Request for Proposal

2022 Lake Holiday Final BMP Design and Permit Support

Purpose

Lake Holiday Country Club Inc. (LHCC) is interested in obtaining proposals from a Professional Hydraulic/Civil Engineer, Certified Lake Manager (CLM), PhD Limnologist, Aquatic Ecologist, Biologist or other qualified individual/contractor to perform the following services:

Prepare the final engineering design and specifications, surveys, dredging plan, construction cost estimates, and federal, state, and local permit applications necessary to implement the removal and long term storage/dewatering of approximately 21,000 cubic yards of phosphorus-rich sediment that has accumulated in two coves within Lake Holiday. The purpose of this action is to control and reduce the levels of phosphorus, sedimentation and their impacts and to assist LHCC's long term strategic goals to manage/restore and sustain the health of the 250 acre man-made Lake Holiday.

Background (see also attached PDF background document)

Lake Holiday Country Club is a gated community encompassing approximately 1900 acres located 15 miles northwest of Winchester, Virginia. The 250 acre lake is 50 years old with a mean depth of 34.5 feet, maximum depth of 90.6 feet and a contributing watershed area of approximately 8,424 acres. Invasive aquatic vegetation prompted a decision to stock 540 sterile grass carp in 2014 which eradicated all aquatic vegetation with the possible exception of roots located in the lake-bed sediments. In October 2016, the lake experienced its first known blue/green harmful algae bloom (HAB) closing the lake to direct contact recreation for several days. Concerns regarding internal/external phosphorus loading and the potential for future harmful algae blooms prompted preparation of a 2018 watershed study entitled "Lake Holiday Pollutant and Hydrologic Loading Analysis", conducted by Princeton Hydro (attached). Two primary tributaries (Isaac's Creek and Yeider's Run) account for approximately 80% of all *annual* external loading of sediment (755+ tons), phosphorus (1,260+ pounds) and nitrogen (12,200+ pounds). A sediment coring/lake bathymetry study was also completed in 2017 by HAB Aquatic Solutions and Aquatic Environmental Consultants entitled "Lake Holiday Restoration Project – Report on Sediment Coring, Alum Dosing and Bathymetry" (attached). The sediment coring study indicated the potential for internal release of phosphorus from lake

bottom sediments, however additional data and analysis was required to determine the relative contribution of phosphorus from both internal (sediments) and external (tributary) sources that could create conditions for nuisance or harmful summertime/fall algae blooms.

During the years 2017 - 2022, Princeton Hydro was contracted to collect additional lake and tributary water quality data to monitor the health of the lake and to develop a mass balance and loading analysis for phosphorus. During 2018 and 2019, Princeton Hydro was also contracted to conduct a hydrologic and BMP feasibility analysis for Isaacs Creek and Yeiders Run, the two primary tributaries that drain the watershed surrounding Lake Holiday. These two reports are entitled "Lake Holiday – Isaacs Creek BMP Analysis Report, and – Yeiders Run BMP Analysis Report" (attached). Based on these analyses it was determined that the most cost-effective BMP option for controlling and reducing future sediment and phosphorus loads to the lake would be to create "in-lake catch basins" by removing accumulated sediment and restoring the original bathymetry (depths and volumes) within the two major cove areas (see background PDF document). The next major step (and the purpose of this RFP) is to finalize the sediment removal/containment plan and prepare all information (including final design/specifications, surveys, selection of dredging approach, construction cost estimates, and required permits) to allow LHCC to proceed to construction.

References

Documents describing prior work performed by Lake Holiday consultants are attached. This information includes several engineering reports prepared by Princeton Hydro, the sediment coring study performed by HAB Aquatic Solutions and Aquatic Environmental Consultants, a 2020 Permit Requirements analysis prepared by GKY and Passage Creek Environmental, and a 2013 sediment and aquatic vegetation study performed by Williamsburg Environmental Group entitled "Lake Holiday Aquatic Vegetation Assessment and Sediment Management Evaluation". These documents are attached in PDF form.

Scope of Work

There are several tasks included in this Scope of Work. LHCC prefers to utilize one consultant (or team of consultants) to address all tasks under one contract. The bidder is welcome to suggest improvements or modifications to these tasks if they feel strongly that it would result in time and cost efficiencies.

