Attachment A

February 5, 2023

Gordon England, PE (ret.), D.WRE
Stormwater Program
Brevard County Natural Resources Management Department
2725 Judge Fran Jamieson Way, Bldg. A
Viera, Florida 32940

SUBJECT: Scope and Fee for the Resiliency Outfall Mapping and Vulnerability Assessment of the Tropical Trail 520 to 528 Expanded Project, Brevard County

Dear Mr. England

Applied Ecology (AEI) is pleased to provide Brevard County Natural Resources Management Department (BCNRMD) with this scope of work for environmental consulting support associated with the development of an updated outfall database, followed by the completion of a vulnerability assessment. Included, and incorporated as part of this scope, is an outline of the project information provided to us, the proposed scope of services, our fee, and the proposed schedule.

Background Information

The East Central Florida Regional Planning Council (ECFRPC) was awarded a Florida Department of Environmental Protection (FDEP) Grant in 2017 to work with stakeholders in Brevard and Volusia Counties to develop the East Central Florida Regional Resiliency Action Plan (ECF RRAP) with the goal to increase the ability of local and regional stakeholders to implement resiliency and climate adaptation strategies across disciplines. The action plan was developed based on the "100 Resilient Cities program" framework and provided an extensive matrix of action items focusing on the following areas: Leadership and Strategy, Economy and Society, Infrastructure and Environment, and Health and Wellbeing. This scope of work provides the required information to address one of the Infrastructure and Environment Action item, namely the ECF RRAP Action IE3.6. The task under IE3.6 includes assessing stormwater system facilities to vulnerabilities to future inundation and erosion including elevations of outfalls into surface water bodies.

This scope of work, funded by the Resilient Florida Grant Program titled "Tropical Trail 520 to 528 Vulnerability Assessment – Expanded" will identify, map, and vertically locate the critical stormwater infrastructure necessary to evaluate the extent of inundation in the Indian River Lagoon due to storm surge and sea level rise. For this effort, AEI will leverage the outfall Geographic Information Systems (GIS) database developed by Applied Ecology under Task Order 19-001-02 Save Our Indian River Lagoon (SOIRL) as initial basemap for the field mapping effort. An initial planning effort will take place to identify the outfalls and connected infrastructure to be prioritized for data collection within the unincorporated areas of Brevard County. An initial planning effort will take place to identify the outfalls and connected infrastructure to be prioritized for data collection within the unincorporated areas of Brevard County. For planning purposes, up to 1,082 outfalls and connected stormwater features were included in the base task efforts. Due to the likelihood of new structures being identified in the field, an additional 144 features are included under Task 3.

Mapping will use, at minimum, a submeter GPS with the capability of collecting both horizontal and vertical coordinates for each of the selected features. Outfall size and material will also be recorded and delivered as a GIS database product, allowing Brevard County to perform future spatial analysis and modeling efforts.

In addition to the significant effort spent in collecting mapping data throughout Brevard County, AEI will proceed with the typical steps required to develop a vulnerability assessment. This includes the acquisition of critical background data (Task 4), conducting an exposure analysis (Task 5), sensitivity analysis (Task 6), and developing a final vulnerability assessment report (Task 7). This scope of work also included project planning and management and coordination throughout.

Proposed Scope of Services

In this scope of work, Applied Ecology will be performing the scope of work to develop a vulnerability assessment report using readily available data as well as field collected data in 8 tasks. The focus of the mapping effort is on outfalls and immediately connected stormwater structures throughout unincorporated Brevard County that are within Indian River Lagoon watershed. The vulnerability assessment will focus on critical assets and regionally significant resources within the India River Lagoon area of interest.

Task 1: Planning and Project Initiation

AEI will evaluate previously available outfall and stormwater infrastructure data, most recently available imagery and LiDAR datasets, city boundaries, as well as other ancillary datasets to develop an efficient plan for the countywide field data collection effort. A grid will be developed to allow best management practices to be enforced during data collection, data processing, and quality assurance. A draft workplan document will include a phased approach by geographic region, detail potential accessibility issues (boat/land/no access), and provide a proposed schedule, milestones, and anticipated deliverables. The post-processing and quality assurance processes will also be summarized in the draft workplan. Due to the extensive field data collection efforts undertaken during this project, a Health and Safety Plan will be included as an Attachment to the workplan document.

