



131 SW 5th Ave.
Meridian, ID 83642
208-288-1992

FINAL MEMORANDUM

Date: SEPTEMBER 13, 2010
To: SCOTT FLEURY AND MIKE FAUGHT, CITY OF ASHLAND
From: LARRY RUPP
Subject: CITY OF ASHLAND WWTP MEMBRANE REPLACEMENT OPTIONS

This memorandum summarizes the review of the membrane replacement options for the Ashland Wastewater Treatment Plant (WWTP). The need for this review is due to the concern with the condition of the existing membranes and the need for additional capacity. Below is a summary of items reviewed in providing our recommendation to the City of Ashland.

1. Review the existing membrane system.
2. Review the membrane inspection spreadsheet provided by Ashland staff.
3. Perform a hydraulic analysis to determine other components that may need to be replaced if a higher capacity membrane is installed.
4. Review membrane replacement options from other potential suppliers to determine if a feasible option exists that will fit within the existing system.
5. Review membrane replacement options from Zenon.
6. Provide a recommendation for membrane replacement.

In addition to the steps listed above, an attempt was made to review the historical operational data (cleaning intervals, permeability, and turbidity) that are available on ZenoTrac. To date, the ZenoTrac data has not been reviewed. The review is pending based on feedback from Zenon. Depending on the data available, it could be used to recommend a higher or lower flux rate and to better determine if the existing membranes are approaching their existing useful life.

EXISTING MEMBRANE SYSTEM

The existing membranes have been in operation since May of 2002. Since the original commissioning, an additional 10 % capacity was added in January 2008 by installing membranes similar to the original membranes in the remaining basin area. Current flows indicate the need for additional capacity is approaching. Another concern is the life of the existing membranes. Additionally, the City has a price guarantee for membrane replacement that is due to expire April 4, 2011.

Plant staff conducted an inspection of the membranes (See summary of results in Table 1). The inspection revealed that a number of fibers are separating from the urethane potting. This is likely due to over exposure of chlorine. Approximately 25% of the membrane cassettes have more than half of the fibers loose.



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Table 1 - Condition of Existing Membrane Cassettes

Trains	Cassettes	Condition of Existing Membrane Cassettes																												Flow	MGD	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
1	1	Installed January 2008																												220	68,640	
1	2	Installed 2002																												220	68,640	
1	3	Installed 2002																												220	68,640	
1	4	Installed 2002																												220	68,640	
1	5	Installed 2002																												220	68,640	
1	6	Installed 2002																												220	68,640	
1	7	Installed 2002																												220	68,640	
1	8	Installed 2002																												220	68,640	
1	9	Installed 2002																												220	68,640	
1	10	Installed 2002																												220	68,640	
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	3/Reass.	g/sfid	Flow	MGD
2	1	Installed January 2008																												0	220	68,640
2	2	Installed 2002																												10	220	68,640
2	3	Installed 2002																												5	220	68,640
2	4	Installed 2002																												0	220	68,640
2	5	Installed 2002																												5	220	68,640
2	6	Installed 2002																												50	220	68,640
2	7	Installed 2002																												50	220	68,640
2	8	Installed 2002																												30	220	68,640
2	9	Installed 2002																												50	220	68,640
2	10	Installed 2002																												50	220	68,640
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	3/Reass.	g/sfid	Flow	MGD
3	1	Installed January 2008																												0	220	68,640
3	2	Installed 2002																												0	220	68,640
3	3	Installed 2002																												0	220	68,640
3	4	Installed 2002																												0	220	68,640
3	5	Installed 2002																												0	220	68,640
3	6	Installed 2002																												0	220	68,640
3	7	Installed 2002																												100	220	68,640
3	8	Installed 2002																												100	220	68,640
3	9	Installed 2002																												100	220	68,640
3	10	Installed 2002																												100	220	68,640
Trains	Cassettes	Percent Loose																												0	220	68,640
4	1	Installed January 2008																												0	220	68,640
4	2	Installed 2002																												0	220	68,640
4	3	Installed 2002																												0	220	68,640
4	4	Installed 2002																												0	220	68,640
4	5	Installed 2002																												0	220	68,640
4	6	Installed 2002																												0	220	68,640
4	7	Installed 2002																												0	220	68,640
4	8	Installed 2002																												0	220	68,640
4	9	Installed 2002																												0	220	68,640
4	10	Installed 2002																												0	220	68,640
		0% Loose																														
		1-48% Loose																														
		100% Loose																														
		2008 Total																												2,746		
		2002 Total																												2,471		



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Another consideration is the life expectancy of the membrane fibers. With Ashland being one of the first tertiary membrane installations, data to determine the life expectancy is not available. Membrane life can vary widely depending on the operating conditions, chemical exposure, membrane materials, and other factors. Loss of permeability even after cleanings is typically an indication of the need to replace membranes. A life expectancy of 10 years is not uncommon for wastewater. For the Ashland WWTP, an even longer life expectancy could be realized as the membranes are only operated 7 months a year.

HYDRAULIC ANALYSIS

The membrane system was modeled hydraulically using spreadsheet calculations. Initially the limiting factor hydraulically is the permeate pumps which have a capacity of 1.13 mgd for a total capacity of 4.5 mgd. The permeate piping is also designed to handle approximately 4.5 mgd. Any membrane capacity expansion beyond 4.5 mgd should include a replacement of both permeate pumps and piping.

POTENTIAL MEMBRANE SUPPLIERS

In addition to the original membrane supplier (GE/Zenon), Koch Membrane Systems (Puron) also provides cassettes/modules that are made to replace GE/Zenon membranes. A proposal from Koch for membrane replacement at the Ashland WWTP is included in Appendix A. The cost for Koch membranes is approximately \$6.00 to \$6.50 per ft.². This is slightly less when compared to GE/Zenon replacement cost shown in Table 2. If this option is pursued, it is recommended that further detailed design level evaluation be completed in order to verify compatibility and identify any required modifications to the existing system.

GE/ZENON REPLACEMENT OPTIONS

GE/Zenon currently manufactures three feasible options for replacing the membranes at the Ashland WWTP. In order of the least to most capacity the options are ZW500C-250, ZW500D-340, and ZW500D-440 with the last three numbers corresponding to the amount of membrane surface area per module. Appendix B contains a copy of GE/Zenon's proposed scope of replacement and budgetary pricing. Table 2 summarizes the GE/Zenon's options. Options 4 and 5 are not recommended at this time as they require a major upgrade of the membrane system. Using the ZW500D-340 would add very little capacity because the current configuration will only fit 20 modules per cassette versus the existing 26 modules per cassette. Similarly the ZW500D-440 option would only be necessary if peak flows require membrane treatment.



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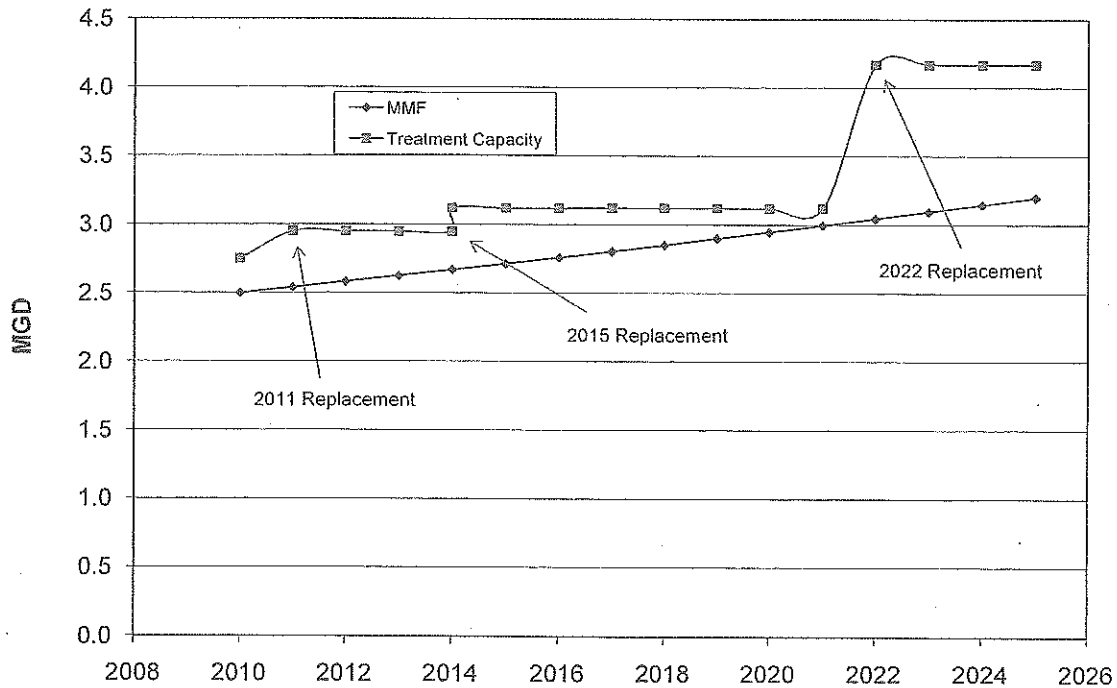
Table 2 - Membrane Replacement Options Cost Summary

	Quoted Price	# of Modules	SF/Modules	\$/SF
2W500C-2505	\$1.75 Million	936	250	\$7.48
2W500D-3405*	\$2.1 - 2.5 Million	800	340	\$7.72 - 9.19
2W500D-4405*	\$2.3 - 2.7 Million	752	440	\$6.95 - 8.16

* Includes cost for modifying blower capacity

Figure 1 shows a recommended replacement schedule. This schedule is based on the maximum month flow and population projections to date (@ 1.66% growth rate) and may require revision as these projections are finalized with the master plan. The details of the membrane replacement are shown in Tables 3-5. For example Table 3 shows a recommendation for replacing modules and moving other existing modules. The result shown in Table 3 are obtained by replacing the damaged cassettes in trains 1, 2, and 3 with new cassettes and moving the good cassettes from train 1 and train 2 to train 3. The result is membranes in the worst condition are replaced and there are two trains of new membranes.

