



MARCO ISLAND NUTRIENT SOURCE EVALUATION PROJECT

EXHIBIT A: SCOPE OF SERVICES

Prepared December 27, 2019

Introduction

Environmental Research & Design, Inc. (ERD) has prepared the following Scope of Services to evaluate sources of nutrient loadings to waterbodies adjacent to Marco Island. This proposal has been developed based on the issues outlined in the Request for Proposals (RFP) issued by the City, discussions with City personnel, review of available information and water quality data, and an on-site visit.

ERD proposes to conduct a 6-month field monitoring program, covering both wet and dry season conditions, to evaluate surface water quality, sediment characteristics, runoff inputs, reuse irrigation, sediment nutrient recycling, bulk precipitation, and groundwater seepage. Isotopes of oxygen (O) and nitrogen (N) will be used to assist in identifying nutrient sources. Loading estimates will be developed for each of the quantified sources. Management recommendations will be developed to improve water quality. Draft and Final Reports will be prepared, and a presentation of results will be provided to the City Commission. The specific work efforts proposed for this project are outlined below.

Scope of Services

1. **Project Kick-off Meeting:** ERD personnel will attend a project kick-off meeting with the City Project Manager to review the overall project objectives, scope of services, primary contacts for each organization, project schedule, meeting schedule, coordination and access issues, and to request specific information from the Client. A site visit will also be conducted to review the general area and select potential monitoring sites.
2. **Collect/Review Available Information:** All existing information in the possession of the City concerning the waterbodies and contributing watersheds will be provided to ERD for review, including previous studies, historical and current water quality data, and drainage basin boundaries for each watershed to be evaluated; and applicable hydrologic/stream gauging data, if available. ERD will review all provided and collected information, and applicable information will be utilized for purposes of this project and summarized in the Final Report.
3. **Historical Water Quality Review and Analysis:** All available historical and current water quality data for the Marco Island area will be collected by ERD. ERD will enter the historical water quality into a statistical database and perform trend analyses and ANOVA comparisons to examine historical trends in water quality. The resulting data will be presented in both tabular and graphical formats. The data will be used to identify “hot spots” and potential loading sources.

4. **Routine Surface Water Quality Monitoring:** Surface water quality monitoring will be performed by ERD at 12 monitoring sites on a monthly basis and used to establish existing water quality characteristics within each waterbody, examine seasonal variability, and evaluate spatial variability. Monitoring sites will be selected to supplement the existing monthly monitoring program conducted by the County. Water quality monitoring will be performed for a period of 6 months, and will include both wet and dry season conditions. During each monitoring event, field measurements of pH, temperature, conductivity, dissolved oxygen, and ORP will be performed at the water surface, and at 0.5 m intervals to the bottom at each monitoring site. A measurement of Secchi disk depth will also be performed. A water sample will be collected at each site, at a depth equal to 50% of the Secchi disk depth and analyzed for the parameters listed in Table 1. Microbiological parameters are not included on this list since there is no indication that bacteria have been a problem, but these can be added if desired by the City. All lab analyses will be conducted in the ERD Laboratory (NELAC #E1031026).

TABLE 1

ANALYTICAL METHODS / DETECTION LIMITS FOR SURFACE WATER SAMPLES

PARAMETER	UNITS	METHOD*	MDL	FEE (\$)
Alkalinity	mg/l	SM-22, Sec. 2320 B	0.6 mg/l	10.00
Ammonia (NH ₃)	mg/l	SM-22, Sec. 4500-NH ₃ G	0.003 mg/l	10.00
Nitrite + Nitrate (NO _x)	mg/l	SM-22, Sec. 4500-NO ₃ F	0.005 mg/l	12.00
Dissolved Total Nitrogen	mg/l	SM-22, Sec. 4500 N C	0.014 mg/l	25.00
Total Nitrogen	mg/l	SM-22, Sec. 4500 N C	0.014 mg/l	25.00
Orthophosphorus (SRP)	mg/l	SM-22, Sec. 4500-P F	0.001 mg/l	10.00
Dissolved Total Phosphorus	mg/l	SM-22, Sec. 4500 P F	0.002 mg/l	17.00
Total Phosphorus	mg/l	SM-22, Sec. 4500 P F	0.002 mg/l	15.00
Color	Pt-Co Unit	SM-22, Sec. 2120 C	1.0 Pt-Co Unit	7.00
Chlorophyll-a	mg/m ³	SM-22, Sec. 10200 H.1.3	0.4 mg/m ³	25.00
TOTAL:				\$ 156.00