The draft workplan document will be presented during the project kickoff meeting to initiate the project. An agenda and brief meeting minutes will be prepared for the kickoff meeting. We anticipate one round of comments to be incorporated in a final workplan document. This task will also include developing a brochure describing the project to hand out to interested parties, particularly the public encountered by the field staff throughout the project duration.

Task 1 Deliverables

- Draft Workplan Document with an associated Health and Safety Plan
- Final Workplan Document after addressing one round of comments
- Kickoff meeting agenda
- Kickoff meeting minutes

Task 2: Mapping - Data Collection within the Indian River Lagoon Watershed

AEI will perform the data collection effort on 1,082 outfalls and connected structures that are within the Indian River Lagoon watershed within Brevard County's unincorporated area. The mapping effort does not include 193 other outfalls that are regarded as not accessible. The classification of accessibility was determined by close review of aerial imagery and includes the following:

- 322 outfalls best accessed by boat that are in the current GIS database
- 74 areas of potential outfall locations (obscured in aerial review) best accessed by boat
- 240 outfalls best accessed by land that are in the current GIS database
- 68 areas of potential outfall locations best accessed by land
- 378 connected structures to the outfalls listed above

The existing outfall GIS database is known to be incomplete. The areas of potential outfall locations were identified by careful review of aerial imagery. The connected structures were identified by comparing the spatial locations of known outfalls to the Digital Elevation Model (DEM). An elevation of 8.5 feet was used to identify the connected structures.

Prior to initiating the field data collection effort, the Global Navigation Satellite System (GNSS) receiver accuracy will be verified using 3 existing high accuracy survey monuments. GNSS metadata will be saved in the GIS attribute table when available.

The data collection will be performed using a Trimble R2 with cm-mode enabled and the Trimble RTX correction service, providing up to 2 cm horizontal and 5 cm vertical accuracy. Beyond horizontal and vertical location, the outfall size and material type (when visible) will be recorded in appropriate fields. This task includes appropriate post-processing and quality assurance of data collection to ensure the final product meets the established project goals and milestones described in the final workplan document.

Task 2 Deliverable

- Monthly completion table of collected features

Task 3: Data Collection – Indian River Lagoon (IRL) (Additional 144 Features)

This task provides an option to expand the data collection to another 144 features (combination of outfalls and connected structures), in case new structures are found during the data collection effect undertaken in Task 2. Since the existing outfall database does not include all existing outfalls, AEI anticipates 5% or more additional outfalls to be located in the field. The144 structures include 48 accessible only by boat and 96 accessible by land. Similar methods to the ones described under Task 2, including data processing/quality assurance is included under this task.

Task 3 Deliverables

- File Geodatabase containing an outfall layer, an inlet layer, and a manhole layer with associated metadata with all-inclusive field collected data associated with Tasks 2 and 3

Task 4: Acquisition of Background Data

In addition to the data collected in Tasks 3 and 4, AEI will research and compile the data needed to perform the Vulnerability Assessment (VA), based on the requirements as defined in Section 380.093, Florida Statute (F.S.). Three main categories of data are required to perform a VA: 1) critical and regionally significant asset inventory, 2) topographic data, and 3) flood scenario-related data. During the research and acquisition

process, AEI will perform a data gap analysis and incorporate its results in a gap analysis memorandum report. The memo will include a summary of data collection, a quality assessment, as well identify gaps as well as recommendations to address these. One round of revisions will be integrated in a final data gap analysis memo report. No new models or data creation will be performed under this task.

Task 4 Deliverables

- File Geodatabase containing available collected data (critical asset inventory and regionally significant features, topographic data and flood scenario data with appropriate metadata (adheres to the Resilient Florida Program's GIS Data Standards)
- Draft Gap Analysis Memorandum Report
- Final Gap Analysis Memorandum Report (after one set of revisions)

Task 5: Exposure Analysis

Once the critical background data are collected, AEI will perform an exposure analysis to identify the depth of water caused by each sea level rise, storm surge, and/or flood scenario. AEI and Brevard County will define the flood scenarios of interest for this analysis, and maps and tables with appropriate elevations based on these will be developed. Draft sections of the VA Report will be developed to focus on the methods and results of the exposure analysis. Any developed GIS products will be provided with appropriate metadata in a file geodatabase.

