UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Bowersock Mills and Power Company Project No. 13526-002-KS

NOTICE OF AVAILABILITY OF ENVIRONMENTAL ASSESSMENT

(August 19, 2010)

In accordance with the National Environmental Policy Act of 1969 and the Federal Energy Regulatory Commission (Commission) regulations, 18 CFR Part 380 (Order No. 486, 52 FR 47879), the Office of Energy Projects has reviewed the application for an original license for the Bowersock Mills and Power Company's Expanded Kansas River Hydropower Project, to be located on the Kansas River, Douglas County, Lawrence, Kansas, and prepared an environmental assessment (EA). In the EA, Commission staff analyzed the potential environmental effects of licensing the project and concluded that issuing a license, with appropriate environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

A copy of the EA is available for review at the Commission in the Public Reference Room or may be viewed on the Commission's website at http://www.ferc.gov using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at FERCOnlineSupport@ferc.gov or toll-free at 1-866-208-3676, or for TTY, (202) 502-8659.

You may also register online at http://www.ferc.gov/docs-filing/esubscription.asp to be notified via email of new filings and issuances related to this or other pending projects. For assistance, contact FERC Online Support.

Any comments should be filed within 30 days from the issuance date of this notice, and should be addressed to the Secretary, Federal Energy Regulatory Commission, 888 First Street, NE, Room 1-A, Washington, DC 20426. Please affix "Expanded Kansas River Hydropower Project No. 13526-002" to all comments. Comments may be filed electronically via the Internet in lieu of paper. The Commission strongly encourages electronic filings which may be filed at http://www.ferc.gov/docs-filing/efiling.asp. See 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's website under the "eFiling" link.

For further information, contact Monte TerHaar at (202) 502-6035.

Kimberly D. Bose,
Secretary.

ENVIRONMENTAL ASSESSMENT FOR HYDROPOWER LICENSE

Expanded Kansas River Hydropower Project

Project No. 13526-002

Kansas

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
888 First Street, NE
Washington, D.C. 20426

U.S. Army Corps of Engineers, Kansas City District
700 Federal Building
Kansas City, MO 64106-2896

August 2010

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EXECUTIVE SUMMARY

On February 8, 2010, Bowersock Mills and Power Company (Bowersock) filed an application for an original license with the Federal Energy Regulatory Commission (Commission) for the proposed Expanded Kansas River Hydropower Project No. 13526 (Expanded Kansas River Project). The 6.5-megawatt (MW) project would be located at the existing Bowersock dam on the Kansas River in Douglas County, Lawrence, Kansas. The proposed project would use the existing powerhouse from the previously exempted Kansas River Project No. 2644, together with a proposed new powerhouse. The project would not occupy federal lands. The average annual generation of the proposed project would be 32,726 megawatt-hours (MWh). This environmental assessment (EA) is a cooperative undertaking between the U.S. Army Corps of Engineers (Corps) and the Federal Energy Regulatory Commission (FERC or Commission).

Proposed Action

Bowersock proposes to surrender its exemption for Project No. 2644 upon the issuance of a license for the Expanded Kansas River Project. The proposed project would consist of the existing Bowersock Millpond, the existing Bowersock dam and south powerhouse which contains seven turbine units, a new north powerhouse with four turbine units, a new automated roller gate, a new transmission line, and modified flashboards. The proposed project is described in more detail in section 2.2. Bowersock proposes measures for the protection and enhancement of environmental resources that includes operating the project run-of-river, developing recreation sites and installing associated signage and two kiosks, and implementing best management practices to control erosion and sediment during project construction. These measures are described in more detail in the EA.

Alternatives Considered

In this EA, staff assesses the effects of constructing and operating the project and recommends conditions for inclusion in any license that may be issued. In addition to Bowersock's proposal, we consider two alternatives: (1) Bowersock's proposal with staff modifications (Staff Alternative); and (2) the no action alternative, which in this case would be continued operation of the exempted project. Under the no action alternative the new north powerhouse and recreation enhancements would not be built and the environmental resources in the project area would remain unchanged.

The recommended staff modifications include the following additional measures: an erosion and sediment control plan for project construction, a monitoring plan for project operation, a recreation plan, and a provision for addressing future effects on previously unidentified cultural resources within the project boundary. The recommended staff modifications include recommendations made by the Corps to

facilitate authorizing Section 10 and 404 permits for construction activities within waters of the United States.

Public Involvement

Before filing its license application, Bowersock conducted pre-filing consultation under the traditional licensing process. The intent of the Commission's pre-filing process is to initiate public involvement early in the project planning process and to encourage citizens, government entities, Indian tribes, and other interested parties to identify and resolve issues prior to an application being filed with the Commission. On August 13, 2009, Bowersock conducted a public meeting and site visit for the project. Scoping was waived because staff determined that the issues that needed to be addressed in the EA had been adequately identified during pre-filing. On April 16, 2010, we issued the Ready for Environmental Analysis notice and in response received comments from the U.S. Department of the Interior (Interior).

Project Effects

Geology and Soils Resources – Project-related construction would temporarily impact approximately 1 acre of the Kansas River streambed. Permanent impacts to the river will be limited to existing disturbed areas at the dam and result in a smaller footprint than currently exists. Staff's recommendation to develop and implement an erosion and sediment control plan is consistent with Bowersock's proposal to implement best management practices during project construction. Developing and implementing an erosion and sedimentation control plan would reduce erosion and sedimentation and minimize hazardous materials from entering the Kansas River during project construction and operation, thereby protecting water quality.

Aquatic Resources – The fisheries in the Kansas River are typical for Midwestern warm-water rivers, and staff determined that no additional measures are necessary. No additional measures have been recommended by the resource agencies. The run-of-river flows from the proposed project would be identical to the flows that have been released in the past which maintained the existing fishery in the Kansas River. Run-of-river operation would protect water quality, quantity, and fishery resources in the Kansas River downstream of the powerhouse. Staff's recommended project operations and flow monitoring plan would establish a framework to periodically confirm that the project is operated in compliance with its license, and provide important data needed for the licensee and resource agencies to evaluate the effects, if any, the required water levels and flows have on aquatic resources. Therefore, the project would, under the proposed flow regime, provide sufficient protection of the fisheries and maintain them at current levels.

Terrestrial Resources – Bowersock proposes to keep ground disturbance to a

minimum. The construction site has previously been disturbed. There is little vegetation at the proposed construction site, thus terrestrial resources are unlikely to be affected.

Threatened and Endangered Species – We find that the proposed project would have no effect on the federally endangered pallid sturgeon and would not destroy or adversely modify any critical habitat. Pallid sturgeon do not occur at the project but have been documented 43 miles downstream of the project in the Kansas River. Because the project would continue to operate run-of-river, flows in Kansas River downstream of the project would essentially remain unchanged. Thus, project operation would not affect the pallid sturgeon or its habitat which may exist downstream of the project. Given the small area disturbed, limited construction activities, and measures to prevent erosion and sedimentation, constructing the proposed project would not alter aquatic habitat downstream of the project.

Recreation Resources – Bowersock proposes to enhance recreation resources by: (1) constructing a pedestrian footpath; (2) constructing a canoe portage consisting of a canoe put-in, take-out, and trail; (3) constructing a tailrace fishing deck; and (4) installing a kiosk at the proposed north powerhouse, a kiosk on the flood protection levee trail, and associated signage. Under the staff alternative, developing and implementing a recreation plan would establish the licensee's responsibilities for operation and maintenance of the new project recreation sites, include a provision for reassessing the location of the canoe put-in, and allow for agency consultation on the plan.

Cultural Resources – The project, as currently proposed, would not adversely affect any property listed in, or eligible for listing in, the National Register of Historic Places. Under the staff alternative, however, any future effects on previously unidentified cultural resources within the project boundary would be addressed.

Conclusion

Based on our analysis, we recommend licensing the project as proposed by Bowersock, with staff's additional measures. In section 4.2 of the EA, we compare the total project cost to the cost of obtaining power from a likely alternative source of power in the region, for each of the alternatives identified above. Our analysis shows that during the first year of operation, under the no-action alternative the existing exempted project produces 11,448 MWh of power at a cost that is $292,000, or about $25.5/MWh, less than the cost of alternative power. Under Bowersock's proposal, the project would produce 32,726 MWh of power at a cost that is $235,000, or about $7.19/MWh, more than the cost of alternative power. The staff-recommended alternative provides the same benefits as Bowersock's proposal because the additional measures recommended by staff have negligible costs or may be provided by contingency costs already included in construction costs.

On the basis of our analysis as the lead federal agency, and the Corps' analysis as a cooperating agency, we conclude that issuing an original license for the proposed project, with the environmental measures that we recommend, would not be a major federal action significantly affecting the quality of the human environment.

We chose the staff alternative as the preferred alternative because: (1) the proposed project would provide a dependable source of electrical energy for the region (32,726 MWh annually); (2) the 6.5 MW of electric energy generated from a renewable resource may offset the use of fossil-fueled, steam-electric generating plants, thereby potentially conserving nonrenewable resources and reducing atmospheric pollution; and (3) the environmental measures recommended by staff would adequately protect and enhance environmental resources affected by the project. The overall benefits of the staff alternative would be worth the cost of the proposed and recommended environmental measures.

ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
Washington, D.C.

U.S. Army Corps of Engineers, Kansas City District
700 Federal Building
Kansas City, MO

Expanded
Kansas River Hydropower Project
Project No. 13526-002 – Kansas

1.0 INTRODUCTION

1.1 APPLICATION

On February 8, 2010, Bowersock Mills and Power Company (Bowersock) filed an application for an original license with the Federal Energy Regulatory Commission (Commission) for the proposed Expanded Kansas River Hydropower Project No. 13526 (Expanded Kansas River Project). The 6.5-megawatt (MW) project would be located at an existing dam on the Kansas River in Douglas County, Lawrence, Kansas (see figure 1). The proposed project would operate using existing facilities from the previously exempted Kansas River Project No. 2644, together with new proposed facilities. The project would not occupy federal lands. The average annual generation of the proposed project would be 32,726 megawatt-hours (MWh).

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The Commission must decide whether to issue a license for the project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued, such as flood control, irrigation, navigation, or water supply, the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection, mitigation of, damage to, and enhancement of fish and wildlife resources (including related spawning grounds and habitat); (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

Issuing a license for the project would allow Bowersock to construct a second powerhouse and increase generation for the term of the license, making electrical power from a renewable resource available for sale to the regional grid. This Environmental Assessment (EA) assesses the environmental and economic effects associated with the construction of a second powerhouse and operation of the project, alternatives to the proposed project, and makes recommendations to the Commission on whether to issue a license, and if so, recommends conditions to become a part of any license issued.

In the EA, Commission staff assess the environmental and economic effects of constructing, operating, and maintaining the project: (1) as proposed by Bowersock (proposed action); and (2) with our recommended measures (staff alternative). We also consider the effects of the no-action alternative.

1.2.2 Need for Power

The proposed project would provide power to meet part of Kansas' power requirements, resource diversity, and capacity needs. The proposed project would have a total installed capacity of 6.5 MW and would generate approximately 32,726 MWh annually.

To assess the need for project power, we reviewed anticipated future use of project power in the operating region in which the project would be located. Project power would be used to meet regional electrical demand. The project would be located in the Southwest Power Pool (SPP) region of the North American Electric Reliability Council (NERC). According to NERC's 2009 forecast, demand for energy in the SPP region is projected to grow from 44,500 MW to 50,000 MW over the 10-year planning period from 2009 through 2019. In the SPP about 44% of energy is generated from gas, 37% from coal, and 6% from renewable resources (i.e., hydropower, wind, and solar energy). Over the next 10 years, NERC estimates that energy from renewable resources will increase to 15% of the energy mix, mostly as a result of large increases in wind generation.

Staff concludes that power from the proposed project would help meet a need for power in the SPP region in both the short and long-term. The proposed project would provide low-cost power that may displace non-renewable, fossil-fueled generation and would contribute to a diversified generation mix. Displacing the operation of fossil-fueled facilities may avoid some power plant emissions and create an environmental benefit.

