



# Organic Material Recovery AND Bioenergy Project



Photos courtesy of City of Astoria, Oregon (<https://www.astoria.or.us/>)

Federal Funding Request: \$54,604,103

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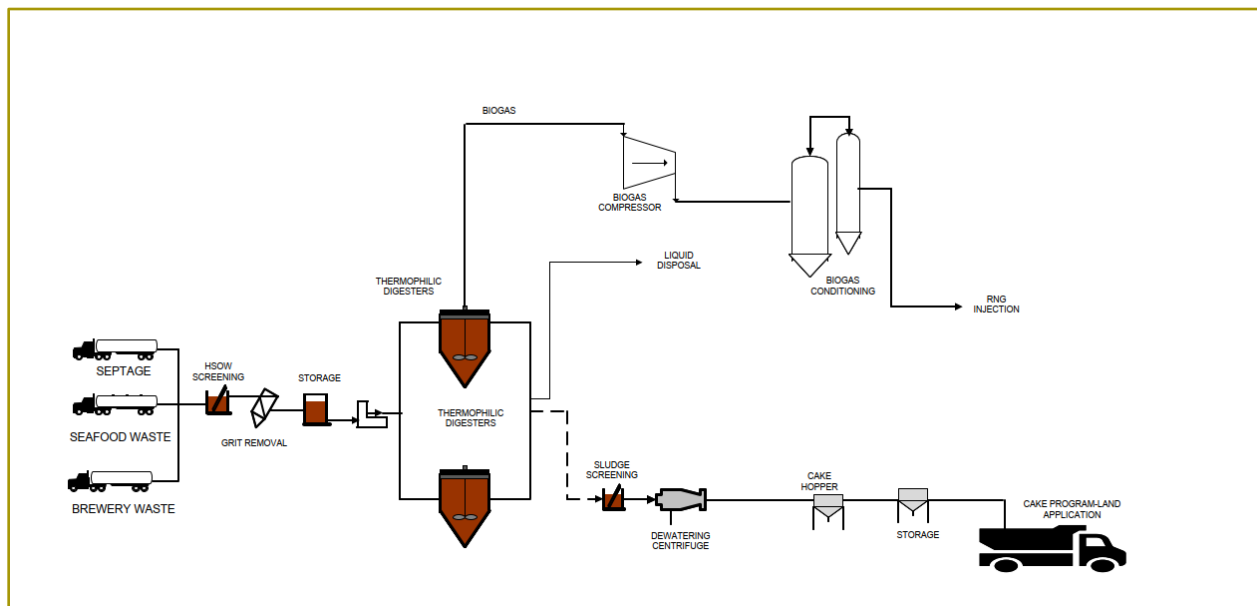
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## 1. OVERALL PROJECT SUMMARY AND APPROACH

Clatsop County, Oregon (County) is requesting \$54.6 million in funding through the EPA's Climate Pollution Reduction Grant (CPRG) Program to implement the findings from a study conducted in 2022 entitled Organic Materials Recovery and Bioenergy Feasibility Study Project for Clatsop County, Oregon (2022 Study). The project consists of design, permitting, and construction of a biodigester system that would receive High-Strength Organic Waste (HSOW) generated by breweries, distilleries, and seafood processors as well as septage collected in the community as represented in Figure 1. The project is estimated to cost \$54.6 million; the County continues to work with local interested parties and State funding agencies, but no additional funding has been secured at this time, so this grant request is for the full \$54.6 million (see Demonstration of Funding Need for additional detail).

Biosolids generated from the local municipal wastewater treatment plants may also be received by this biodigester facility. The County may also consider developing a commercial food waste recovery program whereby the collected material would be pre-processed into a slurry and also received by the biodigester system. Cow manure and brown grease/fat, oils and grease (FOG) are other future sources of HSOW that could potentially be included in this project. For the purpose of this grant application and the associated greenhouse gas (GHG) emissions reduction estimates, these potential future feedstocks are not incorporated.

*Figure 1. Recommend Processing Option for Combined HSOW Feedstocks*



As part of the 2022 Study, both cogeneration (cogen) and renewable natural gas (RNG) were evaluated.

RNG was preliminarily selected for this grant application as it represents the more conservative project cost estimate.

### Background

The seafood processors in Astoria and Warrenton, Oregon have recently been given more stringent National Pollutant Discharge Elimination (NPDES) permit requirements for surface water discharge of fish processing waste and are in the process of determining how to address these requirements through liquids treatment, which is anticipated to be a new, significant additional expense for these businesses.

The proposed biodigester system could receive portions of this waste from the fish processing operations.



The breweries have land applied brewery waste during dry, summer months on dairy farm pasture lands. In the past, during wet season/winter months the breweries have discharged to Astoria's municipal wastewater plant. However, this practice is no longer available/acceptable due to the adverse impacts experienced at this plant when accepting such waste streams. The breweries need a sustainable, long-term, year-round solution for their waste to maintain and expand beer production.

Likewise, the local Astoria, Cannon Beach, Seaside and Warrenton Wastewater Treatment Plants (WWTPs) are not equipped to accept septage waste. This results in haulers needing to drive further distances to WWTPs outside of the area, leading to greater hauling fees for local residents and greater greenhouse gas (GHGs) emissions.

### Project Overview

The biodigester system will consist of the following main components:

- Waste Receiving Station
- Anaerobic Digestion
- Mechanical dewatering post-digestion with a land application beneficial reuse program for remaining solids
- Cogeneration or renewable natural gas (RNG) upgrading equipment

The waste receiving station will include screening and grit removal pretreatment and storage to provide a minimal level of diurnal load equalization. The project will utilize single-stage thermophilic digestion.

The project includes two anaerobic digestion reactors, sized to treat peak loads with both units online. This would result in both units operating at or near capacity during peak loads but would allow one tank to be removed from service for maintenance during low-load seasons (dependent of seafood harvesting fluctuations). Provisions for a third tank could be included for additional redundancy at peak loads or to account for future expansion to accommodate other HSOW feedstocks.

The resulting biogas will be treated to remove moisture, hydrogen sulfide, and siloxane. If RNG is selected, carbon dioxide will also be removed to produce RNG that can be injected into Northwest Natural's natural gas pipeline.

For this grant application's purpose, it has been assumed that RNG is implemented. At the beginning of final design, the comparison between RNG and cogeneration conducted in the 2022 Study will be updated and a final selection made.

The site of the biodigester system will either be Camp Rilea Armed Forces Training Center (Camp Rilea Center) or City of Warrenton Wastewater Treatment Plant (Warrenton WWTP). Likewise, at the beginning of design, the comparison between these two sites that was initially conducted in the 2022 Study will be updated and the site that best meets the needs of the community and this project will be selected.

### Description of GHG Reduction Measures

#### Measure 1: Diversion of seafood processing waste, brewery waste, and septage

The new biodigester project will divert three streams of waste from the existing operations and achieve GHG reduction, as follows:

- **Seafood processing waste:** Currently, seafood processing waste is disposed via discharge to the Columbia River under NPDES permits. The seafood processing waste is rich in organic carbon (high biochemical oxygen demand [BOD]) and nitrogen – which can be further converted to CH<sub>4</sub> and N<sub>2</sub>O in the receiving water environment. Both are potent greenhouse gases (although methods for quantifying these emissions are not well established and subject to high uncertainties). More stringent discharging requirements are expected for the upcoming NPDES permits renewal,



which will lead to the need for expensive on-site treatment, or the seafood processors will have to send the waste to landfill. For this grant application, it is assumed that the future baseline (without current project) for seafood processing waste is landfilling. Therefore, there is significant GHG reduction potential by diverting the waste to the new biodigester system.