Task 5 Deliverables

- File Geodatabase containing the exposure analysis for each selected flood scenario with appropriate metadata (adheres to the Resilient Florida Program's GIS Data Standards)
- Draft Exposure Analysis sections of the VA Technical Report
- Final Exposure Analysis sections of the VA Technical Report

Task 6: Sensitivity Analysis

Once the exposure analysis is complete, AEI will perform the sensitivity analysis to measure the impact of flooding on assets and to apply the data from the exposure analysis to the inventory of critical assets created in the Exposure Analysis Task. The sensitivity analysis will include an evaluation of the impact of flood severity on each asset type and at each flood scenario and assign a risk level based on percentages of land area inundated and number of critical assets affected. Draft sections of the VA Report will be developed to focus on the methods and results of the sensitivity analysis.

Task 6 Deliverables

- Preliminary table of critical and regionally significant assets that are impacted by flooding (by scenario)
- Draft Sensitivity Analysis sections of the VA Technical Report
- Final Sensitivity Analysis sections of the VA Technical Report

Task 7: Final Vulnerability Assessment Report, Maps, and Tables

This task focuses on the reviewing and finalizing the list of the critical and significant assets of concern due to flooding as well as finalizing the Vulnerability Assessment Technical Report. The Report will include the sections previously developed under Tasks 5 and 6, as well as additional maps, tables, and sections that illustrate the process, background information, and recommendations. One round of revisions will be incorporated in the in the VA Technical Report

Task 7 Deliverables

- Final table of critical and regionally significant assets that are impacted by flooding (by scenario)
- Draft VA Technical Report
- Final VA Technical Report

Task 8: Project Management and Coordination

This task includes the development of a project management plan to ensure an efficient data collection effort and subsequent analysis process associated with the VA. Additionally, the task also includes budget for ongoing internal project coordination between field supervisor and project manager, as well as meeting time and coordination with Brevard County (up to 6 meetings in addition to the kickoff meeting).

Task 8 Deliverables

- Meeting agendas and action items, as requested

Fee and Method of Compensation

We propose performing the above scope of services for a time and materials not to exceed the fee of **$*383,585.50*** as follows:

Task	Description	Cost
1	Planning and Project Initiation	$16,561.00
2	Mapping – Data Collection	$195,767.50
3	Data Collection of 144 additional features	$34,190.00
4	Acquisition of Background Data	$18,476.00
5	Exposure Analysis	$18,370.00
6	Sensitivity Analysis	$18,142.00
7	Final Vulnerability Assessment Report, Maps, and Tables	$14,030.00
8	Project Management and Coordination	$26,114.00

Task 2 Direct Expenses	$36,695.00
Task 4 Direct Expenses	$5,240.00
Total Project Cost:	**$383,585.50**

Monthly invoices will be billed based on the hourly effort performed and expenses during each calendar month. Details on the level of effort and associated cost by task are provided in Attachment A and detailed expenses provided in Attachment B.

If unforeseen conditions should require services beyond the scope of services described herein, Applied Ecology will notify you immediately of additional costs necessary to complete the project prior to proceeding. Services beyond those described herein would be invoiced in accordance with our standard schedule of fees at the applicable rates.

Project Assumptions

The following assumptions were used in the development of this scope and fee:

- Only outfalls in unincorporated Brevard County within the IRL watershed boundary are included
- AEI will not trespass on private property to survey any infrastructure
- No recruitment or engagement with the public or private citizens is anticipated (field staff will be trained to provide project brochure and route questions to Brevard County staff)
- Field staff will follow AEI's Health and Safety Plan at all times even if this might prevent data collection of selected structures in case these require exposure to unsafe conditions that cannot be mitigated by AEI's internal procedures
- The deliverable is a File Geodatabase containing outfall, inlet, and manhole layers with metadata
- The layers will not be z enabled (elevations will be in the attribute table instead)
- The elevation of the bottom of the pipe will be recorded in an attribute field
- The pipe diameter will be recorded in an attribute field
- The pipe material of the pipe will be recorded in an attribute field using SWAMP coded domains
- Flumes are to be included as outfall structures
- Horizontal and vertical accuracies described under Task 2 are based on ideal environmental conditions and cannot be guaranteed for all collected features
- Critical infrastructure and regionally significant assets have already been digitized or developed previously.
- No in-house stormwater surge modeling, or other modeling will be developed under this scope to be used as a flooding scenario; we can, however, use ready-to-use results from previously developed stormwater surge modeling efforts
- Only one round of comments is included in any of the final report submissions
- A total of 7 meetings with Brevard County are incorporated in the project management effort
- Geodatabase deliverables will include appropriate FGDC compliant metadata

