Phase IV

Lake Decatur Watershed Management Plan

SCOPE OF SERVICES & BUDGET

Northwater Consulting

October 3, 2022

Rev. October 11, 2022

Exhibit A.1

PHASE IV – Watershed Initiative Development

Phase IV Period: November 1, 2022 through December 31, 2023 (14-months)

Task Summary	Description
Task 4.1. Nine Element[1] Watershed Plan Friends Creek Update	• Finalize watershed plan update to include implementation plan and water quality modeling only. • Initiated in 2022, to be completed during Phase IV under 2020 319 award.
Task 4.2. Nine Element Watershed Plans Wildcat Creek, Willow Branch, and Sand Creek	• Finalize 9-element plan(s) for these three subwatersheds. • Initiated in 2022, to be completed in 2023.
Task 4.3: Nine Element Plan - Camp Creek and South Camp Creek	• Initiate 9-element subwatershed plans for Camp Creek and South Camp Creek. • Plans to be finalized in 2024 under next phase. • Awaiting notice of 2021 Section 319 grant award prior to commencing.
Task 4.4: 319 Grant Applications & Management	• Compile annual grant applications. • Finalize awarded grant agreements and notices to proceed. • Assist City staff with Section 319 grant management and reporting.
Task 4.5: RCPP[2] Management & Execution	• RCPP negotiations and agreements. • Assist City staff with Project Management. • Partner coordination. • Outcome measurement, RCPP-specific monitoring and tracking. • Landowner outreach and one-on-one meetings. • Prepare landowner BMP concepts. • Assist City with program budgets.
Task 4.6: Watershed Coordination & Plan Implementation	• Provide guidance to County SWCDs and assist city with cost-share program if needed. • Conduct one-on-one landowner outreach and engagement.

[1] Nine minimum elements for planning are defined by the Environmental Protection Agency and necessary for grant funding

[2] Regional Conservation Partnership Program of the United States Department of Agriculture

Task Summary	Description
	• Advance BMPs as identified in Bluffs and other completed plans – develop landowner plans to be advanced for survey and design.
Task 4.7. Special Project Advancement	• Prior phases identified and advanced special projects and initiatives with potentially significant water quality benefits and RCPP leveraging opportunities. • Further advance the following opportunities: specialty crops and development of Oakley sediment dewatering basin, conservation practices on City-owned farmland including DeWitt wellfield, carbon and water quality trading, and anchored floating wetlands.
Task 4.8. Section 319 Grant BMP Engineering & Design	• Survey, design, permitting and engineering of 2021 319 grant projects.
Task 4.9. Watershed Monitoring Program	• Continue coordination with the Illinois State Water Survey (ISWS) regarding monitoring at three stations (Sangamon at Cisco bridge, Long Creek, Friends Creek). • Continue automatic monitoring station at Cisco Bridge in partnership with NGRREC. Support NGRREC as needed. • Storm-event sampling at three stations and continued baseline monitoring of select BMP sites. • Data management and annual report.
Task 4.10. Lake Sedimentation & Bathymetry Program	• No major activities planned. Finalize City deliverables and support City bathymetry data requests. • 2024 survey of traps and select transects tentatively planned.
Task 4.11. General Consulting	• Budget for general consulting for out-of-scope services or support that may be requested such as assistance with 2023 City-funded BMP projects.
Task 4.12. Online Watershed Management System	• Platform configuration and initial launch. • System for tracking BMPs, grant management support and progress towards goals and objectives. • Covers 2 years of hosting and maintenance.