Figure 1 - Projected Membrane Replacement Schedule





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Table 3 - Phase 1 Replacement

		Table 3 - Phase 1 Replacement																															
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	sf/cass.	g/s/ft/d	flow	MGD	
1	1	Installed January 2008																										0	250	12	78,000		
1	2	Installed January 2011																										0	250	12	78,000		
1	3	Installed January 2011																										0	250	12	78,000		
1	4	Installed January 2011																										0	250	12	78,000		
1	5	Installed January 2011																										0	250	12	78,000		
1	6	Installed January 2011																										0	250	12	78,000		
1	7	Installed January 2011																										0	250	12	78,000		
1	8	Installed January 2011																										0	250	12	78,000		
1	9	Installed January 2011																										0	250	12	78,000		
1	10	Installed January 2011																										0	250	12	78,000		
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	sf/cass. <td>g/s/ft/d <td>flow <td>MGD</td> </td></td>	g/s/ft/d <td>flow <td>MGD</td> </td>	flow <td>MGD</td>	MGD	
2	1	Installed January 2008																										0	250	12	78,000	0.780	
2	2	Installed January 2011																										0	250	12	78,000		
2	3	Installed January 2011																										0	250	12	78,000		
2	4	Installed January 2011																										0	250	12	78,000		
2	5	Installed January 2011																										0	250	12	78,000		
2	6	Installed January 2011																										0	250	12	78,000		
2	7	Installed January 2011																										0	250	12	78,000		
2	8	Installed January 2011																										0	250	12	78,000		
2	9	Installed January 2011																										0	250	12	78,000		
2	10	Installed January 2011																										0	250	12	78,000		
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	sf/cass. <td>g/s/ft/d <td>flow <td>MGD</td> </td></td>	g/s/ft/d <td>flow <td>MGD</td> </td>	flow <td>MGD</td>	MGD	
3	1	Installed January 2008																										0	250	12	78,000	0.780	
3	2	Installed 2002																										0	220	12	68,640		
3	3	Installed 2002																										0	220	12	68,640		
3	4	Installed 2002																										0	220	12	68,640		
3	5	Installed 2002																										0	220	12	68,640		
3	6	Installed 2002																										0	220	12	68,640		
3	7	Installed 2002																										0	220	12	68,640		
3	8	Installed 2002																										0	220	12	68,640		
3	9	Installed 2002																										0	220	12	68,640		
3	10	Installed 2002																										0	220	12	68,640		
Trains	Cassettes																											Percent Loose			0.696		
4	1	Installed January 2008																										0	250	12	78,000		
4	2	Installed 2002																										0	220	12	68,640		
4	3	Installed 2002																										0	220	12	68,640		
4	4	Installed 2002																										0	220	12	68,640		
4	5	Installed 2002																										0	220	12	68,640		
4	6	Installed 2002																										0	220	12	68,640		
4	7	Installed 2002																										0	220	12	68,640		
4	8	Installed 2002																										0	220	12	68,640		
4	9	Installed 2002																										0	220	12	68,640		
4	10	Installed 2002																										0	220	12	68,640		
		0% Loose																													0.696		
		1-49% Loose																															
		100% Loose																															
		Moved from one train to another																															
		New																															
																															2,952		



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Table 4 - Phase 2 Replacement

		Table 4 - Phase 2 Replacement																																
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	s/cass.	g/s/ft	flow	MGD		
1	1	Installed January 2008																												0	250	12	78,000	
1	2	Installed January 2011																												0	250	12	78,000	
1	3	Installed January 2011																												0	250	12	78,000	
1	4	Installed January 2011																												0	250	12	78,000	
1	5	Installed January 2011																												0	250	12	78,000	
1	6	Installed January 2011																												0	250	12	78,000	
1	7	Installed January 2011																												0	250	12	78,000	
1	8	Installed January 2011																												0	250	12	78,000	
1	9	Installed January 2011																												0	250	12	78,000	
1	10	Installed January 2011																												0	250	12	78,000	
2	1	Installed January 2008																												0	250	12	78,000	0.780
2	2	Installed January 2011																												0	250	12	78,000	
2	3	Installed January 2011																												0	250	12	78,000	
2	4	Installed January 2011																												0	250	12	78,000	
2	5	Installed January 2011																												0	250	12	78,000	
2	6	Installed January 2011																												0	250	12	78,000	
2	7	Installed January 2011																												0	250	12	78,000	
2	8	Installed January 2011																												0	250	12	78,000	
2	9	Installed January 2011																												0	250	12	78,000	
2	10	Installed January 2011																												0	250	12	78,000	
3	1	Installed January 2008																												0	250	12	78,000	0.780
3	2	Installed January 2015																												0	250	12	78,000	
3	3	Installed January 2016																												0	250	12	78,000	
3	4	Installed January 2015																												0	250	12	78,000	
3	5	Installed January 2015																												0	250	12	78,000	
3	6	Installed January 2015																												0	250	12	78,000	
3	7	Installed January 2015																												0	250	12	78,000	
3	8	Installed January 2015																												0	250	12	78,000	
3	9	Installed January 2015																												0	250	12	78,000	
3	10	Installed January 2015																												0	250	12	78,000	
Trains	Cassettes																													Percent Loose				
4	1	Installed January 2008																												0	250	12	78,000	0.780
4	2	Installed January 2015																												0	250	12	78,000	
4	3	Installed January 2015																												0	250	12	78,000	
4	4	Installed January 2015																												0	250	12	78,000	
4	5	Installed January 2015																												0	250	12	78,000	
4	6	Installed January 2015																												0	250	12	78,000	
4	7	Installed January 2015																												0	250	12	78,000	
4	8	Installed January 2015																												0	250	12	78,000	
4	9	Installed January 2015																												0	250	12	78,000	
4	10	Installed January 2015																												0	250	12	78,000	
		0% Loose																																
		1-49% Loose																																
		100% Loose																																
		Moved from one train to another																																
		New																																
																																		3.120



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Table 5 - Phase 3 Replacement

Trains	Cassettes	Year																												Percent Loose	sf/cass.	g/sf/d	fl/w	MGD
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26							
1	1	Installed January 2022																												0	340	12	261,120	
1	2	Installed January 2022																												0	340	12	261,120	
1	3	Installed January 2022																												0	340	12	261,120	
1	4	Installed January 2022																												0	340	12	261,120	
1	5	Installed January 2022																												0	340	12	261,120	
1	6																													0		12	0	
1	7																													0		12	0	
1	8																													0		12	0	
1	9																													0		12	0	
1	10																													0		12	0	
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose				1,306		
2	1	Installed January 2022																												0	340	12	261,120	
2	2	Installed January 2022																												0	340	12	261,120	
2	3	Installed January 2022																												0	340	12	261,120	
2	4	Installed January 2022																												0	340	12	261,120	
2	5	Installed January 2022																												0	340	12	261,120	
2	6																													0		12	0	
2	7																													0		12	0	
2	8																													0		12	0	
2	9																													0		12	0	
2	10																													0		12	0	
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose				1,306		
3	1	Installed January 2015																												0	250	12	78,000	
3	2	Installed January 2015																												0	250	12	78,000	
3	3	Installed January 2015																												0	250	12	78,000	
3	4	Installed January 2015																												0	250	12	78,000	
3	5	Installed January 2015																												0	250	12	78,000	
3	6	Installed January 2015																												0	250	12	78,000	
3	7	Installed January 2015																												0	250	12	78,000	
3	8	Installed January 2015																												0	250	12	78,000	
3	9	Installed January 2015																												0	250	12	78,000	
3	10	Installed January 2015																												0	250	12	78,000	
Trains	Cassettes																													Percent Loose				
4	1	Installed January 2011																												0	250	12	78,000	
4	2	Installed January 2015																												0	250	12	78,000	
4	3	Installed January 2015																												0	250	12	78,000	
4	4	Installed January 2015																												0	250	12	78,000	
4	5	Installed January 2015																												0	250	12	78,000	
4	6	Installed January 2015																												0	250	12	78,000	
4	7	Installed January 2015																												0	250	12	78,000	
4	8	Installed January 2015																												0	250	12	78,000	
4	9	Installed January 2015																												0	250	12	78,000	
4	10	Installed January 2015																												0	250	12	78,000	
		0 % Loose																																
		1-49 % Loose																																
		50-99 % Loose																																
		100 % Loose																																
		Moved from one train to another																																
		New																																
																																		4.171



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The future recommendations account for future flows and should be re-evaluated before proceeding with membrane replacement. The membrane replacement recommendations are based on both meeting capacity objective and on an expected membrane life of 10 to 15 years. Another approach that could be employed would be to replace based on capacity and continue to use the membranes until a drop in performance is noticed. This approach would result in pushing the membranes to the edge of their useful life versus replacing membranes based on expected useful life. Table 6 shows the membrane replacement for phase I if this philosophy is employed.

It should be noted that the recommendations are based on being able to treat maximum month flows. Peak hour flows would bypass the tertiary membrane system. For the purposes of meeting the effluent phosphorus limit treating maximum month flows appears adequate for the near future. Due to the phosphorus limit being load based, the amount of flow that can be bypassed while still meeting the limit will decrease as overall flows increase. As the flow increase requires lower and lower effluent phosphorus concentrations, other options should be explored for meeting the phosphorus limit. If the City desires to treat all flows including peaks, additional membrane capacity will be required. This should be considered as temperature options which may require membrane treated effluent are explored and finalized.

MEMBRANE REPLACEMENT RECOMMENDATION SUMMARY

It is understood that the chosen membrane replacement option which meets the City's budget is as shown in Table 6. This is a less-conservative approach than replacing membranes in both train 1 and train 2. However, with the outstanding temperature issue, which could affect the membrane design and use, this approach is more fiscally conservative. Once a direction is known on the temperature issue, it is recommended to revisit replacing train 2 within the next year or two, as shown in Table 3.

Based on the review conducted, it is recommended to provide 9 new ZW500C- 250 cassettes to train (as shown in Table 6). The estimated replacement cost based on information provided by GE/Zenon is \$400,000. This will allow the City to accomplish the following:

- Replace damaged cassettes
- Take advantage of the replacement price guarantee for one-quarter the membranes
- Upgrade the capacity
- Decision on majority of membrane replacement can be made after knowing the affect of the meeting the future temperature limit on tertiary treatment

In addition, the good cassettes should be moved to train 3, as shown in Table 6, to replace those that have fibers separated from the potting.