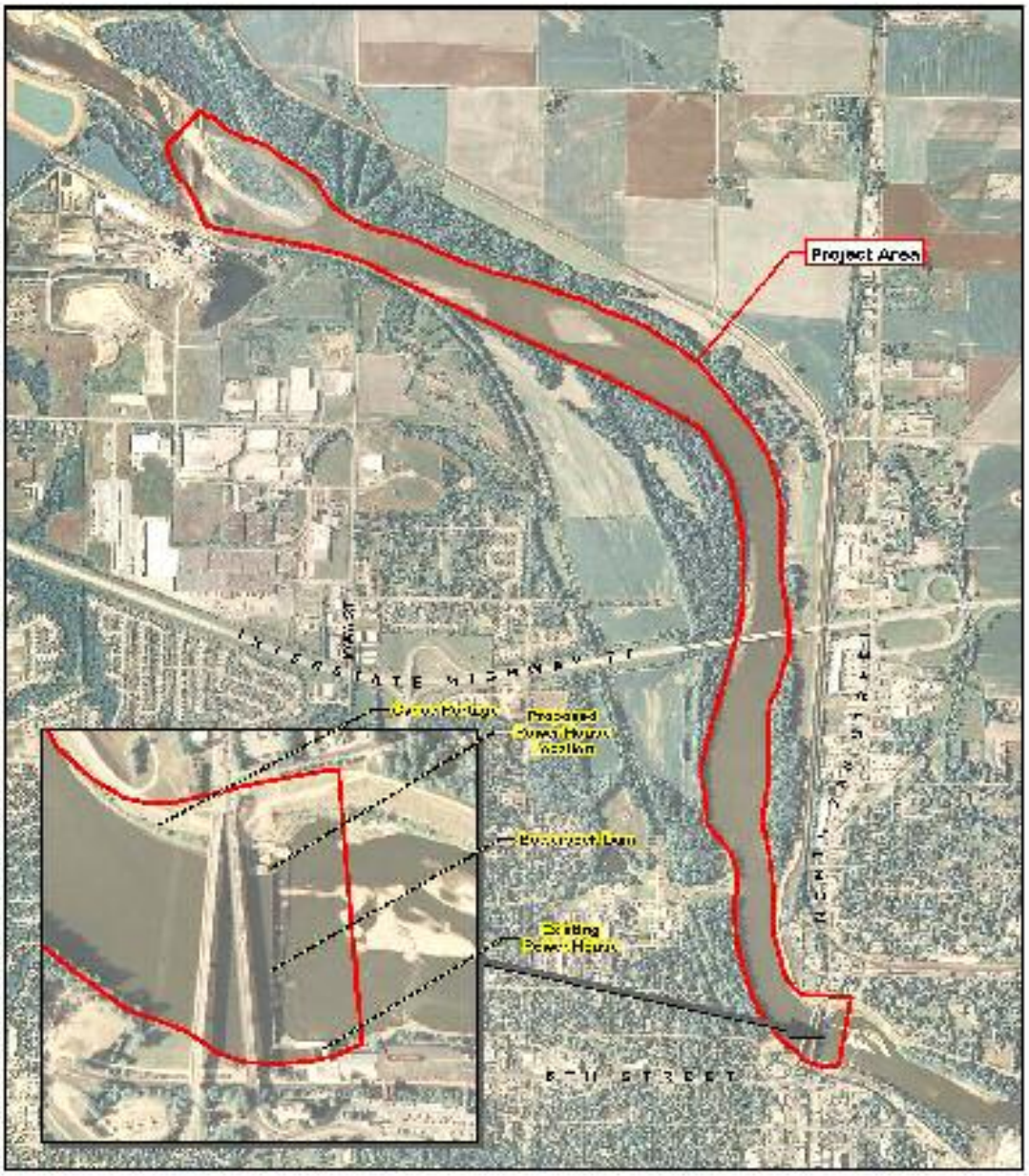

Figure 1. Location of the Expanded Kansas River Project (source: Bowersock Mills and Power Company, 2010a).

1.3 STATUTORY AND REGULATORY REQUIREMENTS

If licensed, the project would be subject to the requirements of the Federal Power Act (FPA) and other applicable statutes. We summarize the major statutory and regulatory requirements in table 1 and describe them below.

Table 1. Major statutory and regulatory requirements for the project.

Requirement	Agency	Status
Section 18 of the FPA – fishway prescriptions	U.S. Department of the Interior (Interior)	Interior requested a Reservation of Authority to construct fishways if needed in the future.
Section 10(j) of the FPA	Kansas Department of Wildlife and Parks (Kansas DWP)	Kansas DWP supports the proposed project. No 10(j) recommendations were filed.
	U.S. Fish and Wildlife Service (FWS)	FWS supports the proposed project. No 10(j) recommendations were filed.
Section 401 of the Clean Water Act (CWA) – water quality certification (certification)	Kansas Department of Health and Environment (Kansas DHE)	Certification was issued April 1, 2010.
Endangered Species Act (ESA)	FWS	Staff concluded "no effect" on T&E species.
Coastal Zone Management Act (CZMA)	N/A	The project is not subject to a coastal zone program review and no consistency certification is needed for the action.
Section 106 of the National Historic Preservation Act (NHPA)	Kansas State Historic Preservation Officer (SHPO)	Kansas SHPO, in a letter dated August 20, 2009, filed with the license application, determined that the proposed project would not adversely affect any property listed in, or eligible for listing in, the National Register of Historic Places.

Section 404 of the Clean Water Act (CWA)	Corps	Permit under review. The Corps received a complete application on June 21, 2010 and issued Public Notice on June 30, 2010.
Section 10 of the Rivers and Harbors Act	Corps	Permit under review. The Corps received a complete application on June 21, 2010 and issued Public Notice on June 30, 2010.

1.3.1 Federal Power Act

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission is to require the construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or Interior. Interior has not filed a fishway prescription; however, by letter filed June 10, 2010, Interior requested that any license issued include a reservation of authority to prescribe fishways.

We recognize that future fish passage needs and management objectives cannot always be determined at the time of project licensing. Under these circumstances, we recommend the Commission follow its practice of reserving the Commission's authority to require such fishways as may be prescribed by the Secretary of the Interior in the future.

1.3.1.2 Section 10(j) Recommendations

Under section 10(j) for the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the proposed project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. No section 10(j) recommendations have been filed.

1.3.1.3 Section 401 Clean Water Act

Under section 401 of the CWA, a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the CWA. On January 29, 2010, Bowersock applied to the Kansas DHE for certification for the Expanded Kansas River Project. The Kansas DHE received this request on January 29, 2010, and timely issued a section 401 WQC on April 1, 2010. The conditions of this certificate are described under section 2.2.5, Modifications to Applicant's Proposal-Mandatory Conditions. The entire WQC is attached as Appendix A.

1.3.1.4 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. There are no known federally listed endangered or threatened species or critical habitat for such species within the project area. The Expanded Kansas River Project is located on the Kansas River, a tributary of the Missouri River. Both rivers are known to support the federally-listed pallid sturgeon *(Scaphirhynchus albus).* However, recent surveys have documented the presence of pallid sturgeon in the Kansas River up to River Mile 11, which is 43 miles downstream of the Bowersock dam which is located at River Mile 54. Staff concluded that issuing a license would not affect federally listed threatened and endangered species. Therefore, further consultation under section 7 is not needed.

1.3.1.5 Coastal Zone Management Act

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. §1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state's CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification.

Kansas has no coastal zone or CZMA program. Therefore, the project is not subject to a coastal zone program review and no consistency certification is needed for the action.

1.3.1.6 National Historic Preservation Act

Under section 106 of the National Historic Preservation Act (NHPA) [1] and its implementing regulations,[2] federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register (defined as historic properties) and afford the Advisory Council a reasonable opportunity to comment on the undertaking. This generally requires the Commission to consult with the State Historic Preservation Officer (SHPO) to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects.

In its license application, Bowersock included a letter, dated August 20, 2009, from the Kansas SHPO stating that the proposed project would not adversely affect any property listed in or eligible for listing in the National Register. As a result of this finding, the drafting of a programmatic agreement to resolve adverse effects on historic properties will not be necessary.

1.3.2 Requirements of the U.S. Army Corps of Engineers

The Corps is a cooperating agency with the Commission on this EA; thus, the Corps did not file any terms and conditions in response to the Commission's April 19, 2010 notice soliciting comments, recommendations, terms and conditions, and prescriptions. In accordance with a Letter of Understanding between the Commission and the Corps (letter filed May 13, 2010), the Commission granted the Corps cooperating agency status. The Letter of Understanding sets forth the parameters under which the Corps would provide environmental and engineering review of the EA.

As a cooperating agency, the Corps intends to adopt this EA, to the extent practicable, as a decision making document to meet the National Environmental Policy Act (NEPA) requirements for its regulatory responsibilities under Section 10 of the River and Harbors Act and Section 404 of the Clean Water Act. The Corps has provided technical comments on the EA related to its environmental expertise and regulatory jurisdiction for development of the purpose and need, and suite of alternatives; and to ensure the NEPA analysis fulfills applicable legal requirements for the issuance of a Corps permit (e.g., conducting the Corps's public interest review, provides the information for the evaluation of alternatives under the Clean Water Act

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[1] 16 U.S.C. § 470 *et seq*. (2006).
[2] 36 C.F.R. Part 800 (2009).

Section 404(b)(1) guidelines, compliance with the Endangered Species Act, applicable Executive Orders, and Section 106 of the National Historic Preservation Act).

1.4 PUBLIC REVIEW AND CONSULTATION

The Commission's regulations (18 CFR § 5.1-5.16) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, the Endangered Species Act, the National Historic Preservation Act, and other statutes. Prefiling consultation must be complete and documented according to the Commission's regulations.

Licensing of the project was initiated on October 23, 2009, when Bowersock filed with the Commission a Pre-Application Document (PAD) and a Notice of Intent (NOI) to license the Expanded Kansas River Project using the Traditional Licensing Process (TLP). The Commission issued a Notice of Commencement of Proceeding and approval of the TLP on November 11, 2009.

1.4.1 Scoping

Commission staff determined that the issues that needed to be addressed in its EA had been adequately identified during the pre-filing period for the application, which included a public meeting and site visit conducted by Bowersock on August 13, 2009, and no new issues were likely to be identified through additional scoping. No comments were filed in response to the Commission's March 3, 2010 notice stating the Commission intended to waive scoping. By letter issued April 19, 2010, the Commission notified Bowersock that further scoping would not be required.

1.4.2 Interventions

On April 16, 2010, the Commission issued a notice that the application had been accepted for filing. This notice set June 15, 2010, as the deadline for filing protests and motions to intervene. In response to this notice, on June 11, 2010, Interior filed a motion to intervene.

1.4.3 Comments on the License Application

The April 16, 2010, notice also stated the application was ready for environmental analysis and requested that comments, recommendations, preliminary terms, conditions, and prescriptions be filed by June 15, 2010. Interior filed comments on June 10, 2010.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the project would not be constructed and no project-related change to current environmental conditions would occur. We use existing conditions as the baseline environmental condition for comparison with other alternatives.

2.1.1 General Area

The Kansas River has a total length of 170 river miles starting at the confluence of the Republican River and Smokey Hill River in Junction City, Kansas, and ending at its confluence with the Missouri River in Kansas City, Missouri. Flows in the Kansas River are primarily regulated by three Corps reservoirs located in the headwaters of the Kansas River (i.e., Perry Lake, located 17 miles northwest of the project on the Delaware River; Tuttle Creek Lake, located 84 miles west of the project on the Big Blue River near Manhattan, Kansas; and Milford Lake, located 35 miles west of the project on the Republican River near Junction City, Kansas). Approximately 49,400 square miles (about 80%) of the total drainage area of the Kansas River below Junction City is controlled by reservoirs. Because of the potential for large flood events, flood protection works have been constructed near population centers. The Kansas River at Lawrence is confined by a levee on the north side of the river, constructed by the Corps in 1953. The levee has a top elevation 830 feet National Geodetic Vertical Datum (NGVD) and is maintained by the city of Lawrence. The south side of the river is contained by soil banks up to the high water mark at elevation 816 to 818 feet NGVD.

The river valley in the reach at the project site is characterized by a relatively high population density with intensive agricultural, residential, and industrial development occurring in the vicinity of the Bowersock Dam. The dam serves as a channel control, preventing degradation, which has been observed in downstream reaches, from progressing upstream (Corps, 1990). The reach is considered relatively stable upstream of the dam with little bank instability and little evidence of degradation.

Primary water uses in the project area include domestic water supply for the city of Lawrence, and cooling water for the 566 MW Westar coal-fired power plant (Westar) located 3.2 miles upstream of the Bowersock dam. Westar can withdraw up to 44.5 cubic feet per second (cfs) for cooling purposes. The city of Lawrence maintains a municipal water intake for the Kaw Water Treatment Plant (Kaw) which is located approximately 2,700 feet upstream of the Bowersock dam. Kaw can divert up to 22.5 cfs when Bowersock Millpond is at the level of the crest of the dam, and up to 34.5 cfs when the millpond levels are higher.

2.1.2 Existing Project Facilities

The existing Bowersock dam and powerhouse currently operates under an exemption as a small hydropower project of 5 MW or less.[3] Bowersock plans to surrender its exemption upon the issuance of a license for the proposed project. The exempted project consists of the 3.3-mile-long, 329-acre Bowersock Millpond at normal water surface elevation 812 feet NGVD, and the 665-foot-long, 17-foot-high Bowersock dam with a crest elevation of 808 feet NGVD. The dam is topped by 150 feet of 4-foot-high Obermeyer steel flashboards located on the south end of the dam, 400 feet of 4-foot-high wooden flashboards at the midsection of the dam, and a 120-foot-long gated spillway at the north end of the dam. The gated spillway consists of seven steel vertical lift gates having a hydraulic capacity of 2,000 cfs. The project also includes the south powerhouse containing seven turbine/generator units having a hydraulic capacity of 2,300 cfs, and installed capacity of 2.14 MW which generates about 11,448 MWh annually; and a 535-foot-long, 2.3-kV transmission line leading from the powerhouse to a substation on the south bank owned by Westar Energy.

2.1.3 Existing Project Operation

The Bowersock dam was originally constructed in 1874 and serves multiple purposes today, including generating hydroelectric energy at the south powerhouse, reducing stream bed degradation in the upper reaches of the Kansas River, protecting from erosion the existing Kansas Department of Transportation bridge piers located immediately upstream of the dam, and creating Bowersock Millpond which provides public recreation and a source of water for the city of Lawrence's municipal water needs.