Method: Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 2012

For purposes of this Scope a total of 12 monitoring sites is proposed with a monitoring period of 6 months to include both wet and dry season conditions, although the number of sites and monitoring frequency can be easily modified if desired by the City. The monitoring data will be combined with County data for the same period and used to establish ambient water quality characteristics and assist in evaluating horizontal variability and potential water quality trends.

5. **Stormwater Runoff (Inflow) Monitoring:** The characteristics of stormwater runoff discharging from various land use categories will be evaluated by performing flow-weighted monitoring at significant outfalls within the drainage basin over a 4-month period, including both wet and dry season conditions. Specific locations and land use types to be included in the monitoring program will be selected jointly by ERD and the City, with a total of 4 monitoring sites proposed. ERD will install stormwater autosamplers with integral flowmeters at each site inside an insulated equipment shelter. Runoff samples will be collected as a flow-weighted composite of runoff generated during the entire storm event, or in the case of baseflow, as a weekly composite, with a target goal of 8 samples collected per site. Each of the collected flow-weighted composite stormwater samples will be returned to the ERD Laboratory and analyzed for the parameters listed in Table 2.

TABLE 2

ANALYTICAL METHODS / DETECTION LIMITS FOR INFLOW WATER SAMPLES

PARAMETER	UNITS	METHOD*	MDL	FEE (\$)
pH	s.u.	SM-22, Sec. 4500-H ⁺ B	N/A	5.00
Specific Conductivity	µmho/cm	SM-22, Sec. 2510 B	0.2 µmho/cm	5.00
Alkalinity	mg/l	SM-22, Sec. 2320 B	0.6 mg/l	10.00
Ammonia (NH ₃)	mg/l	SM-22, Sec. 4500-NH ₃ G	0.003 mg/l	10.00
Nitrite + Nitrate (NO _x)	mg/l	SM-22, Sec. 4500-NO ₃ F	0.005 mg/l	12.00
Dissolved Total Nitrogen	mg/l	SM-22, Sec. 4500 N C	0.014 mg/l	25.00
Total Nitrogen	mg/l	SM-22, Sec. 4500 N C	0.014 mg/l	25.00
Orthophosphorus (SRP)	mg/l	SM-22, Sec. 4500-P F	0.001 mg/l	10.00
Dissolved Total Phosphorus	mg/l	SM-22, Sec. 4500 P F	0.002 mg/l	17.00
Total Phosphorus	mg/l	SM-22, Sec. 4500 P F	0.002 mg/l	15.00
Total Suspended Solids	mg/l	SM -22, Sec. 2540 D	1.2 mg/l	10.00
Color	Pt-Co Unit	SM-22, Sec. 2120 C	1.0 Pt-Co Unit	7.00
Turbidity	NTU	SM-22, Sec. 2130 B	0.3 NTU	7.00
TOTAL:				\$ 158.00

Method: Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 2012

6. **Evaluation of Precipitation Inputs:**

- a. **Direct Precipitation:** Direct precipitation during the monitoring period will be monitored by ERD using a recording rain gauge, with a resolution of 0.01 inches, which will be installed near the center of the drainage basin. This rain gauge will provide a continuous record of all precipitation inputs during the study period.
- b. **Bulk Precipitation:** Continuous measurements of bulk precipitation will be conducted by ERD at a single location near the center of the drainage basin. Bulk precipitation will be collected in a funnel-type device connected to a refrigerated polyethylene sample bottle. Bulk precipitation samples will be retrieved by ERD on a weekly basis during the monitoring program and analyzed for the parameters listed in Table 3. A total of 12 bulk precipitation samples will be collected.