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Table 6 - Phase 1b Replacement Option

Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	flow	MGD
1	1	Installed January 2008																										0	78,000	
1	2	Installed 2002																										0	78,000	
1	3	Installed 2002																										0	68,640	
1	4	Installed 2002																										0	68,640	
1	5	Installed 2002																										0	68,640	
1	6	Installed 2002																										0	68,640	
1	7	Installed 2002																										0	68,640	
1	8	Installed 2002																										0	68,640	
1	9	Installed 2002																										0	68,640	
1	10	Installed 2002																										0	68,640	
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	flow	MGD
2	1	Installed January 2008																										0	78,000	0.696
2	2	Installed January 2011																										0	78,000	
2	3	Installed January 2011																										25	78,000	
1	2	Installed January 2011																										25	78,000	
2	5	Installed January 2011																										25	78,000	
1	3	Installed January 2011																										25	78,000	
1	5	Installed January 2011																										25	78,000	
2	8	Installed January 2011																										25	78,000	
1	7	Installed January 2011																										25	78,000	
1	9	Installed January 2011																										25	78,000	
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	flow	MGD
3	1	Installed January 2006																										0	78,000	0.780
3	2	Installed 2002																										0	78,000	
3	3	Installed 2002																										0	68,640	
3	4	Installed 2002																										0	68,640	
3	5	Installed 2002																										0	68,640	
3	6	Installed 2002																										0	68,640	
1	4	Installed 2002																										0	68,640	
1	6	Installed 2002																										0	68,640	
1	8	Installed 2002																										0	68,640	
2	4	Installed 2002																										0	68,640	
Trains	Cassettes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Percent Loose	flow	MGD
4	1	Installed January 2008																										0	78,000	0.696
4	2	Installed 2002																										0	78,000	
4	3	Installed 2002																										0	68,640	
4	4	Installed 2002																										0	68,640	
4	5	Installed 2002																										0	68,640	
4	6	Installed 2002																										0	68,640	
4	7	Installed 2002																										0	68,640	
4	8	Installed 2002																										0	68,640	
4	9	Installed 2002																										0	68,640	
4	10	Installed 2002																										0	68,640	
		0 % Loose																										0		0.696
		1-49 % Loose																												
		100 % Loose																												2.867
		Moved from one train to another																												
		New																												



131 SW 5th Ave.
Meridian, ID 83642
208-288-1992

Reasons for proceeding with the option shown in Table 3 in the next two years include:

- Some damaged cassettes are not replaced
- The option shown in Table 3 better fits a long-term replacement schedule when considering expected membrane life

It is recommended that this evaluation be performed again prior to future membrane replacement (targeted for 2015) to determine if the replacement shown in table 4 is still the best option. If peak capacity is to be met or once the max month capacity exceeds 4.0 mgd, new piping, pumps, and blower modifications will be required. At that time, converting to a higher capacity membrane would also be necessary.



Membrane Replacement Proposal

3239 Dundas Street West,
Oakville, Ontario, Canada L6M 4B2
Tel: 905 465 3030 Fax: 905 465 3050

To:	The City of Ashland, Oregon referred to here as Ashland or Buyer	Date:	August 31, 2012
		No. of Pages:	21 including cover
Attention:	David Gies, Water Reclamation Supervisor	Email:	giesd@ashland.or.us
Address:	20 E. Main Street Ashland, Oregon, USA 97540	Telephone No.:	541 552 2335
		Fax No.:	541 552 2364
From:	Adam Colling Regional Lifecycle Manager Western USA	Email:	Adam.Colling@ge.com
		Cell No.:	760 685 7959
		Fax No.:	858 550 7469
Subject:	Membrane Replacement – Train #3	Proposal No.:	595616
		Original Project No.:	500127
Plant:	Ashland Wastewater Treatment Plant, Municipal Wastewater-Tertiary Treatment, 500c, 4 trains, 10 cassettes per train, 26 modules per cassette, total module count = 1,040, Substantial Completion Date Oct 17, 2002.		





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GE Water and Process Technologies as Seller submits the information contained in this document for evaluation only by Buyer. Buyer agrees not to reveal its contents except to those in Buyer’s organization as is necessary for evaluation. Copies of this document may not be made without the prior written consent of Seller’s Management. If the preceding is not acceptable to Buyer, this document shall be returned to Seller.

This proposal has been issued, based on the information provided by Buyer and currently available to GE at the time of proposal issuance. Any changes or discrepancies in site conditions, including but not limited to changes in system influent water characteristics, changes in Environmental Health and Safety conditions, changes in Buyer financial standing, Buyer requirements, or any other relevant change or discrepancy in the factual basis upon which this proposal was created may lead to changes in the offering, including but not limited to changes in scope of service, pricing, guarantees, quoted specifications, or terms and conditions.



1 Introduction

The City of Ashland, Oregon is preparing to replace the original 500c-220 ft² modules in the 10 cassettes of Train # 3 with a comparable membrane module.

Further to recent discussions and Ashland’s request for the supply of additional membranes, GE is pleased to offer the following 2 replacement options:

Option 1 - Supply 10 fully populated 26-module cassettes of ZeeWeed® 500c membranes with a total of 260 500c membranes, and 6 fully populated 20-module cassettes of ZeeWeed® 500d membranes modules with a total of 200 500d membranes, crated and ready for ocean shipment.

Option 2 - Supply 16 fully populated 20-module cassettes of ZeeWeed® 500d membranes modules with a total of 320 500d membranes, crated and ready for ocean shipment.

The following table illustrates the surface area comparisons by module and cassette between Ashland’s existing 500c 220 ft² cassettes and the proposed 500c 250 ft² and 500d 350 ft² cassettes.

Item	Existing ZW-500c Cassette	New ZW-500c Cassette	New ZW-500d Cassette
Surface Area per Module	220 ft ²	250 ft ²	350 ft ²
Modules per Cassette	26	26	20
Surface Area per Cassette – fully populated	5,720 ft ²	6,500 ft ²	7,000 ft ²

At this time Ashland has declined the option of on-site FSR assistance for installation of the new membrane cassettes.

1.1 Benefits of new ZeeWeed® membrane modules

Original ZeeWeed® 500c 220 ft² modules replaced with new ZeeWeed® 500c 250 ft² modules

Currently GE is able to provide a ZeeWeed® 500c membrane module with increased surface area (13.5% over the current membranes in service (250 ft² vs 220 ft²).

The advantages of the increased surface area are:

- ❑ It allows the plant to operate the membranes at a reduced flux rate while maintaining flows which can result in longer periods between cleans (reducing nonproductive down-time) and may increase length of overall time in service due to decreased operational stresses on the modules, or,
- ❑ It allows the plant to operate the membranes at the same flux rate while providing increased flows.

Original ZeeWeed® 500c 220 ft² modules replaced with ZeeWeed® 500d 350 ft² modules

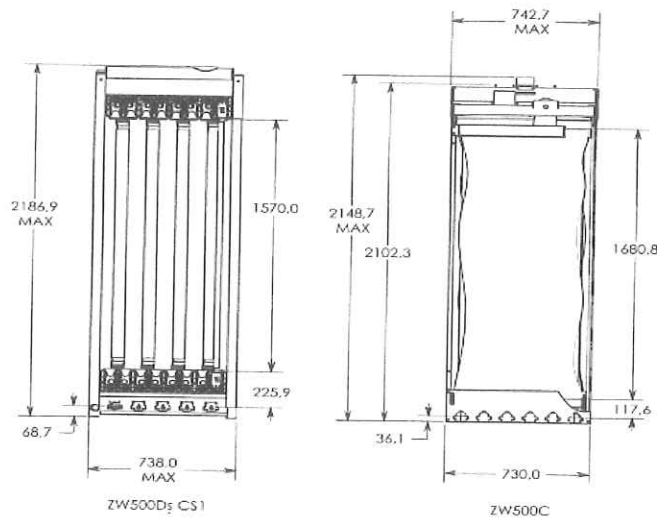
Upgrading from ZeeWeed® 500c to ZeeWeed® 500d modules offers the following advantages:

- ❑ Choices in membrane surface area per module and per cassette each delivering higher surface area density. This allows either a flow/capacity expansion in the same footprint (equipment permitting) or the same flow/capacity in a reduced footprint with fewer modules or at lower flux.
- ❑ Vacuum applied to both top and bottom headers gives the 500d ~7% lower pressure drop resulting in higher design flux rates than a 500c in the same application.



GE Water & Process Technologies

- Each module slides in/out with an individually removable design. Improves and simplifies access for maintenance.
- Advanced module support method (MARS).
- GE investments in R&D will continue to move the 500d technology platform forward whereas 500c features will be maintained as is.
- Upgrading from the 500c module to the standard 500d module can require increased tank levels to accommodate the taller 500d cassettes, which may be critical in facilities with limited tank height. However, GE's 500d 20M short cassettes, specifically designed for 500c retro-fit projects, eliminate this threat. The following picture shows the variations in dimensions between the 500c cassette shown on the right, to the 500d 20M short cassette - shown on the left.



- Ashland is responsible to confirm that the height increase is workable for movements throughout the plant as required.
- Cassette lifting weight requirements change from 2,983 lbs for the 500c to 3,327 lbs for the 500d. Ashland is responsible to verify crane capacity.
- A fact sheet with additional information on the 500d 20M cassette can be found in Attachment A at the end of this document.
- If purchased, the new 500d modules should be tested for integrity at 10 psi. The modules are capable of testing at 11 psi where LT2 compliance is required by regulating authorities.
- By virtue of replacing the existing 500c cassette frames with either new 500c cassette frames or 500d 20M short cassette frames, all of the plastic components in the cassette will be new.

Please be aware that should populated membrane cassettes be purchased, these will arrive on-site on their sides and appropriate space and equipment will need to be made available to safely upright the cassettes for installation.



2 Scope – GE

2.1 Membrane Modules

Option 1 - Supply 10 fully populated 26-module cassettes of ZeeWeed® 500c membranes with a total of 260 500c membranes, and 6 fully populated 20-module cassettes of ZeeWeed® 500d membranes modules with a total of 200 500d membranes, crated and ready for ocean shipment.

Option 2 - Supply 16 fully populated 20-module cassettes of ZeeWeed® 500d membranes modules with a total of 320 500d membranes, crated and ready for ocean shipment.

2.2 Cassette Frames

Supply 500c and 500d cassette frames in the quantities detailed in either option 1 or option 2 above.

2.3 Hardware

Supply associated cassette hardware as follows:

- Hoses and fitting sets for 500c and 500d cassettes
- Lifting brackets for 500d 20M cassettes
- Hanger arms for 500d 20M cassettes
- Lifting brackets for 500d 20M cassettes

2.4 Controls

Provide system controls programming adjustments as required for the new membranes including adjustment of set points for permeate and air flow.

2.5 Membrane Module Warranty

These ZeeWeed® Membrane Modules are supplied with a base 2 year Full Replacement Seller's Warranty against manufacturing defects. For details of the warranty coverage on the membrane modules supplied, please see Section 8.

2.6 Project Management

Planning and off-site assistance during the membrane expansion project.

2.7 Delivery

- CIP** - Delivery will be by standard ocean/ground on the basis of **CIP** Ashland WwTP, Ashland, OR, Incoterms® 2010. CIP = Carriage & Insurance Paid. Partial shipments will be acceptable unless otherwise specified.
- Origin** - Delivery of ZeeWeed® membranes originates from the GE Water & Process Technologies, ZENON Membrane Products (ZEM), Bláthy Ottó u 4, Oroszlány, 2840 Hungary facility.
- Title & Risk** - Title and risk of loss or damage to membrane modules, cassette frames and crating shall pass to Ashland upon delivery to carrier at designated delivery origination point.