The project operates in a run-of-river mode, where water levels in the Bowersock Millpond are maintained near the top of 4-foot-high flashboards, at about 812 feet NGVD. The impoundment elevations are maintained by about 400 feet of wooden flashboards which are manually raised into position, and 150 feet of steel Obermeyer flashboards which are operated by a pneumatic system. In addition, flows can be released into a spillway through seven steel gates at the north end of the dam which are raised or lowered manually. The maximum hydraulic capacity of the south powerhouse is about 2,300 cfs when all seven turbines are operating. When inflows are 2,300 cfs or less, all flows are passed through the powerhouse and regulated by adjusting the turbine

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[3] On November 15, 1985, the Commission issued Bowersock Mills and Power Company an exemption from license for Project No. 2644-001. The order established the Bowersock Millpond as the area within the existing river bank up to elevation 812 feet NGVD. *See* 33 FERC ¶ 62,209 (1985).

wicket gates. When inflows exceed 2,300 cfs, the Obermeyer flashboards are adjusted to release excess flows and maintain the 812 feet target millpond elevation. The Obermeyer flashboards are capable of passing a maximum of 3,984 cfs of flows at millpond elevation 812 feet NGVD. When inflows exceed the combined capacity of the south powerhouse, Obermeyer system, and the gated spillway, the river rises above 812 feet NGVD and the wooden flashboards are topped. The wooden flashboards are designed to collapse when topped by about 6 inches of water, which is equivalent to about 7,000 cfs. The wooden flashboards can not be raised again until the river flow is less than 3,500 cfs.

2.2 APPLICANT'S PROPOSAL

2.2.1 Proposed Project Purpose and Facilities

The proposed project would continue to provide and enhance the multiple purposes of the existing hydroelectric project. The multiple purposes include hydroelectric generation, recreation, and providing a reservoir for the city's municipal water supply. The proposed project would also improve Bowersock's ability to maintain a constant millpond elevation and reduce the incidence of flashboard failure at the project.

The proposed project would consist of the existing Bowersock dam; two powerhouses (the existing powerhouse on the south bank of the Kansas River, and a new 43-foot-wide by 113-foot-long powerhouse located on top of the existing dam at the north end of the river), and about 1,300 feet of transmission line consisting of 535 feet of existing line and 765 feet of new line (Figure 2). The proposed project would have 11 turbines, a total hydraulic capacity of 5,395 cfs, and generation capacity of 6.5 MW. The project would generate an estimated 32,726 MWh annually which would be sold to a local utility.

Bowersock's proposal includes the following features: (1) the 3.8-mile-long, 423-acre Bowersock Millpond at normal water surface elevation 813.5 feet NGVD; (2) the existing 665-foot-long, 17-foot-high timber-crib Bowersock Dam; (3) removing the seven existing spillway gates at the north end of the dam to make way for a new powerhouse; (4) replacing 400 feet of wooden flashboards on the dam to raise the existing flashboards from 4 feet high to 5.5 feet high; (5) 150 feet of refurbished Obermeyer flashboards consisting of 15 gates, each 10 feet long; (6) the existing south powerhouse, containing seven turbine/generator units having an installed capacity of 2.14 MW; (7) a new north powerhouse with four turbine/generator units, having an installed capacity of 4.397 MW; (8) a new 20-foot-wide roller gate adjoining the north powerhouse; (9) an intake flume for the north powerhouse protected by trashracks with 4.5 inch open bar spacing; (10) a new tailrace fishing deck, pedestrian footpath, canoe portage, canoe put-in, canoe take-out, two kiosks, and associated signage; (11) a new

765-foot-long, 12-kV transmission line which would connect the north powerhouse to an existing 535-foot-long 2.3-kV transmission line at the south powerhouse; and (12) appurtenant facilities.

Figure 2. General layout of project facilities at the proposed north powerhouse (Source: Bowersock 2010a).

2.2.2 Proposed Project Operation

The project would be operated in a run-of-river mode, where water levels in the millpond would be maintained near the top of the flashboards at 813.5 feet NGVD, plus or minus 6 inches. Maintaining the millpond elevation would be automated and more efficient through placement of water surface monitors at the north powerhouse, and construction of a new roller gate which would be automatically raised or lowered in response to the elevation data. The north and south powerhouses would be operated in tandem to maintain the millpond elevation during moderate flows. The proposed project would increase the hydraulic capacity (flows through the turbines) from 2,000 cfs to approximately 5,395 cfs.

The project would include construction of a new 20-foot-wide roller gate designed to release flows up to 2,600 cfs. The automated roller gate would provide greater flexibility in releasing high flows, than is possible with the current manually operated gate system, thus reduce the potential for flooding upstream. During high inflows the millpond elevation will be maintained by a combination of flows through the south powerhouse (2,300 cfs), south Obermeyer system (6,424 cfs), north powerhouse (3,084 cfs), and north roller gate (2,600 cfs). Thus, the development could pass up to 14,408 cfs of flows before the millpond elevation would rise. The 5.5-foot-high flashboards would be designed to collapse during periods of high inflows when the water surface elevation rises 6 inches above the top of the flashboards (814 feet NGVD) at approximately 18,000 cfs. It would be possible to raise the fallen flashboards when the river flow drops below 8,500 cfs.

2.2.3 Project Boundary

The Expanded Kansas River Project boundary maps, filed on July 29, 2010, enclose Bowersock Millpond up to normal pool elevation 813.5 feet NGVD; Bowersock dam and spillway; the proposed north and existing south powerhouses; the proposed transmission line and an existing transmission line; and project tailrace to approximately 100 feet downstream of the dam. The proposed project boundary encloses the proposed recreation sites: a pedestrian footpath; a 725-foot-long canoe portage trail; a tailrace fishing deck; and canoe put-in and take-out. The project boundary is defined by the

814-foot NGVD contour line elevation,[4] which allows for the 0.5-foot operation limits proposed by Bowersock.

2.2.4 Proposed Environmental Measures

Bowersock proposes to: (1) operate the project run-of-river; (2) develop new recreation sites, as identified above, and install associated signage and two kiosks; and (3) employ best management practices to protect water quality and control sediment and debris during project construction.

2.2.5 Modifications to Applicant's Proposal

The following mandatory conditions have been provided and evaluated as part of Bowersock's proposal.

Section 401 WQC Conditions

On April 1, 2010, the Kansas DHE issued a 401 WQC for the project. The WQC contains the following measures: (1) posting the WQC on site; (2) implementing good house keeping practices to manage discarded debris and construction materials; (3) avoid or control the discharge of suspended solids from construction activities and removal of riparian vegetation; (4) developing a storm water pollution prevention plan for construction activities which disturb one acre or more; (5) avoid or control the discharge of nutrients from construction activities; (6) avoid or control the discharge of bacteria from wastewater; and (7) avoid or control the discharge of toxic substances such as oil or grease from construction activities; and (8) submitting a project water quality protection plan to the Kansas DHE which addresses minimizing disturbance or removal of riparian/wetland areas, proper disposal of solid wastes and human wastes, proper storage of fuels and chemicals, emergency procedures in the event of spills, and stormwater management.

The measures in the WQC implement best management practices which are widely applied in construction to minimize any potential effects of construction on water quality in the project area. Section 401(d) of the CWA provides that the

[4] The 814-foot contour line is irregular at the upstream end of the Bowersock Millpond; therefore, the boundary at this location extends from the most upstream section of the 814-foot contour on the north side of the river, and crosses the river to include the mouth of Baldwin Creek on the south side of the river.

certification shall become a condition of any federal license that authorizes construction or operation of the project.[5]

2.2.6 Project Safety

Under an original hydropower license, the proposed project would be subject to the Commission's project safety requirements. As part of the licensing process, Commission staff would evaluate the adequacy of the proposed project facilities. Special articles would be included in any license issued, as appropriate. Before the project is constructed, engineers from the Commission's Chicago Regional Office and the Corps would review the designs, plans, and specifications of the proposed intake structure, penstock, powerhouse, and other structures. During construction, engineers from the Commission and the Corps would frequently inspect the project to assure adherence to approved plans and specifications, special license articles relating to construction, operation, and maintenance, and accepted engineering practices and procedures. Once construction is complete and the project enters the operation phase, Commission engineers would inspect it on a regular basis.

2.3 STAFF ALTERNATIVE

The staff alternative, in addition to Bowersock's proposed measures, includes: (1) developing a project operation monitoring plan; (2) developing a recreation plan which would include a safety assessment of the canoe put-in at the tailrace of the north powerhouse; (3) developing an erosion and sediment control plan for project construction; and (4) a provision to address any future effects on previously unidentified cultural resources within the project boundary. The proposed and recommended measures are discussed under the appropriate resource sections and summarized in Section 5 of the EA.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

We considered several alternatives to Bowersock's proposal, but eliminated them from further analysis because they were not practicable in the circumstances of this case, would not meet all the purposes of the proposed project, and would not have less adverse impacts on the environment than the proposed project. In addition, these alternatives did not meet the evaluation of compliance with the section 404(b)(1) guidelines as required in the Corps permitting process. Alternatives eliminated from further consideration include:

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[5] 33 U.S.C. § 1341(d) (2006).

(1) Developing hydropower at another site. No party has suggested developing hydropower at another location and we have no basis for concluding another location would be more appropriate. This alternative is not feasible because it would require constructing a new dam on the Kansas River. The proposed project would minimize potential impacts by utilizing an existing dam which currently serves multiple purposes including generating hydroelectric electricity from the existing south powerhouse, protecting the bridge piers upstream of the project from erosion, and creating the Bowersock Millpond which provides public recreation and a source of water for the city of Lawrence.

(2) Constructing one large powerhouse to replace the existing south powerhouse. This alternative is not feasible because it would require demolition of the existing powerhouse and construction of a larger structure which would necessitate reconfiguration of the dam. The proposed north powerhouse would utilize the footprint of the existing gates in the north section of the dam, provide an opportunity to replace the outdated gates with more efficient roller gates, and provide an opportunity to develop public access on the north side of the river.

3.0 ENVIRONMENTAL ANALYSIS

This section includes: (1) a general description of the project vicinity, (2) an explanation of the scope of our cumulative effects analysis, and (3) our analysis of the proposed action and other recommended environmental measures. Sections are organized by resource area (aquatics, recreation, etc.). Under each resource area, existing conditions are first described. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives.

Staff conclusions and recommended measures are discussed in section 5.2, Comprehensive Development and Recommended Alternative of the EA.[6]

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

A description of the Kansas River Basin is provided in section 2.1.1, *General Area*.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality's regulations for implementing National Environmental Policy Act (40 C.F.R. §1508.7), a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over time, including hydropower and other land and water development activities.

We have not identified any resources that would be cumulatively affected by constructing and operating the project. The project would be connected to an existing, operating dam and powerhouse and would utilize flows in the same manner as the existing project (i.e. run-of-river operation). In addition, no other hydropower projects are located nearby and other developmental activities are far enough away from the

[6] Unless otherwise indicated, our information is taken from the application for license filed by Bowersock (Bowersock, 2010a).

project such that we do not expect that they would cumulatively interact with the project.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the site-specific environmental issues.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EA. Several resource areas are not discussed in this EA because staff determined that they would not be significantly affected. Socioeconomic resources are not assessed because constructing and operating the project would not involve a large numbers of workers, and local infrastructure such as schools, hospitals, lodging, and service businesses would not be significantly affected. Terrestrial resources would not be affected because the project is located in an industrial area with little or no vegetation. In addition, raising the water surface elevation of the millpond by 1.5 feet would not affect terrestrial resources because the new elevation would remain within the existing high water mark and no new vegetation would be inundated. Aesthetics are not assessed because the project is in an industrial urban area. Geology and Soils, Aquatic Resources, Threatened and Endangered Species, Recreation, Cultural Resources, Navigation, Traffic and Transportation Patterns, and Land Use are discussed below. We present our recommendations in section 5.2, *Comprehensive Development and Recommended Alternative*.

3.3.1 Geology and Soils Resources

Affected Environment

Construction of the proposed intake structure, powerhouse, tailrace, transmission line, roller gate, fishing deck, canoe portage, and resurfacing trails along the portage would occur within and adjacent to the Kansas River, which would require ground-disturbing activities and some excavation of the streambed. This could cause bank erosion, stream sedimentation, and disturbance of streambed material and re-suspension of sediments.

Sediment and erosion impacts could also occur both upstream and downstream of the Bowersock dam through changes in the flow regime by increasing the normal pool elevation of the millpond from 812 feet to 813.5 feet NGVD. Downstream erosive potential could increase due to the volume of additional water as well as higher water velocity present during periods of high flow when the flashboards are overtopped. Currently, the flashboard system collapses at 7,000 cfs. In the applicant's proposal the

new flashboards will collapse at 18,000 cfs, creating a potential for increased downstream velocities during high flow periods.

Higher levels of bank saturation created by the increase of water elevation in the millpond could also result in potential increases in bank erosion. River bank saturation at a higher river level than has been present combined with subsequent rapid fluctuation of the river level may produce accelerated bank sloughing in the millpond.

