Technical Memorandum

LOS OLIVOS WASTEWATER COMPARISONS OF REGIONAL AND LOCAL ALTERNATIVES

Date: 3/10/2023

Executive Summary

The purpose of this technical memorandum (TM) is to compare regional and local treatment and dispersal alternative systems and make an initial recommendation on the best approach for the unincorporated community of Los Olivos. This TM has been conducted by Regen AEC (Regen) for the Los Olivos Community Service District (LOCSD) and the Los Olivos Wastewater Reclamation Program Project (LOWRPP).

The analysis included the comparison or multiple regional and multiple local solutions utilizing on a rubric scale with the following categories:

- Economics (Capital and Ongoing Costs)
- Performance (Effluent quality and performance reliability)
- Operations (Complexity of operation)
- Social Impacts (Location, appearance, growth impacts, and disruption during construction)

The alternatives were compared utilizing a scoring matrix from one to five (1-5), with one being the lowest ranking and five being the highest ranking. The matrix has been divided into four categories (above), including various focal elements within each category.

- Centralized Membrane BioReactor treatment with immediate implementation of reuse
- Centralized Membrane BioReactor treatment to percolation chambers
- Centralized secondary treatment to percolation chambers
- Distributed secondary treatment systems to percolation chambers, three to five separate systems distributed throughout the community
- Advanced Onsite for Individual homes & businesses with nitrogen specific treatment
- Hybrid combination of distributed secondary treatment in dense sections of the community and advanced onsite individual home systems in less dense areas

As part of our examination of the community, Regen studied numerous documents and studies provided by the LOCSD, including the technical documents available on the LOCSD website. Regen also attended meetings and watched video of LOCSD meetings to better understand the desires of the community. The review and communication conducted during this contract allowed for the weighting of the various elements within each category based on what is believed to be the communities perspective on prioritization of concerns. As additional data is collected the scoring can continue to be fine-tuned.

Certain processes such as lagoons or other passive-type systems were not included as the requirements for treatment performance based on previous work and regulatory commentary will require nitrogen reduction processes, which are not typically compatible with these types of systems.

Based on the results from the rubric, the Centralized Secondary Treatment to Percolation Chambers alternative scored the highest in two of the four categories including economics,

and operation while also scoring high in performance and social impacts. These systems are proven approaches with technologies that have been approved and implemented for decades.

The Distributed Secondary Systems, Hybrid Alternative, and MBR to Percolation Chambers approaches scored within a reasonable margin to the Centralized Secondary Treatment alternative and should remain in consideration. Centralized secondary treatment, Distributed secondary treatment, and Hybrid alternatives can be adapted to include tertiary equipment for future adaptation to reuse.

The rubric's overall results are shown in the table below. Centralized Secondary Treatment to Percolation Chambers is the recommended approach for treatment and dispersal of treated waters for the LOWRPP project based on current available information.

Alternatives Scoring

Centralized Secondary Treatment to Percolation Chamber	68.4%
Distributed Secondary Treatment to Percolation Chambers Systems	68%
Hybrid Distributed / Advanced Onsite	66.4%
Membrane BioReactor (MBR) Treatment to Percolation Chambers	65.2%
Membrane BioReactor (MBR) Treatment to Immediate Implementation of Reuse	60.4%
Advanced Onsite Treatment and Onsite Dispersal Systems	55.2%

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Introduction

The community of Los Olivos is implementing a sewer project, which includes evaluating and applying long term solutions for the collection, treatment, and reuse/dispersal of its wastewaters. Regen has been contracted to assist the Los Olivos Community Services District with the evaluation of alternatives for the community's wastewater treatment and dispersal/reuse systems.

The purpose of this technical memorandum is to compare centralized, distributed, and onsite treatment alternative systems, and make an initial recommendation on the best approach for the community.

Considerations for regional community wastewater reuse treatment solutions include:

- Centralized Membrane BioReactor treatment to immediate implementation of reuse
- Centralized Membrane BioReactor treatment to percolation chambers
- Centralized Traditional secondary treatment to percolation chambers

Considerations for localized community alternative wastewater solutions include:

- Distributed secondary treatment systems, three to five separate systems distributed throughout the community.
- Advanced Onsite for Individual homes & businesses with nitrogen specific treatment
- Hybrid combination of secondary treatment in dense sections of the community and advanced onsite individual home systems in less dense areas

Within this technical memorandum Regen Engineering developed a ranking system to assist in the evaluation of the various solutions within the community.

