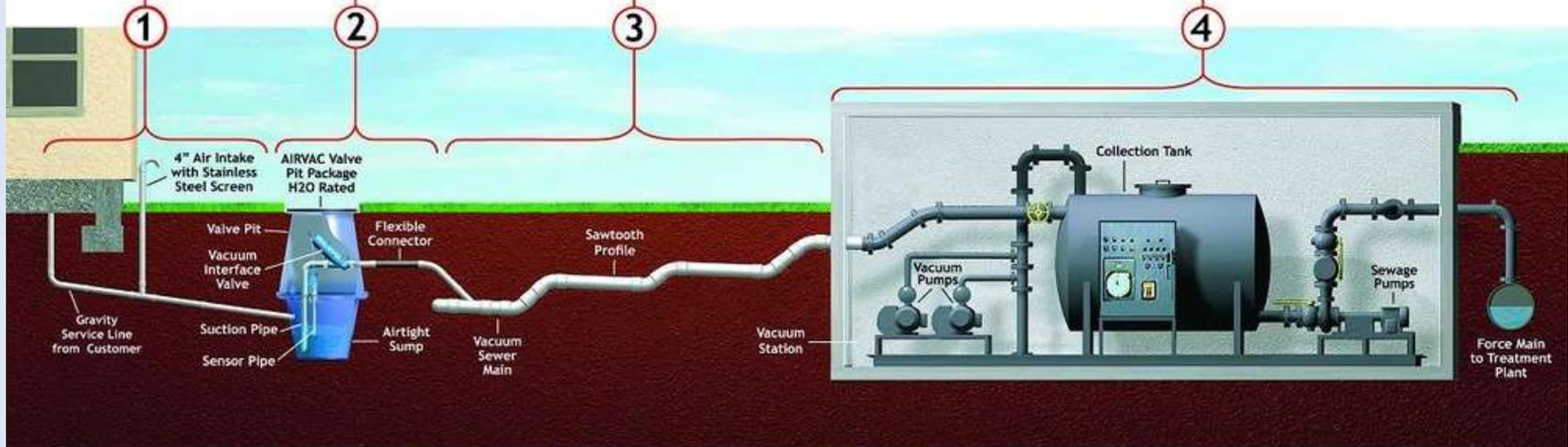
How AIRVAC Works:

1 A traditional gravity line carries wastewater from the customer to an AIRVAC valve pit package.

2 When 10 gallons of wastewater collects in the sump, the AIRVAC valve opens and differential pressure propels the contents into the vacuum main.

3 Wastewater travels at 15 to 18 fps in the vacuum main, which is laid in a sawtooth fashion to insure adequate vacuum levels at the end of each line.

4 Wastewater enters the collection tank. When the tank fills to a predetermined level, sewage pumps transfer the contents to the treatment plant via a force main.



Vacuum Collection System Cost Estimate

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ITEM	TOTAL FOR COMMUNITY
General Construction Costs ^a (10%)	\$375,000
Resident Pit Assemblies	\$1,617,000
4" to 6" Vacuum Collection Piping	\$701,000
Vacuum Pump Station	\$544,000
Pavement Trenching/Restoration	\$848,000
Piping to Disposal Facility	<u>\$42,000</u>
Subtotal	\$4,127,000
Engineering ^b (25%)	\$1,032,000
Sales Tax (8.4%)	\$347,000
Contingency (35%)	<u>\$1,444,000</u>
TOTAL	\$6,950,000

^a Includes mobilization, demobilization, and traffic control

^b Includes project design, permits, surveying, and construction management.