Environmental Effects

Construction Effects: To minimize ground disturbance in the project area, Bowersock proposes to locate the new powerhouse on the existing dam. Seven spillway gates would be removed to make way for the new powerhouse and roller gate. The footprint of the powerhouse is expected to be smaller than the existing footprint of the spillway gates. For construction and maintenance, the project would utilize existing roads and an existing stockpile/staging area historically used for maintenance of the Bowersock dam. The stockpile/staging area is located on the north bank of the Kansas River adjacent to the proposed north powerhouse. The proposed new transmission line would be placed along the side of an existing bridge, thus no new land would be disturbed. Construction activities would be limited to an area less than 1 acre which has been previously disturbed. The canoe portage would utilize existing trails which would be resurfaced in gravel.

Downstream Effects: Water flows in the Kansas River at the Lecompton gauge station, which pass through the project site, can range from 36,600 cfs in a 1-year storm to as much as 240,000 cfs in a 100-year storm (Bowersock 2010a, Appendix F, HEC-RAS Model). Less than a 1-year storm event within the river will cause the flashboards to be overtopped. As indicated by the flow data, from January 2010 to July 2010, flow in the project area would have exceeded 18,000 cfs, causing the flashboards to fall, as many as five times (USGS, Lecompton Stream Gauge Data).

Bowersock uses both operational and passive systems to manage downstream outflow. The existing south powerhouse and the proposed north powerhouse would operate as run-of-river plants. During periods of higher flow, additional turbines are brought on-line. Once all turbines are online and river flows are still increasing, the gates are opened to pass the additional water while maintaining the millpond at normal pool (currently at elevation 812 feet NGVD and proposed at elevation 813.5 feet NGVD) so that the non-automated flashboards do not fall. When all gates are fully opened, including the Obermeyer automated gates, the ability to operationally manage the release of water is exhausted and the non-automated flashboards begin to be overtopped and start falling one at a time, with the weakest board first, etc. Each time one of the eight-foot-long flashboards fall, between 200 and 250 cfs is released and the

millpond declines in elevation in a small incremental amount. If flows are no longer increasing, then no additional flashboards will fall. However, if flows continue to rise, all remaining flashboards will fall, creating a full opening across the dam width to pass water from upstream to downstream.

Upstream Effects: Upstream of Bowersock Dam the reach of the Kansas River is relatively stable with very little bank instability and little evidence of bed degradation (Corps 1990). The dam is an effective channel control. Similar to the Johnson County weir, the Bowersock Dam has prevented degradation that appears to be occurring in the downstream reaches. The structure acts as vertical grade control and has limited the response of the fluvial system to outside influences by fixing the channel at the point of the structure. In turn, this has had a localized stabilizing effect by limiting degradation, lateral migration, and bank erosion.

Soils within the site are classified as Eudora silt-loam complex and are frequently flooded fluvents with a low erodibility rating. These soils have a drainage class of moderately well drained and are partially hydric. They are comprised of silt-loam to a depth of 48 inches with a very fine sandy loam at greater depths. The channel banks tend to be relatively low in the project area. Along the federally constructed levee, the streambanks have a 5:1 slope, with low-lying floodplain inside the levee exhibiting a 30:1 slope. Along the south side of the river, the banks have an approximate 3:1 slope until reaching the overbank areas of the floodplain where the steepness shallows to a 30:1 slope.

Staff Analysis

Constructing the new powerhouse on top of the existing dam, placement of the new transmission line, constructing a canoe portage and fishing deck, and resurfacing existing trails accessing the canoe portage could cause short-term erosion and sedimentation, and contamination of the nearby soils and Kansas River due to hazardous material spills. Implementing the types of measures proposed by Bowersock would ensure that construction and operation related activities do not significantly affect the soil and water resources in the proposed project area.

To further minimize the risk of soils and aquatic resources being contaminated by potentially hazardous materials during construction activities, an erosion and sedimentation control plan should be developed which includes best management practices, such as: (1) a project site plan showing the location of cofferdam dams, rip rap, staked hay bales, geo-textile silt fence areas, excavated material stockpile area, and a temporary siltation catch basin; (2) designating specific sites for fuel storage and fueling vehicles; (3) disposing of all waste material properly; and (4) maintaining on-site sanitary facilities. Providing such detail in the erosion and sediment control plan

would help ensure erosion and sedimentation and hazardous material entering the river is minimized during proposed project construction and operation.

As described above, operational practices would be employed to manage passage of flow at the Bowersock dam without releasing a surge of water during small storm events. For storm events that create flows exceeding 18,000 cfs, causing the flashboards to lower, the release of the initial millpond water downstream is quickly eclipsed by the following peak discharge as flow in the river rises and crests. A modeled 1-year event on the river may produce 36,000 cfs which is more than double the amount that typically would cause the flashboards to collapse. As noted above, high flows have been commonly observed within the river. Because of the operational practices to mitigate energy dissipation to 18,000 cfs, and the fact the river commonly encounters larger flows, we anticipate there would be a negligible increase in downstream erosion potential as a result of project activities.

Because of: (1) the present and historic stability of the reach upstream of the dam; (2) the limited increase in the millpond elevation that would be maintained within the channel banks; (3) the low soil erodibility factor and classification; and (4) the fact the dam itself is an effective channel control, we anticipate no additional adverse effects of accelerated bank erosion in the millpond due to increasing the elevation to 813.5 feet NGVD. High flows exceeding 813.5 feet, and subsequent fluctuating low flows, have been present in this channel reach without significant impacts on the morphology and cross sectional geometry of this relatively stable reach of the river.

3.3.2 Aquatic Resources

Affected Environment

Water Quantity

Water flows in the Kansas River at Bowersock dam are primarily regulated by three Corps reservoirs located in the headwaters of the Kansas River (i.e., Perry Lake, Tuttle Creek Lake, and Milford Lake). Flows in the project area are measured at U.S. Geological Survey (USGS) Gage No. 06891000, located in the Kansas River at Lecompton Kansas, which is 8.5 miles upstream of the Bowersock dam. For the 39-year period of record (January 1969 through December 2008), mean monthly flows have ranged from a low of 2,680 cfs in January, to a high of 12,900 cfs in June. Based on the annual flow duration curve, 12,800 cfs is exceeded 10% of the time, 2,560 cfs is exceeded 50% of the time, and 1,000 cfs is exceeded 90% of the time.

The hydraulic capacity for the proposed project is 5,395 cfs, which would be available about 25% of the time.

Effect of Construction on the Kansas River

Bowersock has designed the project to avoid and minimize impacts to the Kansas River. Permanent impacts have been avoided by locating the new powerhouse in a previously disturbed area and confining new structures within the footprint of the existing spillway. The current footprint of the existing spillway is 0.48 acre and the proposed new powerhouse and facilities would impact approximately 0.37 acre. As proposed, total impacts within the Kansas River at the Bowersock Dam would be reduced by 0.11 acre under this alternative.

In order to construct the powerhouse and appurtenances, a temporary coffer dam is proposed to protect against river flooding during the construction phase. The cofferdam would dewater approximately 1.0 acre and consist of clean fill. Excess fill material resulting from construction activities would be disposed in an upland containment area. Erosion and sediment controls and best management practices would be employed during construction activities.

Aquatic Biota

The fisheries in the Kansas River are typical for Midwestern warm-water rivers. Bowersock identified 55 fish species that occur in the vicinity of the Bowersock dam. These species include common sportfish such as white bass, largemouth bass, rock bass, white crappie, black crappie, walleye, sauger, freshwater drum, and channel catfish. Some of the more unusual species include shovelnose sturgeon, longnose gar, and shortnose gar. Also present are a variety of minnows, chubs, shiners, carpsuckers, buffalo, and sunfish. Gizzard shad are a predominant forage species.

Special Aquatic Sites and Wetlands

No wetlands or special aquatic sites would be impacted within the project boundary.

Environmental Effects

Potential for Increased Flooding

Bowersock proposes to raise the existing flashboards from 4-foot-high to 5.5-foot-high, thereby raising the water surface elevation of Bowersock Millpond from 812 feet NGVD to 813.5 feet NGVD. Increasing the normal water surface elevation by 1.5 feet could increase the potential for flooding upstream of the project.

Bowersock conducted a study (see Bowersock 2010a, Appendix F) to evaluate the effect of higher pond elevations on water levels in the Kansas River upstream of the

Bowersock dam, and in Baldwin Creek which is located 3.63 miles upstream of the Bowersock dam. Parts of the Kansas River and the Baldwin Creek area periodically experience flooding and the proposed project could exacerbate the existing flooding. Bowersock's study shows that Bowersock Millpond is currently 329 acres and extends 3.3 miles upstream when the 4-foot flashboards are up. Increasing the flashboards by 1.5 feet would have a minor effect, increasing Bowersock Millpond to 423 acres and extending it 3.8 miles upstream of the dam. More importantly, at 813.5 feet NGVD, the Bowersock Millpond is well within the normal bank full levels, which are in the range of 816 to 818 feet NGVD; thus, Bowersock's proposal would not inundate any new lands. The study also shows that the proposed project would raise water surface elevations in Baldwin Creek by 1 foot during normal flow periods, but would not cause or contribute to flooding along Baldwin Creek during high flows. When the Kansas River is high enough to flood land along lower Baldwin Creek, the Bowersock flashboards would be down and the millpond elevation would be regulated by the crest elevation of the existing Bowersock dam. The flashboards are designed to fall at 814 feet NGVD, whereas the Baldwin Creek channel banks extend to 819 feet NGVD.

Staff Analysis

Staff reviewed the study results and conclude that the proposed project would slightly increase normal water surface elevations in Baldwin Creek during normal flows. However, the project flashboards would fall long before flood levels are reached in Baldwin Creek, thus the project is not likely to increase flooding in Baldwin Creek. Impacts from the flashboard height would be minor and the proposed height would maintain millpond levels within the bank level. The way they are designed to collapse when overtopped does not provide the potential to increase overbank flows upstream beyond the existing conditions in high water conditions. Similarly, the project would extend the Bowersock Millpond by less than 2,500 feet, thus having a small effect on the size of the millpond. More importantly, the proposed project would increase the hydraulic capacity of the development and provide more control over flow releases. The automated roller gate and water surface monitors would provide greater flexibility in releasing high flows than is possible with the manually operated system. The proposed project has the potential to provide better control of high flows.

Flows Downstream of the Project

The Corps is concerned about maintaining adequate flows below the project during all stages of operation. Multipurpose storage in Milford, Tuttle Creek, and Perry reservoirs is managed by the Corps to maintain downstream flows for water quality, water supply, and for downstream navigation during periods of drought or low flow. Specifically, per an agreement with the State of Kansas, the Corps must maintain flow downstream of DeSoto (Kansas River Mile 31) at 1,000 cfs to meet water quality and

water supply needs. Additionally, during periods of drought or when upstream conditions warrant, the Corps, Kansas City District may be required to provide a supplemental source of water to support navigation on the Missouri River. The actual flow targets are prescribed by the Omaha Reservoir Control Center (RCC) and identified in the Corp's Missouri River Mainstem Master Water Control Manual, dated March 2004. The mainstem Missouri River reservoirs, through Gavins Point Dam, serve as the primary source of supplemental water on the Missouri River, but other tributary reservoirs (in particular, Milford, Tuttle Creek, and Perry lakes, each located upstream of the proposed project) can be used to assist in meeting this downstream flow target.

Staff Analysis

The proposed project would operate in a run-of-river mode. Fluctuation of the millpond water surface elevation would be minimized by maintaining a discharge from the project so that, at any point in time, flows, as measured immediately downstream of the project, approximate the sum of inflows to the project millpond as measured by hourly water surface elevations.

The flashboards would be designed to collapse during flood conditions, when inflows exceed 18,000 cfs. The flashboards could be reset and the millpond refilled when inflows reach 8,500 cfs; thus, adequate inflows are available to maintain downstream flow targets while the millpond is being refilled. The initial filling of the millpond would require approval by the Commission, and could be scheduled as not to occur during a low-flow period.

Under the Staff Alternative, staff recommends Bowersock file a project operations monitoring plan to ensure compliance with run-of-river operation. The plan would include procedures for refilling the millpond in the event of flashboard collapse, while maintaining adequate flows downstream during refill to maintain aquatic resources. Bowersock should prepare the plan after consultation with the Kansas Department of Health and Environment, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service.

Effect on Fish Populations

The proposed project operation could affect downstream flows and aquatic resources downstream of the project as well as aquatic resources in the millpond. The exempted project currently operates in run-of-river mode and the proposed project would operate similarly. When the proposed project is operating, the stream flow volume would remain unchanged when compared to existing conditions. Thus, the existing water quality and the aquatic community located downstream of the project should exhibit similar, if not identical, conditions. Bowersock Millpond would be

raised 1.5 feet above current conditions; however, the pond elevations would remain within the existing banks. The frequency of fluctuations in the millpond elevations are expected to decrease because of improved control of flow releases through the new powerhouse and new roller gates. In addition, the frequency of flashboard failure will decrease. The proposed 5.5-foot-high flashboards are designed to collapse during high flows when river flows reach 18,000 cfs, which occurs about 8% of the time. This is an improvement over current conditions in which flashboards collapse at 7,000 cfs, which occurs 20% of the time.

The proposed project could affect fisheries in the project area through entrainment or impingement. Currently, fish move from Bowersock Millpond downstream via the spillway or through the turbines in the south powerhouse. Once the north powerhouse is constructed, fish could also be vulnerable to turbine entrainment or impingement at the north powerhouse. Currently, a maximum of 2,000 cfs could pass through the south powerhouse. An additional 3,395 cfs could pass through the north powerhouse when constructed.