Task 1: Review Existing Information

Consultant will review previous project documents provided by LHCC (referenced in the Background Section) to assist in development of the following tasks as deemed necessary.

Task 2: Prepare Final Engineering Design and Specifications for In-Lake Catch Basins

The BMP engineering analysis performed earlier (see background) for creation of in-lake sediment catch basins provides what LHCC considers to be a "first cut" of the desired solution, in particular for the Isaacs Cove area. The estimated "capture efficiency" for sediment and phosphorus in the Isaacs Cove catch basin is approximately 25-30% and for the Yeiders Cove catch basin approximately 45%. The consultant must make the necessary modifications to the original Isaacs Cove catch basin (feasibility level) design that will increase the capture efficiency. The ultimate (acceptable) level of capture efficiency will depend, in part, on cost. The improved design can be from a combination of (1) increasing the residence time within the catch basin(s) to allow for increased settling and capture of discharged sediment by enlarging the basin length, depth, and volume, (2) adding an outer underwater berm (rocks or logs, etc.) in Isaacs Cove to act as a partial barrier to sediment flow, and (3) creation of emergent wetlands in the shallow portions of inner Isaacs Cove to serve as a natural filtration mechanism for both sediment and phosphorus. Any vegetation included in this plan would need to be species that are not selectively preferred by grass carp. The consultant will include in their deliverables a detailed description of all hydrologic, hydraulic, and/or limnologic calculations used in the final design of the two catch basins. The deliverables will also include a detailed planting plan for creation of emergent wetlands in portions of the inner (shallow) side channels in Isaacs Cove. LHCC does not envision the use of any hardened (concrete) structures as part of the catch basin design, rather the use of natural materials including rocks, logs, and vegetation, where appropriate, to achieve the desired results. The existing sediment and bathymetric surveys for the two coves date back to 2019. The consultant will advise LHCC if these surveys need to be updated (for purposes of estimating dredging volumes and/or applying for federal and state dredging permits). The consultant will include in their cost proposal a separate line item for sediment and/or bathymetric surveys required. The consultant will be responsible for conducting any required surveys as part of the contract.

Task 2 Deliverables:

Brief report presenting the final design of the in-lake catch basins for Isaacs Cove and Yeiders Cove including hydrologic/hydraulic/limnologic calculations used to determine approximate capture efficiencies of sediment and phosphorus (% of annual amounts discharged from Isaacs Creek and Yeiders Run). For each cove, report will include a map/drawing comparing existing cove volume/shape/bathymetry to planned future conditions after dredging. Volumes and locations of in-place sediment to be removed through dredging should be included in this analysis. For Isaacs Cove, report will include a section detailing the establishment of an outer underwater berm (made of natural materials such as large rocks or logs) whose purpose is to serve as a partial barrier to sediment flow and increase the capture efficiency of the catch basin. This underwater berm must be designed to allow normal passage of power boats and other recreational watercraft (kayaks, canoes, etc.). A cost estimate for constructing the underwater berm should be included as part of the analysis/deliverable. Actual construction of the berm is not part of this contract. An outer underwater berm is not envisioned for Yeiders Cove.

Brief report (or chapter/section) summarizing results of any new bathymetric or sediment surveys conducted during this phase.

Brief report (or chapter/section) presenting a detailed planting plan to establish emergent wetlands within the inner shallow side channels of Isaacs Cove. The plan should address, if needed, any physical alterations of the shape and depths of each area to accommodate creation of a viable emergent wetland system. The plan should include the recommended plant species, approximate number, size, and arrangement of plants shown on a map/drawing. The plan should also include a cost estimate for plant purchase and planting by a future contractor (planting is not part of this contract). It is preferred that the planting plan be broken down into at least three separate physical locations within Isaacs Cove (see coordinates 39.305843, -78.340822; 39.306399, -78.341026; 39.306024, -78.340594) to accommodate possible phasing in of individual sections over multiple years. This plan should also include a strategy for temporarily protecting newly planted vegetation from high flow events caused by major storms. This could include temporary placement of large logs or rocks to divert storm flows away from the side channel(s) until vegetation is sufficiently established, later allowing removal of all or partial removal of the temporary divergence structures to allow streamflow to move through the wetland areas creating a natural filtration mechanism.

