

## **Review of Low Impact Hydropower Institute Application for Low Impact Hydropower Re-Certification: Bowersock Hydroelectric Project**

*Note: This document is essentially the Application Reviewer's Report prepared by Gabriela Goldfarb in 2004 with annotated updates in italics. This approach is being used because the Application Reviewer for the re-certification believes there have been no significant changes that would affect the Project's certifiability.*

### **Introduction and Overview**

This report reviews the application submitted by Bowersock Mills and Power Company (applicant) to the Low Impact Hydropower Institute (LIHI) for Low Impact Hydropower Certification for the Bowersock Hydroelectric Project (project or facility) on the Kansas River in the City of Lawrence in Douglas County, Kansas. The Federal Energy Regulatory Commission (FERC) issued the project a license exemption (FERC 2644) in 1985 for the operation and maintenance of the 2.5 megawatt, run-of-river facility.

Project and site characteristics. The project has been operating on the Kansas River since 1874. The facility consists of a 664-foot long dam, 90-foot spillway, and 60-foot flume. The masonry and rock-filled timber crib dam has a crest elevation of 808 feet mean sea level and a height of 18 feet. The hinged flashboards increase the impoundment level above the dam top by four feet. The corresponding operating head is usually between 18 to 22 feet, depending on water flow. One hundred and fifty feet of flashboards are pneumatically operated and automated. All remaining flashboards are manually raised, and are designed to fall when river flows increase above 8000 cubic feet per second (CFS). There is no bypass reach; the intake section is integral to the powerhouse and has seven turbine generators with a maximum combined rated capacity of 2.5 MW when operating with a head of 22 feet. The 90-foot spillway contains seven manually operated gates. The project is operated as a run-of-river facility, with outflow approximately equal to inflow on an instantaneous basis, and does not inundate land outside the natural confines of the Kansas River.

Historically the project was regularly "flooded out," with high flows and flood plain channels providing greater fish passage opportunities than are available today. Between the 1950s and the 1970s flood control projects, in the form of more than a dozen upstream dams and protective levees, are thought to have reduced or eliminated these opportunities. While American eel was present historically in the Kansas River, the species has never been, and is not now, a focus of resource agency concern.

Today the facility is identified by natural resource agencies as a barrier to upstream migration by fish species under all but extraordinary flood conditions. At the time FERC issued the project its exemption in 1985 the applicant agreed to implement fish passage in partnership with federal and state resource agencies; the relatively modest costs were to be shared between the U.S. Fish and

Wildlife Service (FWS), the Kansas Department of Wildlife and Parks, and the applicant. In the years immediately following the FERC exemption, FWS assigned a low priority to allocating financial resources for the design and engineering components which were its responsibility under the agreement, and a prerequisite for action by the other signatories to the agreement. In recent years, invasive non-native Asian carp have created a problem for native riverine and recreational fisheries in the Kansas River below the facility, and the resource agencies have taken the position that the benefits of installing fish passage at the facility are outweighed by the benefits of maintaining the facility as a barrier to upstream migration of the Asian carp. The federal and state resource agencies acknowledge that the applicant has committed to implement fish passage when required, and that the agencies have not acted to trigger the requirement, though they reserve the right to do so.

**Update 2009** - *In a May 5, 2009 letter from the Kansas Department of Wildlife and Park's Secretary, J. Michael Hayden, summarizes the fish passage issue:*

*Since 2004, discussions regarding fish passage on the Kansas River have continued among parties interested in the health of the Kansas River fish community. Based on these discussions, there appears to be increasing evidence that Bowersock does not function as a complete barrier to non-native organism passage as evidenced by the continued presence of Asiatic carp upstream of the dam. In addition, although the dam may not prevent all aquatic organism passage, it may obstruct the movement of some native species sufficiently to prevent adequate distribution and reproduction within the river. For example, seasonally large numbers of migratory Blue Suckers (*Cypleptus elongates*) tend to occur immediately below Bowersock.*