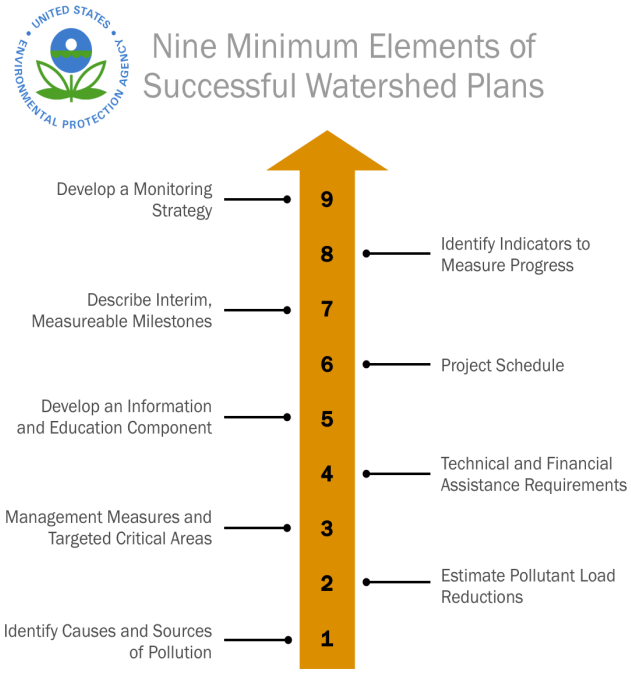

Figure 1 - Nine Minimum Elements Required by Illinois EPA

Task 4.1: Nine Element Watershed Plan – Friends Creek Update

Watershed plan enhancements will be completed for Friends Creek as outlined in the Long-Term Strategy (LTS). The current plan is lacking specific project locations, accurate nutrient and sediment loading estimates and project-based load reductions. Northwater will continue to update the current plan with an actionable implementation component and build a pollutant load model to improve estimates and improvements from project implementation. A portion of this budget is funded through the Illinois EPA Section 319 program. The following activities will be performed to update the plan:

1. Data mining.
2. Complete field work and develop custom map layers.
3. Quantify causes and sources of pollution.
4. Pollution load modeling and analysis.
5. Update nutrient and sediment reduction targets.
6. Identify and map field/property specific management practices.
7. Load reduction calculations.
8. Identification of critical areas & hot spots – prioritize based on nutrient and sediment reductions achieved.
9. Update cost estimates.
10. Landowner/public outreach and meetings.
11. General coordination.

Task 4.2: Nine Element Watershed Plan – Wildcat Creek/Willow Branch & Sand Creek

Nine element plans for Sand Creek and Wildcat Creek (Sangamon River & Willow Branch) were initiated in 2022 (Phase III). They will be completed will be completed in Phase IV and a portion of the budget has been secured through the Illinois EPA Section 319 program.

This task will include the following activities to complete the plans:

1. Data mining.
2. Complete field work and develop custom map layers.
3. Complete watershed characterization and inventory.
4. Identify causes and sources of pollution.
5. Pollution load modeling and analysis.
6. Establish nutrient and sediment reduction targets.
7. Field/property specific management practices.
8. Load reduction calculations.
9. Identification of critical areas & hot spots – prioritize based on nutrient and sediment reductions achieved.
10. Landowner/public outreach and meetings.
11. Education and outreach component consistent with RCPP strategy.
12. Cost estimates and milestones.
13. General coordination.

Task 4.3: Nine Element Watershed Plan – Camp Creek/South Camp Creek

A nine-element watershed plan for Camp Creek and South Camp Creek will be initiated based on the subwatershed plan sequencing defined in the LTS. Depending on grant award notice timeline, approximately 50% of this plan will be completed in 2024. An Illinois EPA Section 319 grant application has been submitted that may fund a portion of this planning effort. This task will include the same activities listed in Task 4.2

Task 4.4: 319 Grant Applications & Management

This task will include preparing Section 319 grant applications in late 2022 and/or 2023, as well as assisting the City with management and oversight of awarded 319 applications.

The 2020 319 grant application was awarded and commenced in 2022. The 2021 319 grant application was submitted and awards have not yet been announced. If awarded, the two-year grant will help fund planning (Task 4.3), and on-the-ground implementation.

Northwater will assist City staff in grant management as outlined below:

1. Quarterly reporting and BMP forms.
2. Partner coordination and project management to ensure deadlines are met.
3. Final reports.

Northwater will prepare and submit a Section 319 grant application(s) in late 2022 and 2023 if the City decides to pursue additional 319 grants. Parameters of this application will be developed based on outcomes of Task 4.4.