To protect fish from impingement or entrainment, Bowersock proposes dimensions of its intake structure so that water velocities at maximum hydraulic capacity do not exceed 1 foot per second. There are no species documented in the impoundment that require passage around the dam to complete their life history requirements. Most of the fish species documented in the impoundment are not pelagic species, but rather prefer benthic habitats or depth, substrate, and cover habitat that is most abundant near the shoreline. Exceptions to this include gizzard shad, green sunfish, and bluegill, three highly fecund and abundant species whose populations would not likely be adversely affected by some degree of entrainment loss.

During project operation, some fish would be entrained and some of those fish would be injured or killed. However, fish survival through turbines operated in the hydraulic head range proposed by Bowersock would probably be in excess of 90%, based on results of numerous other turbine survival studies (EPRI 1997; Winchell et al. 2000). Fish movement would continue to occur by means of spillage at gates in the dam and turbine passage. However, over 90% of the fish that are entrained are expected to survive and would therefore contribute to the downstream fish community.

Staff Analysis

An abundant population of fish has been maintained in the project area with operation of the existing exempted hydropower project. Because of the proposed intake design, the characteristics of the impoundment fish community, hydraulic head, and turbine types, the expanded project is unlikely to have a significant adverse effect on Bowersock Millpond or Kansas River fish communities. Any fish entrained at the

project are likely to be abundant species with high reproductive rates. Survival of entrained fish is likely to exceed 90% so that the majority of entrained fish would contribute to the downstream fish community.

Fish Movement

The proposed project would utilize an existing dam which would continue to deter fish movement upstream of the project in the Kansas River. The Kansas DWP (undated letter included with the license application) indicated that fish passage is discouraged at this time due to the desire to impede the spread of non-native fish species. The Bowersock dam currently serves as a barrier to the spread of the Asian carp. In the event that management objectives change, the Kansas DWP recommended that the project be designed to incorporate aquatic organism passage in the future.

Staff Analysis

Interior requested a reservation of authority to prescribe fish passage in the future, should the circumstances warrant fish passage. As discussed in section 1.3.1.1 *Section 18 Fishway Prescriptions*, staff recommends that any license issued for the Expanded Kansas River Project include such reservation of authority. Staff also recommends that, in the event Interior prescribes fish passage for the Expanded Kansas River Project, Bowersock consult with the Kansas DWP and Interior in developing an appropriate fish passage design.

Rare Species

State listed species within the proposed boundary of the project include the flathead chub (*Platygobio gracilis*) and sturgeon chub (*Macrhybopsis gelida*). Both species are state protected under the Kansas Nongame and Endangered Species Conservation Act. Kansas DWP noted (undated letter filed with the license application) that state-designated critical habitat for the flathead chub and sturgeon chub occurs where the proposed construction would take place, and that Bowersock is required to obtain a permit from Kansas DWP for construction of the north powerhouse. Kansas DWP noted that permit conditions for the proposed construction would include spawning date restrictions and best management practices for erosion control.

On July 9, 2007, the bald eagle was removed from protection under ESA, but it remains protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (Interior, 2010). Respective to Kansas, the bald eagle was state threatened and protected by the Kansas Nongame and Endangered Species Conservation Act, but has been delisted (Kansas DWP, 2010). The species typically nests in large trees or snags, within close proximity of large bodies of open water, which provide suitable foraging habitat.

Staff Analysis

The proposed construction could cause sedimentation, which in turn could affect aquatic habitat, including spawning habitat, for flathead and sturgeon chubs. To minimize project-related effects to flathead and sturgeon chubs, Bowersock should develop, and file for Commission approval, a sediment and erosion control plan for all project construction, including the new powerhouse. This plan should include monitoring of sedimentation and erosion, and restrictions on construction during the critical spawning dates for the flathead chub and sturgeon chub. In addition, the Commission's standard articles require that Bowersock acquire all necessary permits before construction begins, which would include a permit from the Kansas DWP.

No information about bald eagle activity within the vicinity of the proposed project area was reported in the license application, and no resource agency or other stakeholder raised concerns about potential effects of the proposed projects on the bald eagle. Because the proposed project would operate in a run-of-river mode, and because reservoir fluctuations would not cause any new inundations of suitable habitat for the bald eagle, it is unlikely that the project would affect the bald eagle.

3.3.3 Threatened and Endangered Species

Affected Environment

Staff, using the FWS's Information, Planning and Conservation System website, generated a list of four species potentially occurring in Douglas County, Kansas. The listed species included two fish species, the pallid sturgeon (*Scaphirhynchus albus)* and the Topeka shiner *(Notropis topeka)*, and two plant species, Mead's milkweed *(Asclepias meadii)* and western prairie fringed orchid (*Platanthera praeclara)*. Staff eliminated the Topeka shiner, Mead's milkweed, and western prairie fringed orchid due to lack of suitable habitat within the proposed project boundary.

In its letter filed on June 22, 2009, the FWS identified the federally listed pallid sturgeon as potentially occurring within the project boundary because it has been identified in Douglas County, Kansas. The pallid sturgeon was documented in the vicinity of the proposed project during a flood event that occurred in 1951. This historical record is the only record of the pallid sturgeon within the vicinity of the proposed project. This is a large sturgeon that utilizes main channels of large, free-flowing turbid rivers with swift currents, with rocky or sandy substrates (Kansas DWP, 2010).

The Kansas River, from the Bowersock Dam to the mouth, is considered a moderate priority management area for pallid sturgeon by the FWS. By letter filed June 10, 2010, Interior noted the presence of pallid sturgeon in the Kansas River up to River

Mile 11 near the Johnson County weir, which is 43 miles downstream of the Bowersock dam which is located at River Mile 54. In 2009, the Missouri Department of Conservation sampled for pallid sturgeon in the Lower Kansas River, from Lawrence, Kansas to the mouth (52 miles). A total of 4 pallid sturgeon were captured below the Johnson County Weir, between River Mile 5.8 and 14.3. All fish were of hatchery origin. No critical habitat has been designated for the pallid sturgeon.

Environmental Effects

Staff Analysis

We find that the proposed project would have no effect on the federally endangered pallid sturgeon and would not destroy or adversely modify any critical habitat. Pallid sturgeon are not located at the project but have been documented to occur 43 miles downstream of the project in the Kansas River. Because the project would continue to operate run-of-river, historical flows in the Kansas River downstream of the project, would essentially remain unchanged. Thus, project operation would not affect the pallid sturgeon or its habitat which may exist downstream of the project. Given the small area disturbed, limited construction activities, and measures to prevent or minimize erosion and sedimentation, constructing the proposed project would not alter aquatic habitat downstream of the project.

3.3.4 Recreation Resources

Affected Environment

The Kansas DWP and the Corps are the primary agencies that provide resource-based recreation in Kansas (Kansas Department of Wildlife and Parks, 2009). Within 25 miles of the proposed project, two Corps-administered reservoirs, Clinton Lake and Perry Lake, offer a variety of recreational opportunities, such as camping, boating, fishing, hiking, observing wildlife, and picnicking. The Clinton Lake Visitor Center provides interpretative displays about the history of the area, Clinton Lake dam, and wildlife of the area. The 30-mile-long Perry Lake National Recreation Trail follows the Perry Lake shoreline and traverses prairies, upland forest, farm fields, and riparian areas. Both lakes provide flood protection and are part of a network of Corps lakes that help control flooding on the Kansas, Missouri, and Mississippi Rivers (U.S. Army Corps of Engineers, 2010).

Near the proposed project and along the Kansas River, recreational opportunities include fishing,[7] observing wildlife, canoeing, kayaking, rowing, hiking, and biking. Recreational fishing occurs in the lower reaches of the Kansas River below Bowersock dam for channel catfish, largemouth bass, freshwater drum, and walleye. Sport fish species in the upper reaches of the river include bluegill, flathead catfish, and black crappie. Seasonal sandbars are often formed on the river downstream, and provide nesting and foraging habitat for migrating shorebirds. Existing public access to the river, approximately 1/4 mile upstream and downstream from Bowersock dam, offers an opportunity to observe wildlife.

Olsson Associates (2009) notes the University of Kansas constructed a $6 million boathouse and crew facility, located approximately 1/2 mile upstream from Bowersock dam. The university's crew team uses Bowersock Millpond for practice and as a competition site. The boathouse and crew facility is located at Burcham Park.

Near the proposed project, the city of Lawrence operates and maintains two public recreation sites, Burcham Park and Riverfront Park, which are located on the opposite shorelines of the Kansas River. Riverfront Park lies between the riverbank and its flood protection levee near River Mile 52.0, and on the left river bank near River Mile 53.0 (Corps 1988). Burcham Park, known for its cottonwood forest, offers a 1/2-mile-long trail to Constant Park, a playground, and restroom facilities. Riverfront Park offers public boat ramps, 10 miles of trails, overlook areas, and picnic areas. At the park, a crushed limestone trail atop the Corps flood protection levee offers recreational users access for hiking and bicycling. Park benches, trash receptacles, and a drinking fountain are located near the trail. Another nearby public recreation site is the 1-acre Robinson Park. In particular, the park has Founder's Rock, which is a large Sioux quartz rock with 143 inscribed pioneer names who, in 1854, settled in the area. The Kansas River near Bowersock dam is rated Class II and Class III.[8]

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[7] Kansas DHE and Kansas DWP have issued revised fish consumption advisories (updated January 13, 2010): The Kansas River from Lawrence (below Bowersock dam) downstream to Eudora at the confluence of the Wakarusa River (Douglas and Levenworth Counties) for bottom-feeding fish (such as channel catfish, freshwater drum, and flathead catfish) because of polychlorinated biphenyls.

[8] The International Scale of River Difficulty defines six classes of whitewater: Class I – easy; Class II – novice; Class III – intermediate; Class IV – advanced; Class V – expert; and Class VI – extreme.

At the proposed project, annual recreation use, measured as a recreation day, is not available, and future recreation use has not been projected (Bowersock Mills and Paper Company, 2010a). Currently, there are no project recreation sites.

Environmental Effects

To enhance recreation resources at the proposed project, Bowersock proposes to: (1) construct a pedestrian footpath from the existing recreation trail underpass to the proposed tailrace fishing deck; (2) construct a 725-foot-long canoe portage trail and canoe take-out approximately 600 feet upstream from the dam in order for boaters to safely pass around the dam; then, boaters would re-enter the river via the new pedestrian footpath and canoe put-in at the tailrace of the dam; (3) construct a 10-foot-long by 20-foot-wide tailrace fishing deck on the north bank of the Kansas River and install a trash receptacle; and (4) install kiosks at the north powerhouse and on the flood protection levee and signage which would contain information about public safety, a description of the project's operation and benefits, the historical elements of the project, and relevant information from the Kansas DWP. In its license application, Bowersock identifies the proposed recreation sites as within the Expanded Kansas River Project boundary.

By letter filed April 5, 2010, the Corps states that design and construction of any feature within the critical zone of the flood protection levee should comply with guidance concerning local protection of levees, and provides a website for this guidance.

Staff Analysis

Kansas River flows at Bowersock dam are primarily regulated by Corps-administered reservoirs upstream from Bowersock dam. The proposed tailrace fishing deck would be located approximately 55 feet from the proposed tailrace and at elevation 798 NGVD. Bowersock (2010b) notes the average elevation of the tailrace would be approximately 792 NGVD. Because water levels in the Kansas River fluctuate significantly the proposed tailrace fishing deck would likely become inundated; however, Bowersock (2010b) concludes that constructing the fishing deck at such an elevation would keep anglers closer to the river at normal river levels, and discourage public access during high flows.

The proposed tailrace fishing deck would be an improvement over existing conditions because anglers currently walk down rip-rap to access the river. Although anglers may continue to fish along the shoreline, the fishing deck would provide a designated site for anglers and therefore, address a public safety concern.

For pedestrians, Bowersock proposes to construct a pedestrian footpath from the existing recreation trail underpass to the new tailrace fishing deck. We note that

Bowersock's conceptual drawings do not identify an estimated length for the pedestrian footpath. For canoeists and kayakers, Bowersock proposes to construct a 725-foot-long canoe portage trail approximately 600 feet upstream from Bowersock dam for boaters to safety pass around the dam. The trail would allow boaters to re-enter the river via the new pedestrian footpath. Additionally, Bowersock proposes to construct a canoe put-in adjacent to the new tailrace fishing deck, and approximately 75 feet from the proposed tailrace of the north powerhouse.

While the canoe portage trail could fulfill a need for trails, as identified by the Kansas State Comprehensive Outdoor Recreation Plan (Kansas Department of Wildlife and Parks, 2009), the proposed location for a canoe put-in appears to be in close proximity to the proposed tailrace of the north powerhouse. Without a yet-to-be constructed north powerhouse, we find it difficult to ascertain the amount of flows to be released into the tailrace and to identify any associated public safety concern.

Bowersock has a responsibility for public safety and to ensure public access under Part 12 and section 2.7, respectively, of the Commission's regulations. Providing two kiosks and signage at the project,[9] would be an effective means of communicating information to the public. One particular sign worth noting is the proposed warning sign titled "WARNING: HYDROPOWER PROJECT IMMEDIATELY DOWNSTREAM," which Bowersock proposes to install near the canoe portage trail. Development of signage at the project would have a direct beneficial effect on the safe recreational experiences of visitors. Providing information at the kiosks may encourage new visitors to the project and fulfill an identified recreation need at the project.