TABLE 3

ANALYTICAL METHODS / DETECTION LIMITS FOR BULK PRECIPITATION SAMPLES

PARAMETER	UNITS	METHOD*	MDL	FEE (\$)
pH	s.u.	SM-22, Sec. 4500-H ⁺ B	N/A	5.00
Alkalinity	mg/l	SM-22, Sec. 2320 B	0.6 mg/l	10.00
Conductivity	µmho/cm	SM-22, Sec. 2510 B	0.2 µmho/cm	5.00
Ammonia (NH ₃)	mg/l	SM-22, Sec. 4500-NH ₃ G	0.003 mg/l	10.00
Nitrite + Nitrate (NO _x)	mg/l	SM-22, Sec. 4500-NO ₃ F	0.005 mg/l	12.00
Dissolved Total Nitrogen	mg/l	SM-22, Sec. 4500 N C	0.014 mg/l	25.00
Total Nitrogen	mg/l	SM-22, Sec. 4500 N C	0.014 mg/l	25.00
Orthophosphorus (SRP)	mg/l	SM-22, Sec. 4500-P F	0.001 mg/l	10.00
Dissolved Total Phosphorus	mg/l	SM-22, Sec. 4500 P F	0.002 mg/l	17.00
Total Phosphorus	mg/l	SM-22, Sec. 4500 P F	0.002 mg/l	15.00
Color	Pt-Co Unit	SM-22, Sec. 2120 C	1.0 Pt-Co Unit	7.00
TOTAL:				\$ 141.00

Method: Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 2012

7. **Shallow Groundwater Seepage:** Groundwater seepage meters will be installed at 15 locations to be selected jointly by ERD and the City. The locations will be selected based on a review of bathymetric maps, adjacent land use, septic tank areas, and application of reclaimed reuse irrigation. Seepage meters will also be placed in background areas for comparison. Seepage meters allow direct measurement of the quantity and quality of groundwater inflows to waterbodies.

The quantity of seepage influx will be measured, and samples will be collected and analyzed once every month during the 6-month field monitoring program. The collected groundwater seepage samples will be returned to the ERD Laboratory and analyzed for parameters listed in Table 4.

TABLE 4

ANALYTICAL METHODS / DETECTION LIMITS FOR SEEPAGE SAMPLES

PARAMETER	UNITS	METHOD*	MDL	FEE (\$)
pH	s.u.	SM-22, Sec. 4500-H ⁺ B	N/A	5.00
Specific Conductivity	µmho/cm	SM-22, Sec. 2510 B	0.2 µmho/cm	5.00
Alkalinity	mg/l	SM-22, Sec. 2320 B	0.6 mg/l	10.00
Nitrite + Nitrate (NO _x)	mg/l	SM-22, Sec. 4500-NO ₃ F	0.005 mg/l	12.00
Total Nitrogen	mg/l	SM-22, Sec. 4500 N C	0.014 mg/l	25.00
Orthophosphorus (SRP)	mg/l	SM-22, Sec. 4500-P F	0.001 mg/l	10.00
Total Phosphorus	mg/l	SM-22, Sec. 4500 P F	0.002 mg/l	15.00
TOTAL:				\$ 82.00

Method: Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 2012

Locations of each seepage meter will be indicated by GPS coordinates and a submerged floating buoy. Each of the collected seepage samples will be field-filtered prior to collection of samples for laboratory analyses. Stable isotope analyses will be used on selected samples to identify potential sources of NO_x in the seepage.

8. **Sediment Collection/Characterization:** Sediment core samples will be collected at 25 selected locations to assist in evaluating potential water column/sediment interactions and resulting water quality impacts. Sediment core samples will be collected within the lake using a 2-inch diameter split-spoon type core device. Visual characteristics of each sediment core sample will be recorded, and the 0-10 cm layer will be extracted and returned to the ERD Laboratory for chemical analysis. Each of the sediment core samples will be analyzed for the parameters listed in Table 5.