This technical memorandum is organized with the following sections:

- Introduction
- Methodology
- Alternative Comparisons & Ranking
- Results and Recommendations

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Methodology

The alternatives were compared utilizing a scoring matrix from one to five (1-5), with one being the lowest ranking and five being the highest ranking. The matrix has been divided into four categories, including various focal elements within each category. All the criteria are based on previous work completed by various sources and by engineers' experiences with the various alternatives. Scoring is meant to provide guidance for general considerations and does not include a final analysis of specific equipment. The following categories were utilized within the scoring matrix.

Economic

The economic category includes the initial and long-term costs associated with various alternatives. Elements within this category include the following:

- **Capital Costs:** Includes equipment, construction, and soft costs associated with the implementation of the various alternatives.
- **Annual Maintenance Costs**: Includes personnel and material costs associated with the maintenance of the various technologies.
- **Energy Efficiency:** Includes estimates on the energy efficiency of the various technologies in comparison to each other.
- **Repair Costs:** Includes all personnel and equipment associated with the repairs of equipment.
- **Replacement Costs:** Includes all equipment associated with the replacement of parts.

Performance

The performance category includes the expected quality of effluent, quality of equipment, and the equipment's ability to handle fluctuations. Elements within this category include the following**:**

- **Overall Effluent Quality**: The level of effluent quality produced by the treatment technologies in general. Associated with the requirements of the dispersal alternatives.
- **Nitrogen Reduction Capabilities**: The capability of treatment technologies to reduce total nitrogen (TN).
- **Reuse Quality**: The treatment technologies' capabilities to meet reuse quality, typically a Title 22 standard.
- **Innovation**: The innovative approach of various technologies to achieve treatment.
- **Proven Technology:** The years of proven performance of a specific technology.
- **Handles Fluctuating Flows:** The hydraulic loads that include diurnal patterns or other patterns that may impact the performance of pumps and treatment equipment.
- **Handles Fluctuating Strengths**: The characteristic loads that can impact the performance of treatment equipment.
- **Modular Design:** The modular capabilities of the technology, based on the low hydraulic design capacity of the community.

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Operations

The operations category includes the operational elements associated with various alternatives. Elements within this category include the following:

- **Operation Simplicity:** Simplicity of ongoing operations of the technology.
- **Maintenance Requirements:** Level of maintenance required to maintain proper operation of the technology.
- **Repair & Replacement Difficulty:** Difficulty and complexity with respects to the repair and replacement of components within the specific technology.
- **Start-up Simplicity:** Simplicity of commissioning of the system after installation.
- **Sludge Management:** Management of sludge associated with the technology.
- **Equipment Cleaning Frequency:** The frequency in which equipment needs maintained and/or replaced.
- **Chemical Additions:** Costs associated with additive chemicals to clean or enhance the process.

Social Impacts

The social category includes the impact to the community associated with various alternatives. Impacts typically arise due to the time and costs associated with permitting and funding, the physical impacts including aesthetics, locations, and odors, and impacts associated with disruption during construction events. Elements within this category include the following:

- **Simplicity of Approval Process:** This criterion considers the difficulties in obtaining permits and agency approvals. Examples of permits include county septic approvals or Regional Water Quality Control Board (RWQCB) water reuse permits.
- **Grant Funding Potential:** This criterion considers the potential to obtain grant funding based on comments from the RWQCB and County Environmental Health Services (EHS) during the January 10, 2023 workshop.
- **Location:** This criterion considers the complexities of siting various alternatives within the community.
- **Aesthetics:** This criterion considers the “out of the box” aesthetics of the various alternatives.
- **Potential for Odors:** This criterion considers the potential for odors of the various treatment and dispersal/reuse alternatives.
- **Potential Impact to Growth:** This criterion considers the expected impact of a given technology on growth potential.
- **Construction Disruption to Community:** This criterion considers the disruption to the community during the construction process.
- **Ongoing Disruption to Community:** This criterion considers the disruption to the community that is ongoing after initial construction event.