Collection System Cost Estimate Summary

Collection System	Total Cost of System
STEP	\$6,480,000
Grinder Pump	\$6,751,000
Vacuum	\$6,950,000

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Centralized Treatment - MBR

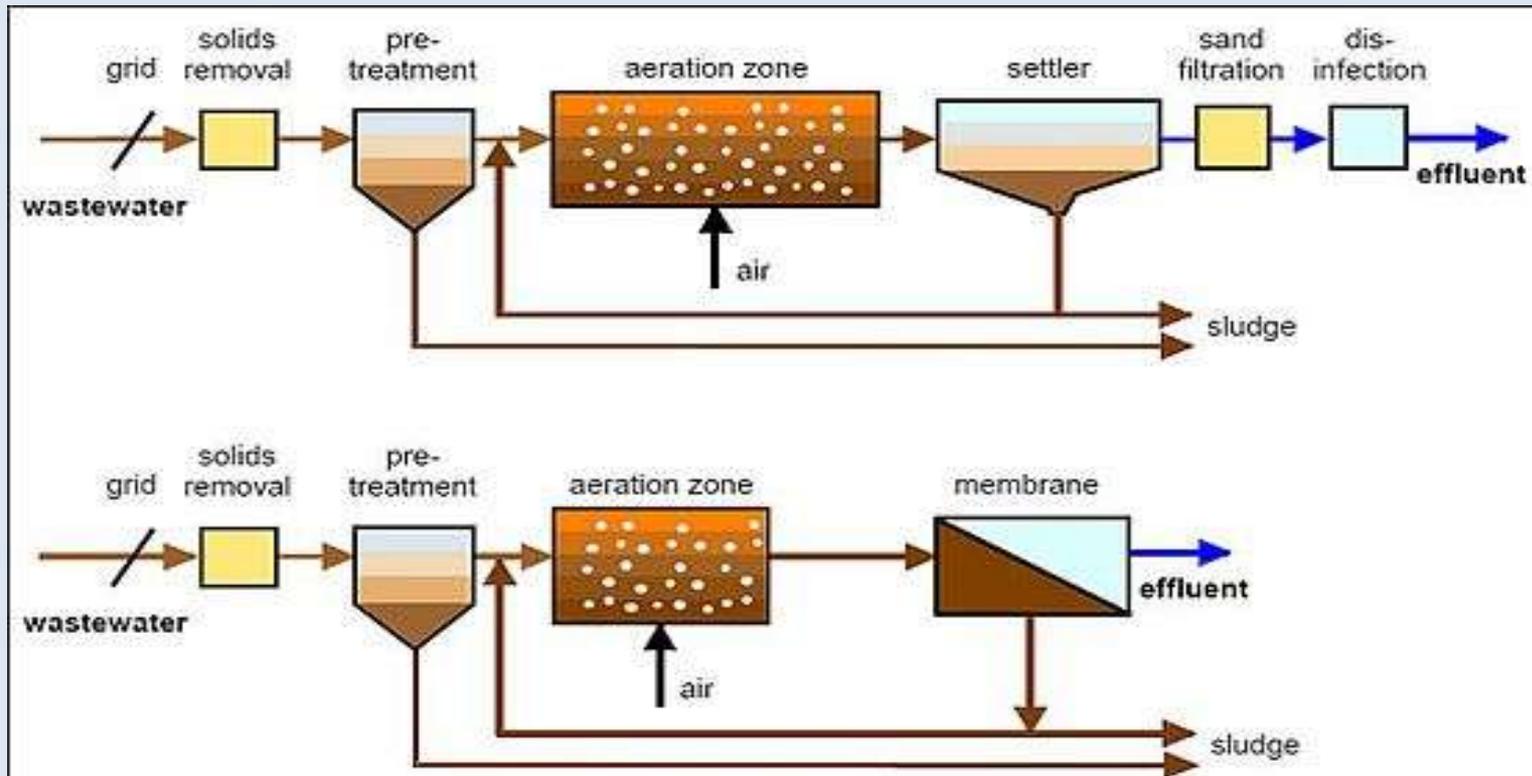


Membrane Bioreactor



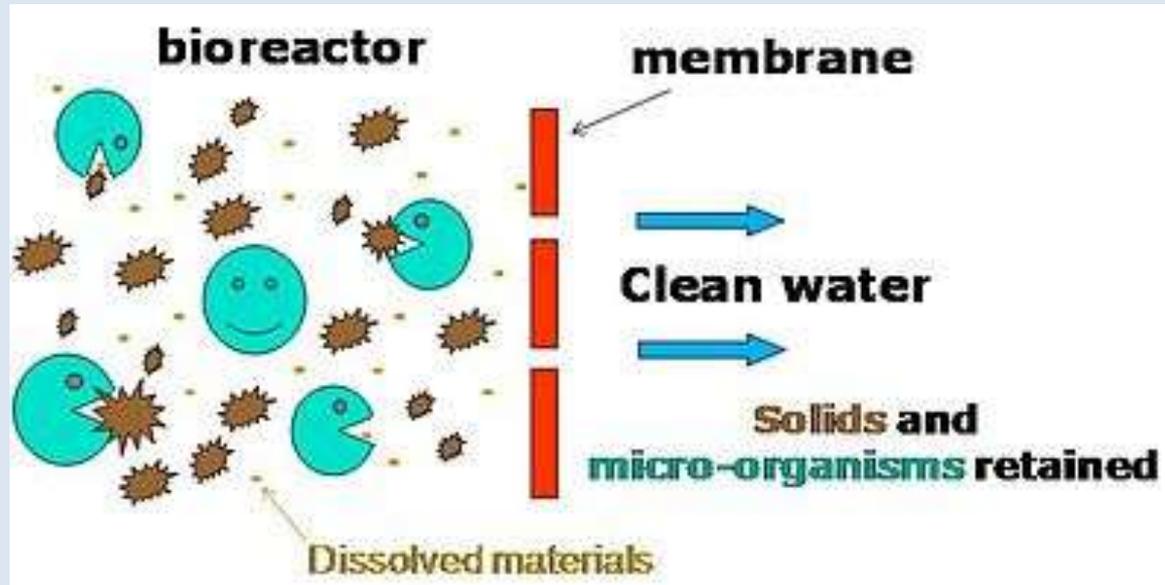
What is MBR Technology?

- Combination of Activated Sludge Treatment and Micro-Filtration



How it Works

- Physical Barrier Provides for Complete Disinfection