- ❑ **Export Documents** - All ZeeWeed® membrane module shipments into the USA require clearance documentation from the EPA. GE will prepare and provide the required EPA documentation to the Carrier.
- ❑ **MPF** - Merchandise Processing Fee is a fee assessed for formal custom entries based on 0.21% of the invoice value, with a minimum of USD \$25 per formal entry and a maximum of USD \$485.
- ❑ **Taxes and US Duty** - A US Customs duty of 3.9% applies to all ZeeWeed® membranes. This duty alone is included in the price table and will be remitted by GE. Any other duties imposed are the responsibility of Ashland. Any applicable sales or value added tax is not included. All applicable Local, State, or Federal taxes are the responsibility of Ashland.
- ❑ **Temperature** - UF membranes cannot be allowed to freeze or overheat and may require temperature-controlled freight and handling according to the season and the planned routing.
- ❑ **Availability** - Delivery of membrane modules is typically 20 weeks after receipt of order. Definitive Membrane Module availability will not be confirmed until a Purchase Order is received from Ashland and acknowledgement of a Purchase Order is issued by GE.

2.8 On Site Technical Advisory Services – PLC code changes

GE will provide 1 Field Service Representative (FSR) on-site for 16 hours (2 x 8-hour days) to download and test the PLC code changes required for this membrane replacement initiative. Ashland retains final responsibility for the installation and commissioning process.

Any overtime or waiting times required due to unforeseen site events outside the control of GE will be invoiced according to the prevailing GE Service Labor Rates Sheet, available on request.

If for any reason additional insurance coverage (e.g. General Construction/Erection All Risk, General Liability) is required above and beyond GE's standard insurance terms for onsite commissioning supervision, Ashland must inform GE in writing 60 days prior to work commencement at site. Ashland will be billed for all additional insurance costs and processing fees.

2.8.1 GE Duties for On Site Services

- ❑ GE will coordinate its work under this agreement in a reasonable manner with the operating staff of the facility.
- ❑ GE will maintain public liability and property damage insurance covering all operations undertaken by GE and its sub-contractors with a minimum limit of \$3,000,000 inclusive for any one accident or occurrence.
- ❑ GE will maintain Workers Compensation and Employers' Liability coverage as per statutory requirements.

3 Scope - Ashland

3.1 Maintenance Notes for Replacement Membranes

At the time of any full plant or full train membrane replacement, it is recommended to evaluate the appropriate timing of repairs or replacement of the following ancillary system components:



- Is it the right time to address any tank coating repairs which may be required?
- Are any of the clamps, camlocks, camlock seals and couplings due for replacement?

Preferential Flow

Preferential flows can create a risk of over-fluxing of new modules when they are installed in the same train with older modules. The mixing of old and new modules in the same cassette also makes management of slack adjustment more difficult. GE recommends that Ashland plan membrane module replacement on a complete cassette and complete train basis wherever possible to achieve both optimal performance and best value from the new membrane modules.

Membrane Slack

GE's membranes are supplied and shipped with an initial factory fiber slack designed to optimize membrane air scouring during operation as well as accommodate a degree of shrinkage. Membranes shrink in length early in their lifecycle when exposed to higher temperature water. The pace of shrinkage slows with age. With the installation of new membranes, the requirements for slack adjustment start a new cycle.

Due to the wide variety of operating environments in which our products can be utilized, it is difficult to generally predict the rate of shrinkage. If membranes operate in a condition of insufficient slack for an extended period of time, irreversible damage to the fiber-urethane bond may occur. Please refer below to the recommended inspection frequencies based on your plant's membrane tank operating temperature. Visual inspections should begin during the membrane installation and be repeated over time on the same cassette. Digital pictures will allow for comparative analysis of the fiber slack over time.

Maximum Operating Temperature	Recommended Slack Inspection Frequency
0-24 °C / 32-76 °F	Every 2 years
25-30 °C / 77-86 °F	Once Per Year
>30 °C / > 86 °F	Twice Per Year

Bubble Test Pressure

Since the original modules were installed, improvements in our manufacturing process have increased the permeability of the 500 series membranes. With that improvement, the bubble test pressure is reduced to 2 psi horizontally and 3 psi vertically. After the membranes are shipped, a formal notice of this change of procedures will be issued as an Addendum to the Operating Manual.

3.2 Installation Preparation

- Receive, off-load, handle and provide temperature controlled storage of the equipment and materials.
- Membrane Membranes must be stored in a sheltered area, protected from freezing, direct sunlight or extreme heat, and sealed as shipped until ready for use. Storage should be in a dark, dry, level area at a temperature of 5-30°C (41-86°F). Membranes should not be stored longer than necessary prior to installation. Ashland is responsible for risk of loss of Seller's parts while in storage at the plant.
- Inspect, evaluate and make repairs as required for the membrane tanks, mounting brackets, hoses and all connections.

3.3 Installation

- Isolate cassettes from the rest of the system as required.



- Remove targeted cassettes from the system as required.
- Install new cassette in the system.
- Dispose of membrane module preservative as well as all retired membrane modules and cassette components.
- Dispose of shipping and packaging materials unless specifically requested not to by GE.

4 Product Support

One of the ways that GE has clearly distinguished itself from other membrane manufacturers is through the range of services and support offered to our customers based on the many years of experience in UF membrane filtration. Included with any membrane replacement are the following services:

Local Support - GE has a global network of GE Water & Process Technologies service personnel that can deploy at short notice. These personnel have access to all the latest tools, procedures and equipment to provide the optimum assistance and support to plant operators.

Technical Support - For the life of each system supplied by GE, plant operators have telephone access to a skilled GE technical support specialist who will assist Plant Operators in troubleshooting of system problems during business hours.

Technical Support - Hours of Operation & Telephone Numbers	
Daytime Hours of Operation:	8:30am to 5:00pm Monday to Friday, Eastern Time Zone GMT-5
Telephone, toll free in North America:	1-866-271-5425
Telephone, outside of North America:	1 905-465-3030 and ask for Technical Support
Email address for Daytime Hours:	GEWater.TechnicalSupport@ge.com

ZeeWeed® Users Group - As an on-going support to ZeeWeed® plants, an annual 2 day ZeeWeed® Users Group meeting is organized by GE consisting of formal meetings and a tour of the hosting ZeeWeed® plant. New technologies are introduced, current issues are tabled, and roundtable discussions ensue. The Users Group has become an excellent forum for experienced operators to keep current, to renew old acquaintances, to exchange the “tricks of the trade” with each other, and to impart their hard-won knowledge to newer ZeeWeed® operators. Generous hospitality combines with informal experiences and exercises to enhance the esprit de corps between domestic and international plant operators.

All ZeeWeed® plants are invited to send operators representing the plant. GE covers conference, food, and hospitality expenses. The plant must cover the operator’s travel and hotel expenses, and a small conference fee. GE supports this forum to facilitate interaction between ZeeWeed® Plant Operators and to provide a forum for real-world feedback to GE’s management, design and operations staff.

5 Health & Safety

Ashland

- Ashland will identify and inform Seller’s personnel of any hazards present in the work place that could impact the delivery of Seller’s scope of supply and agrees to work with Seller to remove, monitor, and control the hazards to a practical level.



GE Water & Process Technologies

- Ashland will provide training to Seller's personnel on all relevant and standard company operating procedures and practices for performing work on site. Such training programs may include, but are not limited to, general environmental health & Safety (EHS), HAZOP, fire protection, drug testing, incident notice, site conduct, standard first aid, chemical receiving, electrical safety, etc. Ashland will provide a certificate of training for Seller's personnel. This program will be fully documented, training materials will be provided, and attendance list will be kept.
- If any type of lifting devices will be used on site, Ashland will provide proof of its maintenance, inspection and certification documentation upon request and will assist the GE Service Representative to complete a safety inspection checklist.
- Where confined space entry may be required, Ashland will provide early notice and will collaborate with GE in planning adequate staffing and in advising the local fire/rescue department.
- No time or cost provision has been made for preparations such as safety record clearances, drug testing, insurance confirmations or pre-job-training in excess of 1 hour. Prior to finalizing the Purchase Order and the work schedule, Ashland will advise GE of any pre-job or pre-mobilization requirements. Where these requirements exceed 1 hour, this time will be charged to Ashland at rates set out in the prevailing GE Labor Rates Sheet.
- Where certain short duration activities require 2 people for safety and the GE FSR is alone at site, Ashland will cooperate as required to assure that correct safety precautions are taken.
- Ashland is responsible for the following safety and environmental provisions:
 - First aid, emergency medical, and chemical spill response.
 - Eyewash and safety showers in the water treatment area.
 - Security and fire protection systems per local codes.
 - Environmental use and discharge permits for all chemicals at Ashland's facility either listed in this document or proposed for use at a later date.
 - Any special permits required for Seller's or Ashland's employees to perform work related to the water treatment system at the facility.
 - All site testing, including soil, ground and surface water, air emissions, etc.
 - Disposal of all solid and liquid waste from the Seller's System including waste materials generated during construction, start up and operation.

GE

- All work on site will be performed in accordance with applicable law and will be performed reasonably, in a clean and safe manner. The GE FSR will abide by the more stringent of the applicable health, safety and environmental policies and procedures of either Ashland or GE.
- GE will provide all applicable safety training required by the health and safety policies. The GE Service Representative will have undergone Workplace Hazardous Material Information System (WHMIS) training and will come equipped with necessary Personal Protective Equipment (PPE).
- Emergencies - In emergencies affecting the safety of persons, work or property at the site and adjacent thereto, GE will act, without previous instructions from Ashland, as the situation warrants. GE will notify Ashland immediately thereafter.