- **Brewery waste:** During half of the year, the brewery waste is land applied on livestock lands (dairy pasture) - reduction of GHG emissions for this portion is assumed to be negligible. During the other half of the year, the brewery waste would need to be hauled to a landfill for disposal. For this grant application, it is assumed that half of this waste is diverted from a landfill to the biodigester system.
- **Septage:** Currently, septage in the region is hauled to WWTPs outside of the region; the waste is fed into the headworks of these facilities which utilize more energy to treat. The new project will enable the septage to be treated within the region (using much less energy) while generating biogas. However, information (e.g., treatment processes and energy consumption at the receiving WWTPs) is not readily available to quantify the 'net' energy benefit. For this grant application, the GHG reduction estimate for septage diversion only includes the reduced truck haulage (current haulage distance about 100 miles round trip).

## Measure 2: Diversion of food waste (in addition to the above HSOWs)

Given the seasonal changes of seafood processing waste (which accounts for more than 2/3 of the total waste streams), the proposed digesters can receive other organic waste during the low seasons of seafood processing (Q1 and Q4). Currently, the county does not have a curbside collection program for food waste, so food waste is landfilled along with other municipal solid waste. There is potential to expand the biodigester operation to include additional food waste, further increasing the GHG reduction.

## Other GHG reduction potentials not quantified in this application

Measures 1 and 2 are included in the GHG emission reduction estimates presented in this grant application. A few other GHG reduction potentials (if this project is implemented) are not included in the calculations for this application, but bear mentioning:

- Biogas energy recovery, as the preferred technology (cogeneration versus RNG) is still to be determined (during the design phase of the project). If cogeneration is selected, there is additional GHG offset from the onsite electricity generation, while the heat recovered will be used to provide digester heating. If RNG is selected, the intention is to monetize the RFS RIN credits; therefore, we are not taking credit for the GHG emission reductions.
- Haulage of waste streams and the processed Class B biosolids within the county, as these estimates were not significant relative to Measures 1&2.
- Septage treatment at WWTPs out of county, as information is not readily available to quantify the 'net' energy and GHG benefit, and the septage waste stream only accounts for approximately 5% of the total waste streams.

## Relevance to Priority Climate Action Plan

The relevant Priority Climate Action Plan (PCAP) to this CPRG application is the [State of Oregon's Priority Climate Action Plan](#). Oregon's PCAP identified three main areas for EPA grant funding: 1) transportation, 2) residential and commercial buildings and 3) waste and materials management. The measures described above relate to the third area: waste and materials management.

This sector was chosen as a priority for CPRG funding for two reasons: First, climate pollution from waste makes up a significant portion of Oregon's total GHG emissions (food waste alone is the second largest source of GHGs generated by people in Oregon); Second, the State has not met its ambitions for reducing pollution from food waste. In 2015, the State Legislature set a goal of recovering 25% of food by 2020 for useful purposes – including anaerobic digestion. The Oregon Department of Environmental



Quality (DEQ) determined that only 10% of food waste was actually recovered in 2020. In 2022, DEQ reported that insufficient capacity played a significant role in this shortfall. While the main source of waste addressed by this project is seafood processing waste, it is highly seasonal. As described above, the biodigester will have the capacity to receive food waste for half of the year, helping Oregon meet its food waste recovery goal.

### Demonstration of Funding Need

The estimated cost of the project is \$54.6 million. The County does not have a wastewater utility and has no means to charge rates or system development charges (SDCs) for this project. The seafood processors are already faced with the increased costs of liquids waste treatment to meet their new NPDES permit requirements. The breweries have a partial seasonal solution with land application; however, are facing increased costs due to the change in policy of the local WWTPs no longer accepting their waste in the wet, winter season. Both industries will face a tipping fee associated with the biodigester project, but it would be an undue burden to incorporate both the annual operating cost as well as all of the upfront capital cost into those tipping fees. The cities of Warrenton and Astoria are facing significant CIPs to maintain and upgrade their WWTPs to serve the municipal wastewater needs of their communities and are working to identify their own funding sources for their needs.

The 2022 Study modeled dozens of financing/funding scenarios including utilizing the IRA tax credit for renewable energy production (none, 25% and 40% credit scenarios). Using simple payback as the metric, the business case evaluation model was most sensitive to changes to the capital investment, with less sensitivity to changes in the potential revenues. The IRA tax credit does significantly reduce the simple payback. For example, under the cogen approach, the business case evaluation payback period is 20 to 30+ years without an IRA tax credit and could be reduced to 13 to 16 years with the IRA tax credit.

However, the County still needs to find a way to finance the project upfront as the tax credit would be obtained later in the project after significant outlays in capital.

Clatsop County is proactively exploring potential funding sources for this project. Possible funding options were identified in the 2022 Study. At this time, it is estimated that approximately 10 percent of the project costs could be funded from the following funding sources:

- Energy Trust of Oregon renewable energy rebate (monies are received after commissioning of project)
- Northwest Natural if RNG; Pacific Power if cogen
- Oregon Department of Energy (ODOE) Community Renewable Energy Grant Program
- Oregon Department of Environmental Quality (DEQ) Priority Climate Action Plan (PCAP) Grant
- Oregon DEQ State Revolving Loan Fund (SRF) Loan Forgiveness

Even if the project successfully secured funding through these options, a CPRG grant or other significant funding source will still be required to implement the project. If funding for this project is not identified, then there will be excessive financial burden on the County and/or the local industries which most likely would curtail growth and possibly result in industries needing to close or relocate. Both the seafood processing and brewery industries are important economic sectors to maintain a diverse economy in Clatsop County.

### Transformative Impact

If grant funding is obtained for this identified project, then the community can most likely be more apt to expand this project to incorporate the other feedstocks previously mentioned (e.g., FOG, biosolids, recovered food waste) to reduce GHG emissions associated with these waste streams and generate more renewable energy. This outcome would be especially desirable because the State of Oregon has a goal to increase the amount of food waste recovered for useful purposes, as described above.

If this project is funded and implemented, it could serve as a model for other municipalities around Oregon and the Nation to sustainably handle HSOWs. This would be a transformative impact of the project, considering the significant GHG emissions from landfills nationwide.

## 2. IMPACT OF GHG REDUCTION MEASURES

Table 1 summarizes the annual GHG emission reduction from Measure 1 and Measure 2. Based on the preliminary schedule, the new biodigester facility is estimated to be operational in January 2028. It is assumed that Measure 1 will be implemented for the initial phase (2028 to 2030), as detailed surveys have been completed to confirm the source and quantity of these waste streams. Additional time will be required for the county to develop a food waste collection program and establish a steady feed stream; therefore, Measure 2 is assumed to be implemented in the medium to long term (2031 to 2050). It is expected that the new biodigester facility will be able to operate close to full design capacity upon start-up in 2028 (established HSOW sources and quantities), and the GHG emission should be similar from year to year (no production expansion expected at the source facilities).