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Alternative Comparison & Rankings

Alternative solutions to handle the wastewater from residential and commercial landowners within the community of Los Olivos have been discussed for many years. Based on previous analysis, community discussion, and regulatory input, the top tear alternatives have been categorized as follows:

Centralized Membrane BioReactor (MBR) Treatment to Immediate Implementation of Reuse

This approach assumes a single regional MBR treatment system designed to meet 10 mg/L total nitrogen (TN) and tertiary treatment levels for full reuse of effluent through the community.

Centralized Membrane BioReactor (MBR) Treatment to Percolation Chambers

This approach assumes a single regional MBR treatment system designed to meet 10 mg/L TN prior to a large cluster dispersal system utilizing percolation chambers as described in the technical memorandum provided by GSI Water Solutions Inc & Confluence Engineering Solutions (ConfluenceES) on December 7, 2022.

Centralized Secondary Treatment to Percolation Chambers

This approach assumes a single regional traditional secondary treatment system designed to meet 10 mg/L TN prior to a large cluster dispersal system utilizing percolation chambers as described in the GSI & ConfluenceES technical memorandum.

Distributed Seconary Treatment Systems to Percolation Chambers

A phased approach utilizing distributed systems throughout the community would consider handling the downtown core area including nearby residences as a single alternative system and developing additional regional systems at strategic locations throughout the remainder of the community.

Advanced Onsite Treatment and Onsite Dispersal Systems

This approach assumes the use of individual advanced onsite systems to treat wastewater to acceptable levels (assumed 10 mg/L TN based on RWQCB and EHS discussion on Jan. 10, 2023). It has been assumed that the district would be responsible for ongoing operation and maintenance as well as capital improvement of individual systems.

Hybrid Distributed Secondary Treatment and Advanced Onsite Combined Alternative

This approach assumes the use of an MBR to percolation chambers for downtown and parcels under 2.5 acres and advanced onsite alternatives for parcels over 2.5 acres.

The above alternatives include a wide variety of systems ranging from activated sludge, attached growth, fixed film, and other similar processes. Certain processes such as lagoons or other passive-type systems were not included as the requirements for treatment performance based on previous work and regulatory commentary require nitrogen reduction processes, which are not typically compatible with these types of systems.

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Weighting Factors

The weighting factors have been derived from a combination of the survey completed by the Los Olivos Sewer District during the workshop on January 24, 2023, and conversations between Regen and the LOCSD during regular meetings. The weighting factors of each category and element are utilized to best weigh what is important to the community, along with the importance of various elements associated with technology selection. Critical elements identified during the in-person and online surveys include Capital Costs, Operation & Maintenance Costs, Ownership, Location, and Impacts to Growth.

The weight scale was completed in even increments with a total weighted relevance of 100%. Each element within the categories was provided a weight that is believed to be a specific representation of the Los Olivos community. It should also be noted that at the January 24, 2023 workshop, the community ranked percolation chambers as the primary dispersal alternative with reuse coming in as a desirable second alternative. Although the preference appeared to be percolation chambers it is unclear if an alternative combination of percolation and reuse may be a more desirable alternative for the community.

Ranking Scale

The ranking scale utilized a one to five (1-5) scoring based on the alternatives ability to meet the criteria lined out as described below. Scores were then multiplied by the weight associated with each element to provide an overall weighted score. Weighting and weighted scores have been provided, along with rankings, in Table 1.

Economic Ranking

Capital Costs: A value of one has been assigned to the highest capital cost alternative. A value of five has been assigned to the lowest cost capital alternative. Capital cost ranking was based on previous engineering analysis and the engineers' extensive experience in estimating treatment technologies for decentralized applications.

Annual Maintenance Costs: A value of one has been assigned to the highest expected maintenance cost alternative. A value of five has been assigned to the lowest expected maintenance cost alternative.

Energy Efficiency: A value of one has been assigned to the highest energy consuming alternative. A value of five has been assigned to the lowest energy consuming alternative.

Repair Costs: A value of one has been assigned to the highest expected repair costs alternative. A value of five has been assigned to the lowest expected repair cost alternative. Repair costs are based on mechanical or physical equipment components that have the potential for failure and require replacement along with the components relative value.