Schedule

We anticipate initiating the project within 2 weeks after notice to proceed (NTP Based on anticipated NTP in early June, the below schedule provides a proposed schedule:

Task	Start Month	Complete Month
Task 1: Planning and Project Initiation	April 2023	May 2023
Task 2: Mapping – Data Collection	June 2023	Mar 2024
Task 3: Additional Mapping (144 structures)	April 2024	May 2024
Task 4: Acquisition of Background Data	January 2024	May 2024
Task 5: Exposure Analysis	June 2024	August 2024
Task 6: Sensitivity Analysis	August 2024	October 2024
Task 7: Final Vulnerability Assessment Report, Maps, and Tables	October 2024	January 2025
Task 8: Project Management and Coordination	April 2023	January 2025
*Assumes NTP of March 15, 2023.		

Authorization

Please provide written authorization to proceed consistent with the terms and conditions of the Ecological Consulting Contract between Brevard County and Applied Ecology dated 09/12/2019.

We appreciate the opportunity to offer our professional services on this project. If you have any questions concerning this proposal, please contact us at 321-499-3336.

Sincerely,

Claudia Listopad, Ph.D., GISP
President, Principal Scientist

Attachments:
Attachment A - Detailed level of effort and associated cost by subtask for the Resiliency Outfall Mapping and Vulnerability Assessment
Attachments B – Detailed expenses for the Resiliency Outfall Mapping and Vulnerability Assessment

Task 1: **Planning and Project Initiation**

Subtask	Description	Principal Scientist ($152)	Sr. Staff Scientist ($110)	Staff Scientist ($85)	Associate Staff Scientist ($66)	Senior Technician ($59.5)	GIS Specialist ($85)	Clerical ($40.5)	Sr. Field Manager ($120)	Field Supervisor ($75)	Field Technician ($59.5)	Total Hrs	Total Cost
1	Plan outfalls & connected structure data collection	1	8	0	0	0	40	0	0	0	0	49	$ 4,432.00
2	Develop workplan summary document to include a HASP	4	12	40	0	0	16	4	0	0	0	76	$ 6,850.00
3	Final Workplan Summary Document (addressing one round of comments/ADA)	2	2	8	0	0	8	4	0	0	0	24	$ 2,046.00
4	Setup data collection geodatabase and AGOL map	0	2	8	0	0	16	0	0	0	8	34	$ 2,736.00
5	Create brochure describing project	0.5	0	4	0	0	0	2	0	0	0	6.5	$ 497.00
ALL	***Planning and Project Initiation***	***7.5***	***24***	***60***	***0***	***0***	***80***	***10***	***0***	***0***	***8***	***189.5***	***$ 16,561.00***

Task 2: ***Mapping - Data Collection***

Subtask	Description	Principal Scientist ($152)	Sr. Staff Scientist ($110)	Staff Scientist ($85)	Associate Staff Scientist ($66)	Senior Technician ($59.5)	GIS Specialist ($85)	Clerical ($40.5)	Sr. Field Manager ($120)	Field Supervisor ($75)	Field Technician ($59.5)	Total Hrs	Total Cost
1	Verify GPS data to 3 high accuracy monuments	0	0	0	0	0	6	0	0	0	6	12	$ 867.00
2	Data Collection of Features (384) Accessible Only By Boat	0	25	0	500	0	0	0	500	0	500	1525	$ 125,500.00
3	Data Collection of Features (308) Accessible By Land	0	10	0	0	0	0	0	0	180	180	370	$ 25,310.00
4	Data Collection of Connected Structures (377)	0	10.5	0	0	0	0	0	0	189	189	388.5	$ 26,575.50
5	Post Processing and Quality Assurance (6 hours per week)	0	15.5	186	0	0	0	0	0	0	0	201.5	$ 17,515.00
ALL	***Mapping - Data Collection***	***0***	***61***	***186***	***500***	***0***	***6***	***0***	***500***	***369***	***875***	***2497***	***$ 195,767.50***