Task 4.5: RCPP Management & Execution

A Regional Conservation Partnership Program (RCPP) application and program was recently awarded to the City of Decatur. The program budget is ~**$25M** dollars of federal funds and partner contributions, with **$9.8M** pledged by the USDA. The USDA has initiated recipient negotiations which must be completed by March 2023. A Phase IV budget allocation will be used to finalize these negotiations and agreements and commence work on the RCPP.

The budget and scope assume that Northwater provides a part-time support role to the City. The roles, responsibilities and level of effort will be better defined and take shape during the first 6-months of the program, at which time this task and the budget can be further discussed and structured.

It is anticipated that Northwater will support the City with the following:

1. USDA negotiations and RCPP agreements.
2. Coordination and management with partners and USDA.
3. Partner and contribution tracking / auditing.
4. Targeted landowner outreach and field-level conservation concept planning.
5. Outcome measurement and tracking.
6. Program expansion, engagement additional partners and improving capacity.
7. Program promotion and presentations.
8. General oversight and project management.

Task 4.6: Watershed Coordination & Plan Implementation

Northwater will work with County SWCDs, the City and others to implement completed subwatershed plans and enhance/expand the newly established City-funded cost-share program. This will include:

1. Provide guidance and training to SWCD and City staff.
2. Conduct strategic one-on-one landowner outreach to forward critical practices on private property identified in the plan(s).
3. Develop landowner concept BMP plans and cost-estimates to facilitate landowner agreement (pre survey & design phase).
4. Work with partners to advance projects prioritized on City-owned property. This includes wetlands, re-connecting streams to their floodplains, prairie restoration, and urban BMPs.

Task 4.7: Special Project Advancement

During previous phases, special projects and initiatives were identified that could generate significant water quality benefits to the lake and watershed. This task includes advancement of some of these projects, including the identification of opportunities and grants to leverage funding for implementation.

These projects included:

1. Upper lake and Big/Long Creek floating wetland system.
2. Specialty crops, fertilizer field trials, treatment wetland and erosion control at the DeWitt well field.
3. Conservation practices on City-owned farmland.
4. Carbon and water quality trading pilot program.
5. Development of sediment dewatering basin to forward opportunities that generate revenue for watershed improvements and grant "match."
    a. Production agriculture and organic crops.
    b. Conservation and innovation.
    c. Marketing and outreach initiatives (i.e. locally sourced products).

This task is available to support further advancement of some or all of these projects on an opportunity basis. These project opportunities all require coordination and synthesis between the City, stakeholders, landowners, regulators, and the private sector.

In Phase IV, a special project priority is to advance feasibility analyses, develop cost estimates, and explore funding opportunities for the anchored floating wetland concept.

Task 4.8: Section 319 BMP Engineering & Design

Northwater will provide survey, engineering and design services under Phase IV for up to four BMP projects. A preliminary list of projects is outlined below, however, the specific projects are subject to amendment.

- This task includes up to four projects
    - The Atkins property (Bluffs subwatershed) terraces and grade control structures
    - The Bendsen property (Friends Creek subwatershed) wetland / pond
    - The Jacobs property (Bluffs subwatershed) ponds and dry dams
    - The City-funded DeWitt wellfield terrace BMP project (not Section 319)

This task is not intended to include survey, design and engineering services for special projects (Task 4.6) or 2023 City-funded BMP projects. For completion of ongoing 2022 City-funded BMP projects, Northwater will utilize remaining budget from Task 3.6 of Phase III.

Task 4.9: Watershed Monitoring Program

The monitoring program initiated in Phase II will be continued. During this phase the buildout (capital and setup costs for monitoring infrastructure) will be completed unless other specific monitoring locations are added in the future. Subsequent years of monitoring will have improved efficiency in terms of time and cost investments to support a sustainable long-term solution.

Under phase IV, a preliminary agreement with National Great Rivers Research and Education Center (NGRREC) will include the pro-bono use of automatic sampling equipment for several of the monitoring stations which will significantly reduce stormwater monitoring costs once those systems are deployed.