Replacement Costs: A value of one has been assigned to the highest replacement costs alternative. A value of five has been assigned to the lowest replacement cost alternative. Replacement components can be costly and are not typically considered in the evaluation of equipment alternatives. A value of one was given if major equipment component replacement

was more frequent than two years. A value of five was given if the major component replacement frequency was greater than 30 years.

Performance Ranking

Overall Effluent Quality: A value of one has been assigned to the lowest effluent quality alternative. A value of five has been assigned to the highest effluent quality alternative.

Nitrogen Reduction Capabilities: A value of one has been assigned to an alternative that does not address nitrogen reduction. A value of five has been assigned to the alternative with the greatest potential to address nitrogen reduction.

Reuse Quality: A value of one has been assigned to an alternative that does not have the ability to provide reuse quality water. A value of five has been assigned to the alternative that does provide reuse quality water.

Innovative: A value of one has been assigned to an alternative that does not utilize innovative approaches to treat or disperse water. A value of five has been assigned an alternative that utilized extremely innovative approaches to treat or disperse water. Innovation can be attractive but does not come without concerns. In the same way, progress relies on innovation and is necessary to improve on traditional approaches.

Proven Technology: A value of one has been assigned to an alternative that does not have a proven track record. A value of five has been assigned an alternative that has a long-established track record. Technology track record can be somewhat subjective and needed to be evaluated based on the size of the system and the years of proven performance within the scale being analyzed. Additionally, systems that have a long-proven track record are not always the best solution for a given community or system size. Early adopters of technology may consider a technology to be “proven” after a relatively short period of time, whereas late adopters may not consider something proven until the technology has been successfully deployed for many centuries.

Handles Fluctuating Flows: A value of one has been assigned to an alternative that does not have capacity to handle fluctuating flows. A value of five has been assigned to the alternative that is designed to handle large fluctuations in flow.

Handles Fluctuating Strengths: A value of one has been assigned to an alternative that does not have capacity to handle fluctuating waste strengths. A value of five has been assigned to the alternative that is designed to handle large fluctuations in waste strength.

Modular Design: A value of one has been assigned to an alternative that does offer the ability to modulate the equipment in phases. A value of five has been assigned to the alternative that can easily be adapted to modulate equipment in phases.

Operation Ranking

Operation Simplicity: A value of one has been assigned to the most complex alternative from an operations perspective. A value of five has been assigned to the simplest alternative from an operations perspective.

Maintenance Requirements: A value of one has been assigned to the most complex alternative from a maintenance perspective. A value of five has been assigned to the simplest alternative from a maintenance perspective.

Repair & Replacement Difficulty: A value of one has been assigned to an alternative that requires complex equipment replacement and repair. A value of five has been assigned an alternative requires no complex equipment replacement or repair.

Start-up Simplicity: A value of one has been assigned to an alternative requires extensive start-up oversight or time. A value of five has been assigned an alternative that does not require start-up oversight or time.

Sludge Management: A value of one has been assigned to an alternative required extensive sludge management practices and time. A value of five has been assigned to an alternative that does not require sludge management.

Equipment Cleaning Frequency: A value of one has been assigned to an alternative that requires very frequent equipment cleaning (daily). A value of five has been assigned an alternative that requires no equipment cleaning.

Chemical Additions: A value of one has been assigned to an alternative that requires a large volume of chemicals to enhance the treatment process or for cleaning purposes. A value of five has been assigned an alternative that requires no chemicals for cleaning or treatment enhancement.

Social/Regulatory Ranking

Simplicity of Approval Process: A value of one has been assigned to an alternative that is unlikely to be approved within the regulatory jurisdiction. A value of five has been assigned an alternative that is a highly likely if not guaranteed to be approved within the regulatory jurisdiction.

Grant Funding Potential: A value of one has been assigned to an alternative that is unlikely to receive grant money in support of the project scope. A value of five has been assigned an alternative that is a highly likely to receive grant funding in support of the project scope.

Location: A value of one has been assigned to an alternative that requires a very large district owned footprint. A value of five has been assigned an alternative that requires no district owned footprint.

