



Request for Qualifications

Ongoing Water Quality Modeling and Regulatory Support

Date of Issue: June 20, 2017

**Upper Neuse River Basin Association
P.O. Box 270
Butner, NC 27509**

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REQUEST FOR QUALIFICATIONS

Project Purpose

The Upper Neuse River Basin Association (UNRBA) is soliciting submittals for qualifications for water quality modeling, cost-benefit analysis, and regulatory support from a *Service Provider* to support the UNRBA with a reevaluation of Stage II of the Falls Lake Nutrient Management Strategy (see NCAC 15A 02B.0275 (5)) and technical support related to alternate regulatory approaches, which may include alternative compliance and regulatory strategies. The Falls Rules, as promulgated, involve significant costs and require actions on the part of UNRBA member governments and other regulated parties that are unprecedented. In light of the potential financial impact of these rules and importance of the resource, the UNRBA secured assistance in evaluating the technical bases and regulatory framework for the Falls Rules, particularly the more costly Stage II portion of the Rules (referred to herein as the “Technical Analysis”). The UNRBA’s consulting partner for the Technical Analysis was Cardno-ENTRIX (this company is now incorporated as Cardno). Cardno-ENTRIX recommended a series of sampling programs, future studies, and water quality modeling approaches to provide a basis for future regulatory action (preliminarily identified in general terms on the UNRBA website: <https://unrba.org/reexamination>, Task 1 report). The UNRBA has taken the Technical Analysis recommendations under advisement and will select the appropriate water quality modeling and regulatory approaches that serve the UNRBA’s objectives. Using the Technical Analysis recommendations and other information, the selected *Service Provider* will work in cooperation with the UNRBA to develop water quality models and evaluate regulatory approaches to accomplish the desired water quality goals.

The UNRBA issued an RFQ for Water Quality Modeling and Regulatory Support on April 8, 2016 and selected Cardno, Inc. (Cardno) as its service provider. A contract for Modeling and Regulatory services was issued on September 21, 2017. Prudent project management and organization changes within the current *Service Provider* dictate the need to revisit the marketplace to ensure the UNRBA has the best available consultant resources to continue this important work. In keeping with that intent, the UNRBA seeks a *Service Provider* to provide ongoing Modeling and Regulatory Support beginning in fiscal year 2018.

Submittal Instructions

Offerors must provide all submittal components in Portable Document Format (PDF) transmitted through electronic mail (email). File size is limited to 15 MB. Paper, fax and oral copies will not be accepted. PDF files should include bookmarks that link to sections to allow easy document navigation. Address the Submittal to the following two parties:

Forrest.Westall@unrba.org
Upper Neuse River Basin Association (UNRBA)
Forrest Westall, Executive Director

And

Michelle.Woolfolk@durhamnc.gov
City of Durham, Public Works Department
Michelle Woolfolk, Water Quality Manager and UNRBA Workgroup Chairperson

In order for the UNRBA to evaluate qualifications fairly and completely, Offerors should clearly follow the format set out herein and provide all of the information requested.

The email should contain the subject line “Submittal for Water Quality Modeling and Regulatory Support – [Firm Name]”. Submittals must be received no later than 5:00 pm EDT on July 11, 2017. See the section “Submittal Content and Format” for additional details on submittal requirements.

Submittal Review Schedule

The procurement process is anticipated to follow the schedule below. **Proposers’ key personnel should hold July 24, 2017 for interviews because the interview panel has already committed this day for interviews and does not anticipate moving the date.**

Table 1 Procurement Schedule

Item	Date in 2017
RFQ release date	June 20, 2017
Deadline for submittal of questions	June 27
Answers to questions posted on UNRBA website	July 3
Due date for qualifications packages	July 11 at 5 pm EDT
Shortlisted teams notified	July 17
Shortlist interviews held in Butner, NC*	July 24
Selected team notified	August 11

*Proposers’ key personnel should hold July 24, 2017 for interviews.

All submitted questions must be provided to the Executive Director, via email to forrest.westall@unrba.org, by June 27, 2017. All questions will be answered on the UNRBA website.

The UNRBA will make every effort to adhere to this schedule. Firms, corporations, centers or other legal entities representing themselves as *Service Providers* submitting in response to this RFQ should make arrangements to provide the UNRBA with appropriate staff for the interviews.

