

**REQUEST FOR PROPOSALS
To Conduct
Lower Jordan River Flow Experiments**

BACKGROUND

The Jordan River Commission is excited to advance the next phase of an applied research project to evaluate the effects of modest adjustments in the management of water flows in the lower Jordan River in achieving dissolved oxygen (DO) improvements while also improving riparian and wetland habitat. This project was initially led by the national non-profit, River Network, but due to staffing changes there, the Jordan River Commission is now taking the lead role in this effort, with ongoing support from River Network and many other community partners.

The problem:

The Jordan River is in northern Utah where it flows approximately 51 miles north from Utah Lake to Great Salt Lake. The Jordan River is identified as impaired for a variety of parameters along its entire length. This project focuses on the lower Jordan. The lower Jordan is made up of three stream reaches (hereafter referred to as reaches 1, 2, and 3, which include the river from 2100 South north to the river's discharge to Great Salt Lake. The three reaches are listed as impaired due to insufficient DO (along with benthic macroinvertebrate problems and *E. coli*). The DO impairment harms the river's designated use for warm water fisheries (Class 3B).

A total maximum daily load (TMDL) is being developed for the relevant reaches (i.e., reaches 1–3). The TMDL will establish loading limitations for total organic matter (OM) to reach the target endpoint for DO.

The entire Jordan River is heavily flow-managed, and the lower Jordan is particularly impacted. At the upstream boundary of the lower Jordan, the average annual flow of the river between 1980 and 2003 was 573,900 acre-feet, but was only 106,145 acre-feet at the next major road crossing (1700 South) just five blocks downstream.¹ This change reflects the impact of a large diversion just downstream of 2100 South—the Surplus Canal—which leaves as little as 10% or 20% of the natural flows in the Jordan River channel. The draft TMDL for the Jordan River notes that flows on the lower Jordan are relatively static stating: "...monthly means flows to the lower Jordan River [are] relatively constant at 190 to 320 cfs."²

The Surplus Canal diversion is managed by Salt Lake County. The County uses the diversion to meet the objectives of both county and municipal flood control programs, minimizing risks to landowners along the lower Jordan, and for downstream water right holders. However, the city and county have indicated openness to the idea of modifying their management if that change could improve use support on the lower Jordan. The Division of Water Rights has also indicated willingness to help understand water rights that must be considered in the proposed experiments.

Part of the solution:

This next chapter of the lower Jordan flow project will investigate how changes to flow management can enhance efforts to achieve water quality criteria for DO, while also improving ecosystem function in the lower Jordan. The project is set up to run in four phases. The first two

¹ Utah Division of Water Quality, Draft Jordan River TMDL Water Quality Study, page 23.

² Ibid.

phases have been completed and funding has been secured for the most critical phase, Phase 3: Flow Experiments.

This project began with several hypotheses about how flow changes might help improve water quality. These included the idea that perhaps flows could “flush” OM from the system and hence improve water quality and the idea that increased flows during critical summer conditions could directly improve the DO levels in the stream (while leaving the OM in place). In this second scenario, water quality modeling indicates that simply providing a larger volume of water (and hence of DO) at the beginning of the impaired reaches would allow the entire stretch of river to comply with water quality criteria. This affect could be further enhanced by changes in temperature and reaeration rate, both of which change as a result of flow.

In Phases 1 and 2, the non-profit River Network gathered a group of the key players on the issue to serve as an advisory team. This technical advisory team (TAT) includes staff from Salt Lake County, which controls the diversion impacting the Jordan, and the Division of Water Quality, which developed the existing TMDL for the river, and several other partners. To date, this team has helped to guide research and initiate conversations with Salt Lake City, Salt Lake County, and the Division of Water Rights regarding the regulatory and management issues that would need to be resolved to increase flows to the lower Jordan. All parties have been open to considering reasonable flow changes.

In Phase 1, River Network tested both the flushing and direct effects hypotheses using existing models (HEC-RAS and QUAL2kw). Questions investigated in Phase 1 included the following:

1. Could increased flows scour OM and hence help achieve water quality criteria or could increased flows directly help achieve DO water quality criteria? If so, what flows would be required?
2. What would be the best timing (e.g., spring or fall) and pattern for the flows?
3. What are the related threats and challenges (e.g., bank stability concerns, flooding, water rights implications)? What are the related benefits (e.g., improvements in habitat structure, improvements in other parameters, degradation)?

Based on the analysis of available data and output from the models, River Network concluded that the first hypothesis (flushing) was not likely to result in water quality benefits and that approach could not be pursued further. However, the second (direct effects) hypothesis showed promise. Results from the modeling effort suggest increasing flows in the lower Jordan by as little as 25% should result in measurably higher DO levels, bringing the river above the chronic standard in late summer (the most critical season for impairment to the fishery use). Although there are uncertainties associated with the initial findings, River Network decided this hypothesis was clearly worth pursuing (see Phase 1 report, available upon request).

In Phase 2 of the project, River Network worked to update the modeling effort with newer (2010–2013) data. This round of modeling was less conclusive than Phase 1’s modeling; although improvements in DO were still found, the data were not as compelling in Phase 2. At that point, the TAT and the consultants agreed that the flow management ideas had been explored as much as possible using models, and that flow experiments would be required in order to test, and hopefully support, the hypothesis.