6 Prices

Option 1 - 10 x ZW-500c 250 ft² 26-module cassettes + 6 x ZW-500d 350 ft² 20-module cassettes

Qty	Item	Total Price USD\$
260	Supply ZeeWeed® 500c 250 ft ² Membrane Modules, populated in 10 cassettes	\$842,860
120	Supply ZeeWeed® 500d 350 ft ² Membrane Modules, populated in 6 cassettes	
16	Supply ZeeWeed® cassette frames - 10 x 500c, 6 x 500d	
16	Cassette Hardware including hoses and fittings, hanger arms and lifting brackets	
1	Controls programming adjustments	
1	Brokerage at US/Canada border	
1	US EPA documentation fee	
1	US Merchandise processing fee	
1	US Customs Duty 3.9%	
1	Site visit - 2 days on site to download and test PLC code changes	
1	Freight based on single stack shipment, and Insurance. CIP Ashland, OR, Incoterms® 2010.	
Fee per additional day on site if required		
Total Surface Area - Option 1 = 107,000 ft ² - Price per ft ² = \$7.877		

Option 2 - 16 x ZW-500d 350 ft² 20-module cassettes

Qty	Item	Total Price USD\$
320	Supply ZeeWeed® 500d 350 ft ² Membrane Modules, populated in 16 cassettes	\$864,540
16	Supply ZeeWeed® cassette frames - for 500d modules	
16	Cassette Hardware including hoses and fittings, hanger arms and lifting brackets	
1	Controls programming adjustments	
1	Brokerage at US/Canada border	
1	US EPA documentation fee	
1	US Merchandise processing fee	
1	US Customs Duty 3.9%	
1	Site visit - 2 days on site to download and test PLC code changes	
1	Freight based on single stack shipment, and Insurance. CIP Ashland, OR, Incoterms® 2010.	
Fee per additional day on site if required		
Total Surface Area - Option 2 = 112,000 ft ² - Price per ft ² = \$7.719		

Please make Purchase Orders out to [ZENON Environmental Corporation](#).



7 Terms and Conditions of Sale

A - Specific Terms and Conditions of Sale

1 Legal Entity for Contracting

ZENON Environmental Corporation is the name of the legal entity providing services and is an affiliate of GE Water & Process Technologies Canada. Purchase Orders and Checks should be made out using the name ZENON Environmental Corporation.

Short Form: Where a short reference is required in this document, for convenience, we are called simply GE.

2 Payment Terms

On approved credit, payment terms are Net 30 Days and invoices will be issued on the following schedule:

- 30% with acceptance of Purchase Order. Shipment of membranes is contingent on receipt of initial milestone payment.
- 70% with membrane module shipping documents supplied to Carrier.

3 Price Validity

Prices quoted are valid up to thirty (30) days after the date of issue of this proposal unless confirmed with a Purchase Order.

4 Bonds

Performance or Payment Bonds are not included in the price. These bonds can be purchased on request but will be at additional cost.

5 No Title to Process Materials

At no time will Seller be deemed to have taken title to Effluent Water, Influent Water, sewage sludge, Non-standard Substances, Hazardous Materials, harvested fibers or any other materials or substances processed at the site or treated by Seller pursuant to this Agreement. Seller does not take responsibility for or provide waste characterization, disposal facility selection, or disposal. Ashland is responsible for all wastes and waste disposal from the plant. Wastes may include, but are not limited to water system reject waste, used RO or ultrafiltration membranes, clean-in-place related wastes and wastewaters, spent media, used granulated activated carbon, cartridge filters, equipment and consumables, lubrication/oil contaminated debris/rags, other maintenance related wastes, lab analysis residuals, and office waste.

6 Purchase Order Guidelines

Please ensure that your Purchase Order has covered the following points. This will ensure accurate and prompt order entry, product delivery, invoicing and accounts receivables processing and will prevent administrative delays for all parties.

- Legal Entity** - Please be sure your Purchase Order is issued in the name of the specific GE legal entity issuing this proposal cited in **Section 7, Item 1; Legal Entity for Contracting**. We will be glad to work with your Purchasing department to set this entity up as an approved Supplier/Vendor.
- Hard Copy** - Our strong preference is to receive a hard copy of your Purchase Order rather than a PO number alone.
- Proposal Number and Date** - Please reference the 6 digit Proposal Number and the Proposal Date which are found in the footer of each page.
- Price** - State the total price you are accepting for this order.
- Taxes** - Provide any required tax exemption certificates.
- Ship-To Address** - Please clearly define the plant site address or delivery location and the Receiver's email & telephone. Specify receiving hours and any special off-loading requirements.
- Delivery Date** - Please include your requested delivery date or agreement start date.



B – General Terms and Conditions of Sale

Note to Purchasing Agent: The following are GE's standard set of commercial terms & conditions, written for moderate value transactions to allow an efficient and rapid provision of services and parts. If these terms are not immediately acceptable, please expect a typical 6-10 week cycle of mutual review to build agreement on changes.

- 1) **Definitions.** All terms not defined herein shall be defined in the Form of Agreement or the Special Conditions.
- 2) **Exclusive Terms and Conditions.** Together with any other terms the parties agree to in writing, these General Terms and Conditions form the exclusive terms ("Agreement") whereby Buyer agrees to purchase, and Seller agrees to sell Equipment and to provide advice, instruction and other services in connection with the sale of that Equipment ("Services"). Notwithstanding any provisions communicated in any way by Buyer to Seller prior to this Agreement including any terms contained in any request for quote by Buyer, Buyer agrees that this Agreement will control the relationship by accepting Equipment and Services from Seller, even if Buyer sends to Seller other terms and conditions to which Seller may not respond. This Agreement may only be revised by a change order approved in writing by both parties.
- 3) **Equipment and Services.** The Equipment to be delivered and the Services to be provided shall be as set out in this Agreement.
- 4) **Prices and Payment.** Buyer shall pay Seller for the Equipment and Services in accordance with the Payment Schedule. Unless otherwise specified in writing, payment is due net thirty (30) days from the date of Seller's invoice. If Seller shall have any doubt at any time as to Buyer's ability to pay, Seller may decline to make deliveries except on receipt of satisfactory security. Seller may require a Letter of Credit or other payment guarantee, in which case the stated amount of the guarantee will be adjusted by Buyer in the event of any currency-based adjustment to prices or payment amounts per the Payment Schedule, and Buyer shall deliver the adjusted guarantee within five (5) days of request by Seller. Buyer agrees to reimburse Seller for collection costs, including 2% interest per month, should Buyer fail to timely pay. Buyer shall have no rights to make any deduction, retention, withholding or setoff relating to any payments due under this Agreement.
- 5) **Taxes and Duties.** Unless expressly stated, the prices quoted herein do not include any taxes or duties. Buyer shall be directly responsible, and reimburse Seller, for the gross amount of any present or future bond, sales, use, excise, value-added, or other similar tax or duty applicable to the price, sale or delivery of any Equipment or services furnished hereunder. Buyer shall furnish Seller with evidence of tax exemption acceptable to taxing authorities if applicable.
- 6) **Delivery.** Unless otherwise specified in this Agreement, Seller shall deliver all Equipment to Buyer FCA (Incoterms 2010) Seller's facility. The time for delivery of the Equipment to Buyer shall be specified in this Agreement. Seller's sole liability for any delay in delivery of the Equipment shall be as expressly set out in this Agreement. The place of delivery specified herein shall be firm and fixed, provided that Buyer may notify Seller no later than 45 days prior to the scheduled shipment date of the Equipment of an alternate point of delivery. Provided the parties agree to a change order to take into account any additional cost or delay incurred by Seller in implementing this change, the alternate place of delivery shall become the agreed place of delivery for all purposes under this Agreement. Failure by Buyer to take delivery of the Equipment shall be a material breach of this Agreement.
- 7) **Title and Risk of Loss.** Title and risk of loss to the Equipment shall be transferred from Seller to Buyer upon delivery in accordance with this Agreement. Title and risk of loss to the Services shall pass as they are performed.
- 8) **Shipment to Storage.** If any part of the Equipment cannot be delivered when ready due to any cause not attributable to Seller, Seller may ship such Equipment to storage. If such Equipment is placed in storage, then (i) title and risk of loss shall thereupon pass to Buyer if it had not already passed; (ii) any amounts otherwise payable to Seller upon delivery or shipment shall be payable upon presentation of Seller's invoice(s); (iii) all expenses incurred by Seller, such as for preparation for and placement into storage, handling, inspection, preservation, insurance, storage, removal charges and any taxes shall be payable by Buyer upon submission of Seller's invoice(s); (v) the Services provided herein shall be subsequently changed to the rate prevailing at the time of actual use and Buyer shall pay the net increase; and (vi) when conditions permit and upon payment of all amounts due hereunder, Seller shall resume delivery of the Equipment.
- 9) **Warranties and Remedies.** Seller warrants that the Equipment shall conform to any specifications set out in this Agreement and shall be free from defects in material and workmanship; and that the Services shall be performed with the degree of skill which can reasonably be expected from a seller engaged in a comparable business and providing



comparable services under comparable circumstances. Seller's warranty does not cover the results of improper handling, storage, installation, commissioning, operation or maintenance of the Equipment by Buyer or third parties, repairs or alterations made by Buyer without Seller's written consent, influent water which does not comply with agreed parameters, or fair wear and tear.

Unless otherwise expressly provided in this Agreement, the foregoing warranties are valid:

- a. for chemicals and Services, for 6 months from their date of delivery or the provision of Services;
- b. for consumables, including Filters and Membranes, 12 months from their date of delivery,
- c. for Equipment other than chemicals and consumables, the earlier of, 15 months from delivery or shipment to storage, or 12 months from start-up/first use.

For Equipment not manufactured by Seller, the warranty shall be the manufacturer's transferable warranty only.

Any claim for breach of these warranties must be promptly notified in writing, and Buyer shall make the defective item available to the Seller, or the claim will be void. Seller's sole responsibility and Buyer's exclusive remedy arising out of or relating to the Equipment or Services or any breach of these warranties is limited to repair or (at Seller's option) replacement of defective items of Equipment, and re-performance of defective Services. Buyer shall make maintenance and operation records available to the Seller upon request during the warranty period.

Buyer is not entitled to extend or transfer this warranty to any other party. The foregoing warranties and remedies are in lieu of and exclude all other warranties and remedies, statutory, express or implied, including any warranty of merchantability or of fitness for a particular purpose.

Unless otherwise expressly stipulated in this Agreement, Seller gives no warranty or guarantee as to process results or performance of the Equipment, including but not limited to product quality, flow, production, capacity, membrane life, chemical consumption, regulatory compliance or energy consumption.

- 10) **Buyer's Responsibilities.** Unless otherwise stipulated in this Agreement, the unloading, handling, storage and installation of the Equipment shall be the responsibility of the Buyer. Seller will not control the actual operation of either Buyer's systems or the Equipment at the Site. Buyer shall also:
- a. provide Seller with complete and accurate data concerning all relevant conditions at the Site, including but not limited to any existing Buyer facility, equipment or processes, influent water or other substances to be treated or measured with the Equipment;
 - b. operate and maintain its facility and all related systems in good operating condition and within the agreed parameters or, if no parameters have been agreed, within generally accepted industry practice;
 - c. operate and maintain the Equipment in accordance with Seller's operations and maintenance manuals or where such manuals are silent, in accordance with generally accepted industry practice.