*Table 1. Summary of Annual GHG Emission Reduction for Measures at Proposed Biodigester Facility*

GHG Emissions, tonne CO <sub>2eq</sub> /y	Measure 1 (Without Food Waste Diversion)		Measure 2 (With Food Waste Diversion)	
	Without Project (Baseline)	With HSOW Biodigester	Without Project (Baseline)	With HSOW Biodigester
Electricity consumption of new process equipment	--	385	--	404
Landfill	6,737	--	9,075	--
Septage haulage (out of county)	38	--	38	--
Land application – emissions	11	242	11	274
Land application – offsets	(40)	(189)	(40)	(214)
Net GHG emissions	6,746	438	9,084	464
GHG reduction from baseline	--	(6,300)	--	(8,600)

### Magnitude of GHG Reductions from 2025 through 2030

It is assumed that Measure 1 will be operational in January 2028, and operate close to full design capacity. The cumulative GHG emission reduction for the period from 2025 through 2030 is calculated as follows:

- Measure 1: 6,300 tonne CO<sub>2eq</sub>/y x 3 years = **18,900 tonne CO<sub>2eq</sub>**

### Magnitude of GHG Reductions from 2025 through 2050

It is assumed that Measure 2 will be operational in January 2031. The cumulative GHG emission reduction for the period from 2025 through 2050 is calculated as follows:

#### Cumulative GHG reduction from 2025 through 2030

- Measure 1: 6,300 tonne CO<sub>2eq</sub>/y x 3 years = **18,900 tonne CO<sub>2eq</sub>**

#### Cumulative GHG reduction from 2031 through 2050

- Measure 2: 8,600 tonne CO<sub>2eq</sub>/y x 20 years = **172,000 tonne CO<sub>2eq</sub>**



### Cumulative GHG reduction from 2025 through 2050

- $18,900 + 172,000 = 190,900 \text{ tonne CO}_{2\text{eq}}$

### Cost Effectiveness of GHG Reductions

The CPRG funding requested is based on the total Project cost in the 2022 Study plus escalation of 3 percent per year as shown in Table 2.

**Table 2. Calculation of the Requested CPRG Funding**

Items	Cost
Total Project Cost (from 2022 Study)	\$50,000,000 (RNG approach)
Escalation	\$4,600,000
Request for EPA IRA CPRG	\$54,600,000

Cost effectiveness of GHG reductions (2025 -2030) =  $\$54,600,000 / 18,900 = \$2,889$  per tonne  $\text{CO}_{2\text{eq}}$

### Documentation of GHG Reduction Assumptions

A summary of the GHG calculations for Measure 1 and Measure 2 considered in this application are presented in Table 1 above and the key assumptions are listed below. The detailed calculations are presented in Appendix D.

- The following GHG reduction measures are quantified in this grant application:
  - ‘Avoided’ GHG emissions by diverting waste from landfills (seafood processing waste, 50% of brewery waste, and potentially food waste)
  - ‘Avoided’ long-distance septage haulage emissions
  - Potential offsets from land application of the final Class B biosolids that are rich in carbon, nitrogen and phosphorus (e.g., carbon sequestration and offsetting commercial fertilizers)
- BEAM\*2022 (<https://www.biosolidsgghgs.org/>), the Biosolids Emissions Assessment Model, was used to quantify the GHG emissions (or offsets) associated with the management of organic waste (landfill or land application) and Class B biosolids (land application) beyond the fence line of the proposed biodigester facility. There are a few assumptions made in the BEAM model:
  - For the scenario where the organic waste goes to landfill, ‘typical landfill’ with 50% methane capture from the landfill gas was selected.
  - For the scenario where the organic waste is diverted from landfill to the new biodigester facility, the waste is digested, dewatered, and the final Class B biosolids are land applied. A 120-d storage facility is included (to manage the seasonality of land application operation), and the potential  $\text{CH}_4$  emissions from extended biosolids storage have been accounted for by the BEAM tool.
  - The haulage of organic waste to landfill or to the new biodigester facility, and the haulage of final Class B product to end use locations was excluded from the analysis, as these haulages are expected to occur within the region (much shorter distances compared with septage haulage out of county), and the associated GHG emissions are relatively small compared with other components.
- Other GHG emissions associated with the operations of the new biodigester facility were calculated based on the activity data (e.g., electricity consumption) and emission factors.
  - The electricity requirements include HSOW processing, thermophilic digestion, and mechanical dewatering. Emission factor of electricity is based on the latest eGRID subregion data at 634.6 lbs ( $\text{CO}_{2\text{e}}$ )/MWh (US EPA eGRID - NWPP).

- The heating requirement (for the digesters) was assessed, and it was determined that there is more than adequate biogas to satisfy the on-site heating demand, regardless of the preferred biogas utilization method. Therefore, supplemental natural gas (for process heating) is not expected.

### 3. ENVIRONMENTAL RESULTS – OUTPUTS, OUTCOMES, AND PERFORMANCE MEASURES

#### Expected Outputs and Outcomes

The proposed project will achieve several short and long-term environmental outputs and outcomes upon commissioning of the Biodigester system that will contribute to the EPA's Strategic Plan goals. The performance period will continue for the operation or life of the facilities, which is planned to be at least 20 years.

Anticipated outputs include, but may not be limited to:

- Design, construction, and operation of a biodigester system able to receive generated HSOW.
- Potential to accept additional wastes including FOG, recovered and pre-processed food waste, and biosolids and generate additional renewable energy.
- Diversion of HSOWs from landfills located outside of the region.
- Potential development of a commercial food waste recovery program.
- Development of semi-annual progress reports documenting ongoing progress, accomplishments, and milestones through the end of the performance period.
- Development of a detailed final report documenting performance achievements.

Anticipated long-term outcomes include:

- Cumulative GHG reduction from 2025 through 2030 equaling 18,900 tonne CO<sub>2eq</sub>.
- Cumulative GHG reduction from 2025 through 2050 equaling 190,900 tonne CO<sub>2eq</sub>.
- Reduced GHG emissions through waste diversion and measures identified in the Oregon PCAP.
- Alleviation of economic constraints on the community, helping tourism driven by the revitalization of Astoria's downtown which includes the flourishing brewing industry and the retention and feasible expansion of the legacy seafood processing industry.
- Economic revitalization to disadvantaged communities and the local economy.
- Decreased costs for homeowners as a result of lower septage hauling fees.
- Reduced pollution exposure to disadvantaged communities as a result of avoiding seafood processing waste from landfills.

Specific target optimization and expected reductions in these outputs are summarized in 3.

*Table 3. Target Optimization and Expected Reductions*

Optimization Item	Without Project	With Project
GHG emission reduction from Table 1	None	<ul style="list-style-type: none"> <li>• Measure 1: 6,300 tonnes CO<sub>2e</sub>/year (1st 3 years)</li> <li>• Measure 2: 8,600 tonnes CO<sub>2O2e</sub>/year (2031 through 2050)</li> </ul>
Diversion of HSOW from landfill	None	<ul style="list-style-type: none"> <li>• Measure 1; 76,621 wet tonnes per year (1st 3 years)</li> <li>• Measure 2; 79,563 wet tonnes per year (2031 to 2050)</li> </ul>

#### Performance Measures and Plan

The County measures GHG-related reductions through BEAM\*2022, which quantifies the GHG emissions (or offsets) associated with the management of organic waste (landfill or land application). Biogas production and RNG injected into Northwest Naturals pipeline will be measured with gas flow meters,

while electrical energy produced by the CHP units will be measured in KW-hrs (if applicable). HSOW solids processed will be measured by flow meters and laboratory solids analysis. These measurements will allow the County to provide reports to the EPA documenting the performance of the optimized digestion system for 24 months of the proposed facilities at operation start-up.