*At this time , the Department is not recommending construction of a fish passage structure in association with Bowersock Dam because sufficient information regarding benefits and detriments of such an action is not available. However, we hope that results of on-going and planned research will provide the information necessary to make an informed decision in the near future. If this new information indicates the dam does not prevent the spread of non-native species upstream and may hinder recovery of threatened or endangered species the Department would recommend that a fish passage structure be considered for installation.*

**Public comment.** LIHI received one public comment regarding the project from the Kansas Whitewater Association supporting the facility's application for certification. The association commended the facility as "a very good steward of the river giving back to the community at every opportunity," citing its co-sponsorship of a river clean up and its support for a whitewater kayak park on the Kansas River.

**Update 2009** – *LIHI received no public comments.*

**General conclusions.** This project is easily found to be consistent with LIHI criteria in all but one area. The issues of fish passage and protection present the Governing Board with a complex set

of facts and considerations. In my view, the applicant's legally enforceable commitment to install fish passage, coupled with the consensus among the resource agencies regarding the management of Asian carp, led me to conclude that the facility is, at present, consistent with the fish passage and protection criteria. The lack of resource agency priority on implementation of fish passage in the past and the absence of any agency focus on catadromous American eel issues is notable, but cannot be laid at the applicant's door.

*Update 2009 – I think that the situation with fish passage has actually clarified since LIHI certified the project in 2004. Based on the updated letters from resource agencies I describe the current situation in this way: Both the KDWP and USFWS clearly state that they are not requiring fish passage at this time. However, if the Bowersock Dam turns out to not be an ineffective barrier to non-native invasive species, and prevents some native species from accessing upstream habitat, then they will require that fish passage be constructed at the Bowersock Dam. The Applicant has committed to implement fish passage when required,*

Recommendation. Based on my review of information submitted by the applicant, my review of additional documentation, and my consultations with resource agency staff, I believe the Bowersock Hydroelectric Project meets all of the criteria to be certified and I recommend certification.

*Update Recommendation 2009 – No change. Certification is recommended, but perhaps with annual updates on the status of fish passage at the Bowersock Dam.*

## Low Impact Certification Criteria

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### A. Flows

- 1) Is the Facility in Compliance with Resource Agency Recommendations issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches?**

**NOT APPLICABLE**

*If NOT APPLICABLE, go to A2.*

- 2) If there is no flow condition recommended by any Resource Agency for the Facility, or if the recommendation was issued prior to January 1, 1987, is the Facility in Compliance**

**with a flow release schedule, both below the tailrace and in all bypassed reaches, that at a minimum meets Aquatic Base Flow standards or “good” habitat flow standards calculated using the Montana-Tennant method?**

**NO**

There is no bypassed reach associated with this project. The project intake is integral to the powerhouse.

*If NO, go to A3.*

**3) If the Facility is unable to meet the flow standards in A.2., has the Applicant demonstrated, and obtained a letter from the relevant Resource Agency confirming that demonstration, that the flow conditions at the Facility are appropriately protective of fish, wildlife, and water quality?**

**YES**

In a December 24, 2002 letter the Division of Water Resources, Kansas Department of Agriculture (KDA) states that

The facility has no effective control over flow conditions. The State of Kansas through agreements among the Kansas Water Office, the U.S. Army Corps of Engineers, and the Kansas River Assurance District operates state owned storage in three of the four federal reservoirs in the Kansas River basin to achieve certain target flows. These flows in part are meant to protect fish, wildlife, and water quality.

In a June 17, 2004 letter the Kansas Department of Health and Environment confirmed agreement with the KDA statement, noting that:

The Assurance District flows for the Kansas River, developed by the Kansas Water Office, were designed to be protective of water quality, fish and wildlife, and consumptive use.

***Update 2009** – In a May 15, 2009 the Division of Water Resources, Kansas Department of Agriculture (KDA) states that: “This letter is to let you know that our comments in our December 24, 2002 letter regarding “Flows” category questions remain unchanged.”*

*If YES, go to B*

**PASS**

## B. Water Quality

### 1) Is the Facility either:

- a) In Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986? Or
- b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?