If Buyer fails to fulfill the foregoing obligations, Seller shall be relieved of any obligations with respect to warranties or any other commitments under this Agreement, and Seller shall have no liability for any loss, damage or injury which Buyer may sustain as a result.

- 11) **General Indemnity.** Seller shall indemnify and hold harmless Buyer from claims for physical damage to third party property or injury to persons, including death, to the extent caused by the negligence of Seller or its officers, agents, employees, and/or assigns while engaged in activities under this Contract. Purchaser shall likewise indemnify and hold harmless Seller from claims for physical damage to third party property or injury to persons, including death, to the extent caused by the negligence of the Buyer, its officers, agents, employees, and/or assigns. In the event such damage or injury is caused by the joint or concurrent negligence of Seller and Buyer, the loss shall be borne by each Party in proportion to its negligence. "Third party" shall not include Buyer or any future owner of the Equipment, their subsidiaries, parents, affiliates, agents, successors or assigns including any operation or maintenance contractor, or their insurer. No portion of the Equipment is "third party property" for the purposes of this Article.
- 12) **Compliance with Laws and Permits.** All permits and licenses which are required to construct, install and/or operate Buyer's facility or equipment, to use the Equipment, or to manage and dispose of any wastes and residues resulting from Buyer's use of the Equipment, shall be obtained and maintained by Buyer at Buyer's sole expense. Buyer is responsible for compliance with all laws and regulations applicable to the storage, use, handling, installation, maintenance, removal, registration and labeling of all Equipment after delivery of the Equipment, as well as for the proper management and

25 limited by
Oregon Tort
Claim Act,
ORS 30.260 -
30.300,



disposal of all wastes and residues. If any change in applicable laws, codes or standards occurring after the date of Seller's proposal to Buyer requires a change to the Equipment or to the performance of the Services, and it is technically feasible to comply with such change, the Seller shall be entitled to an equitable adjustment to price and schedule.

- 13) **Site Conditions.** Seller shall be entitled to assume that any data furnished by the Buyer concerning conditions at the Site is accurate and complete, and reserves the right to utilize the most appropriate design compatible with generally accepted engineering practices, and to make changes in details of design, manufacture and arrangement of Equipment unless precluded by any limitations specified in this Agreement. Seller shall notify Buyer of (1) any conditions at the Site which materially differ from those indicated in the data furnished by Buyer, (2) any previously unknown physical conditions at the site of an unusual nature, not revealed by previous investigations and differing from those ordinarily encountered in the type of Work provided for in this Contract, and (3) the presence of any Hazardous Materials (as defined below), unexploded ordinance, or archaeological remains. If such conditions cause an increase in Seller's cost or in the time required for the performance of Seller's obligations, Seller shall be entitled to an equitable adjustment in the Contract Price and an extension in the time for performance.
- 14) **Hazardous Materials and Wastes.** In the event that Seller encounters any Hazardous Materials (meaning toxic substances, hazardous substances, pollutants, contaminants, regulated wastes, or hazardous wastes as such terms may be defined or classified in any law, statute, directive, ordinance or regulations promulgated by any applicable governmental entity) at the Site, other than Hazardous Materials introduced by Seller or that are otherwise the express responsibility of Seller under this Agreement, Buyer shall immediately take whatever precautions are required to legally eliminate such Hazardous Materials so that the Seller's work under this Agreement may safely proceed. At no time shall Seller be deemed to have taken title to or the responsibility for the disposal of any wastes, Hazardous Materials, influent water, any resultant product streams, wastewater streams, cleaning materials, or any other materials or substances processed by the Equipment or otherwise located at the Job Site or the Project Site. Seller does not take responsibility for and hereby expressly disclaims responsibility for the characterization of wastes, Hazardous Materials, or for the identification or selection of disposal facilities for any wastes.
- 15) **Excusable Delays.** Seller shall not be liable nor in breach or default of its obligations under this Agreement to the extent performance of such obligations is delayed or prevented, directly or indirectly, due to causes beyond the reasonable control of Seller, including, but not limited to: acts of God, natural disasters, unusually severe weather, fire, terrorism, war (declared or undeclared) epidemics, material shortages, insurrection, act (or omissions) of Buyer or Buyer's suppliers or agents, any act (or omission) by any governmental authority, strikes, labor disputes, transportation shortages, or vendor non-performance. The delivery or performance date shall be extended for a period equal to the time lost by reason of delay or non-performance, plus such additional time as may be necessary to overcome the effect of the delay or non-performance. If delivery or performance is delayed for a period exceeding 180 (one hundred and eighty) days, either Party may terminate this Agreement without further liability provided that Seller shall be paid an amount equal to that which would be payable to Seller under the Article entitled "Termination for Cause". If Seller is delayed by any acts (or omissions) of Buyer, or by the prerequisite work of Buyer's other contractors or suppliers, Seller shall be entitled to an equitable adjustment in schedule, price and/or performance, as applicable.
- 16) **Emergencies.** If the safety of Seller's personnel is threatened or likely to be threatened by circumstances outside the reasonable control of Seller, including but not limited to war, armed conflict, civil unrest, riots, terrorism, kidnapping, presence of or exposure to hazardous materials, unsafe working conditions, or by the threat of such circumstances or a lack of adequate protections against such circumstances, Seller shall be entitled to take all necessary steps to ensure the security and safety of its personnel including the evacuation of personnel until such circumstances no longer apply.
- 17) **Intellectual Property.** Both parties agree to keep confidential the other party's proprietary non-public information, if any, which may be acquired in connection with this Agreement. Buyer will not, without Seller's advance written consent, subject Equipment to testing, analysis, or any type of reverse engineering. Seller retains all intellectual property rights including copyright which it has in all drawings and data or other deliverables supplied or developed under this Agreement. Buyer acknowledges that Seller is in the business of selling the Equipment subject to this Agreement and agrees that it will not file patent applications on the Equipment, or processes and methods of using the Equipment, without Seller's express written permission. Buyer further agrees that in any event any such patents will not be asserted against Seller or its other Buyers based upon purchase and use of such Equipment. Seller grants to Buyer a non-exclusive, non-terminable, royalty free license to use the intellectual property embedded in Equipment delivered to and paid for by the Buyer, as well as any drawings, design or data delivered to and paid for by the Buyer, for the purposes of



owning, financing, using, operating and maintaining the relevant Equipment at the Site. Such license may only be assigned to a future owner of the Equipment or to an operations and maintenance subcontractor. Such license does not extend to the re-creation of the Equipment or the manufacture of spares or consumables by Buyer or third parties.

Any software Seller owns and provides pursuant to this Agreement shall remain Seller's property. Seller provides to Buyer a limited, non-exclusive and terminable royalty free project-specific license to such software for the term of this Agreement. Buyer agrees not to copy, sub-license, transfer, reverse engineer, or decode the software. Unless otherwise expressly agreed by Seller, this license shall terminate and the software shall be returned to Seller upon termination of this Agreement, or the material breach of the terms in this section.

Seller shall indemnify and hold harmless Buyer from any rightful claim of any third party that any Equipment or Service infringe a patent in effect in the USA, an EU member state or country of delivery (provided there is a corresponding patent issued by the USA or an EU member state), or U.S. copyright or copyright registered in the country of delivery. If the Buyer notifies the Seller promptly of the receipt of any such claim, does not take any position adverse to the Seller regarding such claim and gives the Seller information, assistance and exclusive authority to settle and defend the claim, the Seller shall, at its own expense, either (i) settle or defend the claim and pay all damages and costs awarded in it against the Buyer, or (ii) procure for the Buyer the right to continue using the Equipment or Service, or (iii) modify or replace the Equipment or Service so that it becomes non-infringing, or (iv) remove the infringing Equipment and refund the price. The above paragraph shall not apply to any Equipment which is manufactured to the Buyer's design, or to alleged infringement arising from the combination, operation, or use of any Equipment or Services with other Equipment or services when such combination is part of any allegedly infringing subject matter. The foregoing states the entire liability of the Seller for patent infringement of any Equipment or Service.

- 18) **Limitations on Liability.** Notwithstanding anything else contained in this Agreement, to the maximum extent permitted by law, and regardless of whether a claim is based in contract (including warranty or indemnity), extra-contractual liability, tort (including negligence or strict liability), statute, equity or any other legal theory:
- a. The total liability of the seller for all claims arising out of or relating to the performance or breach of this agreement or use of any equipment or services shall not exceed the total price paid by buyer under this agreement or, in the case of an agreement for services with a term of more than one year, the annual price payable by buyer under this agreement;
 - b. Seller shall not be liable for any advice, instruction, assistance or any services that are not required under this agreement or for which seller does not charge buyer;
 - c. In no event shall seller be liable for any loss of profit or revenues, loss of production, loss of use of equipment or services or any associated equipment, interruption of business, cost of capital, cost of replacement water or power, downtime costs, increased operating costs, claims of buyer's customers for such damages, or for any special, consequential, incidental, indirect, punitive or exemplary damages;
 - d. All liability on the part of seller shall terminate at the expiry of the applicable warranty period.

For the purposes of this article, "Seller" shall mean Seller, its affiliates, subcontractors and suppliers of any tier, and their respective agents and employees, individually or collectively. If Buyer is supplying Seller's Equipment or Services to a third party, Buyer shall require the third party to agree to be bound by this clause. If Buyer does not obtain this agreement for Seller's benefit for any reason, Buyer shall indemnify and hold Seller harmless from all liability arising out of claims made by the third party in excess of the limitations and exclusion of this clause.

- 19) **Suspension by Seller.** Seller shall have the right to suspend performance upon written notice to Buyer in any case where Seller would have the right to terminate the Agreement under the following Article, without prejudice to Seller's right to terminate this Agreement for cause. Any cost incurred by Seller in accordance with any such suspension (including storage costs) shall be payable by Buyer upon submission of the Seller's invoice(s). Performance of the Seller's obligations shall be extended for a period of time reasonably necessary to overcome the effects of such suspension.
- 20) **Termination for Cause.** This Agreement and any performance pursuant to it may be terminated or suspended by either Party, and the consequences of such termination shall be as set out in the next Article, if the other Party
- a. becomes insolvent, makes an assignment for the benefit of its creditors, has a receiver or trustee appointed for the benefit of its creditors, or files for protection from creditors under any bankruptcy or insolvency laws; or



b. fails to make any payment when due or to establish any payment security required by this Agreement, or commits a material breach or defaults in its material obligations under this Agreement, and such default is not cured within thirty (30) days of written notice from the other Party.