Conditions

The UNRBA reserves the right to reject any or all submittals. The UNRBA will not pay any cost associated with the preparation, submittal, presentation, or evaluation of any statement of qualifications. All submittals and other materials submitted become the property of the UNRBA. Thereafter, submittals become public information.

The UNRBA anticipates issuing one contract for the services sought in this RFQ to serve as the primary contractor of the Modeling and Regulatory Support component of its Reexamination

effort. However, the UNRBA reserves the right to issue separate RFQ(s) for following fiscal years. The selected contractor is encouraged to use sub-contractors to perform work on this contract if needed. If an Offeror intends to use a sub-contractor(s), the Offeror must identify in their submittals the names of the sub-contractor(s), personnel to be used and the portions of the work the sub-contractor(s) will perform. The selected Service Provider may, with the UNRBA's approval, add or delete sub-contractor(s) as necessary during contract services period. The UNRBA reserves the right to directly contract with sub-contractors as it deems necessary. Offerors should specifically describe how they plan to effectively utilize information already developed in the UNRBA's Modeling and Regulatory Support effort. Additionally, an Offeror must address how they would maintain continuity for this effort and meet established deadlines.

The UNRBA is a non-profit organization composed of local governments located in the Upper Neuse River Basin. By signature on their Statement of Qualifications, Offerors certify that their business practices comply with:

- a. The laws of the State of North Carolina
- b. The applicable portion of the Federal Civil Rights Act of 1964,
- c. The Equal Employment Opportunity Act and the regulations issued there under by the federal government
- d. The Americans with Disabilities Act of 1990, and the regulations issued there under by the federal government,
- e. the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law and as in accordance with N.C.G.S. §64-25 et seq.;
- f. the requirements of the Iran Divestment Act and N.C.G.S. § 147-86.59; and
- g. All terms and conditions set out in this RFQ.

The UNRBA opposes discrimination on the basis of race and sex and urges all of its contractors to provide a fair opportunity for minorities, women, and other socially and economically disadvantaged individuals as defined in 15 U.S.C. 637 to participate in their work force and as sub-contractors and vendors under UNRBA contracts.

This RFQ seeks to secure a single contractor for the ongoing development of tools to assist the UNRBA with the evaluation of existing water quality standards and future regulatory approaches. Because the water quality modeling is linked to both the existing monitoring strategy and regulatory framework in place for Falls Lake, the water quality modeling plan must meet relevant requirements of an approved modeling framework under the Falls Lake Rules, an Offeror's familiarity and understanding of the background and basis of the development of the Falls Rules and the provisions of those Rules, Rules Revisions and "consensus principals" will be an important factor in evaluating each potential contractor. Offerors should reference existing developed materials, including all of the Monitoring Program Plan and supporting documents, monitoring result reports, model selection process, Description of a Modeling Framework, Conceptual Modeling Plan, and Modeling and Regulatory Support Kick-Off Meeting Materials (see the UNRBA website, www.unrba.org).

Background

The waters of the Upper Neuse River Basin in North Carolina have many challenges meeting the demands of society and the current environmental standards in place for those waters. Falls Lake is the primary source of drinking water for the City of Raleigh and its 530,000 customers and is immediately downstream of several urban centers, including the City of Durham. Constructed in the early 1980's, Falls Lake is a shallow Piedmont lake with inherent difficulty meeting water quality standards for chlorophyll-*a* because of its geology, morphology, and its topographic location below pre-existing and established land use.

A complex set of rules, guidance, and policies governs activities in the Falls Lake watershed. The Falls Nutrient Strategy Rules overlay several previous regulations, including the Neuse River Nutrient Strategy, NPDES Phase I and Phase II of the Clean Water Act, and state Water Supply Watershed Protection regulations.

In 2008, the North Carolina Division of Water Quality (NC DWQ) and US Environmental Protection Agency (USEPA) placed Falls Lake on the Section 303(d) list of impaired waters because of violations of the State's water quality standards for chlorophyll-*a*, a proxy for algae. DWQ and EPA also listed Falls Lake above I-85 as impaired for turbidity in 2008.

In 2005, the North Carolina General Assembly enacted SL 2005-190 (SB 981, Clean Lakes Act), which directed the North Carolina Environmental Management Commission (EMC) to develop and adopt a nutrient management strategy to reduce nitrogen and phosphorus pollution in Falls Lake by July 1, 2008 (later extended to July 1, 2009). In 2009, the General Assembly enacted SL 2009-486 (SB 1020, Improve Upper Neuse River Water Quality), which extended the deadline again until January 15, 2011 and also allowed for a system crediting early adoption of nutrient reductions and required stricter sedimentation and erosion control measures in the watershed.