Aesthetics: A value of one has been assigned to an alternative that is very difficult to make attractive from the community view. A value of five has been assigned an alternative that can be built or hidden to remain aesthetically pleasing to the community.

Potential for Odors: A value of one has been assigned to an alternative that has historically proven to have odor potential. A value of five has been assigned an alternative that has a track record for not producing odors.

Potential Impact to Growth: A value of one has been assigned to an alternative that would provide the greatest potential for community growth. A value of five has been assigned an alternative that would limit any potential growth within the community. This ranking is based on the community feedback the engineer has received. The desire to keep the community small and quaint has been expressed multiple times. It is likely that the opposite is true for some community members, however this perspective was taken based on community feedback to date.

Construction Disruption to Community: A value of one has been assigned to an alternative that would cause a large amount of disruption during the construction phase of the project. A value of five has been assigned an alternative that would have no disruption to the community during construction.

Ongoing Disruption to Community: A value of one has been assigned to an alternative that would cause a large amount of disruption during the operation phase of the project. A value of five has been assigned an alternative that would have no disruption to the community during ongoing operation of the system.

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Results and Recommendations

As shown in Table 1 and the expanded version in the appendix, the Centralized Secondary Treatment to Percolation Chambers alternative had the highest score, with Distributed Systems approach as a close second alternative. The Hybrid approach was the third highest score, not far behind Secondary Treatment and Distributed Systems. The use of an MBR to Percolation was not far behind these alternatives and presents an optional alternative for further investigation.

The MBR to Reuse alternative as specified in previous work scored below the above alternatives, mainly due to expected costs of the system. Additionally, Advanced Onsite alternative scored the lowest due to the social and regulatory barriers as well as performance categories.

The scoring of the various alternatives, from highest to lowest, is as follows:

- Centralized Secondary Treatment to Percolation Chambers: 68.4%
- Distributed Secondary Treatment Systems to Percolation Chambers Systems: 68%
- Hybrid Distributed / Advanced Onsite Approach: 66.4%
- Centralized Membrane BioReactor (MBR) to Percolation Chambers: 65.2%
- Centralized Membrane BioReactor (MBR) to Immediate Implementation of Reuse: 60.4%
- Advanced Onsite Treatment and Onsite Dispersal Systems: 55.2%

The Distributed and Hybrid solutions have the potential to include many of the benefits of the MBR / Percolation alternative with the isolation of the collection system to areas requiring urgency and varying levels of treatment. The main benefits of the MBR / Percolation option include a high level of regulatory support as well as additional potential for grant funding to assist with the higher cost. Additionally, the utilization of the MBR system allows for future reuse inclusion with minimum modifications.

It should be noted, any individual system can be designed and operated to perform to the highest standards. The rankings listed above are based on typical system designs within the various range of equipment alternatives analyzed, and the regulatory and social elements specific to the Los Olivos region and community.

Regen recommends that the community utilize this technical memorandum as a guide with regards to the benefits and drawbacks of the alternatives. The top-rated alternatives provide benefits that fit well with the needs of the Los Olivos community and are the recommended approach for this community. All the top-rated alternatives utilize a community collection system, can be built in phases, and utilize secondary treatment systems to percolation chambers or ponds. They all provide potential economic advantages over other alternatives and can be converted to reuse capable systems in the future. Further analysis should be completed on viable locations for treatment and dispersal, which will assist in the final selection of the top-rated alternatives.

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Table 1: Los Olivos Wastewater Treatment & Dispersal Options Rubric "Partial"