Phase IV monitoring activities include:

1. Discrete Monitoring
    - Water quality monitoring will continue in partnership with ISWS approximately bi-weekly at the three stations established in late 2019. Locations include, (i) Sangamon River IL 32, (ii) Friends Creek and (iii) Big/Long Creek. Storm-event sampling will target 4-5 storm events during Phase IV. Samples are submitted to the ISWS laboratory for analysis.
    - In Phase IV, the Friends Creek and Big/Long Creek stations will have continuous water level sensors and telemetry systems installed.
    - In Phase IV, automatic water sampling equipment will be installed at 2 or 3 stations to better capture storm events.
2. Continuous Monitoring
    - Northwater will continue to support management of the automatic monitoring station on the Sangamon River at the IL 32 bridge. This is in partnership with NGRREC and includes river stage, nitrate, turbidity, temperature/conductivity, dissolved oxygen and dissolved organic matter. The monitoring sensors, telemetry and solar power system was purchased under Phase II and installation was completed in 2022.
    - On behalf of the City, Northwater will coordinate with NGGREC in the maintenance and operation of the system to minimize downtime. Data will be regularly checked with QA/QC procedures to make sure the station and sensors are in in working order and data quality is satisfactory.
    - BMP Monitoring sites
        - DeWitt Well Field – Baseline monitoring to characterize stormwater and drainage tile flows and sediment and nutrient concentrations. In Phase IV, automatic water sampling equipment will be installed courtesy of NGRREC to better capture storm events.
        - Bluffs Ravine (BMP102) – Baseline monitoring of bank erosion will continue, as well as collection of stormwater samples for sediment and nutrient analysis when feasible.

3. Data Management
    - Server, data, web application and telemetry costs.
    - Monitoring data will be managed and maintained in a relational database system using MS Access. A database architecture has been developed in coordination with the ISWS to make synthesizing data between organizations more efficient.
    - Northwater will also work on developing tools and processes for data validation and QA/QC of sensor data.
    - Online access to sensor and telemetry data will be maintained by Northwater, this includes all telemetry and server related-costs.
    - Managing and maintaining data will be an on-going and important part of the monitoring program.

Task 4.10: Lake Sedimentation and Bathymetry Program

The lake-wide bathymetric baseline mapping was mostly completed in Phase III, so no major activities are planned. It is expected that resurveying of sediment traps and select transects will occur in 2024 (Phase V).

A small budget is included under this task if necessary to finalize City deliverables from the 2022 bathymetry surveying, and to support any City requests related to lake bathymetry data.

Task 4.11: General Consulting

Due to the diverse range of tasks and activities in Phase IV, a general consulting task is included to efficiently support the City as needed in case out of scope engineering or environmental consulting is requested. For example, this may include some support with 2023 City-funded BMP projects, if necessary.

Task 4.12: Online Watershed Management System

The Spatial Watershed Assessment and Management Model (SWAMM) is a custom web-based watershed management software that will be deployed and configured for the Lake Decatur watershed.

The software is a key tool for managing implementation projects in large and complex watersheds. It also helps assure that watershed investments occur in locations that are contributing higher rates of sediment and nutrients.

The system supports planning, collaboration, data sharing, project tracking, and reporting amongst the many partners, projects, investments and initiatives throughout the watershed. Its use was proposed as part of the USDA RCPP grant and will be used for reporting and tracking to the USDA throughout the grant period.