MBR Treatment System Cost Estimate

ITEM	COST RANGE	
General Construction Costs ^a (10%)	\$275,000	\$413,000
MBR Facility	<u>\$2,750,000</u>	<u>\$4,125,000</u>
Subtotal	\$3,025,000	\$4,538,000
Engineering ^b (25%)	\$757,000	\$1,135,000
Sales Tax (8.4%)	\$255,000	\$328,000
Contingency (35%)	<u>\$1,059,000</u>	<u>\$1,589,000</u>
TOTAL	\$5,096,000	\$7,644,000

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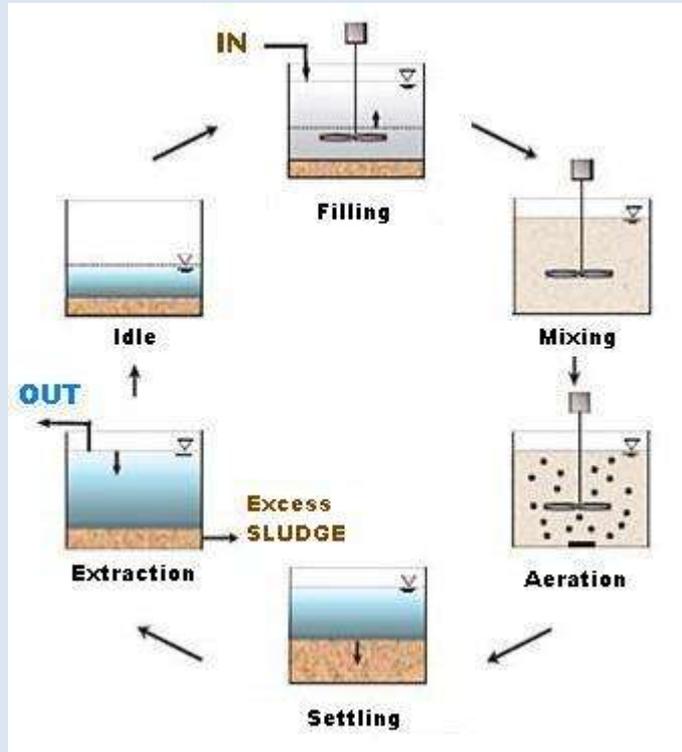
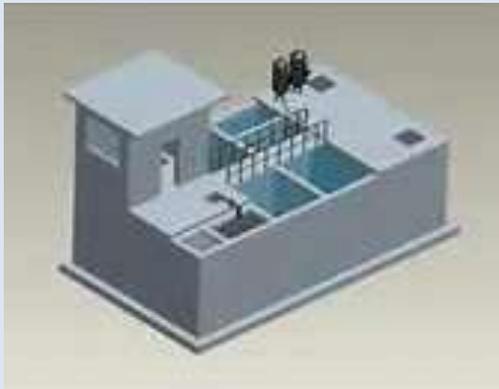
Centralized Treatment - SBR

