

TAB 6

Proposals for Lake Holiday Final BMP Design and Permit Support

Issue: The LC sent an RFP to six engineering firms in September, 2022 receiving two proposals in response. The two proposals received by the October 31, 2022 deadline were from Princeton Hydro and the team of GKY and Passage Creek Environmental.

Background:

Over the last six years the Lake Committee (LC) conducted several scientific studies (using professional consultants) to determine the likely causes of the blue green algae bloom that occurred in the Fall of 2016, temporarily closing the lake to contact recreation. These studies and the data collected has significantly aided in our understanding of the primary drivers that control lake water quality and ecological health. In June 2022 a presentation was made to the Board and LHCC Community summarizing what we have learned and the recommended actions that should be taken to protect future lake health (A Plan for Protecting Lake Holiday's Health, June 2022). The four major actions, and current status are:

1. *Manage return of Submerged Aquatic Vegetation (SAV) and create emergent wetlands.* A subgroup under the LC is currently working on a plan for reestablishing SAV, which will only be possible once the carp are gone, which will take another 5-10 years. However, establishing emergent wetlands in Isaacs Cove is being addressed under Action 3 below.
2. *Control local community-scale sources of sediment and phosphorus.* The LC is currently developing an RFP to solicit engineering services to apply for state and local permits and develop feasibility-level design options for the control of sediment erosion in the highest priority Stream Paths within LHCC property. This work is expected to begin in 2023.
3. *Implement a sediment removal action for Isaacs and Yeiders Coves (Lake Holiday Final BMP Design and Permit Support).* The first step in this process is to solicit professional consulting services to develop final engineering design plans for dredging and dredged material containment, and application of all environmental permits. The range of cost for these services was estimated between \$70,000 to \$140,000. The proposal review and award recommendation is the subject of this document.
4. *Create a HAB (Harmful Algae Bloom) Emergency Action Plan.* This plan is currently under development by Princeton Hydro and is expected to be available during the 2023 timeframe.

Funding Source: This engineering contract will be funded out of Replacement Reserve.

Summary: The LC sent an RFP to six engineering firms in September, 2022 receiving two proposals in response. The two proposals received by the October 31, 2022 deadline were from Princeton Hydro and the team of GKY and Passage Creek Environmental. Based on an initial review, several questions were sent to each bidder with a request for responses and final

proposals by November 16, 2022. The questions sent to each bidder, and their responses, are listed below in Appendix A. The final review summarized in Table 1 takes into account the responses from each bidder. The recommendation for award selection, and selection logic, is summarized below.

Recommendation:

Technical and Experience - based on an evaluation of the technical proposals summarized in Table 1, GKY's proposal scored the highest (640 out of a possible 700 points compared to 615 for Princeton Hydro). GKY's experience in dredging-related projects, especially in the design of dredged material dewatering facilities, as well as environmental permitting within the state of Virginia, is superior compared to Princeton Hydro's. An initial concern regarding GKY's capabilities to address the hydraulic design of the catch basins was adequately addressed in GKY's revised proposal. Princeton Hydro's proposal demonstrated a lack of understanding of basic lake dredging processes, initially leaving out any discussion of "wet-mechanical" dredging which is highly feasible and potentially represents a lower cost option for Lake Holiday. Princeton Hydro also failed to include any discussion or analysis for the geotechnical design of the dredged material containment facility, whereas GKY proposed to include the services of subcontractor Triad Engineering (geotechnical engineering specialists) to perform these critical services.

Schedule: the proposed schedule for each bidder is similar and does not significantly factor into the selection decision.

Cost – GKY's proposed (fixed fee and T&M) total cost for all "required" tasks is \$144,000, compared to Princeton Hydro's proposed (fixed fee) total cost for all "required" tasks of \$265,345. The lower cost proposed by GKY reflects their greater familiarity and experience with dredging-related projects, and with environmental permitting coordination with regulatory agencies in the state of Virginia. It is also of interest to note that GKY provided (T&M) cost estimates for construction management services whereas Princeton Hydro did not.

Based on the above, **GKY's team is recommended for award** of a contract for this Scope of Work if LHCC decides to move forward with this project. GKY's proposed cost (\$144,000) is similar to the high end of the cost range initially estimated for this work (\$70,000 to \$140,000) presented to the Board in June, 2022. If the Board approves award of this contract, work is expected to begin immediately.

Motion: Approve GKY and Passage Creek Environmental engineering proposal for final lake BMP design and permit support with funding to come out of Replacement Reserve.