The proposed project

The analysis presented in Phases 1 and 2 of this project demonstrates that there is a complex relationship between DO and flow in the lower Jordan. The purpose of the flow experiments (Phase 3) proposed in this plan is to provide empirical data about the influence of flow on chronic low DO conditions in the lower Jordan during dry base flow conditions. The primary questions that guide the experimental design proposed here are as follows:

1. Is there a relationship between flow and DO? If so, is the relationship predictable?
2. Is there a flow threshold, based on management at the Surplus Canal, that results in DO being maintained above the chronic (7-day) water quality standard of 5.5 milligrams per liter (mg/L) at all sites in the lower Jordan during baseflow dry conditions?
3. What is the relative importance of flow variation and pattern versus mean daily or weekly flow?

These experimental questions have been designed to be answered with a series of flow experiments, under the following river conditions, in two consecutive summer seasons: 1) during the baseflow period (generally July, August, and September); 2) when no storms have resulted in runoff for 3 days before the start of the experiment; 3) when no other large changes in diversions or discharges are planned for the lower Jordan during the experiments; and 4) when the DO pattern is steady over the 3 days before the experiment.

After the flow experiments are conducted, the experimental results will be used to generate a set of management recommendations for flow on the lower Jordan. These recommendations will be 1) based on good, sound science and 2) designed with input from the entities that will most need to embrace them: the water managers. After the grant period, we will work with water managers to implement the recommendations to improve water quality and downstream habitat.

A complete project plan and design, including stakeholder outreach, monitoring, and experimental coordination, has been developed. Unfortunately, the available funding for the project is less than originally envisioned, and the scope of the project will need to be adjusted to meet current available resources.

SCOPE OF WORK

The scope of the project is outlined in detail in the attached *Lower Jordan River: Plan for Flow Experiments (2014-2016)*. Anticipated deliverables are as follows:

1. Draft Experiment Plan
2. Final Experiment Plan
3. Coordination Plan
4. Pulse and ramp-up experiment implementation
5. Experimental monitoring
6. Data analysis
7. Draft Report
8. Final Report

BUDGET

The Jordan River Commission was awarded \$162,255 from the Division of Water Quality for this project. A budget range of \$145,000 to \$155,000 has been preliminarily identified for the completion of this scope of work by a consulting team, and we have \$7,000 set aside for direct costs associated with this project (printing, materials, equipment, etc.).

The remainder of the funding award will include a contingency budget for additional required meetings or changes in scope, and JRC administrative costs, printing of final reports, and any physical educational tools used to communicate the findings to the Jordan River Watershed community.

SELECTION COMMITTEE, SCHEDULE & EVALUATION CRITERIA

Selection Committee

The selection committee will be comprised of the following individuals:

Hilary Arens, Utah Division of Water Quality and JRC Technical Advisory Committee
Mike Allred, Utah Division of Water Quality
Jesse Stewart, Salt Lake City Public Utilities
Scott Baird, Salt Lake County Engineering and Flood Control
Laura Hanson, Jordan River Commission
Nicole Silk, River Network

Selection Schedule

RFP Released:	June 2, 2015
Proposals Due:	July 2, 2015
Preliminary Selection or Short List Announced:	July 21, 2015
Interviews (if needed):	July 28, 2015
Selection Finalized:	August 20, 2015

Evaluation Criteria

Evaluation Area	Possible Points
Qualifications	35
Proposed Approach	35
Timeline	15
Project Budget	15
TOTAL POINTS	100

SUBMITTAL REQUIREMENTS

Submit one (1) electronic PDF copy of your completed proposal by 5:00 pm on June 12, 2015 to the following:

Laura Hanson
Jordan River Commission
Lahanson@utah.gov

Proposals must be no longer than 10 pages, excluding the cover letter and resumes. Resumes should be submitted as an appendix to the proposal. The proposal must include the following elements:

1. **Qualifications**
 - a. Firm Profile
 - i. Provide a brief overview of the members of your team including the location of the office serving this project.
 - b. Relevant Project Experience
 - i. Provide descriptions of relevant past projects that illustrate your team's experience completing projects of similar scope, topic, or objectives.
 - c. Key Personnel
 - i. Provide brief bio resumes for each the team's key personnel, describing their relevant experience and their proposed role on this project.
2. **Proposed Project Timeline**
 - a. Provide a project timeline illustrating project start and completion dates, all project meetings, the goals for each meeting, and all key project milestones.
3. **Proposed Project Budget**

Provide an itemized budget including the specific elements outlined the attached *Lower Jordan River: Plan for Flow Experiments (2014-2016)*

- a. **Items not to be included** in the scope or itemized budget. These tasks have been dropped from the preliminary project proposal due to reduced funding availability:
 - i. Impounded wetland management
 - ii. Stage and flow
 - iii. Inundation of mitigation wetlands and riparian restoration
- b. **Items to be included** in the scope and in an itemized project budget:
 - i. Project Management
 - ii. Technical Advisory Team Meetings

- iii. Proposed Flow Experiments
 - 1. Please provide cost per individual experiment for each of the following:
 - a. Pulse
 - b. Ramp-up
 - 2. Include a cost for the proposed total number of experiments of each type.
- iv. Experimental Monitoring
 - 1. Please provide cost per individual experiment for each of the following:
 - a. Dissolved Oxygen and Water Quality
 - b. Reaeration
 - 2. Include a cost for the proposed total number of monitoring efforts of each type and method.
- v. Coordination Plan
- vi. Analysis and Reporting
 - Please provide a cost using the following assumptions:
 - 1. Pulse – experiment conducted two (2) times between 2015-2017
 - 2. Ramp-up – experiment conducted three (3) times between 2015-2017

4. References

- a. Provide three client references for relevant past projects. Projects must have been completed within the last five years.

FOR MORE INFORMATION

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