Sequencing Batch Reactor



SBR Technology

Ecosystem Technologies Inc (ESTI)



Ecosystem Technologies Inc (ESTI)

T&D Water Technologies and Development © 2009

SBR Treatment System Cost Estimate

ITEM	COST RANGE	
General Construction Costs ^a (10%)	\$248,000	\$385,000
SBR Facility	<u>\$2,475,000</u>	<u>\$3,850,000</u>
Subtotal	\$2,723,000	\$4,235,000
Engineering ^b (25%)	\$681,000	\$1,059,000
Sales Tax (8.4%)	\$229,000	\$356,000
Contingency (35%)	<u>\$954,000</u>	<u>\$1,483,000</u>
TOTAL	\$4,587,000	\$7,133,000

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Drainfield Disposal Cost Estimate

ITEM	COST
General Construction Costs ^a (10%)	\$109,000
Land Acquisition	\$250,000
Site Grading	\$25,000
Drainfield Piping	\$875,000
Dosing Facility	\$113,000
Electrical I&C	<u>\$75,000</u>
Subtotal	\$1,447,000
Engineering ^b (25%)	\$362,000
Sales Tax (8.4%)	\$122,000
Contingency (35%)	<u>\$507,000</u>
TOTAL	\$2,438,000

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Land Application Disposal



Geophotos



USGS

Land Application Disposal Cost Estimate

ITEM	COST
General Construction Costs ^a (10%)	\$201,000
Sprayer Pump and Controller	\$250,000
Irrigation Piping and Spray Heads	\$700,000
Temporary Storage Lagoon (30 days)	\$720,000
Land Acquisition (26 acres)	\$260,000
Electric/I&C	<u>\$75,000</u>
Subtotal	\$2,206,000
Engineering ^b (25%)	\$552,000
Sales Tax (8.4%)	\$186,000
Contingency (35%)	<u>\$773,000</u>
TOTAL:	\$3,717,000