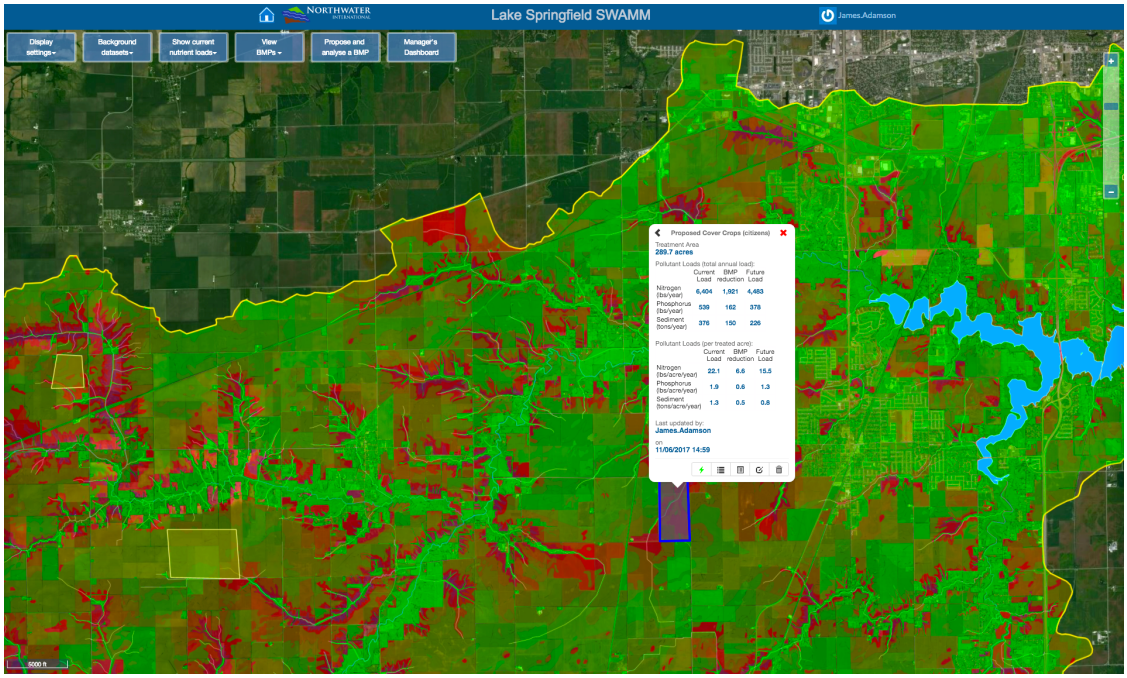

Figure 2 - Screenshot of SWAMM Online

SWAMM functionality includes:

- Explore watershed maps and have access to all of the map layers and analysis published in the watershed plans
    - i.e., critical areas, sources of nutrients/sediment, highly erodible land, watershed boundaries, best management practices etc.
- Plan a project anywhere in the watershed and estimate the sediment and nutrient improvements to the lake.
- Tools (such as cost-benefit analysis) to help select the best project type to achieve the greatest lake and watershed benefits.
- Calculate the sediment and nutrient inputs from any user-defined area of the watershed.
- Manage projects and project progress across many partners and organizations. Account for all projects and investments that are occurring in the watershed that reduce sediment and nutrient input to the lake.
- Executive Dashboard
    - Quickly observe sediment and nutrient inputs to the lake and progress towards achieving goals
    - Quantification of nutrient and sediment reductions based on projects and BMPs planned and/or constructed
    - Visualize and analyze the status of project and BMPs and the associated watershed/lake benefits

SWAMM deployment for Decatur will follow the stages outlined below:

1. Stage 1 – Platform Configuration, identify each organization using the platform and customize data architecture around BMP projects so that the valuable data is properly captured, retained and in a format for the partners and also the USDA/NRCS and SWCDs.

2. Stage 2 – A process will be performed to work with partners and compile existing BMP data and integrate into the SWAMM system.

3. Stage 3 – Import pollutant analysis maps for completed subwatersheds.

4. Stage 4 – A 3-to-4-month duration to work with and test the system, provide some training and make minor adjustments and bug fixes. This does not include any custom feature development, but there will be an opportunity to identify and prioritize custom features that might benefit the RCPP management.

The budget includes the purchase of the software, two years of hosting and maintenance. It also includes labor for training, and collaborating with the organizations and partners to develop the data architecture. Annual license and maintenance cost for SWAMM after the two-year period is $5,000/year.

Exhibit A

A.1 – Phase IV Budget Summary

A.2 – Phase IV Budget Detail

Lake Decatur Watershed Planning & Management

Phase 4 – Budget Summary

The budgetary estimates are provided in the table below for the period from November 1, 2022 – December 31, 2023.