Task 3: ***Additional Mapping (144 Features) and Data Acquisition Reporting***

Subtask	Description	Principal Scientist ($152)	Sr. Staff Scientist ($110)	Staff Scientist ($85)	Associate Staff Scientist ($66)	Senior Technician ($59.5)	GIS Specialist ($85)	Clerical ($40.5)	Sr. Field Manager ($120)	Field Supervisor ($75)	Field Technician ($59.5)	Total Hrs	Total Cost
1	Data Collection of Features (48) Accessible Only By Boat	0	4.5	0	60	0	0	0	60	0	60	184.5	$ 15,225.00
2	Data Collection of Features (96) Accessible By Land	0	4.5	0	0	0	0	0	0	54	54	112.5	$ 7,758.00
3	Post Processing and Quality Assurance (6 hours per week)	0	2	24	0	0	0	0	0	0	0	26	$ 2,260.00
4	Deliver spatial layer (GDB) with elevations and metadata (includes Task 2 and 3 data)	1	8	0	0	0	16	0	0	0	0	25	$ 2,392.00
ALL	***Additional Mapping (144 Features) and Data Acquisition Rep***	***7***	***31***	***56***	***60***	***0***	***32***	***6***	***60***	***54***	***114***	***420***	***$ 34,190.00***

Task 4: Acquisition of Background Data

Subtask	Description	Principal Scientist ($152)	Sr. Staff Scientist ($110)	Staff Scientist ($85)	Associate Staff Scientist ($66)	Senior Technician ($59.5)	GIS Specialist ($85)	Clerical ($40.5)	Sr. Field Manager ($120)	Field Supervisor ($75)	Field Technician ($59.5)	Total Hrs	Total Cost
1	Critical asset inventory (transportation, critical infrastructure, communications and emergency facilities) and regionally significant resources (natural, cultural and cultural assets)	0	4	0	0	40	12	0	0	0	0	56	$ 3,840.00
2	Topographic data (in addition to data collected in Tasks 2-3)	0	1	0	0	16	8	0	0	0	0	25	$ 1,742.00
3	Flood scenario datasets (NOAA intermediate-low and high scenarios and FEMA 100-year storm surge modeling); precipitation, gages, GW, ET, LULC, etc.	1	8	0	0	24	16	0	0	0	0	49	$ 3,820.00
4	Data Gap Analysis	0	4	0	0	16	12	0	0	0	0	32	$ 2,412.00
5	Draft Data Gap Analysis Report with Recommendations	4	8	24	0	0	8	0	0	0	0	44	$ 4,208.00
6	Final Data Gap Analysis Report with Recommendations	1	2	8	0	0	2	0	0	0	0	13	$ 1,222.00
7	Geodatabase of available data with metadata	0.5	0	0	0	8	8	0	0	0	0	16.5	$ 1,232.00
ALL	***Acquisition of Background Data***	***6.5***	***27***	***32***	***0***	***104***	***66***	***0***	***0***	***0***	***0***	***236***	***$ 18,476.00***

Task 5: Exposure Analysis

Subtask	Description	Principal Scientist ($152.00)	Sr. Staff Scientist ($110.00)	Staff Scientist ($85.00)	Associate Staff Scientist ($66.00)	Senior Technician ($59.50)	GIS Specialist ($85.00)	Clerical ($40.50)	Sr. Field Manager ($120.00)	Field Supervisor ($75.00)	Field Technician ($59.50)	Total Hrs	Total Cost
1	Define flood scenarios (water surface depths) for SLR, storm surge flooding, rainfall-induced flooding, and others as needed	2	8	0	0	0	16	0	0	0	0	26	$ 2,544.00
2	Create maps and tables with appropriate elevations based on flood scenarios	0	12	0	0	40	24	0	0	0	0	76	$ 5,740.00
3	Draft Sections of the Vulnerability Assessment (VA) Report for the Exposure Analysis: modeling process, types of models, resulting tables and maps of flood depths by scenario	8	16	24	0	12	16	0	0	0	0	76	$ 7,090.00
4	Final Sections of the VA report for the Exposure Analysis	2	4	8	0	0	4	0	0	0	0	18	$ 1,764.00
5	Geodatabase of available data with metadata	0.5	0	0	0	8	8	0	0	0	0	16.5	$ 1,232.00
ALL	***Exposure Analysis***	***12.5***	***40***	***32***	***0***	***60***	***68***	***0***	***0***	***0***	***0***	***212.5***	***$ 18,370.00***