In 2010, recognizing that major political disagreements over water quality in Falls Lake would affect their ability to solve other critical regional problems, many impacted local governments developed a set of "Consensus Principles" to help shape the proposed rules. The principles included three fundamental agreements: (1) that any rules would need to protect Falls Lake for the purpose of water supply, (2) that additional water quality monitoring would provide useful information, and (3) that North Carolina should consider that new information before going beyond those actions necessary to protect Falls Lake for the purpose of water supply. The City of Durham, Durham County, Granville County, City of Raleigh, Wake County, Orange County, Person County, Butner, Creedmoor, and the South Granville Water and Sewer Authority adopted the Consensus Principles in their comments on the rules. Section Nine of the Consensus Principles, which is most relevant to this RFQ, states the following:

"The process by which the proposed regulatory scheme has been developed relied on a limited data base which will be substantially enhanced by a more rigorous program of sampling, monitoring and analysis. In addition, it may not be feasible to attain all currently designated uses in the Upper Lake and attempting to do so may result in substantial and widespread economic and social impact. The EMC should therefore begin a re-examination of its nutrient management strategy for Falls Lake by January 1, 2018 [later changed by rule to 2021]. **The re-examination should consider, among other things, (i) the physical, chemical, and biological conditions of the Lake with a focus**

on nutrient loading impacts and the potential for achieving the Stage I goal by 2021 [later changed in the final rule to 2024] as well as the feasibility of both achieving the Stage II reduction goals and meeting the water quality standard for chlorophyll-a in the Upper Lake, (ii) the cost of achieving, or attempting to achieve, the Stage II reduction goals and the water quality standard in the Upper Lake, (iii) the existing uses in the Upper Lake and whether alternative water quality standards would be sufficient to protect those existing uses, and (iv) the impact of the management of Falls Lake on water quality in the Upper Lake. As the first step in the re-examination, a Scientific Advisory Board should analyze and review the information identified above along with the additional monitoring and modeling data compiled since the model was approved and should present its recommendations for changes in the Nutrient Management Strategy and its implementing rules to DWQ and the EMC by January 1, 2019 [later changed in the final rule to 2024]. In light of the report from the Science Advisory Board, the EMC should direct the DWQ to prepare proposed rule revisions, if any, and an updated fiscal note on Stage II by August 1, 2019 [later changed in the final rule to 2025]. In its development of any proposed rule revisions, DWQ shall consult with the local governments and other interested parties. Except to the extent that management measures identified as a part of Stage II are required to achieve the Stage I goal, local governments should not be required to begin implementing Stage II management measures without **a determination by the EMC of whether alternative goals and/or standards should be established for the Upper Lake.**” [emphases added]

On November 18, 2010, the EMC adopted the nutrient management rules for Falls Lake, with an effective date of January 15, 2011. The North Carolina Rules Review Commission approved the rules with minor technical language changes and the rules took permanent effect on January 15, 2011. The rules address the re-examination prior to implementing Stage II in section 15A NCAC 02B.0275. Section (5)(f) describes specific requirements of any stakeholder desiring to submit data or modeling to the NCDWQ regarding Falls Lake and the requirement to re-examine the Stage II goals. This section of the rule follows:

- (f) Recognizing the uncertainty associated with model-based load reduction targets, to ensure that allowable loads to Falls Reservoir remain appropriate as implementation proceeds, a person may at any time during implementation of the Falls nutrient strategy develop and submit for Commission approval supplemental nutrient response modeling of Falls Reservoir based on additional data collected after a period of implementation. The Commission may consider revisions to the requirements of Stage II based on the results of such modeling as follows:
 - (i) A person shall obtain Division review and approval of any monitoring study plan and description of the modeling framework to be used prior to commencement of such a study. The study plan and modeling framework shall meet any division requirements for data quality and model support or design in place at that time. Within 180 days of receipt, the division shall either approve the plan and modeling framework or notify the person

seeking to perform the supplemental modeling of changes to the plan and modeling framework required by the Division;¹