Category	Criteria	Weight	Systems Ranking					
			MBR/Reuse	MBR/Perc	Secondary/Perc	Distributed/Perc	Advanced Onsite	Hybrid
Economic	Capital Costs	12%	1	2	3	3	4	3
	Annual Maintenance Costs	6%	1	2	3	3	2	3
	Energy Efficiency	2%	1	1	2	2	2	1
	Repair Costs	2%	1	2	3	3	2	3
	Replacement Costs	2%	1	1	2	2	2	2
Economic Score	Maximum Score	24%	5%	9%	14%	14%	14%	13%
Performance	Overall Effluent Quality	2%	5	5	4	4	2	4
	Nitrogen Reduction Capabilities	8%	5	5	5	5	3	4
	Reuse Quality	6%	5	4	2	2	1	2
	Innovative	2%	4	4	3	3	3	4
	Proven Technology	2%	4	4	5	4	3	4
	Handles Fluctuating Flows	2%	2	2	2	3	4	3
	Handles Fluctuating Strength	2%	3	3	2	3	2	3
	Modular Design	2%	2	2	4	5	5	5
Performance Score	Maximum Score	26%	22%	21%	18%	19%	14%	18%
Operations	Operation Simplicity	2%	1	2	3	3	2	3
	Maintenance Requirements	2%	1	2	3	3	3	3
	Repair & Replacement Difficulty	2%	2	3	3	3	4	3
	Start-up Simplicity	2%	2	3	4	4	2	4
	Sludge Management	2%	1	2	3	4	5	4
	Equipment Clean/Replacement Freq.	2%	1	1	3	3	3	3
	Chemical Addition	2%	1	1	3	3	2	3
Operation Score	Maximum Score	14%	4%	6%	9%	9%	8%	9%
Social/Regulatory	Simplicity of Approval Process	4%	5	5	4	3	1	3
	Grant Funding Potential	8%	5	5	4	3	1	3
	Location	2%	5	5	4	3	2	3
	Aesthetics	2%	4	4	4	4	3	4
	Potential for Odors	4%	4	4	3	3	3	3
	Potential Impact to Growth	6%	1	1	2	4	5	4
	Construction Disruption to Community	6%	5	5	5	4	3	4
	Ongoing Disruption to Community	4%	5	5	5	5	3	5
Social/Reg Score	Maximum Score	36%	30%	30%	28%	26%	19%	26%
Total		100%	**60.40%**	**65.20%**	**68.40%**	**68.00%**	**55.20%**	**66.40%**

Note: Scoring was completed utilizing: $((R_1 \times W_1) + (R_2 \times W_2)) + etc. / (H_r)$; R=Ranking, W=Weight, H_r = Highest Number in Ranking Criteria. An expanded version of the rubric can be found in the Appendix.

Additional in-depth evaluation can be completed to provide greater insight into the difference between alternatives, and fine tuning of the rankings may allow for more accurate scoring. Greater community engagement would also allow for additional fine tuning of the weight scale to verify the preferences of the Los Olivos community. A full analytical rubric could be completed with more time. This in-depth analysis would allow for greater assessment of specific system cost, performance, operational analysis, and social/regulatory elements. Additional work is currently underway including groundwater monitoring and an evaluation of funding alternatives. This work could provide important information that would allow for additional fine tuning and alteration to the comparison's rubric.