A scale to weigh feedstocks received will be integrated into the design of the HSOW receiving station of the biodigester system. The project will track materials that classify for D-3 and D-5 RINs, if applicable, for reporting to the EPA's Renewable Fuel Standard (RFS) Renewable Identification Numbers (RINs) Program. Audits will be performed by a qualified third party to comply with the RFS Program to validate feedstocks and associated RINs.

### Authorities, Implementation Timeline, and Milestones

Table 4. Table provides the major milestones and anticipated schedule for the project design and construction of the proposed facilities. Operation of the proposed facilities is expected to begin immediately following substantial completion of construction of the proposed facilities. The operation of the facilities and generation of the expected benefits and cost savings is expected to last for the useful life of the proposed facilities, which is expected to be 20 years.

*Table 4. Table 4 Anticipated Project Schedule*

Milestone	Approximate Duration	Anticipated Deadline
Receive Grant Award		September 2024
Design & Permitting Phase Scoping	2 months	October – November 2023
Approval and Notice to Proceed	1 month	December 2024
Design & Permitting Phase	12 months	January 2025 – December 2025
Procure Contractor	3 months	January 2026 – March 2026
Construction	24 months	April 2026 – April 2028

The County is currently working to perform several next steps by the end of 2024 that were identified in the 2022 Feasibility Study including:

- Conducting a digestion pilot test to further study how best to digest the project feedstocks.
- Engagement with potential private-sector partners (P3s) to gauge marketplace interest for implementing this project with alternative project delivery approaches.
- Continual stakeholder and community engagement.

As part of the 2022 Study, a list of ten sites were identified by the County's stakeholder group as potential locations for the Regional Biodigester Project. This list was screened down to the top three most promising sites based on factors such as location, permitting complexity/zoning, and size appropriateness.

The three most promising sites included:

1. Camp Rilea Armed Forces Training Center (Camp Rilea Center)
2. The City of Warrenton Wastewater Treatment Plant (WWTP)
3. Skipanon Peninsula

The three sites were further evaluated against cost to develop the site, cost of land, size, accommodation of recycle streams, trucking, and permitting complexity. The Skipanon Peninsula was screened out due to the water industry zoning and lack of infrastructure at the sites, which would be more costly to develop. The two sites that were selected for further evaluation regarding land use and environmental permitting were the Camp Rilea Center and The City of Warrenton WWTP.



A high-level desktop review of wetlands and waters, cultural resources, and land use constraints was conducted for the two sites. Maps were generated to visually depict the land use and wetlands and waters constraints from publicly available data sources. A constraints evaluation matrix was also generated from the high-level desktop review.

The 2022 Study concluded that the Camp Rilea Center site was preferable since it is a developed site with its own wastewater treatment system and renewable energy goals. The City of Warrenton WWTP was the second preferable choice as it also has availability of utilities and the potential to utilize the existing lagoons for sidestream supernatant that will be produced by the Regional Biodigester.

Since completion of the study, the County had additional discussions with the City of Warrenton while they were completing a wastewater facilities plan update. Their preferred WWTP upgrading option was to install a more compact treatment technology which would make land available that is currently used for treatment lagoons. A portion of their existing site could be repurposed for this project. Therefore, the Warrenton WWTP is now the preferred site for the Regional Biodigester project.

Anticipated permitting efforts for the project at that site are as follows:

- NEPA: An Environmental Assessment (EA) including compliance with cross-cutting authorities would be developed. It is assumed the EA will result in a Finding of No Significant Impact; this assumption will be revisited upon commencement of the design and permitting phase of the project.
- Land Use:
  - No zoning change is anticipated for the Biodigester site
  - Right-of-way acquisition for utilities in and out of the facility
- Environmental:
  - Water Quality: No NPDES discharge permit is anticipated; liquid recycling streams generated by this project will be routed to the Warrenton WWTP headworks and managed through the City's industrial pretreatment program (IPP).
  - Stormwater: Applicable stormwater permits associated with modifying and further developing this site for the project are anticipated. NPDES Construction Stormwater General Permit coverage would be obtained addressing construction impacts greater than 1 acre.
  - Wetlands and Waters: It is assumed that the Project impacts will be contained to within the existing Warrenton WWTP site avoiding impacts to jurisdictional wetlands and waters outside of the Warrenton WWTP such that USACE Section 404 and Oregon Department State Lands Removal/Fill permits will not be necessary.
  - Air: Applicable Regional/State air permits will be required
- Building: Applicable City of Warrenton and Clatsop County Building Permit Review
- Transportation: Pertinent traffic studies
- All other pertinent permitting activities will be identified at the start of the project's design and permitting scoping phase.

It is anticipated that these permitting efforts can be completed within the schedule shown in Table 4 - Anticipated Project Schedule.

This project will involve a coalition of many interested parties. Letters of support have been provided in Appendix H from the following entities to demonstrate the broad support in the local community and at the State level for this project:

- Buoy Beer Co./Pilot House Distilling/River Barrel Distributing
- Camp Rilea Armed Forces Training Center
- City of Warrenton



- Columbia Pacific Economic Development District - a private non-profit organization established to assist in diversifying and strengthening the economy and livability of Northwest Oregon.
- Energy Trust of Oregon
- Fort George Brewing
- Pacific Seafoods
- State Senator Suzanne Weber