As previously noted, recreation use data is not available; however, the proposed recreation measures are designed to address current and reasonably foreseeable future project-related recreational demand at those sites. The recreation use data collected at 6-year intervals for the Licensed Hydropower Development Recreation Report (Form 80) filing would provide data for assessing site capacity and adjusting recreation resource management practices to meet future recreation needs.

3.3.5 Cultural Resources

Affected Environment

[9] Pursuant to 18 C.F.R. section 8.2 of the Commission's regulations, a licensee is required to post and maintain a conspicuous sign at all points of public access as required by the license.

In the 1800s, pioneers traveled the Oregon and Santa Fe Trails, which traversed parts of the city of Lawrence and Douglas County, Kansas, and settled in the area. The Union Pacific Railroad began work on its Kansas line in 1864 and rails were laid in the city of Lawrence. To provide a source of power for the growing economy of the city, the 665-foot-long Bowersock dam was constructed in 1874 and spanned the Kansas River. At that time, Minnesota and Kansas were the only two states west of the Mississippi that utilized water power. By the mid-1880s, the Douglas County Mills and Delaware Flour Mill, located in Lawrence, relied entirely on water power. By 1885, various mills (such as, flouring and paper) and minor industries (such as, a printing office) utilized this source of power. The Douglas County Mills produced 500 barrels of flour per day (Bowersock Mills and Paper Company, undated).

Since its construction, the dam has undergone periodic modifications (Bowersock Mills and Power Company, 2010a). Located at the south end of the Bowersock dam, the south powerhouse is L-shaped and has been in operation since 1905. The 120-foot-long spillway, constructed circa 1952, is located at the north end of the dam. The gated section of the spillway would be removed and replaced with the north powerhouse.

Today the purposes of the Bowersock dam are: (1) maintaining the water supply for Lawrence, Kansas; (2) generating hydroelectric power at Project No. 2644; (3) recreation; (4) protecting the Kansas Department of Transportation bridge piers; and (5) protecting the sand streambed and sandbars in the upper reaches of the Kansas River (Bowersock Mills and Power Company, 2010a). In its license application, Bowersock states that the Kansas SHPO confirmed the south powerhouse and dam are not listed in the National Register. Further, Bowersock includes a letter dated August 20, 2009, from the Kansas SHPO which determines the proposed project would not adversely affect any property listed in, or eligible for listing in, the National Register.

Staff Analysis

Bowersock does not propose any specific measures for cultural resources. In its license application, Bowersock states that there have been no surveys, inventories, or subsurface testing recommended by the State of Kansas due to the existing disturbed area. Bowersock (2010a) queried the National Park Service and Kansas Historical Society databases to determine whether historic properties occur in the project boundary. The databases did not reveal any such properties.

Based on the best available information, we conclude, as did the Kansas SHPO, that the proposed project would not adversely affect any property listed in, or eligible for listing in, the National Register. Should there be future land-disturbing or ground-disturbing activities associated with any Commission-approved modifications or changes to the project, consultation with the Kansas SHPO, the Corps, and the

Commission staff regarding measures prior to such changes would help to avoid or mitigate any adverse effects on previously unidentified cultural resources.

3.3.6 Navigation

Affected Environment

Historically, the Kansas River and its valley have been avenues of transportation through what would become eastern Kansas. European settlement brought steam navigation to the river in the 1800's; however, the flashy nature of the river and its shallow, braided course during low flows make navigation difficult. Today, the Kansas River is classified as navigable and is a section 10 waterway under the Rivers and Harbors Act, but no commercial navigation operates on its waters. Six dredging companies are currently in operation on the Kansas River in 11 areas.

Staff Analysis

Commercial navigation and dredging operations are not currently present in the project area and are not expected to be future activities. Commercial navigation exists downstream on the Missouri River. Minimum flow requirements, to support navigation on the Missouri River, can be maintained by utilizing flows from the Kansas River and its tributaries. Flow targets related to supporting downstream navigation are addressed in Section 3.3.2, *Aquatic Resources*, of this document. Recreation boating occurs in the area and is anticipated to be enhanced by project-related measures. Recreation resources and recreational boating are discussed in Section 3.3.4, *Recreation Resources*, of this document.

3.3.7 Traffic and Transportation Patterns

Affected Environment

The Massachusetts Street bridge and the I-70 Kansas Turnpike bridge are located immediately upstream of the project. Natural gas pipelines, pipelines carrying refined products, and pipelines carrying liquified petroleum gas, are in the vicinity of the project and are numerous in the Lower Kansas River basin.

Staff Analysis

The project is not likely to cause more than minimal impacts to traffic and transportation patterns. There will be no direct impacts to pipelines or traffic patterns. Minor secondary impacts may increase localized traffic congestion during construction for the movement and transportation of equipment and materials to and from the project worksite.

3.3.8 Land Use

Affected Environment

Land use information obtained from the Mid-America Regional Council (MARC), City of Lawrence Planning Department, Kansas Geographic Information Systems (GIS) and Douglas County identifies the area located along the north side of the Kansas River as institutional, residential, recreational, and commercial. The institutional area applies to the existing Kansas River levee and the area encompassed by Riverfront Park, which includes the public access recreational hiking and bicycling trail along the top of the flood protection levee. The area along the south bank of the Kansas River is identified as institutional, recreational, residential, commercial, and agricultural. Sand and gravel is dredged from the Kansas River immediately below the Bowersock dam at Lawrence, Kansas. The primary local use for sand and gravel is for paving and construction.

Staff Analysis

There will be no anticipated land use changes as a result of this project.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the project's use of the Kansas River for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp*.,[10] the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead Corp*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the cost of individual measures considered in the EA for the protection, mitigation and enhancement of environmental resources affected by the project; (2) the cost of alternative power; (3) the total project cost (i.e. for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

4.1 POWER AND ECONOMIC BENEFITS OF THE PROJECT

Table 2 summarizes the assumptions and economic information we use in our analysis. This information was provided by Bowersock in its license application. We find that the values provided by Bowersock are reasonable for the purposes of our analysis. Cost items common to all alternatives include: taxes and insurance costs; net investment (the total investment in power plant facilities to be depreciated); estimated future capital investment required to maintain and extend the life of plant equipment and facilities; licensing costs; normal operation and maintenance cost; and Commission fees. Throughout this section all dollars are 2010 unless otherwise specified.

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[10] 72 FERC ¶ 61,027 (1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

Table 2. Assumptions for the economic analysis of the proposed project. (Source: Staff and Bowersock, 2010a)

Economic parameter	Value	Sources
Period of analysis	30 years	Staff
Term of financing	20 years	Staff
Inflation and escalation	0 percent	Staff
Interest/discount rate	5.0 percent	Bowersock
Cost of capital	5.0 percent	Bowersock
Federal tax rate	34 percent	Staff
State tax	0 percent	Bowersock
Net investment [a]	$20,601,150	Bowersock
Annual Operation and Maintenance [b]	$823,000	Bowersock
Average annual generation (MWh)	32,726 MWh	Bowersock
Energy rate	$70/MWh [c]	Staff
Capacity rate	NA [d]	Staff
Energy and capacity value	NA	Staff

[a] Net investment includes $20,468,650 total capital cost to construct the project and $132,500 to develop the license application.

[b] Annual O&M cost includes insurance, Commission and management fees.

[c] Under its current sales contract, Bowersock receives $0.05/KWh for energy generated. Bowersock expects to renegotiate a contract based current prices in the region, which is approximately $0.07/KWh.

[d] The project would operate run-of-river and no capacity benefits are expected.

4.2 COMPARISON OF ALTERNATIVES

Table 3 summarizes the installed capacity, annual generation, cost of alternative power, estimated total project cost, and difference between the cost of alternative power and total project cost for each of the alternatives considered in this EA: no-action, the applicant's proposal, and the staff alternative.

Table 3. Summary of the annual cost of alternative power and annual project cost for three alternatives for the Expanded Kansas River Project (Source: staff).

	No Action	**Bowersock's Proposal**	**Staff Alternative**
Installed capacity (MW)	2.14	6.5	6.5
Annual generation (MWh)	11,448	32,726	32,726
Annual cost of alternative power ($/MWh)	$801,000 70.00	$2,291,000 70.00	$2,291,000 70.00
Annual project cost ($/MWh)	$509,000 44.5	$2,526,000 77.19	$2,526,000 77.19
Difference between the cost of alternative power and project cost ($/MWh)	$292,000 25.5	($235,000)[a] (7.19)[a]	($235,000)[a] (7.19)[a]

a A number in parenthesis denotes that the difference between the cost of alternative power and project cost is negative, thus the total project cost is greater than the cost of alternative power.

4.2.1 No-action Alternative

Under the no-action alternative, the project would continue to operate as it does now. The project would have an installed capacity of 2.14 MW, and generate an average of 11,448 MWh of electricity annually. The average annual cost of alternative power would be $801,000, or about $70/MWh. The average annual project cost would be $509,000, or about $44.5/MWh. Overall, the project would produce power at a cost that is $292,000, or $25.5/MWh, less than the cost of alternative power.

4.2.2 Power and Economic Benefits of the Proposed Alternative

Bowersock proposes to construct a new powerhouse and construct recreation facilities. The new powerhouse would increase the project's installed capacity to 6.5

MW, and generate an average of 32,726 MWh of electricity annually. The average annual cost of alternative power would be $2,291,000, or about $70/MWh. Construction costs and the cost of environmental measures would be about $20,601,000 and annual O&M would be $823,000. In total, the average annual project cost would be $2,526,000, or about $77.9/MWh. Overall, the project would produce power at a cost that is $235,000, or $7.19/MWh, more than the cost of alternative power.

4.2.3 Power and Economic Benefits of the Staff-recommended Alternative

The staff alternative includes the same developmental proposal as Bowersock's proposal and, therefore, would have the same energy attributes. Table 4 shows the staff-recommended additions or modifications to Bowersock's proposed measures. The estimated costs of these additional measures is either negligible or may be included in contingency costs already included in the construction costs. Overall, the project would produce power at a cost the same as proposed by Bowersock.

Staff's analysis shows that the cost of constructing the project would be slightly greater than the cost of alternative power; however, staff's analysis does not include approximately $80,000 per year in renewable energy credits which may be available in Kansas, nor other financial incentives which may be available to developing green energy in the region. In addition, our economic analysis is conducted for a 30-year period of analysis and 20-year period of financing which can affect overall costs. Although our analysis shows that the project as recommended would cost more to operate than our estimated cost of alternative power, it is the applicant who must decide whether to accept a license and any financial risk that entails.

Although staff does not explicitly account for the effects inflation may have on the future cost of electricity, the fact that hydropower generation is relatively insensitive to inflation compared to fossil fueled generators is an important economic consideration for power producers and the consumers they serve. This is one reason project economics is only one of the many public interest factors the Commission considers in determining whether or not, and under what conditions, to issue a license.

4.3 COST OF ENVIRONMENTAL MEASURES

Table 4 gives the cost of each of the environmental measures considered in our analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table 4. Cost of environmental mitigation and protection measures considered in assessing the environmental effects to operate the project. (Source: Staff and Bowersock)

Environmental Enhancement Measures	Recommending Entities	Capital Cost	O&M cost	Levelized Annual Cost
Geology and Soils Resources				
Develop and implement an erosion/sediment control plan.	Staff	N/A [a]	N/A [a]	N/A [a]
Aquatic Resources				
Operate the project in a run-of-river mode and develop a project operations and flow monitoring plan.	Bowersock, Staff	$0	$0	$0
Recreation Resources				
Construct a footpath, canoe portage trail, tailrace fishing deck with a trash receptacle, and a canoe put-in; install signage and two kiosks. Develop and implement a recreation plan.	Bowersock Staff	$37,000 N/A [c]	N/A [b] N/A	$2,000 N/A
Cultural Resources				
Consult with agencies regarding measures for previously unidentified cultural resources.	Staff	N/A	N/A	N/A

[a] The capital cost and O&M cost to develop and implement the plan is included in the overall development costs.

[b] The O&M cost to maintain the recreation sites is included in the overall project O&M costs.

[c] The cost for developing the recreation plan is included in the cost for constructing the recreation sites.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPARISON OF ALTERNATIVES

In this section, we compare the developmental and non-developmental effects of Bowersock's proposal as modified by staff, with the no-action alternative. Annual generation under the staff alternative would be 32,726 MWh, and under the no action alternative annual generation would be 11,448 MWh. We summarize the environmental effects of the different alternatives below.

Geology and Soils Resources – Staff's recommendation to develop and implement an erosion and sediment control plan is consistent with Bowersock's proposal to implement best management practices during project construction. The erosion and sediment control plan would provide protection for soil disturbance and help prevent sediments from reaching the Kansas River and affecting water quality during construction.

Aquatic Resources – Bowersock proposes to operate the project run-of-river. No additional measures have been recommended by the resource agencies. The run-of-river flows from the proposed project would be identical to the flows that have been released in the past that have helped to maintain the existing fishery in the Kansas River. Run-of-river operation would protect water quality, quantity, and fishery resources in the Kansas River downstream of the powerhouse. Staff's recommended project operations and flow monitoring plan would establish a framework to periodically confirm that the project is operated in compliance with its license, and provide important data needed for the licensee and resource agencies to evaluate the effects, if any, the required water levels and flows have on aquatic resources. Therefore, the project would, under the proposed flow regime, provide sufficient protection of the fisheries and maintain them at current levels.