TABLE 5

ANALYTICAL METHODS / DETECTION LIMITS FOR SEDIMENT SAMPLES

PARAMETER	UNITS	SAMPLE PREP.*	ANALYSIS REFERENCE*	MDL	FEE (\$)
Moisture Content	%	EPA/CE-81-1 ¹ p. 3-54	EPA/CE-81-1 p. 3-58	0.1%	12.50
Organic Content	%	EPA/CE-81-1 p. 3-52	EPA/CE-81-1 pp. 3-52 to 3-53	0.1%	12.50
Sediment Density	g/cm ³	EPA/CE-81-1 p. 3-61	EPA/CE-81-1 pp. 3-61 to 3-62	N/A	10.00
Total Phosphorus	µg/cm ³	EPA/CE-81-1 pp. 3-227 to 3-228 (Method C)	EPA 365.4 ²	0.1 µg/cm ³	20.00
Total Nitrogen	µg/cm ³	EPA/CE-81-1 p. 3-201	EPA/CE-81-1 pp. 3-201 to 3-204	10 µg/cm ³	25.00
pH	s.u.	EPA 9045 ³	EPA 9045	N/A	7.00
Phosphorus Speciation	--	--	--	--	100.00
TOTAL:					\$ 187.00

References:

1. Procedures for Handling and Chemical Analysis of Sediments and Water Samples, EPA/Corps of Engineers, EPA/CE-81-1, 1981.
2. Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, Revised March 1983.
3. Test Methods for Evaluating Solid Wastes, Physical-Chemical Methods, 3rd Edition, EPA-SW/846, Updated November 1990.

Each of the core samples will also be analyzed using the Chang and Jackson phosphorus speciation technique which divides sediment phosphorus associations into the following categories:

- | | |
|---|------------------------------|
| a. Saloid-Bound Phosphorus
(soluble + easily exchangeable) | b. Iron-Bound Phosphorus |
| | c. Aluminum-Bound Phosphorus |

The results of the sediment analyses and speciation procedures will be used to identify general sediment characteristics and to assist in estimating the potential for internal recycling of nutrients from the sediments into the overlying water column in each waterbody. Isopleth maps will be prepared for each evaluated sediment parameter and waterbody.

9. **Evaluation of Internal Nutrient Recycling:** Direct measurements of internal recycling of nitrogen and phosphorus under aerobic and anaerobic conditions will be performed using sediment release rate experiments on sediment core samples collected at 8 locations within the waterbodies. Large diameter (10 cm) sediment core samples will be collected from a variety of water depths and sediment characteristics and returned to the ERD Laboratory Specific locations for collection of the large diameter core samples will be based upon the results of the sediment core samples collected under Task 7.

Following collection, the large diameter core samples will be incubated under both aerobic and anaerobic conditions. Release of nitrogen phosphorus will be measured in each core sample over time. The release rate information will be combined with historical dissolved oxygen field measurements, as well as the general sediment characterization information, to estimate nutrient recycling based on the percentage of aerobic and anaerobic zones. The samples will be analyzed for the parameters listed in Table 6.

TABLE 6

ANALYTICAL METHODS / DETECTION LIMITS FOR LARGE CORE SAMPLES

PARAMETER	UNITS	METHOD*	MDL	FEE (\$)
Ammonia (NH ₃)	mg/l	SM-22, Sec. 4500-NH ₃ G	0.003 mg/l	10.00
Nitrite + Nitrate (NO _x)	mg/l	SM-22, Sec. 4500-NO ₃ F	0.005 mg/l	12.00
Total Nitrogen	mg/l	SM-22, Sec. 4500 N C	0.014 mg/l	25.00
Orthophosphorus (SRP)	mg/l	SM-22, Sec. 4500-P F	0.001 mg/l	10.00
Total Phosphorus	mg/l	SM-22, Sec. 4500 P F	0.002 mg/l	15.00
TOTAL:				\$ 72.00