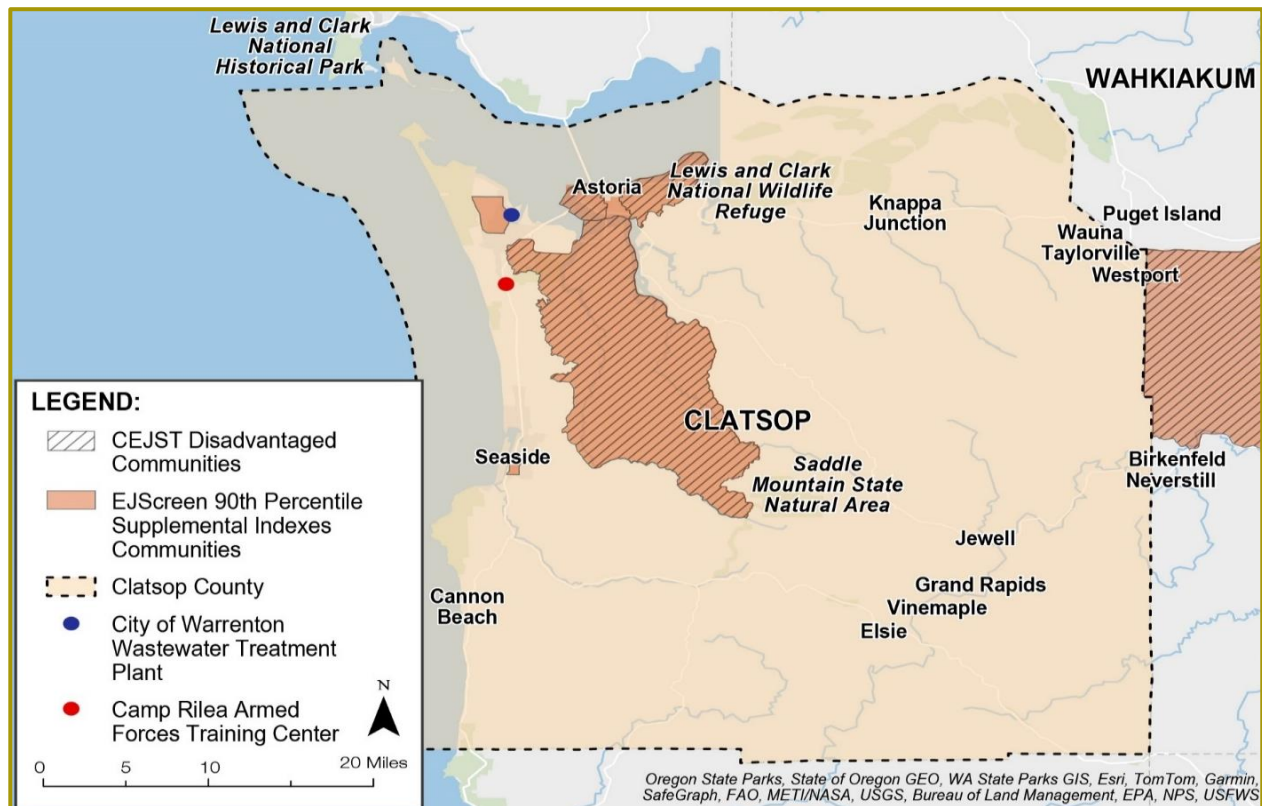
#### 4. LOW-INCOME AND DISADVANTAGED COMMUNITIES

##### Community Benefits

The North Coast region of Oregon includes the communities of Astoria, Warrenton, and Hammond in Clatsop County. The City of Astoria, home to over 10,000 residents, is the largest city in the region and the County Seat. It is divided into three census tracts, two of which are classified as disadvantaged by CEJST. A large, rural stretch of unincorporated Clatsop County directly south of Astoria is also recognized as disadvantaged by CEJST. Figure 2 shows a map of these communities. Most of the HSOWs that the biodigester system will receive are produced by the seafood processors and breweries in the County, most of which are located in Astoria (some are also located in Warrenton, a small city West of Astoria). The low-income percentiles from the CEJST for these areas are shown in Table 5.

The septage could come from anywhere in Clatsop County. As such, all three census tracts in the County that are classified as disadvantaged stand to benefit from the project. A full list of census tracts that will be affected by the project is found in Attachment F.

*Figure 2. Map of CEJST and EJ Screen-Defined Disadvantaged Communities in Clatsop County, OR*



Logging and fishing were historically the predominant industries and job providers in Clatsop County. Over the past few decades, however, the logging industry in particular has declined, causing difficulties for the local economy. More recently, a shift toward tourism and sustainable seafood harvesting has

helped revitalize the communities’ economies and provided a new source of employment, though not at the same level of family wage jobs as the timber industry.

Table 5. Review of Climate and Economic Justice Screening Tool in Project Vicinity

CEJST Census Tract No	Population	Low Income (Percentile)
41007950100	3,534	72nd
41007950300	3,011	71st
41007950600	3,189	77th

People in households where income is less than or equal to twice the federal poverty level, not including students enrolled in higher education. <https://screeningtool.geoplatform.gov/en/#12.26/46.18068/-123.85819>

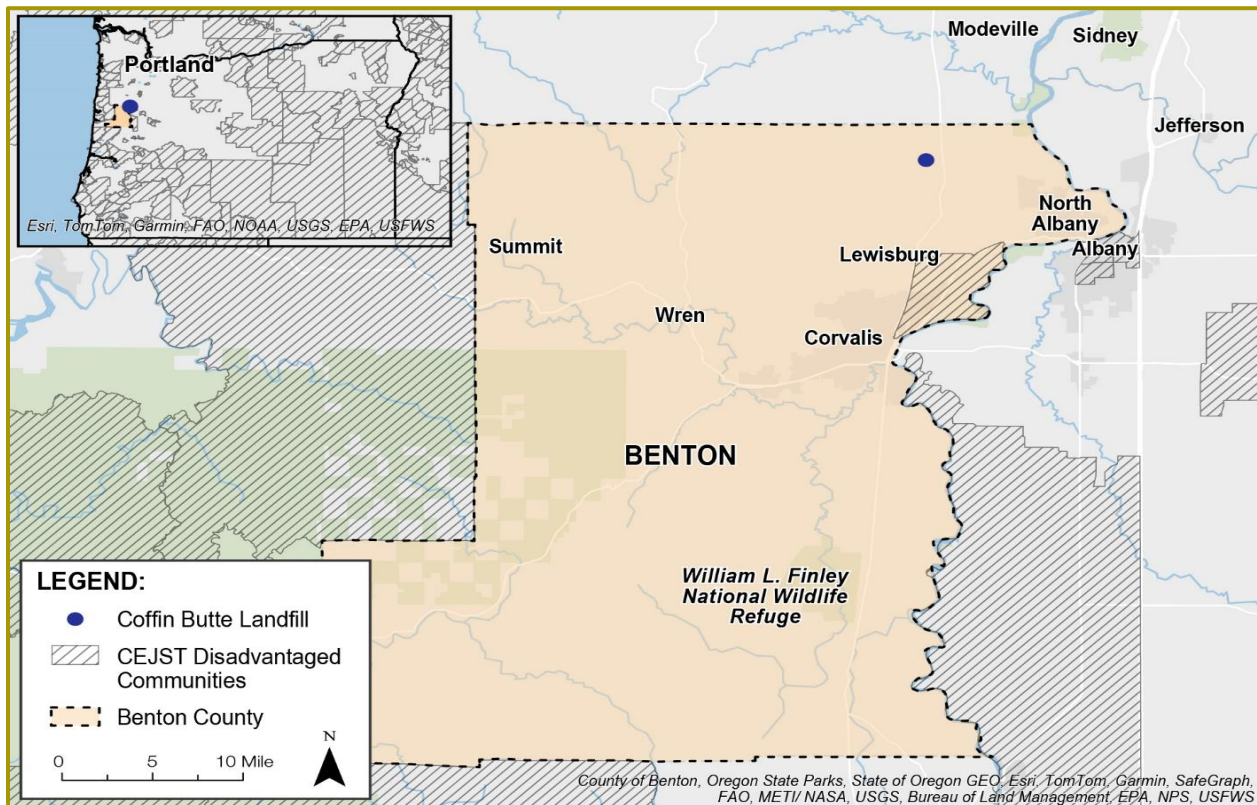
A five-year economic development strategy for the City of Astoria called “Advance Astoria” was developed in 2017. This study identified a “batch strategy” for economic prosperity. Two of the seven foundational areas or “batches” that were identified were Craft Beverage & Fermentation and Seafood Processing. As discussed in previous sections of this application, the current processing capacity limitations within Clatsop County for HSOWs generated by breweries, distilleries, and seafood processors are causing cost concerns for local businesses and industries. These limitations also affect residents, as septage must be hauled to facilities outside of the County, which increases costs for homeowners. None of the WWTPs in the County currently accept septage, forcing haulers to bring it to the Rainier WWTP (driving distance of 100 miles roundtrip) or Longview, Washington.

By increasing capacity for HSOW processing within the County, this project offers sizable economic benefits to the disadvantaged communities identified above. The reduced waste disposal costs for local businesses that the biodigester system will make possible will free up more money for them to reinvest in the local economy. This is especially true for the breweries and seafood processors which are both key economic drivers and the biggest producers of HSOWs. Homeowners will also benefit from lower septage hauling fees, since providers will no longer have to make the long trips to WWTPs outside of the County.