Phase 4: Nov 1, 2022 – December 31, 2023	Estimated Labor	DC & Supplies and Equipment	Estimated Fees	Estimate Covered by Grant Funds
Task 4.1: Nine Element Plan - Friend's Creek Update	$59,995.35	$660.00	$60,655.35	$36,000.00
Task 4.2: Nine Element Plan - Willow, Wildcat and Sand Creeks	$81,534.90	$660.00	$82,194.90	$49,000.00
Task 4.3: Nine Element Plan - Camp Creek and TBD watershed	$84,808.05	$5,060.00	$89,868.05	$53,000.00
Task 4.4: 319 Grant Applications & Management	$23,579.52	$1,650.00	$25,229.52	--
Task 4.5: RCPP Management & Execution	$212,104.20	$23,650.00	$235,754.20	~$15,000.00 - $90,000.00
Task 4.6: Watershed Coordination & Plan Implementation	$38,802.60	$2,200.00	$41,002.60	--
Task 4.7: Special Project Advancement	$48,205.35	$18,700.00	$66,905.35	--
Task 4.8: Section 319 BMP Engineering & Design	$43,023.60	$17,820.00	$60,843.60	~$8,500.00 - 15,500.00
Task 4.9: Watershed Monitoring Program	$78,630.45	$12,430.00	$91,060.45	--
Task 4.10: Lake Sedimentation & Bathymetry Program	$5,491.92	$0.00	$5,491.92	
Task 4.11: General Consulting	$24,929.82	$1,650.00	$26,579.82	
Task 4.12: Online Watershed Management System	$0.00	$95,000.00	$95,000.00	~$10,000.00 - $47,000.00
			$880,585.76	**$171,500.00 - $290,500.00**

Notes

1. These are considered budgetary not to exceed maximums.
2. Task 4.5 supports the City with management and execution of the $9.8M Regional Conservation Partnership Program (RCPP) grant awarded to the City in August 2022.
3. It is estimated that between $171,500.00 and $290,500.00 of the $880,585.76 (20-33%) will be reimbursed from awarded grant funding from the Illinois EPA section 319 and RCPP. This estimate will be refined after RCPP grant negotiations are completed.
4. Tasks 4.1 through 4.2 are approximately 40% covered by Illinois EPA section 319 grant awards. A grant application has been submitted for Task 4.3 and award status is expected in 2023.

Exhibit A.2

Lake Decatur Watershed Management Phase IV: November 2022 - December 2023

	Principal	Sr. Engineer / Scientist	Enginner / Scientist II	Environmental Scientist / GIS Analyst I	Environmental Technician / GIS Analyst
Hours					
Task 4.1: Nine Element Plan - Friend's Creek Update	155	40	12	180	270
Task 4.2: Nine Element Plan - Willow, Wildcat and Sand Creeks	220	40	40	250	310
Task 4.3: Nine Element Plan - Camp Creek	205	88	40	220	350
Task 4.4: 319 Grant Applications & Management	125	0	0	32	5
Task 4.5: RCPP Management & Execution	810	330	20	250	250
Task 4.6: Watershed Coordination & Plan Implementation	230	5	0	0	0
Task 4.7: Special Project Advancement	125	200	5	10	0
Task 4.8: Section 319 BMP Engineering & Design	60	250	4	0	0
Task 4.9: Watershed Monitoring Program	150	220	80	70	215
Task 4.10: Lake Sedimentation & Bathymetry Program	8	16	0	16	16
Task 4.12: General Consulting	50	120	0	12	0
Task 4.13: Online Watershed Management System					

Direct Labor					
Task 4.1: Nine Element Plan - Friend's Creek Update	$8,569.95	$1,740.00	$446.40	$4,881.60	$4,360.50
Task 4.2: Nine Element Plan - Willow, Wildcat and Sand Creeks	$12,163.80	$1,740.00	$1,488.00	$6,780.00	$5,006.50
Task 4.3: Nine Element Plan - Camp Creek and TBD watershed	$11,334.45	$3,828.00	$1,488.00	$5,966.40	$5,652.50
Task 4.4: 319 Grant Applications & Management	$6,911.25	$0.00	$0.00	$867.84	$80.75
Task 4.5: RCPP Management & Execution	$44,784.90	$14,355.00	$744.00	$6,780.00	$4,037.50
Task 4.6: Watershed Coordination & Plan Implementation	$12,716.70	$217.50	$0.00	$0.00	$0.00
Task 4.7: Special Project Advancement	$6,911.25	$8,700.00	$186.00	$271.20	$0.00
Task 4.8: Section 319 BMP Engineering & Design	$3,317.40	$10,875.00	$148.80	$0.00	$0.00
Task 4.9: Watershed Monitoring Program	$8,293.50	$9,570.00	$2,976.00	$1,898.40	$3,472.25
Task 4.10: Lake Sedimentation & Bathymetry Program	$442.32	$696.00	$0.00	$433.92	$258.40
Task 4.11: General Consulting	$2,764.50	$5,220.00	$0.00	$325.44	$0.00
Task 4.12: Online Watershed Management System	$0.00	$0.00	$0.00	$0.00	$0.00