Task 6: Sensitivity Analysis

Subtask	Description	Principal Scientist ($152.00)	Sr. Staff Scientist ($110.00)	Staff Scientist ($85.00)	Associate Staff Scientist ($66.00)	Senior Technician ($59.50)	GIS Specialist ($85.00)	Clerical ($40.50)	Sr. Field Manager ($120.00)	Field Supervisor ($75.00)	Field Technician ($59.50)	Total Hrs	Total Cost
1	Perform sensitivity analysis based on flooding depth for scenarios on critical assets by type: flood severity and risk level (% land use, # assets flooded)	2	12	0	0	24	24	0	0	0	0	62	$ 5,092.00
2	Develop list of critical and regionally significant assets impacted by flooding (by scenario)	0	4	0	0	16	0	0	0	0	0	20	$ 1,392.00
3	Maps and tables of sensitive analyses results	0	2	0	0	32	8	0	0	0	0	42	$ 2,804.00
4	Draft Sections of the Vulnerability Assessment (VA) Report for the Sensitivity Analysis	8	16	24	0	12	16	0	0	0	0	76	$ 7,090.00
5	Final Sections of the VA Report for the Sensitivity Analysis	2	4	8	0	0	4	0	0	0	0	18	$ 1,764.00
ALL	***Sensitivity Analysis***	***12***	***38***	***32***	***0***	***84***	***52***	***0***	***0***	***0***	***0***	***218***	***$ 18,142.00***

Task 7: Final Vulnerability Assessment Report, Maps and Tables

Subtask	Description	Principal Scientist ($152.00)	Sr. Staff Scientist ($110.00)	Staff Scientist ($85.00)	Associate Staff Scientist ($66.00)	Senior Technician ($59.50)	GIS Specialist ($85.00)	Clerical ($40.50)	Sr. Field Manager ($120.00)	Field Supervisor ($75.00)	Field Technician ($59.50)	Total Hrs	Total Cost
1	Draft Final Vulnerability Assessment Report with Maps and Tables incorporated, introduction and recommendations	8	16	40	0	0	24	0	0	0	0	88	$ 8,416.00
2	Revised Final Vulnerability Assessment Report with Maps and Tables incorporated, introduction and recommendations (1 round)	4	6	16	0	0	8	0	0	0	0	34	$ 3,308.00
3	Final list of critical and significant assets prioritized by need	1	4	0	0	0	12	0	0	0	0	17	$ 1,612.00
4	Meeting to discuss report findings/revisions	2	2	0	0	0	2	0	0	0	0	6	$ 694.00
ALL	***Final Vulnerability Assessment Report, Maps and Tables***	***15***	***28***	***56***	***0***	***0***	***46***	***0***	***0***	***0***	***0***	***145***	***$ 14,030.00***

Task 8: Project Management and Coordination

Subtask	Description	Principal Scientist ($152.00)	Sr. Staff Scientist ($110.00)	Staff Scientist ($85.00)	Associate Staff Scientist ($66.00)	Senior Technician ($59.50)	GIS Specialist ($85.00)	Clerical ($40.50)	Sr. Field Manager ($120.00)	Field Supervisor ($75.00)	Field Technician ($59.50)	Total Hrs	Total Cost
1	Development of a project management plan	8	8	12	0	0	8	0	0	0	0	36	$ 3,796.00
2	Prepare and attend kickoff meeting, meeting minutes	4	8	0	0	0	8	0	0	0	0	20	$ 2,168.00
3	Project Setup, status reports (monthly), internal coordination	56	36	16	0	0	16	28	0	0	0	152	$ 16,326.00
4	External meeting (up to 6 in addition to KOM)	12	12	0	0	0	8	0	0	0	0	32	$ 3,824.00
ALL	***Project Management and Coordination***	***80***	***64***	***28***	***0***	***0***	***40***	***28***	***0***	***0***	***0***	***240***	***$ 26,114.00***