- (ii) Supplemental modeling shall include a minimum of three years of lake water quality data unless the person performing the modeling can provide information to the Division demonstrating that a shorter time span is sufficient;
- (iii) The Commission may accept modeling products and results that estimate a range of combinations of nitrogen and phosphorus percentage load reductions needed to meet the goal of the Falls nutrient strategy, along with associated allowable loads to Falls Reservoir, from the watersheds of Ellerbe Creek, Eno River, Little River, Flat River, and Knap of Reeds Creek and that otherwise comply with the requirements of this Item. Such modeling may incorporate the results of studies that provide new data on various nutrient sources such as atmospheric deposition, internal loading, and loading from tributaries other than those identified in this Sub-item. The Division shall assure that the supplemental modeling is conducted in accordance with the quality assurance requirements of the Division;
- (iv) The Commission shall review Stage II requirements if a party submits supplemental modeling data, products and results acceptable to the Commission for this purpose. Where supplemental modeling is accepted by the Commission, and results indicate allowable loads of nitrogen and phosphorus to Falls Reservoir from the watersheds of Ellerbe Creek, Eno River, Little River, Flat River, and Knap of Reeds Creek that are substantially different than those identified in Item (3), then the Commission may initiate rulemaking to establish those allowable loads as the revised objective of Stage II relative to their associated baseline values;

The full text of NCAC 02B.0275 (5) also provides requirements for data development related to assessing Lake conditions and reporting to the EMC on progress in improving water quality under these rules. It is the UNRBA's objective with its Monitoring Program and the Modeling and Regulatory Support effort to see that all data collected be used under the provisions of the Falls Lake Rules and for all State activities related to assessment of Falls Lake.

Consistent with the Consensus Principles and beyond the formal reexamination process identified in the Falls Lake Rules, the UNRBA has done a preliminary evaluation of other regulatory actions that may be necessary to properly reflect the conclusions of its monitoring and modeling work. This preliminary identification of potential approaches was referenced earlier in the RFQ and presents the need for technical support to more fully identify and evaluate appropriate regulatory options as part of a comprehensive reexamination of the Falls Lake Nutrient Strategy.

¹ The term *modeling framework* is not defined in the Falls Lake Rules. For the purposes of this RFQ, a model framework is as described in EPA's Guidance on the Development, Evaluation, and Application of Environmental Models. EPA/100/K-09/003.

In the 2016 Session of the NC General Assembly, the Legislature passed Session Law 2016-94, which includes provisions related to Falls Lake and the rules readoption process for the Falls Lake Nutrient Management Strategy. This legislation directs the University of North Carolina to undertake an evaluation of the nutrient strategies for both Jordan and Falls reservoirs and for the results of those evaluations to be provided to and used by the Environmental Management Commission in the development of the rules. The UNRBA has been in discussions with UNC to secure coordination between its work and that being undertaken by UNC. Potential *Service Providers* should consider the implications of this coordination in the performance of its work for modeling and regulatory support of the UNRBA. The schedule in SL 2016-94 has a direct impact on the importance of the timing of the completion of the UNRBA's Reexamination. The UNRBA has recently submitted proposed revisions to this Session Law to better coordinate the two efforts, but at the time of this RFQ issuance no final action on this request is available.

Project planning

Service Providers responding to this RFQ should consider how the UNRBA is proceeding with its Falls Lake Nutrient Strategy Reexamination. The UNRBA is currently engaged in a comprehensive monitoring program to support the Reexamination (background information can be found at the UNRBA website: <https://unrba.org/>, under the appropriate tabs). The monitoring program began in August 2014 and will continue for a minimum of four years, with an additional year as an option if needed to supplement data due to unusual hydrologic or weather conditions. The UNRBA may, following the current monitoring plan, continue with an ongoing monitoring program depending on its progress toward a successful reexamination and the need for continued monitoring to evaluate the modified strategy.

The FY for the UNRBA runs July 1st through the following June 30th of each year. Current total monitoring program funding is \$ 800,000 per year. Beginning FY 2017, the UNRBA established a modeling and regulatory support contract that runs parallel to the monitoring program. The modeling and regulatory support contract budget for FY 2018 is based on the funding remaining after approving the FY 2017 Monitoring Program Contract and Scope of Work. The current Modeling and Regulatory Support Contract is for \$ 85,000. FY 2018 funding for the modeling and regulatory support contract will be calculated by subtracting the amount necessary to support an appropriate monitoring effort for FY 2018 from the total available budget. This means that the successful *Service Provider* for the modeling and regulatory support contract will be required to negotiate an FY 2018 contract and scope of work following the approval of the FY 2018 Monitoring Program. Preparing the FY 2018 modeling and regulatory support contract will be a collaborative process between the UNRBA and the *Service Provider* selected and will be based on establishing an initial priority list of activities and work products essential to the successful completion of a strategy reexamination package.