Direct Costs (Subs, mileage, equipment, etc)	ODCs	Subonsultant #1	Subconsultant #2	Subcontractors	10%	Total
Task 4.1: Nine Element Plan - Friend's Creek Update	$600.00	$0.00	$0.00	$0.00	$60.00	$660.00
Task 4.2: Nine Element Plan - Willow, Wildcat and Sand Creeks	$600.00	$0.00	$0.00	$0.00	$60.00	$660.00
Task 4.3: Nine Element Plan - Camp Creek	$4,600.00	$0.00	$0.00	$0.00	$460.00	$5,060.00
Task 4.4: 319 Grant Applications & Management	$1,500.00	$0.00	$0.00	$0.00	$150.00	$1,650.00
Task 4.5: RCPP Management & Execution	$9,500.00	$12,000.00	$0.00	$0.00	$2,150.00	$23,650.00
Task 4.6: Watershed Coordination & Plan Implementation	$2,000.00	$0.00	$0.00	$0.00	$200.00	$2,200.00
Task 4.7: Special Project Advancement	$8,500.00	$8,500.00	$0.00	$0.00	$1,700.00	$18,700.00
Task 4.8: Section 319 BMP Engineering & Design	$4,200.00	$12,000.00	$0.00	$0.00	$1,620.00	$17,820.00
Task 4.9: Watershed Monitoring Program	$4,500.00	$0.00	$6,800.00	$0.00	$1,130.00	$12,430.00
Task 4.10: Lake Sedimentation & Bathymetry Program	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Task 4.11: General Consulting	$1,500.00	$0.00	$0.00	$0.00	$150.00	$1,650.00
Task 4.12: Online Watershed Management System	$95,000.00	$0.00	$0.00	$0.00	$0.00	$95,000.00

Phase IV Total	Direct Labour	Estimated Labour	DC & Supplies/Equ	Estimated Cost
Task 4.1: Nine Element Plan - Friend's Creek Update	$19,998.45	$59,995.35	$660.00	$60,655.35
Task 4.2: Nine Element Plan - Willow, Wildcat and Sand Creeks	$27,178.30	$81,534.90	$660.00	$82,194.90
Task 4.3: Nine Element Plan - Camp Creek and TBD watershed	$28,269.35	$84,808.05	$5,060.00	$89,868.05
Task 4.4: 319 Grant Applications & Management	$7,859.84	$23,579.52	$1,650.00	$25,229.52
Task 4.5: RCPP Management & Execution	$70,701.40	$212,104.20	$23,650.00	$235,754.20
Task 4.6: Watershed Coordination & Plan Implementation	$12,934.20	$38,802.60	$2,200.00	$41,002.60
Task 4.7: Special Project Advancement	$16,068.45	$48,205.35	$18,700.00	$66,905.35
Task 4.8: Section 319 BMP Engineering & Design	$14,341.20	$43,023.60	$17,820.00	$60,843.60
Task 4.9: Watershed Monitoring Program	$26,210.15	$78,630.45	$12,430.00	$91,060.45
Task 4.10: Lake Sedimentation & Bathymetry Program	$1,830.64	$5,491.92	$0.00	$5,491.92
Task 4.11: General Consulting	$8,309.94	$24,929.82	$1,650.00	$26,579.82
Task 4.12: Online Watershed Management System	$0.00	$0.00	$95,000.00	$95,000.00

Phase IV Total	**$880,585.76**
Estimated Grant Contributions	**$171,500 - $290,500**
Estimated Total Phase IV City Costs	**$590,085.76 - $672,085.76**