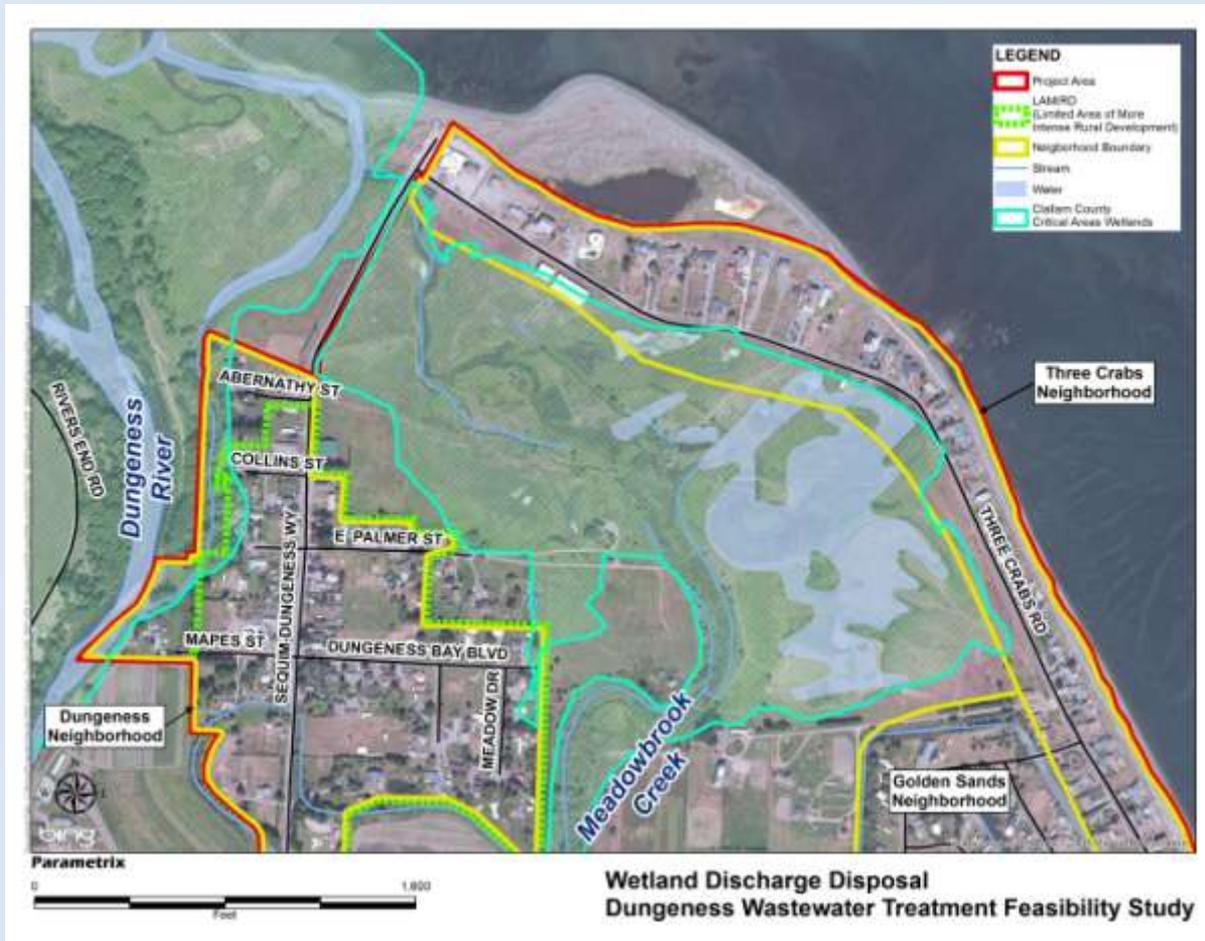
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Wetland Discharge Disposal



Wetland Discharge Disposal Cost Estimate

ITEM	COST
General Construction Costs ^a (10%)	\$49,000
6" Outfall Main	\$259,000
6" Outfall Diffuser	\$74,000
Effluent Chiller Unit	\$67,000
Effluent Re-aeration Unit	<u>\$76,000</u>
Subtotal	\$530,000
Engineering ^b (35%)	\$186,000
Sales Tax (8.4%)	\$45,000
Contingency (35%)	<u>\$186,000</u>
TOTAL:	\$947,000

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Direct Stream Discharge Disposal



Westsound Engineering

Direct Stream Discharge Cost Estimate

ITEM	COST
General Construction Costs ^a (10%)	\$38,000
6" Outfall Main	\$149,000
6" Outfall Diffuser	\$74,000
Effluent Chiller Unit	\$72,000
Effluent Re-Aeration Unit	<u>\$76,000</u>
Subtotal	\$409,000
Engineering ^b (35%)	\$144,000
Sales Tax (8.4%)	\$35,000
Contingency (35%)	<u>\$144,000</u>
TOTAL:	\$732,000

^a Includes mobilization, demobilization, and traffic control

^b Includes project design, permits, surveying, and construction management.