Co-benefits to disadvantaged communities include pollution avoidance from ensuring that seafood processing waste is not disposed of in landfills. Landfills are a significant source of toxic air pollutants, including toluene, benzene, xylenes, vinyl chloride, and ethyl benzene. These pollutants are known or suspected to cause cancer and other adverse health effects in humans, according to EPA. As described in section 1(a) of this application, there is a genuine risk that without funding, seafood processors will be forced to send their waste to landfills. The most likely destination for this waste is the Coffin Butte Landfill in Benton County, OR, which is located near multiple disadvantaged communities, as shown in Figure 3. This outcome would further burden these communities by exposing them to these toxic air pollutants.

Finally, Clatsop County’s workforce development initiatives will ensure that residents of disadvantaged communities will benefit from expanded career pathways. The County works with Clatsop Community College, located in Astoria, to offer paid summer internships for students aged 16 and up through its Clatsop WORKS Program. The WORKS Program collaborates with local employers – including the Clatsop County Government – to place students in positions that suit their interests. In 2023, 40 internship positions were offered and 31 led to full time employment. It is expected that once the biodigester system is operational, internship positions in waste management will be offered through the program.

Figure 3. Map Showing the Location of the Coffin Butte Landfill in Benton County, OR



## Community Engagement

Clatsop County has prioritized community engagement from the inception of this project. For the original feasibility study, Clatsop County held four separate community stakeholder meetings in 2021 and 2022 that included over 50 representatives from both private and public sector agencies as well as individual community members.

Outreach included entities within Clatsop County: breweries, seafood processing industries, septage haulers, dairies, and food waste producers including hospitals, schools, and restaurants. In addition, stakeholders were asked to provide information regarding potential viable properties for the siting of the Regional Biodigester Facility.

Since completion of the 2022 Study, the County has continued dialogue with many of these stakeholders to continue to move the project forward.

During the design phase, the County will enhance and expand public outreach efforts by conducting community open houses in the cities of Astoria, Seaside and Warrenton to explain the drivers/needs of the project as well as the benefits to the environmental resilience and economic well-being of the community. This will also be an opportunity for the County to obtain feedback so that community input and concerns can be heard and addressed. Utilizing this collaborative approach will further increase the value that this project is providing to the community.

## 5. JOB QUALITY

The project will be directly responsible for creating the following jobs:

- Professional services required to design and permit project
- Skilled and unskilled labor for construction





- Two to three FTEs of skilled operations and maintenance staff to manage, operate and maintain the facility, including regulatory/permit and safety compliance programs

Moreover, it will relieve a constraint on local businesses by reducing the cost of waste management. As mentioned in Section 4(a), the seafood processing and brewery industries are among the main economic drivers and job providers in Clatsop County. Due to more stringent NPDES regulations and policy changes at the local WWTPs, however, waste management has become a significant challenge. By easing this difficulty, the project will enable local businesses to remain in the community and potentially expand their operations, which would create new jobs by stimulating economic activity.

Clatsop County is committed to ensuring that grant funds support high road labor practices. Its general labor standards are set by federal and state law, as well as collective bargaining agreements and personnel policies at the County level.

## 6. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

### Past Performance

The following five projects demonstrate Clatsop County's ability to manage and administer federally funded and non-federally funded projects.

#### **Bonneville Power Administration – Select Area Fisheries Enhancement (SAFE)**

ALN# 99.999 \$525,040 2023 – 2024 FY annual amount

The SAFE project is a well-established cooperative program that strives to deliver quality commercial and recreational fishing opportunities in a setting which maximizes the return of hatchery production into fisheries. This has been annually renewed for over 20 years.

County contract administrator: Steve Meshke – 503-325-6452 - [spmeshke@clatsopcounty.gov](mailto:spmeshke@clatsopcounty.gov)

BPA contract administrator: Tracy Hauser – 503-230-4296 - [tlhauser@bpa.gov](mailto:tlhauser@bpa.gov)

#### **State of Oregon – Balance of State – State of Emergency Due to Homelessness IGA**

OHCS Grant Agreement #8078 \$4,191,313 2023 – 2025 biennium amount

In response to the January 10, 2023 Governor declared state of emergency on homelessness the state awarded Clatsop County through the state agency Oregon Housing & Community Services (OHCS), funds to increase shelter bed capacity by 80 beds and provide rapid re-housing funds to re-house at least 42 households through June 30, 2025.

County contract administrator: Elissa Gertler - [egertler@clatsopcounty.gov](mailto:egertler@clatsopcounty.gov)

OHCS contract administrator: Liz Hearn – 971-433-9215 - [liz.hearn@hcs.oregon.gov](mailto:liz.hearn@hcs.oregon.gov)

#### **US Department of Treasury – State & Local Fiscal Recovery Funds (SLFRF)**

ALN# 21.027 \$7,813,040 – Awarded in 2021 to be expended by December 31, 2026

The SLFRF funds were allocated to state, local, territorial, and Tribal governments across the country to support their response to and recovery from the COVID-19 public health emergency.

County contract administrator: Monica Steele – 503-338-3609 – [msteele@clatsopcounty.gov](mailto:msteele@clatsopcounty.gov)

SLFRF contact: 844-529-9527 – [SLFRP@treasury.gov](mailto:SLFRP@treasury.gov)





### EPA – Community-Wide Brownfield Grant

ALN# 66.818 \$500,000 – Awarded in 2022 to be expended by September 2026

The community-wide grant supports the development of a county-wide GIS-based brownfield inventory, the completion of approximately 10 -12 Phase I Environmental Assessments and four Phase II Environmental Assessments as well as planning funds for potential development of sites.

County contract administrator: Monica Steele – 503-338-3609 – [msteele@clatsopcounty.gov](mailto:msteele@clatsopcounty.gov)

EPA contract administrator: Sarah Frederick – 206-553-1601 - [Frederick.Sarah@epa.govgo](mailto:Frederick.Sarah@epa.govgo)

### Clatsop County Jail - General Obligation Bond – Series 2019

GO Bond – Series 2019 – R&O 2018120000 \$20,000,000 – Issued March 2019

In 2018 Clatsop County voters approved a \$20M General Obligation Bond for the construction of a new jail space in Clatsop County. The engineering design and construction took approximately three years to complete, and the total cost of the project was approximately \$29M. As the project manager, Monica Steele was responsible for working with municipal bond underwriters and bond counsel on the sale and issuance of debt for the project. In addition to project specific oversight and collaboration with an external project manager, architects, engineers and contractors for the completion of the capital project on time and on budget. The debt repayment is for a 20-year period and Ms. Steele oversees the finance department responsible for the tax collection of the levy as well as timely processing of the principal and interest payments.

County “Issuer” administrator: Monica Steele – 503-338-3609 – [msteele@clatsopcounty.gov](mailto:msteele@clatsopcounty.gov)

Paying Agent administrator: US Bank - [maryanne.adriano@usbank.com](mailto:maryanne.adriano@usbank.com)

### Reporting Requirements

Clatsop County has a proven track record of complying with reporting requirements for both federally and non-federally funded projects. The County has or is complying with quarterly (Q), bi-annually (BA) and/or annual (A) reporting requirements for each of the agreements listed in Table 6.