Jim Pagenkopf, BMP Working Group of Lake Committee

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January 24, 2023

Table 1. Summary of Proposal Review/Comparison for GKY and Princeton Hydro

Project Experience	GKY	Princeton Hydro
	<p>Provided 4 good examples of past projects that are similar in scope to Lake Holiday project in terms of dredging and dredged material disposal/containment and permit/construction support. However catch basin hydraulic retention efficiency experience is lacking(see below) Score – 80 out of 100</p>	<p>Provided 4 good examples of past projects that are similar in scope to Lake Holiday project in terms of dredging and dredged material disposal/containment and permit/construction support. PH also provided past experience in modeling hydraulic retention efficiency. Score – 90 out of 100</p>
Resumes	<p>Provided 6 resumes for project personnel. Overall relevant project experience appears to be quite strong, especially with similar wet-mechanical dredging and environmental permit projects in Virginia. Also, GKY’s Sean Mowery lists project experience in hydraulic retention efficiency calculations Score – 95 out of 100</p>	<p>Provided 10 resumes for project personnel. Overall relevant project experience appears to be quite strong. Score – 90 out of 100</p>
Scope of Work	GKY	Princeton Hydro
Task 1 – Review Existing Info	<p>Adequate, no comments Fixed Fee \$3,300</p>	<p>Adequate, no comments Fixed Fee \$7,700</p>
Task 2 – Prepare Final Engineering Design and Specs for in-lake catch basins	<p>Provided an updated proposed approach for catch basin BMP hydraulic design that adequately addresses the goals and requirements of the RFP SOW. Also added a proposed new survey to measure the depths of unconsolidated sediment in the dredge areas. Score – 90 out of 100 Fixed Fee \$51,700</p>	<p>Provided a complete and responsive approach to the RFP SOW. In response to a question, PH maintains a “redo” of the hydrologic/hydraulic modeling of the watershed to account for design changes (berms, vegetation, etc.) to the catch basin in Isaacs Cove. Score – 90 out of 100 Fixed Fee \$106,795</p>
Task 3 – Sediment Dewatering Containment Facility	<p>Provided a complete and responsive approach to RFP SOW. No comments. Score – 95 out of 100 Fixed Fee \$34,100</p>	<p>PH did not include any surveying or geotechnical analysis in their approach. Score – 80 out of 100 Fixed Fee \$51,350</p>
Task 4 – Dredging Plan Fast Track	<p>Provided a complete and responsive approach to RFP SOW. Note that GKY appears to have more extensive experience</p>	<p>PH’s response to questions on the assumption of “in the dry” mechanical dredging states that PH will also consider “in the</p>

	in developing dredging plans and dredging oversight than PH. Score – 95 out of 100 Fixed Fee \$1,900	wet” mechanical dredging in their options analysis. Score – 90 out of 100 Fixed Fee \$13,000
Task 5 – Permits	Provided a complete and responsive approach to RFP SOW. No comments. Score – 95 out of 100 Fixed Fee \$23,400	Approach does not include wetlands delineation or follow-up communication w/agencies Score – 85 out of 100 Fixed Fee \$86,500

Optional Task 6 – Construction Management/Oversight Services	Provided a complete and responsive approach to RFP SOW. Score – 90 out of 100 T&M estimate \$30,200	Provided a complete and responsive approach to RFP SOW. Score – 90 out of 100 T&M estimate (TBD)
Task 7 – Meetings and Coordination	Additional cost est. provided T&M estimate \$6,500	Included in price – see assumptions.
Task 8 – Lake Professional Services (GKY only)	Additional cost est. provided for use of certified lake management consulting services. T&M estimate \$10,000	N/A (note these types of lake management consulting services already provided in PH technical responses to SOW.
Optional Task 9 – After Dredge Bathymetric Survey (GKY only)	Note – this post dredge survey will likely be required Fixed Fee \$8,200	Not Addressed
Optional Task 10 – VSMP Permit and SWPPP (GKY only)	Note – these permits/analyses may not be needed Fixed Fee \$4,000	Not Addressed
Optional Task 11 – Sediment Push Pole Survey (GKY only)	Note – this survey will be required Fixed Fee \$13,200	PH assumes using the original survey conducted in 2019.