The *Service Provider* selected will be required to negotiate a contract renewal and scope revision for each following FY. The UNRBA anticipates increasing the funding available to the monitoring and regulatory support contract incrementally. An annual funding level between \$300,000 and \$600,000 may be available for the modeling and regulatory support contract beginning in FY2019. The selected contractor, during FY 2017 and subsequent years, will work with the UNRBA to develop an appropriate list of work activities and products for FY 2018 and following years. The budgets for FYs following FY 2017 will be projected based on the work activities and products identified and may include some portion of the current Monitoring Program budget or an alternate funding source established by the UNRBA. It is the general intent

of the UNRBA to retain the same Service Provider over the period of time needed to develop and complete the strategy reexamination process. However, the UNRBA reserves its right to terminate this arrangement based on the availability of funding, changes in UNRBA's objectives and goals, deficiencies in performance or changes in the staffing of the *Service Provider*.

SCOPE OF WORK

The UNRBA requires assistance from a qualified and experienced *Service Provider* to develop and implement tools including a water quality modeling program that effectively supports the UNRBA's goal of providing a successful reexamination of the Falls Lake Nutrient Management Strategy, with focus on Stage II requirements under the existing Falls Lake Rules and to support other appropriate regulatory options. The tools developed under this scope of work must be acceptable to DWR and other DEQ divisions and support a successful submittal under the provisions of the re-examination process as discussed in the background section, and other established regulatory procedures under state and federal law (relative to seeking other regulatory options). It is the expectation of the UNRBA that the watershed model outputs will be used as inputs to the reservoir nutrient response model and the cost-benefit modeling.

As previously described, the prospective *Service Provider* sought under this RFQ will be required to negotiate a contract renewal and scope revision for each contract year, beginning with 2017-2018.

2016-2017 Scope of Work, Year One of Modeling and Regulatory Support Effort

As a point of reference, the UNRBA is providing a summary of the Scope of Work for the current Service Provider and the current contract period, September 21, 2016 through October 20, 2017. These are the tasks that Cardno is responsible for and the UNRBA approved for year one of the modeling and regulatory support effort:

Phase 1: Develop a QAPP for the Falls Lake Response Models and the Falls Lake Watershed Model(s)

The goal of Phase 1 of the project is to develop the lake and watershed Modeling QAPP that will guide development of the models used to support the UNRBA reexamination of Stage II of the Falls Lake Nutrient Management Strategy. The Modeling QAPP will include both the lake and watershed models. While the main deliverable associated with Phase 1 is the modeling QAPP, several preliminary activities are needed to define the specific objectives of each type of model and select the best models to meet the chosen objectives. A conceptual modeling plan will be developed to summarize the modeling objectives and identify the models the UNRBA has selected for the lake modeling, watershed modeling, and empirical/probabilistic/Bayesian modeling. Elements of this conceptual plan will be incorporated into the Modeling QAPP. Depending on the selected models and the QAPP, the previously submitted, DWR-approved Description of the Model Framework may need to be revised for consistency relevant to the lake modeling and the watershed modeling approach.

Cardno and its teaming partners (the Team) will develop in consultation with the UNRBA a conceptual plan for conducting the lake and watershed modeling using a multi-modeling approach. Development of the conceptual plan will include the following tasks:

- Discussion of the UNRBA goals for the lake modeling effort during a Kickoff Meeting expected to be held in conjunction with the September 28, 2016 PFC meeting. This meeting will include additional watershed stakeholders including DWR, DOT, Neuse River Keeper, land conservation trusts, environmental groups, WOC, Health and Human Services Onsite Wastewater (county reps also), watershed associations, soil and water conservation. This meeting will be an extension of the PFC meeting and will occur in the afternoon following the meeting.
- Review and evaluation of potential lake model packages (e.g., EFDC, BATHTUB, CE-QUAL-W2, WASP, WARMF-lake, WARMF-CE-QUAL-W2, and stochastic modeling; addressing 1D/2D/3D models and capabilities) that will support a recommendation to the UNRBA of the modeling packages or combination of packages that will provide accurate and appropriate simulation of nutrients, algae, and total organic carbon to support the UNRBA's Falls Lake Nutrient Management Strategy reexamination. Comparison of models will be provided in tabular format with preliminary recommendations in the form of a slide presentation developed by the Team for discussion with the MRSW and PFC. A brief description of why each model was selected will be included in the QAPP.
- Review and evaluation of potential watershed model packages (e.g., WARMF, SWAT, SPARROW, PC-SWMM, RHYSS, and stochastic modeling) with the MRSW and PFC to develop a recommendation on the package or combination of packages can provide accurate and appropriate simulation of watershed nutrient and total organic carbon loading given the monitoring data and modeling objectives defined by the UNRBA to support reexamination of the Falls Lake Nutrient Management Strategy. Comparison of models will be provided in tabular format with preliminary recommendations in the form of a slide presentation developed by the Team for discussion with the MRSW and PFC. A brief description of why each model was selected will be included in the QAPP.
- Development of supporting materials that describe the conceptual modeling plan. These materials will be distributed prior to the UNRBA PFC meeting or meetings that will discuss and make decisions on the conceptual modeling plan. These supporting materials may include slides, handouts, figures, and tables. Relevant information from these materials will be incorporated into the Modeling QAPP and its appendices.

The conceptual model plan and evaluation of models will be used to develop the Modeling QAPP. Decisions regarding the model selection and conceptual model plan will be documented in the form of meeting notes during MRSW and PFC meetings by Cardno. The Team will develop the Modeling QAPP in accordance with the Falls Lake Rules (15A NCAC 02B .0275 (5) (f)) and will use EPA's (2002) Guidance for Quality Assurance Project Plans for Modeling (QA/G-5M) EPA/240/R-02/007.

A draft of the Modeling QAPP will be provided iteratively to the UNRBA MRSW and PFC for review and editing, and then to the NC Division of Water Resources (DWR) for review prior to formal submittal. The Team will be responsible for finalizing the QAPP for submittal to the agency and assisting the UNRBA in responding to any agency comments or issues.

Phase 1, First Year Deliverables:

The schedule for deliverables associated with Phase 1 is presented in Figure 1. This prospective schedule is based on meeting the UNRBA objectives and time frames for this project. Based on review and input by the MRSW, PFC, UNRBA, and DWR, this schedule may need to be revised.

1. Slides and handout materials (electronic copies in native format) to facilitate discussion of a) model evaluation and selection and b) development of the conceptual modeling plan. Key elements of these materials will be included in the Modeling QAPP to formally document why specific models were selected and how multiple models may be used to support the reexamination.
2. Draft and final Falls Lake nutrient response and watershed Modeling QAPP.
3. Presentations to the UNRBA Path Forward committee or UNRBA Board of Directors as appropriate and needed (see Phase 5), and
4. Revisions to the previously submitted Description of the Model Framework that was approved by DWR for consistency with the revised modeling QAPP.

Phase 2: Develop a Two-Year Work Plan

The Team will develop, in consultation with the UNRBA, a two-year work plan (approximately October 2017 to September 2019) for the modeling project including implementation of the watershed and lake modeling conceptual plans from Phase 1 and the providing a successful reexamination of the Falls Lake Nutrient Management Strategy, including additional regulatory options. The work plan will include detailed task breakdown structures and cost estimates for the two year period based on the local government fiscal year. The Team will seek input and direction from the MRSW and Path Forward Committee regarding the development of the work plan.

2017-2018 Scope of Work, Year Two of Modeling and Regulatory Support Effort

The *Service Provider* sought with this RFQ will be required to develop a scope of services for year two of the Modeling and Regulatory Support effort.

Service Areas

Specific tasks for FY 2018 and following contract years will be negotiated following the UNRBA's selection of a *Service Provider* through this RFQ. However, the UNRBA has identified several different service areas and skill sets that would be necessary to completing future work. These service areas are directly applicable to the goals of completing lake and watershed modeling needed to support the development of a revised nutrient management strategy for Falls Lake. In addition, the Service Provider sought through this RFQ will be required to carefully review the previous work completed under year one of the Modeling and Regulatory Support contract and verify the appropriateness of the decisions made based on the work completed in year one. This includes a review and assessment of all completed work products, the processes used to finalize this work, and the recommendations made by the year one contractor. This assessment will be reviewed by the UNRBA and will be used to develop specific tasks for the year two Scope of Work for Modeling and Regulatory Support activities.