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Discharge Cost Estimate Summary

DISPOSAL METHOD	COST
Drainfield Disposal	\$2,438,000
Land Application	\$3,717,000
Wetland Discharge	\$947,000
Direct Stream Discharge	\$732,000

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Centralized Collection, Treatment and Disposal Cost Summary

ITEM	COST RANGE	
Collection System	\$6,480,000	\$6,950,000
Treatment System	\$4,587,000	\$7,644,000
Disposal System	\$732,000	\$3,717,000
TOTAL	\$11,799,000	\$18,311,000

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Centralized System O&M Cost Estimate

ITEM	COST
Operation and Maintenance Staff	\$103,000
Billing/Collections Administration	\$13,000
Sludge Disposal	\$47,000
Equipment Repair/Replacement (Pumps, controls, etc)	\$80,000
Electrical Usage	\$21,000
Laboratory Testing	\$11,000
Individual STEP Maintenance	<u>\$87,000</u>
Subtotal	\$362,000
Sales Tax (8.4%)	\$31,000
Contingency (10%)	<u>\$37,000</u>
TOTAL	\$429,000

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Centralized System Cost Estimate Summary

Item	Cost Range	
STEP Pump Collection System	\$6,480,000	\$6,480,000
Sequencing Batch Reactor (SBR)	\$4,587,000	\$7,133,000
Stream/Wetland Disposal System	<u>\$732,000</u>	<u>\$947,000</u>
Total Capital Cost:	\$11,799,000	\$14,560,000
Total O&M Cost:	\$429,000	\$429,000
Number of Lots	293	293
Total Capital Cost per Lot	<u>\$40,270</u>	<u>\$49,700</u>
20 Yr Capital Funding Retirement per Lot	\$1,210	\$1,500
Annual O&M per Lot	\$1,470	\$1,470
TOTAL ANNUAL COST PER LOT :	\$2,680	\$2,970

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Centralized System “Bottom Line”

- System maintenance not performed by individual property owners but by LOSS operator(s)
- Maintenance, repairs or upgrade future costs will be shared by property owners
- Will require creation of entity for billing and administration (oversight) of system

Centralized System “Bottom Line” (Cont.)

- High level of nutrient removal
- Disinfection, which is part of system, removes most fecal coliform
- Treatment/discharge methods not dependent on soil conditions
- Treatment can be modified to meet future regulations

Centralized System “Bottom Line” (Cont.)

- Regulated by State Department of Health (DOH) – LOSS Operating permit
- Discharge methods will require more permitting/studies

Wastewater Collection and Treatment Alternatives

1. Individual On-site septic systems (OSS)
2. Clustered Large On-site Sewage Systems (LOSS)
 - Collection System with Drainfield Disposal
3. Centralized Collection, Treatment and Disposal
4. Centralized Collection and Conveyance to Existing Wastewater Treatment Plant

Centralized Collection and Conveyance to Existing WWTP



City of Bellevue



Sunland WWTP



Google Earth



Pump
Station
Location

SunLand
WWTP

Conveyance to Existing SunLand WWTP Cost Estimate

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ITEM	COST
General Construction Costs ^a (10%)	\$110,000
Traffic Control	\$60,000
250 gpm Pump Station	\$500,000
6" Force Main Piping	\$492,000
Gravel Shoulder Restoration	\$47,000
Upgrade to SunLand Facility ^b	<u>\$2,500,000</u>
Subtotal	\$3,709,000
Engineering ^c (25%)	\$928,000
Sales Tax (8.4%)	\$312,000
Contingency (35%)	<u>\$1,299,000</u>
TOTAL:	\$6,248,000

^a Includes mobilization, demobilization, and traffic control.

^b Rough estimate based on cost for new SBR presented earlier. A more detailed study would be required to analyze the existing facility and quantify the necessary upgrades.

^c Includes project design, permits, surveying, and construction management.