*Table 6. Past and Ongoing Project Reporting*

Project Title	Type of Funding / Agency	Assistance Agreement Number	Start and End of Funding – Reporting Requirement (Q, BA ,A)	Contact from Funding Agency
BPA – SAFE	Federal Grant	99.999	10/1/23 – 9/30/24 (Q)	<a href="mailto:tlhauser@bpa.gov">tlhauser@bpa.gov</a>
BOS – Emergency Homelessness Funding	State/OHCS Grant		10/31/23 – 6/30/25 (Q)	<a href="mailto:liz.hearn@hcs.oregon.gov">liz.hearn@hcs.oregon.gov</a>
SLRF	Federal Grant/Dept. of Treasury	21.027	5/1/21 – 12/30/26 (A)	<a href="mailto:SLFRP@treasury.gov">SLFRP@treasury.gov</a>
Community-wide Brownfield Grant	Federal Grant/EPA	66.818	11/1/22 – 9/30/26 (Q)	<a href="mailto:Frederick.Sarah@epa.govgo">Frederick.Sarah@epa.govgo</a>
Jail - General Obligation Bond	General Obligation Debt		2019 – 2039 (A)	<a href="mailto:maryanne.adriano@usbank.com">maryanne.adriano@usbank.com</a>

### Staff Expertise

Clatsop County has managed federally funded projects as outlined in section 6(a). The County will conduct a competitive process to hire a qualified design consultant and to procure a general contractor



to build the project. Monica Steele, Assistant County Manager, whose experience is further detailed in her abbreviated resume (attached with this application) will serve as the County's Project Manager and will ensure that the proposed project's goals and GHG reduction measures are met.

Monica is an experienced public servant who has developed a proven track record over the past 14 years of delivering projects funded through federal grants. She recently helped complete a jail construction project with general obligation bond funds approved by Clatsop County voters, as described in section 6(a). She is also currently administering an \$8 million SLRF grant to support the County's response to and recovery from the COVID-19 public health emergency, as well as a \$4.2M state grant to address the homelessness crisis in Clatsop County which has the highest rate of homelessness per capita in the state of Oregon.

In 2021, the County issued an RFP to hire a consultant to conduct a feasibility study for this project. Jacobs was selected and worked with the County to generate the 2022 Study. The County has retained Jacobs to conduct additional work that was identified as "next steps" in the 2022 Study. Several of those scope items are listed in section 3(c).

Three key staff from the Jacobs team are as follows:

- Kristen Jackson, P.E. – Consultant Project Manager
- Corey Klibert, P.E. – Consultant Project Engineer
- Matt Noesen, P.E., PMP – Consultant Project Advisor

Short resumes for these staff are included with Appendix G.

## 7. BUDGET

### Budget Detail

Table 7 depicts the SF-424A budget for both measures 1 and 2 by expenditure year. A detailed budget spreadsheet as well as the SF424-A have been attached to this application package. As one biodigester facility will be constructed for both measures, costs are not broken down by measure. The total Project cost is \$54,604,103. All incurred costs will be contractual. A construction contingency of 30% is included within the budget as a mitigation measure for any potential cost overruns and any unanticipated expenses.

The County has sufficient funding to cover costs for conducting stakeholder engagement, environmental work, as well as grant management. These costs are therefore not included within the Total Project Budget.

*Table 7 Total Project Budget for Both Measures*

Category	Year 1	Year 2	Year 3	Year 4	Total
Equipment	\$0	\$7,166,988	\$0	\$0	\$7,166,988
Construction	\$0	\$16,733,837	\$14,656,980	\$3,705,998	\$35,096,815
Contractual	\$4,606,754	\$7,733,546	\$0	\$0	\$12,340,300
Total (Direct Costs)	\$4,606,754	\$31,634,370	\$14,656,980	\$3,705,998	\$54,604,103

The biodigester facility consists of four primary components:

- HSOB biodigester for a total cost of \$4,992,510
- Silo Anaerobic Digester System for a total cost of \$24,721,932
- RNG upgrading equipment for a total cost of \$13,069,432
- Centrifuge Dewatering Facility for a total cost of \$11,820,229



## Personnel

The County is not seeking grant funding for County personnel costs and as such none have been provided within the project budget.

## Fringe Benefits

As the County is not seeking grant funding for County personnel costs, the project budget does not include fringe benefits.

## Travel

The County is not seeking grant funding for County personnel travel costs, so the project budget does not include travel costs.

## Equipment

Table 8 identifies the equipment costs the County expects to incur for the construction of the biodigester facility.

*Table 8. Equipment Budget*

Category	Year 1	Year 2	Year 3	Year 4	Total
<b>HSOW Receiving Station</b>					
Miscellaneous Equipment (5%)	\$0	\$309,608	\$0	\$0	\$309,608
<b>RNG Upgrading Equipment</b>					
Bulk H <sub>2</sub> S Reduction System	\$0	\$275,000	\$0	\$0	\$275,000
Raw Gas Blower	\$0	\$225,000	\$0	\$0	\$225,000
H <sub>2</sub> S Polisher	\$0	\$175,000	\$0	\$0	\$175,000
PSA Upgrading System	\$0	\$1,950,000	\$0	\$0	\$1,950,000
Emergency Flare	\$0	\$100,000	\$0	\$0	\$100,000
Containerized E-house	\$0	\$150,000	\$0	\$0	\$150,000
Miscellaneous (5%)	\$0	\$143,750	\$0	\$0	\$143,750
<b>Centrifuge Dewatering Facility</b>					
Centrifuges	\$0	\$763,547	\$0	\$0	\$763,547
Shaftless Screw Conveyor	\$0	\$303,678	\$0	\$0	\$303,678
Bulk Tanks (7,353 gallons each)	\$0	\$55,075	\$0	\$0	\$55,075
Metering Pumps	\$0	\$19,928	\$0	\$0	\$19,928
Miscellaneous (10%)	\$0	\$106,723	\$0	\$0	\$106,723
<b>Silo Anaerobic Digester</b>					
Mixing Pumps (Active) (0 hp)	\$0	\$961,620	\$0	\$0	\$961,620
Transfer Pumps (Active) (43 hp)	\$0	\$120,397	\$0	\$0	\$120,397
Transfer Pumps (Standby) (43 hp)	\$0	\$120,397	\$0	\$0	\$120,397
Sludge Heating Pumps (Active) (18 hp)	\$0	\$927,793	\$0	\$0	\$927,793



Category	Year 1	Year 2	Year 3	Year 4	Total
Dewatering Feed Pumps (Active) (4 hp)	\$0	\$32,805	\$0	\$0	\$32,805
Dewatering Feed Pumps (Standby) (4 hp)	\$0	\$32,805	\$0	\$0	\$32,805
Boilers (2,444,339 BTU/hour each)	\$0	\$93,773	\$0	\$0	\$93,773
Fuel Oil Tank (1 each, 385 gallons)	\$0	\$3,714	\$0	\$0	\$3,714
Flares	\$0	\$60,949	\$0	\$0	\$60,949
Miscellaneous (10%)	\$0	\$235,425	\$0	\$0	\$235,425
Total (Direct Costs)	\$0	\$7,166,987	\$0	\$0	\$7,166,987

### Contractual

The County will procure the services of one firm to carry out the non-construction work for permitting, engineering, construction services, commissioning, and startup work of the biodigester facility. To account for inflation, costs were escalated at a rate of 9% for year 1 and 12% for year 2 as the original budget was prepared by a cost estimator using 2022-dollar values. Table 9 depicts contractual costs by expenditure year.