Threatened and Endangered Species – We find that the proposed project would have no effect on the federally endangered pallid sturgeon and would not destroy or adversely modify any critical habitat. As stated in our analysis, because the project would continue to operate run-of-river, historical flows in Kansas River downstream of the project, would essentially remain unchanged. Thus, project operation would not affect the pallid sturgeon or its habitat which may exist downstream of the project. Project construction would disturb only a small area on the existing dam and the north bank of the river with little or no vegetation, and the construction period would be a short-term temporary occurrence. Given the small area disturbed, limited construction activities, and measures to prevent erosion and sedimentation during construction, constructing the proposed project would have no effect on any threatened and endangered species which may occur in the area.

Recreation Resources – Under the proposed action, Bowersock would construct the following sites: a pedestrian footpath; a canoe portage trail; a canoe take-out; a canoe put-in; and a tailrace fishing deck. In its license application, Bowersock identifies the recreation sites on its Exhibit G drawings as within the project boundary. Bowersock also proposes to install signage, a kiosk and trash receptacle at the north powerhouse, and a kiosk on the flood protection levee trail.

In staff's analysis, the canoe put-in appears to be in close proximity (an estimated 75 feet) to the proposed tailrace. Without a yet-to-be constructed north powerhouse, staff finds it difficult to ascertain the amount of flows to be released into the tailrace and to identify any associated public safety concern. Under the staff alternative, Bowersock would develop and implement a recreation plan for the project, including a provision to reassess the location for a canoe put-in.

With regard to Bowersock's proposal to install a kiosk on the existing flood protection levee trail, the Corps website provides guidance for the protection of levees. The website states that the detail and content of drawings, specifications, and calculations submitted for Corps review would depend on the proposed project. Bowersock did not provide any details or drawings for either kiosk; therefore, staff recommends the recreation plan include a detailed description, drawings, and specifications for the kiosks. Bowersock should consult with the Corps and the city of Lawrence, which maintains the flood protection levee, for the design and installation of the kiosk on the flood protection levee.

Cultural Resources – The project, as currently proposed, would not adversely affect any properties that are listed or eligible for listing in the National Register. Under the staff alternative, however, any future effects on previously unidentified cultural resources that are located within the project boundary would be addressed.

5.2 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for licensing the Expanded Kansas River Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review and evaluation of the environmental and economic effects of no action, the proposed action, and the proposed action with staff modified measures (staff alternative), we recommend the staff alternative as the preferred alternative. This alternative includes elements of the applicant's proposal and additional staff-recommended measures.

We recommend this alternative because: (1) a hydropower license would allow Bowersock to construct its proposed project and provide a beneficial and dependable source of electric energy; (2) the 6.5 MW of electric energy generated from a renewable resource may offset the use of fossil-fuel, steam-electric generating plants, thereby conserving nonrenewable resources and reducing atmospheric pollution; (3) the public benefits of this alternative would exceed those of the no-action alternative; (4) the recommended measures would protect water quality, fish, historic properties, and would improve recreation opportunities at the project; and (5) this alternative is considered the least damaging practicable alternative on the aquatic ecosystem.

In the following section, we make recommendations as to which environmental measures proposed by Bowersock or recommended by agencies or any other entities should be included in any license issued for the project. In addition to Bowersock's proposed measures, we recommend additional staff-recommended measures be included in any license issued for the project.

Measures Proposed by Bowersock

● Operate the project in run-of-river mode whereby instantaneous outflows from the project approximate instantaneous inflows.

● Maintain the Bowersock Millpond at a target elevation 813.5 feet NGVD, plus or minus 6 inches due to operational constraints.

● Construct the following recreation sites: (1) a pedestrian footpath; (2) a 725-foot-long canoe portage trail; (3) a 10-foot-long by 20-foot-wide tailrace fishing deck with a trash receptacle; and, (4) a canoe put-in and a canoe take-out. Bowersock would also install associated signage, a kiosk at the project north powerhouse, and a kiosk on the flood protection levee trail. The recreation sites would be included within the project boundary.

● Implement best management practices during project construction.

Additional Measures Recommended by Staff

● Develop a project operations and flow monitoring plan to monitor run-of-river operation, millpond elevations, flows through the north and south powerhouses, and flows passed to the project tailrace during periods of refilling the millpond.

● Develop an erosion and sediment control plan for project construction which incorporates best management practices.

● Develop and implement a recreation plan that also includes a provision to reassess the location for the canoe put-in at the tailrace of the north powerhouse.

● Consult with the Kansas SHPO, the Corps, and Commission staff prior to any future land-clearing or ground-disturbing activities within the project boundary to avoid or mitigate effects on previously unidentified cultural resources.

The following is a discussion of the basis for the recommended measures.

Project Operations and Compliance Monitoring Plan

Bowersock proposes to operate the project in run-of-river mode, similar to the exempted project currently operating at the site. Therefore, there would be no change in river flows. Maintaining run-of-river operation would continue to protect water quality, aquatic biota, aquatic habitat, and support downstream navigation needs to same extent they are protected now, by minimizing fluctuations of water surface levels both upstream and downstream of the project. Therefore, we recommend continuing this mode of operation.

Bowersock proposes to maintain the Bowersock Millpond elevation near the top of wooden flashboards, at 813.5 feet NGVD, plus or minus six inches. The wooden flashboards would be 5.5 feet high and are designed to collapse during high flows. Bowersock's proposal raises the millpond elevation by 1.5 feet; however, water surface elevations would continue to remain within the normal bank full levels, which are in the range of 816 to 818 feet NGVD. Bowersock's proposal would not contribute to flooding upstream of the project because the flashboards are designed to collapse during high flow events. The millpond would continue to provide multiple benefits to the region including: (a) public recreation, (b) providing a source of water for municipal water needs, (c) reducing stream bed degradation in the upper reaches of the Kansas River, and (d) protecting highway bridge piers, located immediately upstream of the project, from erosion. In addition, maintaining the millpond elevation at 813.5 feet NGVD would improve the efficiency of operating the Kaw Water treatment Plant located 2,700 feet upstream of the Bowersock dam. Therefore, we recommend that this

measure be included in any license which may be issued for the Expanded Kansas River Project.

In addition, we recommend that Bowersock develop and implement a project operations and flow monitoring plan, which would include, at a minimum, the equipment and methods to monitor run-of-river operation, monitor water surface elevations in the Bowersock Millpond, and flows passed to the project tailrace. The plan should also include a procedure for refilling the Bowersock Millpond in the event of flashboard collapse, while maintaining adequate flows downstream of the dam during refill to maintain downstream aquatic resources. Such a plan would establish a framework to periodically confirm that the project is operated in compliance with a new license, and provide important data needed for the licensee and the resource agencies to evaluate what effects, if any, the required water levels and flows have on the resources.

Erosion and Sedimentation Control Plan/Monitoring Tailrace for Erosion

Ground disturbing construction-related activities can lead to stream bank erosion and sedimentation and exposure of soils and streams to hazardous materials. Sediment from construction activities and hazardous material spills can be transported downstream and can adversely affect downstream water sources and recreational areas. Sedimentation can also clog stream channels, cover fish spawning areas, and reduce downstream water quality, and hazardous spills can contaminate stream beds, adversely affect water quality, and kill or displace aquatic organisms.

Bowersock proposes to implement best management practices to avoid soil erosion and scour in the tailrace associated with constructing the new powerhouse. The WQC issued by the Kansas DHE requires that Bowersock implement good house keeping practices during project construction as well as submit a water quality protection plan to the Kansas DHE. We recommend developing a detailed soil erosion and sedimentation control plan which includes best management practices, such as: (1) a project site plan showing the location of a cofferdam dam, rip rap, staked hay bales, geo-textile silt fence areas, excavated material stockpile area, and a temporary siltation catch basin; (2) designating specific sites for fuel storage and fueling vehicles; (3) disposing of all waste material properly; (4) maintaining on site sanitary facilities; and (5) reseeding disturbed vegetated areas with native plants once construction is complete. Providing such detail would help ensure erosion and sedimentation and hazardous material entering the river is minimized during proposed project construction and operation.

We recommend that prior to project construction, Bowersock file an erosion and sediment control plan, developed in consultation with the relevant resource agencies, for Commission approval. The cost for developing this plan would be minor and included

in contingency cost already allocated by Bowersock in total project construction and O&M costs.

Recreation Resources

Construction of a pedestrian footpath, a canoe portage trail, and a tailrace fishing deck would create additional opportunities for recreation. Installation of associated signage, a kiosk at the north powerhouse, and a kiosk on the flood protection levee trail would be an effective means of communicating information to the public. Under the staff alternative, Bowersock would develop and implement a recreation plan to include the aforementioned measures. Because these recreation sites would serve a project purpose, the sites should be made project facilities and included within the Expanded Kansas River Project boundary. As discussed in section 3.3.5, we find the benefits of a recreation plan would justify the capital cost of $37,000.

In staff's analysis, we note that the proposed location for the canoe put-in appears to be in close proximity to the proposed tailrace (an estimated 75 feet). Without a yet-to-be constructed north powerhouse we find it difficult to ascertain the pattern of flows to be released into the tailrace and to identify any potential public safety concerns. The staff-recommended recreation plan should include a provision for Bowersock to reassess the location of the canoe put-in. We expect the cost of our additional measure to be nominal because Bowersock could conduct, after consultation with the Kansas DWP, the Corps, and the city of Lawrence, such an assessment during project construction.

Cultural Resources

Staff recommends that any license issued contain a provision requiring Bowersock to consult with the Kansas SHPO, the Corps, and Commission staff prior to undertaking any project-related construction or land-disturbing activities other than those specifically authorized by a license order. We expect the cost of consulting with those entities would be nominal. This measure would ensure that any cultural resources that may be uncovered during future land-clearing or ground-disturbing activities within the project boundary would be protected.

Other Issues

The total authorized nameplate capacity for the exempted Kansas River Project (i.e., south powerhouse) is 2.140 MW.[11] Information filed by Bowersock on May 11, 2010, shows that the nameplate capacity for the existing south powerhouse is slightly less, at 2.105 MW. The generators at the existing south powerhouse have undergone multiple rewinds since 1991; however, the nameplates on the generators were never revised. The proposed nameplate capacity for the north powerhouse is 4.397 MW;[12] thus, the total project capacity could be 6.502 MW, or 6.537 MW depending on which capacity for the south powerhouse is used. For purposes of our analysis, the difference is minor; thus, we estimate the authorized capacity at 6.5 MW for the purpose of this EA. It is not uncommon for minor changes in capacity of new construction based on the availability and specifications of the new generator units which would be installed at the north powerhouse. Any modifications to the installed capacities of the north and south powerhouses should be identified in the final as-built drawings, which we recommend be included in any license issued for this project.

5.3 UNAVOIDABLE ADVERSE EFFECTS

Some fish entrainment mortality may occur at the project; however, this long-term impact is expected to be minor, given the existing condition of the project area fishery. Recreation users, as well as wildlife at the project, may experience temporary and minor disturbance during the construction of project features.

5.4 SUMMARY OF SECTION 10(j) RECOMMENDATIONS

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by the federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

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[11] An order amending the exemption for the Kansas River Project No. P-2644-002, issued June 24, 1991 determined the authorized capacity for the South powerhouse is 2.140 MW. *See* 55 FERC ¶ 62,273 (1991).

[12] We used the lesser of the turbine rating and generator rating to determine the capacity for the generating unit. For the North powerhouse we used a turbine rating of 873.62 kilowatts (kw) for generating units No. 8 and 9, and a generator rating of 1,325 kw for generating units No 10 and 11, for a total rated capacity of 4,397 kw.

Section 10(j) of the FPA states that whenever the Commission finds that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency. No section 10(j) recommendations were filed in response to the ready for environmental analysis notice.

5.5 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA,[13] requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project under section 10(a)(2)(A), federal and state agencies filed seven comprehensive plans that address various resources in Kansas. Of these, staff identified and reviewed four comprehensive plans that are relevant to the Expanded Kansas River Project.[14] No inconsistencies were found.

6.0 FINDING OF NO SIGNIFICANT IMPACT

Licensing the Expanded Kansas River Project as proposed with the additional staff-recommended measures would protect fish and wildlife resources, minimize soil erosion during project construction, improve recreation resources, and protect previously unidentified cultural resources.

Based on our independent analysis, with input from the Corps as a cooperating agency, the issuance of a license for the project, as proposed with additional staff-recommended measures, would not constitute a major federal action significantly affecting the quality of the human environment.

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[13] 16 U.S.C.§803(a)(2)(A)

[14] (1) Department of the Army, Corps of Engineers, Kansas City District. 1988. Feasibility Report - Kansas and Osage Rivers, Kansas. Kansas City, Missouri. December 1988.; (2) Kansas Department of Wildlife and Parks. 2009. Kansas State Comprehensive Outdoor Recreation Plan (SCORP): 2009-2014. Pratt, Kansas. January 2009; (3) U.S. Fish and Wildlife Service. Undated. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.; and (4) U.S. Fish and Wildlife Service. 1986. Whooping Crane Recovery Plan. Department of the Interior, Albuquerque, New Mexico. December 23, 1986.