Major Task Summary

Subtask	Description	Principal Scientist ($152)	Sr. Staff Scientist ($110)	Staff Scientist ($85)	Associate Staff Scientist ($66)	Senior Technician ($59.5)	GIS Specialist ($85)	Clerical ($40.5)	Sr. Field Manager ($120)	Field Supervisor ($75)	Field Technician ($59.5)	Total Hrs	Total Cost
1	Planning and Project Initiation	8	24	60	0	0	80	10	0	0	8	189.5	$ 16,561.00
2	Mapping - Data Collection	0	61	186	500	0	6	0	500	369	875	2497	$ 195,767.50
3	Additional Mapping (144 Features) and Data Acquisition Reporting	7	31	56	60	0	32	6	60	54	114	420	$ 34,190.00
4	Acquisition of Background Data	6.5	27	32	0	104	66	0	0	0	0	235.5	$ 18,476.00
5	Exposure Analysis	12.5	40	32	0	60	68	0	0	0	0	212.5	$ 18,370.00
6	Sensitivity Analysis	12	38	32	0	84	52	0	0	0	0	218	$ 18,142.00
7	Final Vulnerability Assessment Report, Maps and Tables	15	28	56	0	0	46	0	0	0	0	145	$ 14,030.00
8	Project Management and Coordination	80	64	28	0	0	40	28	0	0	0	240	$ 26,114.00
	Total Labor	***140.5***	***313***	***482***	***560***	***248***	***390***	***44***	***560***	***423***	***997***	***4158***	***$ 341,650.50***
	Project Expenses - Task 2												***$36,695.00***
	Project Expenses - Task 3												***$5,240.00***
	Total Project												***$ 383,585.50***

Attachment B-1: Expenses Associated with Task 2

REPRODUCTION EXPENSES: TASK 2	UNIT	RATE/UNIT	# UNITS	TOTAL COST
PHOTOCOPIES:				
B/W Copies – 8½"x11"	Copy	$0.05		**$0.00**
B/W Copies – 11"x17"	Copy	$0.10		**$0.00**
Color Copies – 8½" x 11"	Copy	$1.00		**$0.00**
Color Copies – 11" x 17"	Copy	$2.00		**$0.00**
TOTAL REPRODUCTION EXPENSES:				**$0.00**
FIELD EXPENSES: TASK 2	**UNIT**	**RATE/UNIT**	**# UNITS**	**TOTAL COST**
Water Level Meter	Day	$15.00		**$0.00**
Water Quality Meter (YSI style multi parameter) with flow-cell	Day	$45.00		**$0.00**
YSI Rental	Per Unit	$35.00		**$0.00**
Turbidity Meter	Day	$25.00		**$0.00**
Field Sampling Supplies (tubing, decon, jars, bottles, foil, disposables, ect.)	Day	$40.00		**$0.00**
Tubing - LDPE	Per Foot	$0.15		**$0.00**
Tubing - Silicone	Per Foot	$1.70		**$0.00**
Ice, DI water, Calibration standards, Gloves	Day	$15.00		**$0.00**
Isotope Supplies (filters, vials, syringes)	Day	$10.00		**$0.00**
Field Sampling Inline 0.2/0.45 micron (or similar) Filters	Each	$30.00		**$0.00**
Stormwater Autosampler (ISCO style)	Month	$500.00		**$0.00**
Hydrological Flow/Stage Data Loggers	Month	$200.00		**$0.00**
GPS Trimble R2 Unit (cm mode)	**Month**	**$850.00**	**10**	**$8,500.00**
GPS Unit SxBlue with iPhone/table	Day	$100.00		**$0.00**
GPS Trimble R2 Unit (cm mode)	Day	$150.00		**$0.00**
Digital Camera	Day	$10.00		**$0.00**
Underwater Camera	Day	$20.00		**$0.00**
Peristaltic Pump	Day	$50.00		**$0.00**
Centrifugal Pump	Day	$35.00		**$0.00**
Generator	Day	$60.00		**$0.00**
Soil Hand Auger Set	Day	$10.00		**$0.00**
Muck thickness poles	Day	$30.00		**$0.00**
Sediment Core Sampler	Day	$20.00		**$0.00**
Sediment Muck Probing Set	Day	$25.00		**$0.00**
Drainage Structure Inventory (mahole popper, saftety cones, lighting, etc.)	Day	$10.00		**$0.00**
Specialized Field Truck 4x4 - tow package	Day	$100.00		**$0.00**
John Boat / Carolina Skiff	Day	$100.00		**$0.00**
Truck	**Day**	**$100.00**	**91**	**$9,100.00**
Deck Boat	**Day**	**$300.00**	**50**	**$15,000.00**
Diving Boat Gear (dive flag, transect tape with reel, etc.)	Day	$25.00		**$0.00**
Diving Gear (tanks, regulator, wetsuit, fins, etc.) per person	Day	$100.00		**$0.00**
Lake Bottom Seepage Meters (fabrication/preparation)	Month	$100.00		**$0.00**
Sample Cooler Shipping to lab - overnight	Each	$50.00		**$0.00**
Temporary Well Installation	Each	$140.00		**$0.00**
Miscellaneous Expenses	**Day**	**$45.00**	**91**	**$4,095.00**
TOTAL FIELD EXPENSES:				**$36,695.00**
TOTAL TASK 2 EXPENSES				**$36,695.00**