Method: Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 2012

10. **Evaluate Golf Course Practices:** ERD personnel will meet with representatives of the on-site golf courses to discuss maintenance activities, fertilization, and reuse irrigation. The information will be used to identify possible water quality impacts and will be summarized in the Final Report.
11. **Reuse Irrigation Impacts:** Impacts from reuse irrigation will be evaluated by collection and analysis of reuse water and information on the quantity of application within watersheds for impacted waters. ERD will collect samples of reuse water during each site visit, and the samples will be analyzed for the parameters outlined under Stormwater Runoff. The relative contribution of reuse water to overall nutrient loadings will be evaluated from basic hydrologic budgets and the results of the isotope analyses.
12. **Identify Nutrient Sources:** At the conclusion of the field monitoring efforts, ERD will develop hydrologic and nutrient budgets for the waterbodies. The nutrient budget will include runoff, bulk precipitation, groundwater seepage, and internal recycling. The hydrologic budget will include stormwater inflows, groundwater seepage, deep groundwater losses, direct precipitation, interconnected flows, and evaporation.
13. **Develop Management Recommendations:** Based upon the information obtained during the review of existing information and the data obtained during the field monitoring program, ERD will develop a Management Recommendation Plan which outlines efforts to be undertaken to reduce loadings to waterbodies and improve water quality. These recommendations will include both structural and non-structural techniques, as appropriate, to improve water quality. Conceptual designs, including construction, annual operation and maintenance costs, and pollutant removal costs and benefits, will be calculated for each evaluated management option.

14. **Prepare Draft Final Report:** At the conclusion of the tasks outlined above, ERD will prepare a Draft Final Report which describes all field and laboratory work efforts performed, summarizes the analyses and conclusions of the study, and outlines the recommended management plan.
15. **Review Meeting:** The ERD Project Director will attend a meeting with City personnel to discuss the Draft Final Report and receive comments.
16. **Prepare Final Report:** ERD will prepare a Final Report for the project based upon the review comments provided by the City.
17. **Prepare/Give Presentation of Results:** The ERD Project Director will prepare a presentation summarizing the work efforts and results of the project. A presentation of the results will be provided to either the Client or other interested parties as directed by the City.



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MARCO ISLAND NUTRIENT SOURCE EVALUATION PROJECT

EXHIBIT B: MAN-HOURS / FEE SUMMARY

Prepared December 27, 2019

A. Labor

TASK	DESCRIPTION	MAN-HOURS*							TASK AMOUNT (\$)
		PM	SE	LM	FT	CH	D	CL	
1	Project Kick-off Meeting	12	--	--	--	--	--	--	\$ 2,025.36
2	Collect/Review Available Information	3	12	4	--	--	--	--	2,071.98
3	Historical Water Quality Evaluation and Trend Analysis	3	4	20	--	--	--	--	2,386.22
4	Routine Surface Water Monitoring (6 months)	8	--	72	72	--	--	--	11,197.68
5	Inflow Monitoring (4 months)								
	a. Install autosamplers at 4 locations	16	--	24	32	--	--	--	6,495.12
	b. Routine monitoring and sample collection	12	--	120	48	--	--	--	13,828.32
6	Evaluation of Precipitation Inputs	4	--	20	12	--	--	--	2,898.36
7	Shallow Groundwater Seepage								
	a. Seepage meter preparation/installation	8	--	12	24	--	--	--	3,759.72
	b. Routine monitoring and sample collection	2	--	24	36	--	--	--	4,388.28
8	Sediment Collection/Characterization	8	--	12	12	24	--	2	4,493.04
9	Evaluation of Internal Nutrient Recycling								
	a. Collection of large core samples	8	--	12	24	--	--	--	3,759.72
	b. Routine monitoring and sample collection	4	--	12	90	--	--	--	7,309.92
10	Evaluate Golf Course Practices	8	--	4	4	--	--	--	1,897.32
11	Reuse Irrigation Impacts	12	6	12	12	--	--	--	4,303.92
12	Identify Nutrient Sources	16	24	--	--	--	4	--	5,494.20
13	Develop Management Recommendations	36	24	--	--	--	24	--	10,092.00
14	Prepare Draft Final Report	64	16	8	--	--	6	24	14,707.22
15	Review Meeting	12	--	--	--	--	--	--	2,025.36
16	Prepare Final Report	8	4	2	--	--	4	6	2,479.34
17	Prepare/Give Presentation of Results	20	2	--	--	--	--	6	3,902.32
TOTAL – LABOR:		264	92	358	366	24	38	38	\$ 109,515.40