Total Technical Score	640 out of 700	615 out of 700
Cost Comparison	All Required Tasks \$144,100 Optional Tasks \$ 42,400 Grand Total \$186,500 (includes estimate for construction management)	All Required Tasks \$265,345 Optional Tasks (not estimated) Total \$265,345 (does not include construction management)

Appendix A

Questions sent to each bidder (and their responses) as a result of the review of initial proposals submitted October 31, 2022

GKY Questions:

1. Please provide one page (or standard off the shelf) resumes for all key personnel expected to work on this project.
2. In the Task 2 technical approach, GKY assumes that a 6 ft depth will be the nominal depth for the catch basins in navigable areas of the basins. That is incorrect. LHCC wishes the dredging approach to remove all “unconsolidated” sediment that has accumulated in the basins since the creation of the man-made lake (1973) to be removed to maximize the volume and residence time of the in-lake catch basins (i.e., remove all unconsolidated sediment). Also, there is no discussion of what calculation methods (hydrologic, hydraulic, limnologic) are anticipated to be used for sizing the basins (length, depth, volume) and estimating the effect of adding a submerged weir and vegetation (Isaacs Cove only) to optimize the retention efficiency of the basins. LHCC anticipates the need for a trade-off analysis between basin size/cost and retention efficiency in the ultimate BMP design. This is a critical aspect of the project. Please address as appropriate.
3. In the Optional Task 6 for Construction Management Services, GKY makes no mention of providing construction management/oversight services for emergent wetland creation. Please provide additional clarification as appropriate.

GKY’s Responses – please see GKY’s revised proposal incorporating these changes:

Our revised proposal is attached. Following is a summary of all changes that were made:

- Updated the Table of Contents to reflect the changes noted above.
- Tab 1 – section 1.e, added “and Resumes” to Tab 2
- Tab 2 – renamed to “Project Experience and Resumes”
- Tab 2 – Added resumes of key staff to address comment #1.
- Tab 3 – Revised the “Sediment Volume Analysis” section under Task 2 to address the first part of comment #2.
- Tab 3 – Added “Design Calculations” section under Task 2 to address the second part of comment #2.
- Tab 3 – Added clarifying language in the third paragraph of Task 6 scope to address comment #3.
- Tab 3 – Added optional Task 11 for Sediment Push Pole Survey.
- Tab 4 – Added Tasks 8, 9, and 10 (which were previously not shown) to the schedule. No change in project duration.
- Tab 4 – Added Task 11 (new task) to the schedule. No change in project duration.
- Tab 5 – Added Task 11 to the pricing summary table and updated the summations at the bottom of the table accordingly.

Princeton Hydro Questions, and Responses (in Red Font). Note, no revisions were made by PH to the original proposal submitted on October 31.

1. In the Task 2 technical approach, PH proposes to conduct a “Hydrologic and Hydraulic” analysis for purposes of supporting the design of the final BMPs. Since PH has already performed this analysis (or very similar) in earlier studies to develop preliminary BMP options, please explain why this analysis needs to be redone.

The purpose of this task is to evaluate the hydraulics associated with berm creation and select emergent wetland habitat configuration specific to particle and nutrient settling. In this sense, the modeling is not being redone, but will build on that model conducted earlier to aid in the draft and final design to optimize sediment and nutrient retention. This task would be additive to that conducted earlier and would not be a repetitive exercise.

2. In the Task 4 technical approach, PH mentions that mechanical dredging would likely be performed “in the dry”. It is our understanding that mechanical dredging can be performed “in the wet”, using barge hoppers to store and transfer dredged materials to trucks for transport to the containment facility. Please advise on PH’s experience/knowledge with this type of mechanical dredging approach and/or if there are reasons why PH does not recommend this type of dredging approach

Princeton Hydro's response regarding mechanical dredging in the dry was not meant to be an all-inclusive statement but a suggestion of one mechanism of dredging. Utilizing mechanical dredging equipment, staged on a barge with a hopper barge for transport, is also a potential means to remove sediment. Ultimately, the efficiencies, cost, and level of community disruption will be reviewed as part of Task 4 with a recommended 'best approach' for the method of dredging. This may include the scenario provided in this question. The use of a floating barge-mounted excavator and sediment hopper is an option. For this approach care would need to be taken using a turbidity barrier (curtain) surrounding the dredging area in order to protect the biota of the lake, and then offloading of the material would necessitate a location adjacent to the shoreline to offload material and allow the dredged material to dewater. This is definitely an option to be considered.

Please note – A turbidity barrier (curtain) will be specified in the recommendations in any circumstance where increases of turbidity may occur.

3. In the Optional Task 6 for Construction Management Services, PH makes no mention of providing construction management/oversight services for emergent wetland creation. Please provide additional clarification as appropriate.

Princeton Hydro's construction oversight specialists and engineers would provide oversight for the entirety of the project including establishment of emergent wetlands. We have extensive experience in overseeing mechanical and hydraulic dredging, wetland creation, and other marine construction as a facet of restoration projects and routinely conduct oversight to ensure plants are installed according to the specifications established in the Planting Plan. Princeton Hydro can provide additional examples of our experience in oversight related to wetland creation if requested.