General requirements: Firm or consultant team conducting this work should have, at a minimum, one certified lake manager (CLM) on staff with preference for limnologist with doctoral degree. In addition, staff should include at least one professional engineer registered in the state of Virginia. In addition, staff should include one certified aquatic plant ecologist/wetland specialist.

Task 3. Sediment Dewatering/Containment Facility

Consultant will prepare preliminary and final design of the sediment dewatering/containment facility needed to accommodate sediment removed/transferred by the (future) dredging contractor. The approximate location of the proposed facility site is shown on the map included in the background PDF document attached (Coordinates 39.301673, -78.312790). Sizing of the containment facility (volume/surface area/berm height/length) will depend, in part, on whether the dredging method selected is mechanical or hydraulic (see Task 4). Clearly Task 3 and Task 4 are tightly interdependent. Final design requirements will depend on the recommendations and decisions that result from Task 4. Consultant will also determine potential need for addition of offsite clay or similar materials (liners) that may be needed to reinforce berm's ability to prevent unwanted lateral seepage. Existing soil conditions are primarily fractured shale in this region. Sizing of the containment facility should also consider allowance for potential additional material from maintenance dredging in the future.

Task 3 Deliverables:

Brief report detailing the design of the Dewatering/Containment facility including physical layout, sizing specifications, estimated volumes of offsite materials needed (if any) to create and stabilize berms (including any specialized materials such as clay or other types of liners, etc.). The report will also include cost estimate for construction by a (future) contractor. Construction of the dewatering facility is not part of this contract.

General requirements: Firm or consultant team conducting this work should have, at a minimum, at least one professional engineer registered in the state of Virginia.

Task 4. Dredging Plan – Fast Track

As presented in the Background pdf document, removal of approximately 21,000 cubic yards of phosphorus rich sediment will be required to create the in-lake catch basins in Isaacs and Yeiders Coves. Under Task 4, the consultant will

provide a brief comparison of the two primary dredging methods available (mechanical and hydraulic) to allow LHCC to select the optimal approach, weighing dredging costs (including mobilization/demobilization), transfer method of sediment to the long term containment/dewatering facility, size and location of the containment/dewatering facility, and potential environmental impacts. The consultant should consider, at a minimum, the following factors:

- Selection of methods that minimize sediment re-disturbance and movement (Hydraulic vs Mechanical Dredging)
- Accessibility of barges into tight cove locations/docks
- Method for installation and removal of temporary silt curtains
- Accuracy of dredging machine and ability to maneuver near docks
- Possible need for temporary re-location of boat docks
- Selection of sediment transfer method from dredger to dewatering/containment area (pipeline vs barge-to-truck vs in-place dewatering "socks")
- Location and sizing of the dewatering/containment area
- Comparing costs vs benefits of each alternative approach

Note that the comparative analysis between possible dredging methods is on a fast-track schedule. LHCC wishes to make a decision as soon as possible on the optimal dredging method/approach to allow the consultant to focus remaining activities assuming use of the preferred dredging method. Final design of the containment/dewatering facility in Task 3 depends on the results of Task 4.

Task 4 Deliverables:

Brief report summarizing the comparison of available dredging methods, costs, sediment transfer/containment requirements, and potential environmental impacts. This report ***should be prepared on a fast-track basis*** to allow LHCC to select the preferred dredging method (mechanical vs. hydraulic) to allow the consultant to finalize all other aspects of this project.

General requirements: Firm or consultant team conducting this work should have, at a minimum, one certified lake manager (CLM) on staff with preference for limnologist with doctoral degree. In addition, staff should include at least one professional engineer registered in the state of Virginia.

Task 5. Permits

The following permits will be required in order to conduct dredging activities and sediment disposal/containment for creating the two in-lake catch basins:

Frederick County Land Disturbance Permit, which will require:
- Erosion and Sediment (E&S) Control Plan
- Land Disturbance Permit Application Package, including,
  - E&S Plan Approved by Public Works
  - Land Disturbance Submission Checklist
  - Land Disturbance Permit Application
  - E&S Guaranty Estimate Form

Virginia Dept of Environmental Quality (DEQ)
- Individual Permit (IP) for surface water impacts over 2 acres of aerial coverage

United States Army Corps of Engineers (USACE)
- Individual Permit (IP) for surface water impacts over 1 acre

Virginia Marine Resources Commission (VMRC)
- VMRC Permit is required for Isaacs Cove (Drainage area exceeds 5 sq miles)

Consultant will be responsible for preparing all information necessary for each permit application as well as follow-up with each regulatory agency as required to achieve permit approvals. The consultant will be responsible for submission of each permit application and all communications, and meetings if required (by phone or in person) with each regulatory authority.