Ph. I Labor subtotal: \$76,309.16

B. Laboratory Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
3	Surface Water Samples (12 samples/month x 6 months x \$156/sample)	\$ 11,232.00
4	Inflow Water Samples (4 sites x 8 samples/site x \$158/sample)	5,056.00
5	Bulk Precipitation Samples (15 samples x \$141/sample)	2,115.00
6	Groundwater Seepage Samples (70 samples x \$82/sample)	5,740.00
9	Reuse Irrigation Samples (12 samples x \$141/sample)	1,692.00
7	Sediment Analyses (25 samples x \$187/sample)	4,675.00
8	Internal Recycling Analyses (8 core samples x 16 samples/core x \$72/sample)	9,216.00
All Ph I TOTAL – LABORATORY EXPENSES:		\$ 39,726.00

C. Reimbursable Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
3	Surface Water Monitoring Supplies/Filters, etc. (12 samples x 6 months x \$15/sample)	\$ 1,080.00
3	Surface Water Monitoring Equipment Use (6 events x \$100/event)	600.00
4	Autosampler Rental (4 units x 4 months x \$250/month)	4,000.00
5	Seepage Meter Fabrication/Preparation/Rental (15 seepage meters x \$125/meter)	1,875.00
5	Seepage Meter Sample Supplies/Filters (70 samples x \$25/sample)	1,750.00
5	Isotope Analyses (75 samples x \$55/sample)	4,125.00
9	Recycling Evaluation Supplies (large diameter core cylinders, gases, supplies, etc.) (8 core tubes x \$200/tube)	1,600.00
All Ph I TOTAL – REIMBURSABLE EXPENSES:		\$ 15,030.00

PROJECT TOTAL: \$ 164,271.40

*Personnel Hourly Rates

SYMBOL	PERSONNEL CLASSIFICATION	HOURLY RATE (\$/hr)
PM	Project Manager	168.78
SE	Senior Engineer	106.22
LM	Limnologist	72.75
FT	Field Technician	64.02
CH	Chemist	58.20
D	Draftsman	61.11
CL	Clerical	52.38

Phase 1 total:

\$ 131,065.16

FY20



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EXHIBIT C: SUPPLEMENTAL SERVICES MAN-HOURS / FEE SUMMARY

Prepared December 27, 2019

1. Additional Surface Water Monitoring Sites

A. Labor

TASK	DESCRIPTION	MAN-HOURS*					TASK AMOUNT (\$)
		PM	SE	LM	FT	CH	
4	Routine Surface Water Monitoring (6 months)	2	--	2	2	--	\$ 611.10

B. Laboratory Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
4	Surface Water Samples (1 sample/month x 6 months x \$156/sample)	\$ 936.00

C. Reimbursable Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
4	Surface Water Monitoring Supplies/Filters, etc. (1 sample x 6 months x \$15/sample)	\$ 90.00

TOTAL / SITE – ADDITIONAL SURFACE WATER MONITORING SITES:

\$ 1,637.10

*Personnel Hourly Rates

SYMBOL	PERSONNEL CLASSIFICATION	HOURLY RATE (\$/hr)
PM	Project Manager	168.78
SE	Senior Engineer	106.22
LM	Limnologist	72.75
FT	Field Technician	64.02
CH	Chemist	58.20



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EXHIBIT C: SUPPLEMENTAL SERVICES MAN-HOURS / FEE SUMMARY

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2. Additional Seepage Meter Monitoring Sites

A. Labor

TASK	DESCRIPTION	MAN-HOURS*					TASK AMOUNT (\$)
		PM	SE	LM	FT	CH	
7	Shallow Groundwater Seepage						
	a. Seepage monitoring preparation / installation	2	--	2	4	--	\$ 739.14
	b. Routine monitoring and sample collection	1	--	2	4	--	570.36

B. Laboratory Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
7	Groundwater Seepage (5 samples x \$62/sample)	\$ 410.00