Sequim Water Reclamation Facility (WRF)





Pump Station Location

Connection Point (North End Pump Station)

Conveyance to Sequim WRF Cost Estimate

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ITEM	COST
General Construction Costs ^a (10%)	\$236,000
Traffic Control	\$100,000
Dungeness 250 gpm Pump Station	\$500,000
4" Force Main Piping	\$798,000
Gravel Shoulder Restoration	\$76,000
Upgrade Sequim Pump Station	\$50,000
Treatment Plant Capacity Reserve Cost	<u>\$997,000</u>
Subtotal	\$2,774,000
Engineering ^b (25%)	\$694,000
Sales Tax (8.4%)	\$234,000
Contingency (35%)	<u>\$971,000</u>
TOTAL	\$4,673,000

^a Includes mobilization, demobilization, and traffic control

^b Includes project design, permits, surveying, and construction management.

* Additional connection fee for system upgrades may be needed

Conveyance to Sequim O&M Cost Estimate

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ITEM	COST
Operation and Maintenance Staff	\$19,000
Billing/Collections Administration	\$13,000
Pump Station Equipment Repair/Replacement	\$19,000
Electrical Usage	\$6,000
Individual STEP Maintenance	<u>\$87,000</u>
Subtotal	\$144,000
Sales Tax (8.4%)	\$13,000
Contingency (10%)	<u>\$15,000</u>
Total Dungeness Collection System	\$172,000
Annual Sequim Collection System Fee	\$32,000
Annual Sequim Collection System Fee	<u>\$261,000</u>
TOTAL	\$465,000

Conveyance System to Existing WWTP O&M Cost Estimate Summary

Item	Cost Range
STEP Pump Collection System	\$6,480,000
Pump Station and Force Main System	\$2,733,000
Sequim Sewer System Capacity Purchase	<u>\$1,940,000</u>
Total Capital Cost:	\$11,153,000
Dungeness Conveyance System O&M	\$190,000
Sequim Sewer Fee*	<u>\$293,000</u>
Total O&M Cost:	<u>\$465,000</u>
Number of Lots	293
Total Capital Cost per Lot	<u>\$38,070</u>
20 Yr Capital Funding Retirement per Lot	\$1,150
Annual O&M per Lot	\$1,600
TOTAL ANNUAL COST PER LOT :	\$2,750

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Existing WWTP System “Bottom Line”

- System maintenance not performed by individual property owners
- High level of nutrient removal
- Disinfection, which is part of system, removes most fecal coliform
- Beneficial use of treated wastewater (reclaimed water)

Existing WWTP System “Bottom Line”

(Cont.)

- Responsibility of treatment and disposal system compliance not with community
- Requires significant governmental policy changes at county and state levels

Cost Summary of Alternatives

ALTERNATIVE	CAPITAL COST	O&M COST
Individual On-Site Septic Systems	\$9,300 to \$32,300 (per lot)	\$300 to \$400/yr per lot
Clustered (Neighborhood) Systems	\$10,756,000	\$258,000/yr
Centralized (Entire Project Area) System	\$14,560,000	\$429,000/yr
Centralized Collection System to Sequim WRF	\$11,153,000	\$465,000/yr

ALTERNATIVE	CAPITAL COST (PER LOT)	O&M COST (PER LOT)
Individual On-Site Septic Systems	\$970/yr	\$400/yr
Clustered (Neighborhood) Systems	\$1,100/yr	\$880/yr
Centralized (Entire Project Area) System	\$1,500/yr	\$1,470/yr
Centralized Collection System to Sequim WRF	\$1,150/yr	\$1,600/yr

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Benefits Scoring - Environment

- **Long Term Fecal Coliform Reduction:** How well does system potentially treat fecal coliform and will it do so for its lifetime
- **Long Term Nutrient Reduction:** How well does system potentially treat nutrients (nitrogen) and will it do so for its lifetime
- **Drinking Water Quality Protection:** Does system protect drinking water sources (aquifers)
- **Wetland Water Quality Protection :** Does alternative enhance or provide a benefit to the local wetlands