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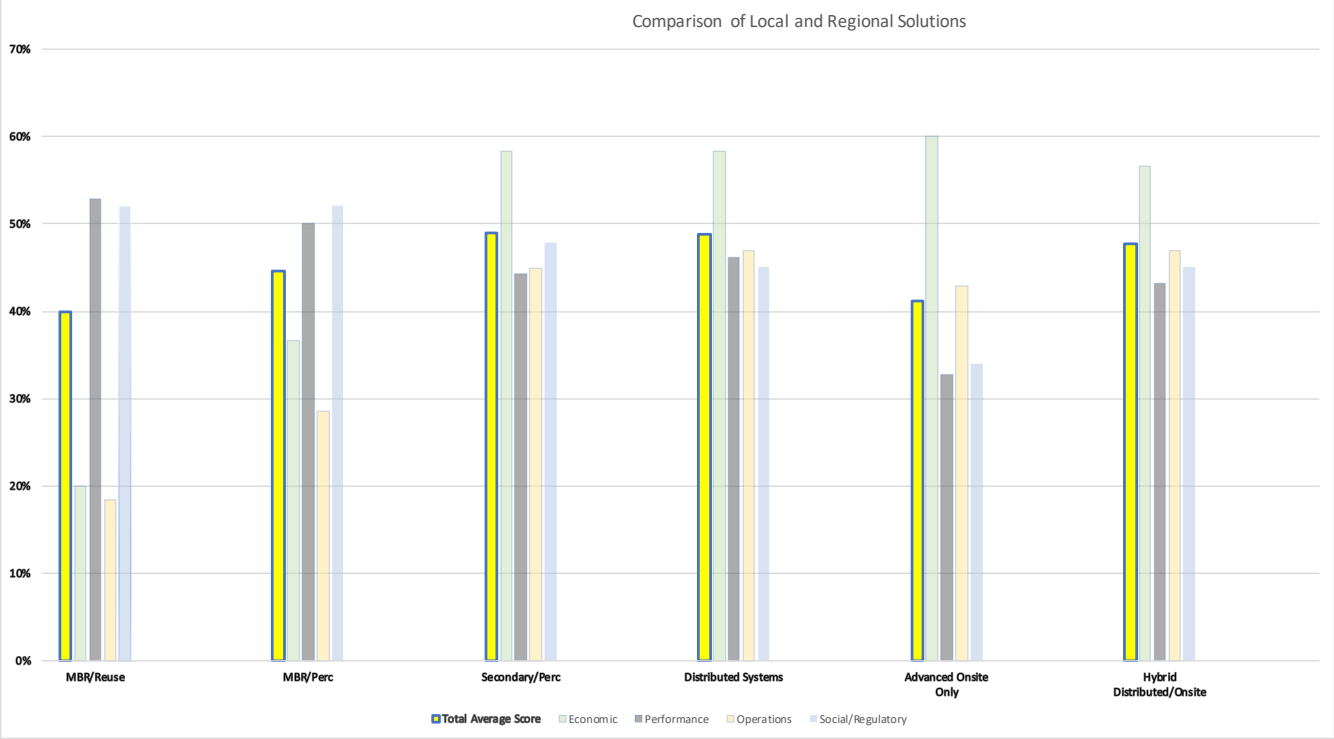