*Table 9. Contractual Budget*

Category	Year 1	Year 2	Year 3	Year 4	Total
<b>HSOW Receiving Station</b>					
Non-Construction Work (Permitting, Engineering, Construction Services, Commissioning & Startup)	\$445,687	\$457,953	\$0	\$0	\$903,640
<b>RNG Upgrading Equipment</b>					
Non-Construction Work (Permitting, Engineering, Construction Services, Commissioning & Startup)	\$898,909	\$923,650	\$0	\$0	\$1,822,559
Interconnection to NW Natural Pipeline	\$0	\$3,000,000	\$0	\$0	\$3,000,000
<b>Centrifuge Dewatering Facility</b>					
Non-Construction Work (Permitting, Engineering, Construction Services, Commissioning & Startup)	\$1,055,205	\$1,084,247	\$0	\$0	\$2,139,452
<b>Silo Anaerobic Digester</b>					
Non-Construction Work (Permitting, Engineering, Construction Services, Commissioning & Startup)	\$2,206,954	\$2,267,696	\$0	\$0	\$4,474,649
Total (Direct Costs)	\$4,606,755	\$7,733,546	\$0	\$0	\$12,340,300





## Construction

The County will procure the services of one firm to carry out the construction work of the biodigester facility. To account for inflation, costs were escalated at a rate of 12% for year 2, 15% for year 3, and 18% for year 4 as the original budget was prepared by a cost estimator using 2022-dollar values. Table 10 depicts contractual costs by expenditure year.

*Table 10. Construction Budget*

Category	Year 1	Year 2	Year 3	Year 4	Total
<b>HSOW Receiving Station</b>					
Construction	\$0	\$595,638	\$815,456	\$209,182	\$1,620,276
Sitework Preparation (Electrical, Piping, Overall)	\$0	\$445,079	\$0	\$0	\$445,079
Plant Computer System	\$0	\$103,668	\$0	\$0	\$103,668
<b>RNG Upgrading Equipment</b>					
Construction	\$0	\$316,969	\$433,945	\$111,316	\$862,230
Sitework Preparation (Electrical, Piping, Overall)	\$0	\$972,038	\$0	\$0	\$972,038
Plant Computer System	\$0	\$226,406	\$0	\$0	\$226,406
<b>Centrifuge Dewatering Facility</b>					
Construction	\$0	\$1,214,687	\$1,662,964	\$426,586	\$3,304,237
Sitework Preparation (Electrical, Piping, Overall)	\$0	\$1,066,738	\$0	\$0	\$1,066,738
Plant Computer System	\$0	\$248,464	\$0	\$0	\$248,464
<b>Silo Anaerobic Digester</b>					
Construction	\$0	\$2,549,035	\$3,489,750	\$895,197	\$6,933,982
Sitework Preparation (Electrical, Piping, Overall)	\$0	\$2,230,509	\$0	\$0	\$2,230,509
Plant Computer System	\$0	\$519,529	\$0	\$0	\$519,529
Overhead (12%)	\$0	\$1,156,506	\$1,470,102	\$367,526	\$2,994,134
Profit (10%)	\$0	\$1,076,035	\$1,434,714	\$358,678	\$2,869,427
Mob/Bonds/Insurance (3%)	\$0	\$355,092	\$473,456	\$118,364	\$946,912
Contingency (30%)	\$0	\$3,657,444	\$4,876,593	\$1,219,148	\$9,753,185
Total (Direct Costs)	\$0	\$16,138,199	\$14,656,980	\$3,705,997	\$35,096,814

## Other

The County is not seeking grant funding for other costs not quantified above in the previous budget tables.

## Indirect Charges

The County has not budgeted for indirect charges as the County is not seeking grant funding for County personnel costs.

Expenditure of Awarded Funds

The County has provided a detailed project schedule under Section 3c within the workplan. The biodigester facility will help the County meet state GHG emission reduction goals. As the State food recovery goals were not met by 50% in 2020, the County needs to rapidly address the insufficient capacity of its waste facilities to meet State goals. The County therefore intends to rapidly expedite funds by April 2028 upon the proposed project schedule. No significant project delays are anticipated, as no ROW acquisition is expected to be required for the construction of the biodigester facility. Minimal ROW acquisition is however expected for the RNG pipe to tie in with the NW Natural Gas pipeline.

Founded in 1844, the County has been providing services to its residents for over a century. The County has decades of experience in delivering projects funded through grants. The County has experienced grant funding and finance personnel who will ensure the project is delivered in compliance with all federal reporting standards. The County is authorized under federal, state, and local laws and regulations to request and receive federal funds. The County has never been excluded from receiving contracts by the federal government. The County does not anticipate any issues in the obligation and execution of the grant award as the County has procedures and controls in place to ensure funds are expended in compliance with federal reporting regulations.

The County intends to contract for the design and construction of the proposed facilities using either a traditional design, bid, build approach or potentially using a P3 model depending on the outcomes of the P3 sounding effort that will be conducted in summer of 2024. The County has sound procurement standards that comply with federal requirements, supporting its technical capacity to receive federal funds and hire a contractor to deliver the project. The County’s purchasing department has established procedures for obtaining competitive bids from Engineering firms and Contractors, monitoring and managing professional services firms and construction contractors to help ensure that the project is designed and constructed in a timely and cost-effective manner. As indicated in section **3C Authorities, Implementation Timeline, and Milestones**, facility design is anticipated to be completed in approximately 12 months and construction in 24 months.

Reasonableness of Costs

The requested grant funds are reasonable for the anticipated GHG emissions reductions of 190,900 tonne of CO<sub>2eq</sub> by 2050 for a County home to about 40,000 people. The project will help the County meet GHG emissions reductions goals in line with EPA Strategic Plan goals. The GHG emissions reduction estimates for this project are as follows:

Cumulative GHG reduction from 2025 through 2030

- Measure 1: 6,300 tonne CO<sub>2eq</sub>/y x 3 years = 18,900 tonne CO<sub>2eq</sub>

Cumulative GHG reduction from 2031 through 2050

- Measure 2: 8,600 tonne CO<sub>2eq</sub>/y x 20 years = 172,000 tonne CO<sub>2eq</sub>

Cumulative GHG reduction from 2025 through 2050

- 18,900 + 172,000 = 190,900 tonne CO<sub>2eq</sub>

The metrics for GHG emission reductions for this project have been estimated as follows:

- Cost of GHG reductions (2025 -2030) = \$54,600,000/18,900 = \$2,889
- Cost of GHG reductions (2031 - 2050) = \$54,600,000/172,000 = \$317
- Cost of GHG reductions (2025 - 2050) = \$54,600,000/190,900 = \$286

Project cost per mass of volatile solids received:

- Measure 1: \$9.16 per pound of volatile solids received per year



- Measure 2: \$8.11 per pound of volatile solids received per year

*Non-Construction Work (Permitting, Engineering, Construction Services, Commissioning & Startup) as a percent of construction subtotal = \$12.3 million/\$54.6 million = 22.6 %*

This percent falls into the range of reasonableness for this process heavy, complicated type of facility which range from 20 to 25%.

The HSOW feedstocks, especially from seafood processing which comprise the majority of the loading to this biodigester system, are highly variable seasonally. This aspect of the loading may tend to drive up the cost metrics relative to other waste to renewable energy projects.