Benefits Scoring - Environment

FACTORS	INDIVIDUAL OSS	CLUSTERED SYSTEM	CENTRALIZED SYSTEM	CENTRALIZED SYSTEM TO SEQUIM
Long Term Fecal Coliform Reduction	1	2	4	4
Long Term Nutrient Reduction	1	2	4	4
Drinking Water Quality Protection	2	1	3	4
Wetland Water Quality Protection	2	1	3	4
TOTAL SCORE	6	6	14	16

Scoring Rating:

1 = Fair (lowest) to 4 = Best (highest)

Benefits Scoring - Financial

- **Capital Costs:** Cost of building the system
- **Operation and Maintenance Costs:** Ongoing cost of maintaining and operating the system
- **Grant/Load Eligibility:** How easy the alternative will likely be funded (low difficulty)
- **Long-Term Reliability of System:** How well does system respond to environmental stressors (high ground water), changing regulations, or risk of failing components
- **Susceptibility to Rising Sea Levels:** Is the system likely to be flooded or otherwise affected by higher groundwater
- **Positive Property Value Impact:** Does alternative increase the use and/or value of the property
- **Flexibility for Future Regionalization:** Can alternative be easily expanded or altered for a larger (regional) system

Benefits Scoring - Financial

FACTORS	INDIVIDUAL OSS	CLUSTERED SYSTEM	CENTRALIZED SYSTEM	CENTRALIZED SYSTEM TO SEQUIM
Capital Costs (20 Yr)	4	3	1	2
Operation and Maintenance Costs	4	3	2	1
Grant/Loan Eligibility	1	1	3	4
Long Term Reliability of System	1	2	3	4
Susceptibility to Rising Sea Levels	1	2	3	4
Positive Property Value Impact	2	3	3	3
Flexibility for Future Options	1	2	3	4
TOTAL SCORE	14	16	18	22

Scoring Rating:

1 = Fair (lowest) to 4 = Best (highest)

Benefits Scoring - Regulatory

- **Permitting Complexity:** Difficulty or issues that will hinder or slow the permitting process
- **Growth Management Act (GMA) Compliance:** Does alternative stay in compliance by not providing service to areas outside of a GMA boundary (state regulation)

Benefits Scoring - Regulatory

FACTORS	INDIVIDUAL OSS	CLUSTERED SYSTEM	CENTRALIZED SYSTEM	CENTRALIZED SYSTEM TO SEQUIM
Permitting Complexity	4	2	1	3
Growth Management Act (GMA) Compliance	4	3	2	0*
TOTAL SCORE	8	5	3	3

* Option is not in compliance with current GMA Regulations.

Scoring Rating:

1 = Fair (lowest) to 4 = Best (highest)

Benefits Scoring - Summary

Scores	INDIVIDUAL OSS	CLUSTERED SYSTEM	CENTRALIZED SYSTEM	CENTRALIZED SYSTEM TO SEQUIM
Environment	7	8	17	20
Financial	13	14	15	18
Regulatory	8	5	3	3
TOTAL SCORE	28	27	35	41

Scoring Rating:

1 = Fair (lowest) to 4 = Best (highest)

Public Process – Next Steps

Date	Audience	Focus
Feb 9	Project Area community	Draft FS workshop #3 Parametrix
Feb 13	DRMT	Draft FS briefing
Feb 19	Board of Health	Draft FS briefing
March 9	Project Area community; DRMT	Draft FS workshop #4 Parametrix
March 13	DRMT	Update, take comments
March 20	Planning Commission	Draft FS briefing
March 26 or April 9	Board of Commissioners Worksession	Final Draft FS Forum #1 Parametrix

Discussion

- Open discussion / Q & A



Thank you!

- Project message line: **360-417-2542**
- Webpage:

<http://www.clallam.net/HHS/EnvironmentalHealth/DungenessWastewater.html>

*Thank you also to the Jamestown S’Klallam Tribe
for the aerial photo of Brandt Point (taken December 2006)*