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Appendix

Category	Criteria	Weight	Systems Ratings											
			MBR/Reuse		MBR/Perc		Secondary/Perc		Distributed Systems		Advanced Onsite Only		Hybrid Distributed/Onsite	
Economic	Capital Costs	12%	1	Very Expensive	2	Expensive	3	Costly	3	Costly	4	Differed to Property Land Owners	3	Costly
	Annual Maintenance Costs	6%	1	3 Full Time Empolyees (High-certification)	2	2 Full Time Empolyees (High-certification)	3	2 Full Time Empolyees (low-certification)	3	2 Full Time Empolyees (low-certification)	2	3 Full Time Empolyees (minimal-certified)	3	2 Full Time Empolyees (low-certification)
	Energy Efficiency	2%	1	Very Energy Intensive	1	Energy Intensive	2	Energy Reasonable	2	Energy Reasonable	2	Energy Intensive Overall	1	Energy Reasonable
	Repair Costs	2%	1	Expensive Components	2	Expensive Components	3	Inexpensive Components	3	Inexpensive Components	2	Expensive Over Time	3	Inexpensive Components
	Replacement Costs	2%	1	3-5 years typically	1	3-5 years typically	2	Estimated 5-15 Years	2	Estimated 5-15 Years	2	5-20 Year, Varies with Equipment Supplier	2	Estimated 5-15 Years
Economic Score	Maximum Score	24%	5%		9%		14%		14%		14%		13%	
Performance	Overall Effluent Quality	2%	5	Very High Quality	5	Very High Quality	4	High Quality	4	High Quality	2	Varies from Low to High Quality	4	High Quality
	Nitrogen Reduction Capabilities	8%	5	Capable of meeting low standard	5	Capable of meeting low standard	5	Capable of meeting low standard	5	Capable of meeting low standard	3	Varies, But Typically Not Great	4	Capable of meeting low standard
	Reuse Quality	6%	5	Reuse Water Quality standard	4	Reuse Water Quality standard	2	Requires Add On Components	2	Requires Add On Components	1	Possible But Costly	2	Requires Add On Components
	Innovative	2%	4	Innovative Technology	4	Innovative Technology	3	Can Be Innovative	3	Can Be Innovative	3	Can Be Innovative Technology	4	Innovative Technology
	Proven Technology	2%	4	Good Track Record	4	Good Track Record	5	Long Track Record	4	Good Track Record	3	Not So Good Track Record in Area	4	Good Track Record
	Handles Fluctuating Flows	2%	2	With Added Equalization	2	With Added Equalization	2	With Added Equalization	3	With Equalization	4	Small Impacts Hydraulically from Single Lots	3	With Added Equalization
	Handles Fluctuating Strength	2%	3	Moderately Handles Some Fluctuation	3	Moderately Handles Some Fluctuation	2	Handles Some Fluctuation	3	Flexible in Design	2	Most Have Trouble With Variation	3	Flexible in Design
	Modular Design	2%	2	Modular At Higher Flow Rates	2	Modular At Higher Flow Rates	4	Modular Design Capability	5	Very Modular	5	Very Modular	5	Very Modular
Performance Score	Maximum Score	26%	22%		21%		18%		19%		14%		18%	
Operations	Operation Simplicity	2%	1	Complex (High level of monitoring)	2	Relatively Complex	3	Relatively Simple	3	Relatively Simple	2	Complexity (may vary depending on monitoring)	3	Relatively Simple
	Maintenance Requirements	2%	1	High Maintenance Comparatively	2	High Maintenance Comparatively	3	Moderate	3	Moderate	3	Minimal, Depending on Technology	3	Moderate
	Repair & Replacement Difficulty	2%	2	Relatively Straight Forward	3	Relatively Straight Forward	3	Relatively Straight Forward	3	Relatively Straight Forward	4	Simple Low Cost	3	Relatively Straight Forward
	Start-up Simplicity	2%	2	Complex	3	Somewhat Complex	4	Straight Forward	4	Straight Forward	2	Can be complex with various equipment	4	Straight Forward
	Sludge Management	2%	1	High Sludge Volumes	2	High Sludge Volumes	3	Large Sludge Volumes	4	Moderate Sludge Volumes	5	Minimal, Handled by Others	4	Moderate Sludge Volumes
	Equipment Clean/Replacement Freq.	2%	1	High	1	High	3	Moderate	3	Moderate	3	Moderate	3	Moderate
	Chemical Addition	2%	1	High Usage for Cleaning	1	High Usage for Cleaning	3	Moderate Usage	3	Moderate Usage	2	Can be complex with various equipment	3	Moderate Usage
Operation Score	Maximum Score	14%	4%		6%		9%		9%		8%		9%	
Social/Regulatory	Simplicity of Approval Process	4%	5	High Level of Regulatory Support	5	Regulatory Support but Future Reuse	4	Common Processes	3	Common Process w/ Different Approach	1	Regulatory Barriors	3	Common Process w/ Different Approach
	Grant Funding Potential	8%	5	Potential Quick Access/Process	5	Potential Quick Access/Process	4	Good, but not Reuse or MBR	3	Moderate Potential Assistance	1	Expected Slower Process / Unknown Assistance	3	Moderate Potential Assistance
	Location	2%	5	Small Compact Footprint	5	Small Compact Footprint	4	Compact Footprint	3	Multiple Small Compact Footprint	2	Large OnLot Space Requirements	3	Mulitple Small Compact Footprint
	Aesthetics	2%	4	Can be hidden	4	Can be hidden	4	Can be hidden	4	Can be hidden	3	Various Equipment visible on each lot	4	Can be hidden
	Potential for Odors	4%	4	Should Not Have Odors	4	Should Not Have Odors	3	Unlikely To Have Odors	3	Unlikely To Have Odors	3	Many Systems, Higher Potential for Odors	3	Unlikely To Have Odors
	Potential Impact to Growth	6%	1	Higher Capacity Could Mean Growth	1	Higher Capacity Could Mean Growth	2	Capacity Could Mean Growth	4	Controlled Growth Potential	5	Minimal Growth Impact	4	Controlled Growth Potential
	Construction Disruption to Community	6%	5	Minimal	5	Minimal	5	Minimal	4	Minimal but multiple sites	3	Construction at multiple locations	4	Minimal but multiple sites
	Ongoing Disruption to Community	4%	5	Minimal	5	Minimal	5	Minimal	5	Minimal	3	Pumping, repairs, maintenance	5	Minimal
Social/Reg Score	Maximum Score	36%	30%		30%		28%		26%		19%		26%	
Total		100%	*60.40%*		*65.20%*		*68.40%*		*68.00%*		*55.20%*		*66.40%*	