General requirements: Firm or consultant team conducting this work should have, at a minimum, one certified lake manager (CLM) on staff with preference for limnologist with doctoral degree. In addition, staff should include at least one professional engineer registered in the state of Virginia. In addition, staff should include one certified aquatic plant ecologist/wetland specialist.

Optional Task 6 Construction Management/Oversight Services

Consultant will provide a Time and Materials cost estimate to provide construction management services during the bidding process and construction of the sediment containment/dewatering facility, emergent wetlands creation in Isaacs Cove, and dredging operations.

Deliverables (Due dates for all deliverables to be determined. Offeror should provide suggested delivery dates as part of offeror's proposal.)

Task 1: Provide comments on existing data and analysis conducted by previous Lake Holiday consultants.

Task 2: Provide brief report presenting the final design of the in-lake catch basins for Isaacs Cove and Yeiders Cove.

Task 3: Provide brief report presenting the design and cost estimate for the Dewatering/Containment Facility.

Task 4: (Fast Track) Brief report summarizing the comparison of available dredging methods, estimated costs, sediment transfer/containment requirements, and potential environmental impacts. This report ***should be prepared on a fast-track basis*** to allow LHCC to select the preferred dredging method and to allow design of the sediment dewatering/containment facility.

Task 5: All required permit applications and all efforts necessary to ensure receipt of permit approvals by regulatory agencies.

Optional Task 6: Provide Time and Materials cost estimate for Construction Management Services.

Proposal Preparation Requirements

The offeror shall provide a summary of previous experience in conducting studies and analyses similar to those specified in this scope of work and a list of references knowledgeable about offeror's prior experience.

The offeror shall provide a brief description of their technical approach used to conduct each task. In particular for Task 2, describing any proposed calculation methods (hydraulic, hydrologic, limnologic) expected to be used in the design of the in-lake catch basins, and proposed methods/techniques for creation and protection of emergent wetlands.

Offeror's proposal shall include a detailed schedule and costs for accomplishing each and all tasks specified in the scope of work.

Proposals are due at the following address not later than 5:00 pm on October 14, 2022.

Lake Holiday Country Club, Inc
231 Redland Road
Cross Junction, VA 22625
Attn: Mike Goodwin, General Manager

An electronic copy may be provided to gm@lakeholidaycc.org.

Offerors may address questions regarding this solicitation to Mike Goodwin (see above).

Signed Proposal Considered An Offer

Receipt of a signed proposal shall be considered an offer on the part of the Offeror. The terms, conditions and specifications of this proposal will become part of the contract, if the proposal shall be deemed approved and accepted by the Lake Holliday Homeowners Association Board. The Offeror to whom this project is awarded shall execute a written contract with the Lake Holiday Homeowners Association, to perform the work as outlined in these specifications and in accordance with all the conditions as described in this RFP.

Award of Bid

The Lake Holiday POA Board, at its sole discretion, following an objective evaluation, intends to award this contract to the most responsible, responsive Offeror. Price will be a consideration but will not be the determining factor in our selection. The award of this contract will be based and granted on "**BEST VALUE." "BEST VALUE"** will allow the POA Board to consider factors beyond pricing such as whether the responsible Offeror is able to meet and/or exceed the required specifications. **"BEST VALUE"** will permit and reflect prudent stewardship of POA non-profit funds and trust. Award of the contract to one Offeror does not mean that the other proposals lacked merit. Award of the contract signifies that after all factors have been considered, the selected proposal was deemed most advantageous to the Lake Holiday Property Owners Association.

Proposal Evaluation Factors

Factors to be considered in the "Best Value" determination include:

- Offeror's technical approach
- Ability to meet schedule
- Prior experience
- Cost

LHCC reserves the right to reject all proposals if none satisfies the evaluation criteria.