Attachment B-1: Expenses Associated with Task 2

REPRODUCTION EXPENSES: TASK 2	UNIT	RATE/UNIT	# UNITS	TOTAL COST
PHOTOCOPIES:				
B/W Copies – 8½"x11"	Copy	$0.05		**$0.00**
B/W Copies – 11"x17"	Copy	$0.10		**$0.00**
Color Copies – 8½" x 11"	Copy	$1.00		**$0.00**
Color Copies – 11" x 17"	Copy	$2.00		**$0.00**
TOTAL REPRODUCTION EXPENSES:				**$0.00**
FIELD EXPENSES: TASK 2	**UNIT**	**RATE/UNIT**	**# UNITS**	**TOTAL COST**
Water Level Meter	Day	$15.00		**$0.00**
Water Quality Meter (YSI style multi parameter) with flow-cell	Day	$45.00		**$0.00**
YSI Rental	Per Unit	$35.00		**$0.00**
Turbidity Meter	Day	$25.00		**$0.00**
Field Sampling Supplies (tubing, decon, jars, bottles, foil, disposables, ect.)	Day	$40.00		**$0.00**
Tubing - LDPE	Per Foot	$0.15		**$0.00**
Tubing - Silicone	Per Foot	$1.70		**$0.00**
Ice, DI water, Calibration standards, Gloves	Day	$15.00		**$0.00**
Isotope Supplies (filters, vials, syringes)	Day	$10.00		**$0.00**
Field Sampling Inline 0.2/0.45 micron (or similar) Filters	Each	$30.00		**$0.00**
Stormwater Autosampler (ISCO style)	Month	$500.00		**$0.00**
Hydrological Flow/Stage Data Loggers	Month	$200.00		**$0.00**
GPS Trimble R2 Unit (cm mode)	**Month**	**$850.00**	**10**	**$8,500.00**
GPS Unit SxBlue with iPhone/table	Day	$100.00		**$0.00**
GPS Trimble R2 Unit (cm mode)	Day	$150.00		**$0.00**
Digital Camera	Day	$10.00		**$0.00**
Underwater Camera	Day	$20.00		**$0.00**
Peristaltic Pump	Day	$50.00		**$0.00**
Centrifugal Pump	Day	$35.00		**$0.00**
Generator	Day	$60.00		**$0.00**
Soil Hand Auger Set	Day	$10.00		**$0.00**
Muck thickness poles	Day	$30.00		**$0.00**
Sediment Core Sampler	Day	$20.00		**$0.00**
Sediment Muck Probing Set	Day	$25.00		**$0.00**
Drainage Structure Inventory (mahole popper, saftety cones, lighting, etc.)	Day	$10.00		**$0.00**
Specialized Field Truck 4x4 - tow package	Day	$100.00		**$0.00**
John Boat / Carolina Skiff	Day	$100.00		**$0.00**
Truck	**Day**	**$100.00**	**91**	**$9,100.00**
Deck Boat	**Day**	**$300.00**	**50**	**$15,000.00**
Diving Boat Gear (dive flag, transect tape with reel, etc.)	Day	$25.00		**$0.00**
Diving Gear (tanks, regulator, wetsuit, fins, etc.) per person	Day	$100.00		**$0.00**
Lake Bottom Seepage Meters (fabrication/preparation)	Month	$100.00		**$0.00**
Sample Cooler Shipping to lab - overnight	Each	$50.00		**$0.00**
Temporary Well Installation	Each	$140.00		**$0.00**
Miscellaneous Expenses	**Day**	**$45.00**	**91**	**$4,095.00**
TOTAL FIELD EXPENSES:				**$36,695.00**
TOTAL TASK 2 EXPENSES				**$36,695.00**