Beyond the initial assessment of work already completed, it is expected that the Scope of Work for year two and subsequent work will likely address the following modeling components:

Reservoir Nutrient Response Modeling

For coming FYs the *Service Provider*, in coordination with the UNRBA and its consultants, will provide fully developed reservoir water quality modeling tools with a focus on nutrients, algae and total organic carbon. The NC Division of Water Resources used the Environmental Fluid Dynamics Code (EFDC) modeling package to simulate chlorophyll *a* in Falls Lake. This model was applied in three dimensions. Falls Lake has also been evaluated using a BATHTUB model package. Cardno ENTRIX² recommended multiple modeling packages for the Falls Lake re-evaluation. This recommended multiple model approach included the EFDC and other lake modeling packages, and a site-specific stochastic model using techniques such as structural equation modeling (SEM) or Bayesian modeling. The UNRBA has selected the WARMF watershed model package and two lake nutrient response modeling packages (EFDC and WARMF-LAKE) to support the reexamination. A designated use model will also be developed to link water quality to designated uses. The UNRBA is considering an optional fifth type of model package to simulate ecosystem response as another means to evaluate the aquatic life use.

Watershed Nutrient Modeling

The *Service Provider*, in coordination with the UNRBA, will provide watershed water quality modeling services with a focus on sediment, nutrients, and total organic carbon. The NC Division of Water Resources used the Watershed Assessment and Risk Management Framework (WARMF) modeling package to simulate nutrient loads from the watershed above Interstate 85 to Falls Lake. Although the watershed area below Interstate 85 is spatially represented in the model, the Division of Water Resources did not calibrate this portion of the model. PC-SWMM and SPARROW applications also exist for the Falls Lake watershed, in addition to the existing Falls Lake watershed application of WARMF. There are other research watershed models available. The WARMF application has been updated by the City of Durham for the Ellerbe and

² Cardno ENTRIX. 2013. Task 4: Review of Existing Models and Recommendations for Future Studies. Support of Long Term Planning and Regulatory Activities in the Falls Lake Watershed. https://unrba.org/sites/default/files/Task4TM_FINALJune18.pdf

Little Lick Creek watersheds. As noted, the UNRBA has identified the WARMF watershed model package for simulation of the watershed inputs to the lake.

In subsequent years, the *Service Provider* will calibrate and validate a WARMF watershed model for the Falls Lake watershed. Based on an approved FY 2018 Scope of Work, the selected *Service Provider* will provide regular updates to the UNRBA Path Forward Committee and, as appropriate the Board, including presentations and memoranda describing the development of model package inputs. These will accompany comment periods to allow the UNRBA local governments to verify assumptions and information.

Cost-Benefit Analysis

The *Service Provider* will develop or apply an existing tool to evaluate the cost-benefits of different nutrient reduction strategies. This tool should be capable of evaluating strategies on a variety of spatial scales, including watershed and jurisdictional bases. The tool should execute within either MS Excel® or MS Access®. The tool will include not only the benefits of meeting the chlorophyll-*a* standard, but also other benefits such as reduced total organic carbon levels, increased recreation, increased or more robust aquatic life, and fishing benefits. Costs to implement new and existing development regulations, as well as upgrades to existing wastewater treatment plants, should be included in the tool. The cost-benefit analysis completed for the UNRBA may be used to support the development of required agency fiscal impacts analyses for support of any proposed management strategy changes (Falls Lake Rules or other regulatory options). The cost-benefit tool should be accessible, usable, and alterable by the UNRBA member governments.

Regulatory Options Support

The *Service Provider* will support the UNRBA as it develops alternative regulatory options. The regulatory options component of the UNRBA's Reexamination of the eutrophication management strategy for Falls Lake will be managed by the UNRBA with support from its contractors, including any legal support retained by the Association. The Modeling and Regulatory Support Service Provider will assist in developing the technical aspects of the alternative approaches developed by the UNRBA and providing modeling evaluations of proposed regulatory options. The type of support that will be provided includes developing model configurations that accurately simulate identified management scenarios, providing assessments of how specific management options impact water quality, and assessing the financial impacts on local jurisdictions and the public. These efforts will likely include technical input and the application of cost-benefit tools to quantitatively evaluate management scenarios.