21) **Consequences of Termination.** Upon the termination of this Agreement by Seller for cause, or by Buyer without cause, Buyer shall pay to Seller within thirty (30) days of receipt of invoice the price of all Equipment or Services delivered at the date of termination, plus an amount equal to all costs and expenses incurred in the engineering, sourcing, financing, procurement, manufacture, storage and transportation of the Equipment including materials, work in progress and any cancellation charges assessed against Seller by Seller's suppliers including reasonable overhead and profit on all such costs and expenses. Alternatively, if any schedule of termination payments has been agreed between the Parties, Buyer shall pay to Seller within thirty (30) days of receipt of invoice the amounts set out in that schedule.

22) **Governing Law and Dispute Resolution (US Sales).** This Agreement shall be governed by the substantive laws of the State of ~~New York~~ ^{Oregon}. In the event of a dispute concerning this Agreement, the complaining party shall notify the other party in writing thereof. Management level representatives of both parties shall meet at an agreed location to attempt to resolve the dispute in good faith. Should the dispute not be resolved within thirty (30) days after such notice, the complaining party shall seek remedies exclusively through arbitration. The seat of arbitration shall be the federal district court in ~~Philadelphia, PA~~ ^{Portland, OR}, and the rules of the arbitration will be the Commercial Arbitration Rules of the American Arbitration Association, which are incorporated by reference into this clause.

Governing Law and Dispute Resolution (International Sales) This Agreement shall be governed by the substantive laws of England and Wales. In the event of any dispute arising out of or in connection with this Agreement, either party may notify the other party in writing thereof, and management level representatives of both parties shall meet at an agreed location to attempt to resolve the dispute in good faith. Should the dispute not be resolved within thirty (30) days after such notice, either party may refer the dispute to arbitration, and the dispute shall be finally settled by arbitration in London in the English language under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said Rules.

- 23) **No Nuclear Use.** Save as expressly permitted by this Agreement, the Buyer warrants that it shall not use or permit the use of the Equipment in connection with any nuclear installation or activity. Seller shall have no liability whatsoever for any nuclear or other damage, injury or contamination arising in connection with any such use.
- 24) **Export Control.** Buyer acknowledges that all US-origin equipment, software and data are potentially subject to US export control laws and undertakes not to divert or re-export such items from the agreed final destination except in accordance with those laws.
- 25) **Global Sourcing.** Seller may manufacture and source the Equipment and any part thereof globally in the country or countries of its choosing, provided that the Equipment complies with all the requirements specified in this Agreement.
- 26) **Changes.** All changes to the Equipment or Services shall be subject to mutual agreement via a written change order or variation, which shall only become effective once signed by both Parties.
- 27) **Conflicts; Survival, Assignment.** If there is any conflict between this Agreement and any written proposal or quotation provided by Seller, then the terms and conditions set forth in this Agreement shall prevail. If any term or condition of this Agreement or any accompanying terms and conditions are held invalid or illegal, then such terms and conditions shall be reformed to be made legal or valid, or deleted, but the remaining terms and conditions shall remain in full force and effect, and this Agreement shall be interpreted and implemented in a manner which best fulfills our intended agreement. This Agreement may be assigned by Seller to any affiliate of Seller, but shall not otherwise be assigned by either Party without the other Party's prior written consent, and any assignment without such consent shall be void.
- 28) **No third party beneficiary.** Except as specifically set forth in the Article entitled "Limitations on Liability", this Agreement is not intended to, and does not, give to any person who is not a party to this Agreement any rights to enforce any provisions contained in this Agreement.
- 29) **Entire Agreement.** This Agreement embodies the entire agreement between Buyer and Seller and supersedes any previous documents, correspondence or agreements between them. No modification, amendment, revision, waiver, or other change shall be binding on either Party unless agreed in writing by the Party's authorized representative. Any oral or written representation, warranty, course of dealing, or trade usage not specified herein shall not be binding on either Party. Each Party agrees that it has not relied on, or been induced by, any representations of the other Party not contained in this Agreement.



8 Seller's Warranty - ZeeWeed® Membrane Module

2 Year Full Replacement

This schedule sets out the warranty with respect to ZeeWeed® Membrane Modules ("Membrane Modules"). No other warranties, expressed or implied are made in connection with the sale of these products, including, without limitation, warranties as to fitness for any particular purpose or use or merchantability of these products. The warranty provided herein will be the exclusive and sole remedy of Buyer, and in no event will the Seller be liable for any special, direct, indirect or consequential damages, including, without limitation, loss of profits. This warranty is not transferable.

1 Product

This warranty applies to only the Membrane Modules supplied under the Contract of Sale. Membrane Module means a complete Membrane Module. This warranty does not cover air piping to the Membrane Module, permeate piping from the Membrane Module, piping connection fittings, connecting hardware and cassette frames with their associated components including but not limited to spacers, aerator tubes, aerator assemblies, screen, module dummies or module blanks.

Identification: Membrane Modules are shipped by the Seller with a serial number identification which confirms their place in the cohort set of Membrane Modules covered by this Membrane Module warranty.

2 Seller

ZENON Environmental Corporation is the name of the Seller and is the Seller offering this warranty. The Seller may assign this warranty to other GE affiliates.

3 Buyer

Buyer means The City of Ashland, Oregon.

4 Project

Project means either the membranes sold under this proposal # 595616.

5 Contract of Sale

Contract of Sale means the sales contract governing the sale of Membrane Module(s) for the Project between Buyer and the Seller or its GE affiliate.

6 Scope of Warranty

The Seller warrants that its Membrane Module(s) will be free of defects due to faulty materials or errors in manufacturing workmanship.

Regular Membrane Module inspection and normal fiber repair shall be the responsibility of Buyer.

All replacement Membrane Modules will be shipped on the basis of INCOTERMS 2010 EXW GE Manufacturing facility.

All ancillary costs including but not limited to bagging, boxing, crating, freight, freight insurance, applicable taxes, import duties, brokerage, receiving, forklift services, storage at site, re-attachment hardware, hose/clamp/camlock replacement, crane services, installation, fiber repair materials, glycerin flushing, commissioning and waste disposal are the responsibility of Buyer.

Full Replacement - Full Replacement means that in the case of a valid warranty claim for a Membrane Module failure, Buyer receives a replacement Membrane Module and does not pay for the value of use of the Membrane Module prior to failure.

Prorated Replacement - Prorated Replacement means Buyer pays for actual use of a membrane module from which Buyer has derived value over time. Prorated Replacement allows the Seller to pay reasonable compensation under warranty for any product use not enjoyed by Buyer due to premature failure.

The ratio of Full Replacement to Prorated Replacement in this Warranty is set out in Item 8 of Section 8.



7 Warranty Start Date

For original membranes, this membrane warranty will start on the earlier of:

- a. The date that installation of the original Membrane Module(s) has been substantially completed, or
- b. Six months from the date of shipment of the original Membrane Module(s) to Buyer.

For replacement or expansion membranes, this membrane warranty will start on the earlier of:

- a. The date of installation, or
- b. 1 month from the date of delivery to site.

8 Warranty Duration

Total Warranty Duration: a total of 24 months composed of a Base Period and an Extended Period.

Base Period with Full Replacement: 24 months

All purchasers of ZeeWeed® Membrane Modules are entitled to this Base Period of Full Replacement warranty coverage without purchasing an extended Seller's Warranty.

Extended Period with Full Replacement: a total of 0 months following the Base Period

Replacement Membrane Modules are covered by warranty only to the extent of the warranty of the original Membrane Module which has been replaced. At all events, this warranty shall expire and be of no force or effect 24 months following the Warranty Start Date.

9 Notification of Claim

All claims filed under this warranty shall be made in writing by Buyer within 30 days of identifying a defect.

Buyer shall provide the following information:

- 1) A description of the defect giving rise to the claim;
- 2) Photographs showing the manufacturing defect;
- 3) The serial number(s) of the Membrane Module(s) which is (are) the subject of the warranty claim; and
- 4) Operating data and repair history for the life of Membrane Modules which are the subject of a warranty claim.

10 Verification of Claim

After receipt of written notification of a defect, the Seller will promptly undertake such investigations as, in the Seller's opinion, are necessary to verify whether a defect exists. The Seller reserves the right to require additional data as necessary to validate claims. Buyer may, in the course of these investigations, be requested to return Membrane Module(s) to the Seller for examination. The Seller may also conduct reasonable tests and inspections at Buyer's plant or premises. If the results of the investigation do not validate the defect claimed, Buyer will reimburse the Seller for all reasonable expenses associated with said investigation, including expenses for all tests, inspections, and associated travel.

11 Satisfaction of Claims

The Seller will have the right to satisfy claims under this warranty in a flexible manner. Such flexibility may include the repair of existing Membrane Modules or changes in operating protocols or Membrane Module replacement or by upgrading failed Membrane Modules with newer Membrane Module(s) that may embody design and efficiency improvements. Buyer consents to the supply of replacement Membrane Modules which may be of a different design than original Membrane Modules.

12 Operating Information

To maintain the Membrane Module warranty, membrane system operation records from initial start-up date until claim must be maintained by Buyer and made available to the Seller upon request. Records must be provided in sufficient detail to verify uninterrupted compliance with the Seller's Operations and Maintenance Manual prepared by the Seller and supplied to Buyer as part of the Contract. At a minimum, operation data must include information on feed water quality, temperatures, flows, trans-membrane pressures, aeration rates, permeate quality, cleaning intervals, cleaning chemical concentrations, elapsed time since start-up, relevant analytical data and reporting of any screen bypass events.

Buyer shall maintain and share access to a single reference copy in electronic form of a Membrane Module map containing the history of activity by Membrane Module. Buyer shall log its procedures performed related to a Membrane Module including relocation of Membrane Modules, repairs, replacements and any other noteworthy events.

Buyer authorizes the Seller to conduct any reasonable review of operation and maintenance records or to inspect facilities where Membrane Modules are installed, upon reasonable notice to Buyer. Such reviews and/or inspections are intended to also assist the Seller and Buyer in detection of membrane system faults and to optimize the care and operation of the Membrane Modules.

13 Limitation of Warranties

Occurrence of any of the following as reasonably determined by the Seller will void this warranty:

- a. A material failure to operate the membrane system in accordance with Seller's Operations and Maintenance Manual supplied to Buyer as part of the Contract, including material failure to adhere to the Seller's specified Membrane Module cleaning procedures and the use of anything other than Seller-approved Membrane Module cleaning agents.
- b. Failure to adhere to the preventive maintenance program as presented in the Seller's Operations and Maintenance Manual.
- c. Failure to ensure correct operation and/or functioning of the screening equipment.
- d. Introduction of destructive foreign materials into the Membrane Module tanks. Destructive foreign materials may include natural or human-made materials that are introduced into the membrane system influent channel or tanks originating from construction and maintenance activities or from inadequate pretreatment or from aquatic species including clams and snails or from damage to the tank or tank coating. Sand and other materials that are naturally present in the influent will not be considered destructive foreign materials. Buyer shall be responsible to maintain correct function of the screen mechanism and to flush tanks of accumulated sand at the tank bottom.
- e. Failure to install and maintain operating data acquisition and electronic data transmission functions at the plant.
- f. Physical abuse or misuse, incorrect removal or installation of Membrane Modules by non-Seller personnel including fiber damage caused by operator error in handling of Membrane Modules or cassettes.
- g. Unauthorized alteration of any components or parts originally supplied by the Seller.
- h. Intentional damage.