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8.0 LIST OF PREPARERS

Federal Energy Regulatory Commission

Monte TerHaar – Project Coordinator, Environmental Engineer; (M.S., Environmental in Civil Engineering, M.S. Zoology, Fishery Biology).

Jennifer Adams – Terrestrial Resources, Threatened and Endangered Species; (M.S., Biological Sciences, B.S, Agriculture).

Patti Leppert - Recreation Resources, Cultural Resources (Environmental Protection Specialist; M.A. Recreation and Parks/Biology).

U.S. Army Corps of Engineers

Kale Horton - Regulatory Project Manager; (M.S. Engineering Management, M.S. Environmental Science, B.S. Wildlife Conservation Management).

Appendix A

Water Quality Certificate

KANSAS
DEPARTMENT OF HEALTH AND ENVIRONMENT

Mark Parkinson, Governor
Roderick L. Bremby, Secretary

www.kdheks.gov

April 1, 2010

Jonathan Polak, PE
Environmental Sciences
Olsson Associates
7301 West 133rd Street, Suite 200
Overland Park, KS 66213

Re: Section 401 Water Quality Certification for Federal Energy Regulatory Commission (FERC) Licensing of the Bowersock and Mills Power Company Expanded Kansas River Hydropower Project, (Pre-Application Document for Preliminary Permit No. 13526. (Olsson and Associates #2008-1208)

Dear Mr. Polak:

On January 29, 2010, the Kansas Department of Health and Environment (KDHE) received a request for a Section 401 Water Quality Certification (WQC) from Olsson and Associates on behalf of Bowersock and Mills Power Company for the purpose of meeting licensing requirements by FERC for proposed expansion of its operation on the Kansas River, Lawrence, KS. This 401 WQC will address the operations of the new facility on the north side of the river. The KDHE will also issue a separate 401 WQC for the Section 404 Dredge and Fill Permit for the actual construction.

Project Description: The proposed project for expansion of facilities is located on the Kansas River, on the north side of the river (Longitude -95.23556 and Latitude 38.97723), across from the existing hydroelectric power plant (BMPC South) located in the Southeast Quarter (SE ¼) of the Southwest Quarter (SW ¼) of Section 30, Township 12 South, Range 20 East in Douglas County, Kansas. The physical address for the project site is 546 Massachusetts Street, Lawrence, Kansas 66044.

Bowersock and Mills Power Company is proposing to add two new turbines, operations building and other structures to the north side of the river.

Findings. Based on the information submitted by Olsson and Associates and Bowersock and Mills Power Company and subsequent telephone discussions with the both parties, KDEH has determined the project has the potential to discharge pollutants from the following sources:

1. Construction, grading, scraping, clearing etc.
2. Mechanical fluid spills/leaks; and
3. Operations of the new facility in concert with the existing facility.

If not minimized or otherwise controlled, discharges from these sources will cause impacts to surface waters of the state [KAR 28-16-28b]. The Kansas River is documented in the Kansas Surface Water Register [KAR 28-16-28(g)] as having designated uses of: Primary contact recreation stream segment is by law or written permission of the landowner open to and accessible by the public, domestic water, special aquatic life support (SALU), food procurement, groundwater recharge, industrial, irrigation, livestock watering supplies.

Waters designated as SALU contain designated critical habitat for threatened or endangered species, known populations of threatened or endangered species or uncommon combinations of plants and animals as documented in KAR 28-16-28d(b)(2)(A). To assure quick response to any water quality complaint occurring during the project, Bowersock and Mills Power Company shall submit a project water quality protection plan (see item 6 below) to:

Kansas Department of Health and Environment
Bureau of Water- Watershed Management Section
1000 SW Jackson Street, Ste. 420, Topeka, KS
66612-1367. Attention: Scott Satterthwaite

Pursuant to Clean Water Act Section 401and KAR 28-16-28f (c), the Kansas Department of Health and Environment finds this project will not result in a violation of Kansas Water Quality Standards and hereby issues a Water Quality Certification for execution and subsequent operation of the Bowersock and Mills Power Company (BMPC) expansion project, subject to the following conditions:

KDHE CONDITIONS

1. A copy of this water quality certification shall be posted on site during construction.

2. The BMPC shall implement good housekeeping practices to assure conditions do not cause the following:
   a. Surface waters of the state within and below the project area to contain discarded solid material, including trash, garbage rubbish, offal, grass clippings, discarded building or construction materials,

car bodies, tires, wire and other unwanted or discarded materials [KAR 28-16-28e(b)(3)].

3. The BMPC shall avoid or control the discharge of suspended solids from construction activities and removal of riparian vegetation so that they may not cause:

   a. Surface waters of the state within and below the project to have floating debris, scum, foam, froth and other floating materials directly or indirectly attributable to the project [KAR 28-16-28e(b)(4)].

   b. Surface waters of the state within or below the project to have deposits of sludge or fine solids [KAR 28-16-28e(b)(6)].

   c. Alteration of the natural appearance of surface waters of the state within or below the project by the addition of color-producing or turbidity-producing substances of artificial origin [KAR 28-16-28e(b)(8)].

   d. The concentration of dissolved oxygen in the Kansas River to be lower than 5.0 mg/L.

   e. Addition of suspended solids to the Kansas River in amounts and concentrations that will interfere with the behavior, reproduction, physical habitat, or other factors related to the survival and propagation of aquatic or semi aquatic life or terrestrial wildlife [KAR 28-16-28e(c)(2)(B)].

4. Construction activities disturbing one acre or more are subject to the National Pollutant Discharge Elimination System (N.P.D.E.S.) storm water permit requirements of 40 C.F.R. 122.26. The BMPC shall contact Mr. Larry Hook at 785/296-5549, lhook@kdheks.gov; Bureau of Water - Industrial Programs (BOW IP) for instructions or visit KDHE's website: www.kdheks.gov/stormwater. This permit requires a Stormwater Pollution Prevention Plan (SWP3) be prepared for implementation and be available for submittal to KDHE BOW IP.

5. The BMPC shall avoid or control the discharge of nutrients from construction activities, removal of permanent riparian vegetation, so that the project does not cause:

a. Any surface waters of the state within and below the project to have floating debris, scum, foam, froth and other floating materials directly or indirectly attributable to the project [KAR 28-16-28e(b)(4)].

b. Any surface waters of the state within and below the project to contain taste and odor producing substances at concentrations which interfere with the production of potable water by conventional water treatment processes, impart an unpalatable flavor to edible aquatic or semi-aquatic life or terrestrial wildlife or that result in noticeable odors in the vicinity [KAR 28-16-28e(b)(7)].

c. Alteration of the natural appearance of surface waters of the state within or below the project by the addition of color-producing or turbidity-producing substances of artificial origin [KAR 28-16-28e(b)(8].

d. The introduction of plant nutrients into streams, lakes, or wetlands from artificial sources shall be controlled to prevent the accelerated succession or replacement of aquatic biota or the production of undesirable quantities or kinds of aquatic life [KAR 28-16-28e(c)(2)(A)].

e. The introduction of plant nutrients into surface waters designated for primary or secondary contact recreational use shall be controlled to prevent the development of objectionable concentrations of algae or algal by-products or nuisance growths of submersed, floating, or emergent aquatic vegetation [KAR 28-16-28e(c)(7)(A)].

f. The concentration of dissolved oxygen in the Kansas River to be lower than 5.0 mg/L.

6. BMPC shall avoid or control the discharge of *Escherichia-coli* bacteria from the daily wastewater associated with manned operations and maintenance, so that the project does not cause the *Escherichia-coli* bacteria concentration of the Kansas River to exceed a geometric mean of 427 organisms per 100 milliliters during the period of Apri1 through October 31 and geometric mean of 3,843 organisms per 100 milliliters during the period of November 1 through March 31.

7. The BMPC shall avoid or control the discharge of toxic substances, oil and grease and other fluids from construction activities, so that the project does <u>not</u> cause:

a. Any surface waters of the state within and below the project area to have a public health hazard, nuisance condition or impairments of designated uses [KAR 28-16-28e(b)].

b. Any surface waters of the state within and below the project area to have toxic substances, radioactive isotopes, and infectious microorganisms in concentrations or in combinations that jeopardize the public health or the survival or well-being of livestock, domestic animals, terrestrial wildlife or aquatic or semiaquatic life [KAR 28-16 28e(b)].

c. Any surface waters of the state within and below the project area to have a visible oil and grease film or sheen on the water surface or on submerged substrate or adjoining shore lines, nor have a sludge or emulsion deposit below the water surface of adjoining shorelines [KAR 28-16-28e(b)].

d. The pH in the Kansas River to be below 6.5 or above 8.5.

e. In the Kansas River listed harmful concentrations of any substance alone or in combination with other substances causing toxic, carcinogenic, teratogenic, or mutagenic effects in humans [KAR 28-16-28e(c)(3)(C)].

f. Concentrations of substances that bio-accumulate in the tissues of edible organisms to exceed a cancer risk level of (10^{-6}) in persons consuming organisms taken from the Kansas River [KAR 28-16-28e(c)(4)(B)].

g. The concentration of dissolved oxygen in the Kansas River to be lower than 5.0 mg/L.

8. The water quality protection plan previously referenced on page 2 shall include the water quality protection measure listed below if not already addressed in the SWP3 as described in Condition 4.

a. **Riparian/Wetland Areas**: Minimize removal or disturbance of riparian/wetland areas (areas adjacent to water bodies). KDHE encourages the use of plants consistent with adjoining vegetation materials to minimize impacts from improper handling of fertilizers and pesticides.

b. **Solid Waste**: All waste materials produced by the construction project shall be disposed of in accordance with the provisions of the Kansas solid waste management statutes and regulations (K.S.A. 65-3401 and K.A.R. 28-29-1 et. seq.) or applicable local rules. Good house keeping including personal refuse such as food containers, sacks etc. shall be addressed. Good house keeping practices described above should also be incorporated into operations and management of wetlands and other structures once constructed to the extent practicable.

c. **Fuels: Chemicals and Maintenance Areas**: All fuels and chemicals necessary to complete the project shall be stored in such a manner that accidental spillage is minimized or can be temporarily contained before reaching the water body. Equipment maintenance areas shall also be located in this manner.

d. The applicant has stated the bathrooms will be equipped with composting toilets whose solids will be disposed of compliant with county codes. All other wastewater (grey water, including floor drains) will be deposited into a self contained receptacle and regularly pumped for proper disposal. This is consistent with the requirement to comply with KAR 28-5-1 through 9, Bulletin 4-2 and county codes; and meet local ordinances. The BMPC shall contact the Lawrence-Douglas County Health Department to assure compliance with local codes and ordinances: Mr. Richard Ziesenis, (785) 843-3060, rziesenis@ldchd.lawrence.ks.us.

e. **All stormwater** shall be managed in a manner consistent with local ordinances administered through the City of Lawrence.

f. **Alternatives** to solvents and cleaners should be considered to prevent accidental spills directly to the Kansas River**.**

g. **Materials** used for bank stabilization or armoring shall be free of pollutants likely to wash off into the Kansas River.

h. **Spills:** Should a spill of fuel or discharge of pollutants occur, the local emergency staff should be contacted first by dialing 911. The Kansas Department of Health and Environment shall then be notified immediately: (785) 296-1679 (24 hours a day.) These incidences should also be reported to the National Spill Response Center (1-800*424-8802). Hazardous materials spills and air releases that meet federal reportable quantities must also be reported to Kansas Division of Emergency Management (800-275-0297)."* These reporting numbers shall be posted in several locations around the site. A Spill Prevention and Response Plan

should be prepared. This should include reportable quantity limits (see www.kansas.gov/kdem).

9. This certification does not relieve the BMPC of the responsibility for any discharge into waters of the state. The Kansas Department of Health and Environment retains the option of revoking or revising this certification any time an inappropriate discharge may occur. As provided by K.S.A. 65-171(f), failure to comply with the conditions of this certification may subject the responsible party to fines up to $10,000 per violation with each day the violation occurs constituting a separate violation.

10. If the BMPC believes the conditions of this certification will result in impairment of important social and economic development, the BMPC is advised of the variance provisions of KAR 28-16-28b(jjj) and KAR 28-16-28f(e).

Finally, the location of this activity involving the Kansas River is located within the Lower Kansas River Watershed Restoration and Protection Strategy project area. The Stakeholder Leadership Team has received several certified letters which they have noted. Please keep them informed of your progress by communicating with Mr. Rick Davis at: 785/233-5632, or by emailing to: rdavis@kaws.org.

Questions concerning this certification may be directed to Mr. Scott Satterthwaite, 785-296-5573 or by email at: ssattert@kdhe.state.ks.us.

Sincerely,

Scott L. Satterthwaite, M.S.
Non-point Source Pollution Control Specialist
Bureau of Water-Watershed Management Section

EC: KDHE-Hook, Reed, Carlson
KDHE NEDO- Rowlands
KDA-DWR, Matt Scherer
EPA- Catherine Holsten
USF&WS- Susan Blackford
KDWP- James Larson
US ACE- Kayle Horton
Rick Davis- KAWS
Richard Ziesenis- Lawrence-Douglas County Health Department
Sarah-Hill Nelson- Bowersock Mills Power CompanyMPC

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