SUBMITTAL CONTENT AND FORMAT

Submittals must document that the *Service Provider* will comply with all of the provisions and conditions in this RFQ. Submittals must be signed by a company officer empowered to bind the firm, company, center or legal entity submitting as a *Service Provider*.

Form, Content and Length of Statement of Qualifications

Proposers' statements of qualifications should be structured as to form, content, and length as described in this section. The statement of qualifications should provide information that allows

the UNRBA to understand how the proposed *Service Provider* (whether one firm or a team of firms) is able to provide the services described and fulfill the needs of the UNRBA as described in this RFQ, including specified Tasks and Service Areas. Submittals must include the complete name and address of the firm, corporation, center or other legal entity applying as the *Service Provider* and the name, mailing address, email address, and telephone number of the person the UNRBA should contact regarding the submittal.

Proposals may not use less than 10 point Times New Roman font. (Other fonts are acceptable but the size should be no smaller than 10 point in Times New Roman.) Since qualification packages are to be submitted electronically, page limitations in this section refer to pages of content. The page limitations do not include front cover, back cover, section dividers, table of contents, non-collusion certification, exceptions, and conflicts of interest.

Cover Letter (Maximum of 1 page)

The submittals should contain a cover letter, signed by a principal in the *Service Provider*, indicating his or her title that he or she has authority to submit the Statement of Qualifications on behalf of the *Service Provider*, including the cover letter. The cover letter should contain the following statement:

“The undersigned has the authority to submit this submittal on behalf of the name of company in response to the Upper Neuse River Basin Association RFQ for “Water Quality Modeling and Regulatory Support.”

Qualifications (Maximum of 10 pages, including all sub-items)

Firm(s) description(s)

Submittals must include a firm overview and brief description of the firm’s history. Also include the complete name and address of the firm, corporation, center or other legal entity applying as the *Service Provider* and the name, mailing address, email address, and telephone number of the person the UNRBA should contact regarding the submittal.

Project organizational chart and description

The submittal should provide a description of the project team structure and qualifications. Senior and key members of the project team should be included in the organizational chart. A quality assurance officer shall be included on the project team. Clearly identify the prime contractor and any sub-contractors, and the general roles on the project.

Relevant Experience

The submittal should include the firm, entity or center’s experience for each water quality model included in the Scope of Work, as well as any other water quality models that may be relevant to the work of the UNRBA. The submittal should also include experience that is relevant to the Association’s need for regulatory options support. Experience with the triennial review process, Total Maximum Daily Loads (TMDLs) and implementation plans, NPDES permit negotiation, site-specific standards, and use attainability analysis should be highlighted. Project descriptions will include the cost of the project, duration of the project, a short project description, and key project personnel.

References

The submittal should include at least three references, at least one of whom can describe the project manager's experience and qualifications.

Project Team Résumés (Maximum of 10 pages)

One-page resumes of all senior and key personnel should be provided. A quality assurance officer shall be included on the project team. The office locations of each team member should be specified on the résumés. The submittal should, as a part of the information provided for subcontractors, include the names, locations, and general roles of the project team members.

Non-Collusion Certification

The Upper Neuse River Basin Association prohibits collusion, which is defined as a secret agreement for a deceitful or fraudulent purpose. Include and sign the following with your submittal:

The Upper Neuse River Basin Association prohibits collusion, which is defined as a secret agreement for a deceitful or fraudulent purpose.

I, _____ affirm that I have not engaged in collusion with any UNRBA employee(s), other person, corporations or firms relating to this submittal. I understand collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards.

Signature: _____

Exceptions

Any and all exceptions to the RFQ must be listed on an item-by-item basis and cross-referenced with the RFQ document. If there are no exceptions, Offerors must expressly state that no exceptions are taken.

Conflicts of Interest

Each submittal shall include a statement indicating whether or not the firm or any individuals that may work under contract has a possible conflict of interest (e.g., anyone working for or on behalf of the State of North Carolina, the Upper Neuse River Basin Association, or one of the UNRBA's member governments) and, if so, the nature of that potential conflict. The UNRBA Board of Directors reserves the right to use this information as selection criteria if any interest disclosed from any source could either give the appearance of a conflict or cause speculation as to the objectivity of the potential service provider in performing the work required. The Board's determination regarding any questions of conflict of interest shall be final.