14 Return Procedure

In the event that the return of a Membrane Module is required pursuant to this warranty, Buyer will first obtain a Return Goods Authorization (RGA) number from the Seller. Membrane Module(s) shipped to the Seller for warranty examination must be shipped freight prepaid. If Buyer desires temporary replacement Membrane Module(s) to replace those alleged to be defective and returned to the Seller for warranty examination, Buyer shall be responsible for the cost associated with any such replacements until examination of the returned Membrane Modules pursuant to this warranty is complete. Any Membrane Module examined by Seller as part of a warranty claim where the Membrane Module is subsequently found to be performing as warranted or where a Membrane Module failure is not covered under the warranty will be returned to Buyer, freight collect.



9 Signed Agreement

Ashland and GE acknowledge that they have read and understood this Agreement and agree to be bound by the terms and conditions specified in it.

Offered by ZENON Environmental Corporation
Legal Entity: Also known as GE or Seller

Authorized Signature By: Jim Imrie

Title: Manager, Global Lifecycle Services

Signature
Date:

Signature:

x

Accepted by The City of Ashland, Oregon
Legal Entity: Also known as Ashland or Buyer

Authorized Signature By:

Title:

Signature
Date:

Signature:

x

Purchase Order No:

Agreement Start Date:

Upon acceptance of this proposal, please forward the following either • by email with .pdf attachments or • by postal mail or • by fax.

- 1) this signature page completed
- 2) a hard copy of your purchase order, and
- 3) any required tax exemption certificates

to:

Jim Imrie Jim.Imrie@ge.com
Manager, Global Lifecycle Services
GE Water & Process Technologies
3239 Dundas Street West,
Oakville, Ontario, Canada L6M 4B2
Fax No.: 905 465-3050

When both signatures have been made, a scanned copy of the Agreement will be emailed with the order acknowledgement to Ashland.

Doc Control Author: JC Filename: Ashland 595616 Membrane Replacement 06-Aug-31-2012.docx Last Modified: 8/31/2012 9:27 AM
Technical Review: RM Commercial Review: RM DOA: JJ

Approved as to form

Attachment A ZeeWeed® 500d Cassette Fact Sheet

GE Power & Water

Water & Process Technologies

ZeeWeed* 500D Cassette



Note: Drawing of 48M Cassette

Cassette Dimensions

Product	Width (A) mm (in)	Length (B) mm (in)	Height (C) mm (in)
64M	1,745 (68.7)	2,112 (83.1)	2,536 (99.8)
48M			
20M	738 (29.1)	1,744 (68.7)	2,504 (98.6)
16M			
20Ms			2,141 (84.3)
16Ms			

Cassette Tie-Points & Weights

Application	Product	Max. # of ZW Modules	Min. # of ZW Modules	Permeate Connection	Air Connection	Max. Shipping Weight* kg (lb)	Lifting Weight ** kg (lb)
MBR	48M	48	24	1 x 6" vert. pipe	2 x 3" pipe	1,729 (3,812)	1,959 – 4,064 (4,320 – 9,039)
	16M	16	8	1 x 4" FNPT half coupling	1 x 3" FNPT half coupling	714 (1,574)	756 – 1,464 (1,667 – 3,254)
	16Ms***	16	8	2 x 3" FNPT half coupling		677 (1,493)	1,366 (2,946)
Non-MBR	64M	64	32	1 x 8" horz. Pipe	2 x 3" pipe	2,033 (4,483)	2,375 – 4,380 (5,237 – 10,009)
	20M	20	10	1 x 4" FNPT half coupling	1 x 3" FNPT half coupling	800 (1,764)	870 – 1,553 (1,918 – 3,534)
	20Ms***	20	10	2 x 3" FNPT half coupling		754 (1,662)	1,509 (3,327)

* Crated with maximum number of modules

** Varies with number of modules, module surface area and solids accumulation

*** 16Ms and 20Ms are intended for retrofit applications, a version with a 1 x 4" FMPT permeate connection is available as a custom order



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SPECIAL PROCUREMENT REQUEST FOR APPROVAL

To: City Council, Local Contract Review Board
From: Michael Faught, Public Works Director
Date: November 6, 2012
Subject: REQUEST FOR APPROVAL OF A SPECIAL PROCUREMENT

In accordance with ORS279B.085, this request for approval of a Special Procurement is being presented to the City Council for approval. This written request for approval describes the proposed contracting procedure and the goods or services or the class of goods or services to be acquired through the special procurement and the circumstances that justify the use of a special procurement under the standards set forth ORS 279B.085(4).

- 1. Requesting Department Name: Public Works Department, Wastewater Treatment Plant
2. Department Contact Name: David Gies
3. Type of Request: X Class Special Procurement Contract-specific Special Procurement
4. Time Period Requested: From To:
5. Total Estimated Cost: \$864,540.00
6. Short title of the Procurement: Membrane Filter Replacement

Supplies and/or Services or class of Supplies and/or Services to be acquired:

The City of Ashland wastewater treatment plant needs to replace failing membrane filters in order to meet the established regulatory requirements for phosphorous removal. These requirements are established under the current National Pollutant Discharge Elimination System permit (NPDES). The City of Ashland needs to purchase new membrane filters from GE Water and Process Technologies in order to replace the failing ones within the membrane treatment system. The City is seeking to purchase ten new ZeeWeed 550d-350 filtration modules. The filter modules represent a very important component in the treatment system. If the City of Ashland fails to meet the treatment requirements of the NPDES permit it can be fined by the Department of Environmental Quality (DEQ).

7. Background and Proposed Contracting Procedure: Provide a description of what has been done in the past and the proposed procedure. The Agency may, but is not required to, also include the following types of documents: Notice/Advertising, Solicitation(s), Bid/Proposal Forms(s), Contract Form(s), and any other documents or forms to be used in the proposed contracting procedure. Attach additional sheets as needed.

Background: Direct Award.

8. Justification for use of Special Procurement: Describe the circumstances that justify the use of a Special Procurement. Attach relevant documentation.

This is a special procurement for goods due to the fact that GE Water and Process Technologies manufacture the only membrane filters that are known to work directly with the existing membrane filtration system. There is another manufacturer of membrane filters, but the City of Ashland's consultant engineer handling wastewater items informed the City that their would be additional studies and pre-design that would need to be accomplished to verify if the membranes would work within the confines of the existing system. In addition, the membranes from the other manufacturer create a decrease in square-footage and thus a reduction in treatment ability. The treatment plant currently uses ZeeWeed 500c-220 and -250 membranes in its treatment trains without issue. Currently their can be a lead time of 90-120 days for arrival of the membrane filters after purchase. The membranes need to be installed and tested by April 2013 in order to go online in May of 2013. The membranes need to be online from May to November of each year in order to meet the phosphorous removal requirements.

9. Findings to Satisfy the Required Standards: This proposed special procurement:

___X___ (a) will be unlikely to encourage favoritism in the awarding of public contracts or to substantially diminish competition for public contracts because:

GE Water and Process Technologies currently manufacture the existing filter membranes at the treatment plant and have the ability to deliver the product in the time frame necessary in order to meet regulatory requirements.

(Please provide specific information that demonstrates how the proposed Special Procurement meets this requirement.); **and**

___X___ (b)(i) will result in substantial cost savings to the contracting agency or to the public because:

By not having to do additional engineering studies/pre-design for the other membrane filtration manufacturer that could create additional costs for system changes and meeting the timelines required by regulatory issues the City of Ashland will generate a cost savings.

(Please provide the total estimate cost savings to be gained and the rationale for determining the cost savings); **or**

___X___ (b)(ii) will otherwise substantially promote the public interest in a manner that could not practicably be realized by complying with the requirements of ORS 279B.055, 279B.060, 279B.065, or 279B.070, or any rules adopted thereunder because:

The GE membrane filters are a known commodity that work directly within the existing treatment system. The additional cost, time, reduction in capacity and possible DEQ fines possible associated with choosing the other manufacturer would not be in the City's best interest.

(Please provide specific information that demonstrates how the proposed Special Procurement meets this requirement.)

Public Notice:

Pursuant to ORS 279B.085(5) and OAR 137-047-0285(2), a Contracting Agency shall give public notice of the Contract Review Authority's approval of a Special Procurement in the same manner as a public notice of competitive sealed Bids under ORS 279B.055(4) and OAR 137-047-0300. The public notice shall describe the Goods or Services or class of Goods or Services to be acquired through the Special Procurement and shall give such public notice of the approval of a Special Procurement at least seven (7) Days before Award of the Contract.

After the Special Procurement has been approved by the City Council, the following public notice will be posted on the City's website to allow for the seven (7) day protest period.

Date Public Notice first appeared on www.ashland.or.us – 11-7-2012

PUBLIC NOTICE

Approval of a Special Procurement

First date of publication: 11-7-2012

A request for approval of a Special Procurement was presented to and approved by the City Council, acting as the Local Contract Review Board, on 11-6-2012

The class special procurement was processed to purchase ten new ZeeWeed 500d-350 Filtration Modules. The filtration modules represent a unique component at the City of Ashland's wastewater treatment plant. They provided for phosphorous removal from May to November of each year. The removal of phosphorous is a requirement of the current National Pollutant Discharge Permit for the City of Ashland.

It has been determined based on written findings that the Special Procurement will be unlikely to encourage favoritism in the awarding of public contracts or to substantially diminish competition for public contracts, and result in substantial cost savings or substantially promote the public interest in a manner that could not be realized by complying with the requirements that are applicable in ORS 279B.055, 279B.060, 279B.065, or 279B.070.

An affected person may protest the request for approval of a Special Procurement in accordance with ORS 279B.400 and OAR 137-047-0300. A written protest shall be delivered to the following address: City of Ashland, *Scott Fleury, Engineering, 51 Winburn Way, Ashland, OR 97520*. The seven (7) protest period will expire at 5:00pm on *November 13th, 2012*.

This public notice is being published on the City's Internet World Wide Web site at least seven days prior to the award of a public contract resulting from this request for approval of a Special Procurement.