C. Reimbursable Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
7	Seepage meter fabrication/preparation/rental (1 seepage meter x \$125/meter)	\$ 125.00
7	Seepage meter sample supplies/filters (5 samples x \$25/sample)	125.00

TOTAL / SITE – ADDITIONAL SEEPAGE METER MONITORING SITES:

\$ 1,969.50

*Personnel Hourly Rates

SYMBOL	PERSONNEL CLASSIFICATION	HOURLY RATE (\$/hr)
PM	Project Manager	168.78
SE	Senior Engineer	106.22
LM	Limnologist	72.75
FT	Field Technician	64.02
CH	Chemist	58.20



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MARCO ISLAND NUTRIENT SOURCE EVALUATION PROJECT

EXHIBIT C: SUPPLEMENTAL SERVICES MAN-HOURS / FEE SUMMARY

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3. Additional Sediment Monitoring Sites

A. Labor

TASK	DESCRIPTION	MAN-HOURS*					TASK AMOUNT (\$)
		PM	SE	LM	FT	CH	
8	Sediment Collection/Characterization	1	--	1	1	2	\$ 421.95

B. Laboratory Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
8	Sediment Analyses (1 sample x \$187/sample)	187.00

TOTAL / SITE – ADDITIONAL SEDIMENT MONITORING SITES:

\$ 608.95

*Personnel Hourly Rates

SYMBOL	PERSONNEL CLASSIFICATION	HOURLY RATE (\$/hr)
PM	Project Manager	168.78
SE	Senior Engineer	106.22
LM	Limnologist	72.75
FT	Field Technician	64.02
CH	Chemist	58.20



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EXHIBIT C: SUPPLEMENTAL SERVICES MAN-HOURS / FEE SUMMARY

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4. Additional Runoff Monitoring Sites

A. Labor

TASK	DESCRIPTION	MAN-HOURS*					TASK AMOUNT (\$)
		PM	SE	LM	FT	CH	
5	Inflow Monitoring – 6 months						
	a. Install autosampler at 1 location	4	--	6	8	--	\$ 1,623.78
	b. Routine monitoring and sample collection	2	--	24	12	--	2,851.80

B. Laboratory Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
5	Runoff/Inflow Samples (1 site x 8 samples/site x \$158/sample)	\$ 1,264.00

C. Reimbursable Expenses

TASK	DESCRIPTION	TASK AMOUNT (\$)
5	Autosampler Rental (1 unit x 6 months x \$250/month)	\$ 1,500.00

TOTAL / SITE – ADDITIONAL RUNOFF MONITORING SITES:

\$ 7,239.58

*Personnel Hourly Rates

SYMBOL	PERSONNEL CLASSIFICATION	HOURLY RATE (\$/hr)
PM	Project Manager	168.78
SE	Senior Engineer	106.22
LM	Limnologist	72.75
FT	Field Technician	64.02
CH	Chemist	58.20



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MARCO ISLAND NUTRIENT SOURCE EVALUATION PROJECT EXHIBIT D: PROJECT SCHEDULE Prepared December 27, 2019

Phase 1

TASK	DESCRIPTION	2020												2021					
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
1	Project Kick-off Meeting		*																
2	Collect/Review Available Information																		
3	Historical Water Quality Review and Analysis																		
4	Routine Surface Water Monitoring - 6 months																		
	Runoff Inflow Monitoring - 4 months																		
5	a. Install Autosamplers at 4 locations																		
	b. Routine Monitoring and Sample Collection																		
6	Evaluation of Precipitation Inputs																		
	Shallow Groundwater Seepage																		
7	a. Seepage Meter Preparation/Installation																		
	b. Routine Monitoring and Sample Collection																		
8	Sediment Collection/Characterization																		
	Evaluation of Internal Nutrient Recycling																		
9	a. Collection of Large Core Samples																		
	b. Routine Monitoring and Sample Collection																		
10	Evaluate Golf Course Practices																		
11	Reuse Irrigation Impacts																		
12	Identify Nutrient Sources																		
13	Develop Management Recommendations																		
14	Prepare Draft Final Report																		
15	Review Meeting																		
16	Prepare Final Report																		
17	Prepare/Give Presentation of Results																		