YES

In a December 9, 2002 letter the Kansas Department of Health and Environment (KDHE) stated that:

“...your facility has not been identified as causing or contributing to an impairment of any designated uses for the Kansas River. Therefore, KDHE considers your facility to be in compliance with state water quality standards.”

The author of that letter confirmed this still to be the case in a September 30, 2004 telephone conversation.

*Update 2009 - In a May 13, 2009 letter regarding the Low Impact Hydropower Institute certification, the Kansas Department of Health and Environment (KDHE) has reviewed information regarding the Kansas River near Lawrence and finds no indication that the Bowersock Mills and Power Company has been identified as impacting water quality. Specifically:*

- *The facility is not required to have either a state or federal wastewater disposal permit. As such, a §401 water quality is not required. Additionally, your facility has not been identified as causing or contributing to an impairment of any designated uses for the Kansas River. Therefore, KDHE considers your facility to be in compliance with state water quality standards.*
- *The Kansas River in this area has been listed on the 303d list (impaired water list) for chlordane, bacteria, ammonia, and biological impairments. Your facility has not been identified as contributing [to] any of these impairments.”*

*If YES, go to B2.*

### 2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and

**designated uses) pursuant to Section 303(d) of the Clean Water Act?**

**YES**

According to KDHE, the Kansas River in the facility area and downstream reach is listed for chlordane, bacteria, ammonia, nutrients, and oxygen demanding substances.

*If YES, go to B3.*

**3) If the answer to question B.2 is yes, has there been a determination that the Facility is not a cause of that violation?**

**YES**

In its December 9, 2002 letter, confirmed in a September 30, 2004 telephone call, KDHE stated that the “facility has not been identified as contributing [to] any of these impairments.”

*Update 2009 - In its May 13, 2009 letter, KDHE stated that the “facility has not been identified as contributing [to] any of these impairments.”*

*If YES, go to C.*

**PASS**

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**C. Fish Passage and Protection**

**1) Is the Facility in Compliance with *Mandatory Fish Passage Prescriptions* for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?**

**NOT APPLICABLE**

*If NOT APPLICABLE, go to C2.*

**2) Are there historic records of anadromous and/or catadromous fish movement through the Facility area, but anadromous and/or catadromous fish do not presently move through the Facility area (e.g., because passage is blocked at a downstream dam or the fish run is extinct)?**

**NO**

According to a technical report of the Kansas Biological Survey there are records dating as far back as the 1870s of the presence of the American eel in the Kansas River.<sup>1</sup> The American eel has not been declared extirpated or extinct by the state or federal government. Neither level of government tracks the fish nor considers it a species of concern. The Kansas Biological Survey database designates the species as “relatively rare” (i.e., it is not designated as extirpated).<sup>2</sup> American eel presently move through the facility area on an incidental basis, likely associated with infrequent periods of very high flows. In 1994 state wildlife and parks staff reported to a FWS official in a nearby FWS field office a specimen caught 120 miles upstream of the facility subsequent to the massive Midwest floods of 1993.<sup>3</sup> The FWS official said he received anecdotal information from fishers about landings below the facility. State agency officials’ records indicated a finding in 1987, though information about the location of that finding was not readily available. According to a 2003 letter from Kansas Department of Wildlife and Parks (KDWP), “[t]o the best of our knowledge, there is not enough scientific evidence collected to either support or reject extirpation of the American Eel at or downstream of the Facility.” This assessment was confirmed in recent telephone conversations with KDWP and FWS.

*If NO, go to C3.*

**3) If, since December 31, 1986:**

- a) Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in C2a above), and**
- b) The Resource Agencies declined to issue a Mandatory Fish Passage Prescription,**
- c) Was a reason for the Resource Agencies’ declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?**

**NOT APPLICABLE.**

*If NOT APPLICABLE, go to C4.*

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<sup>1</sup> Haslouer, Stephen G. Taxonomic Synonymy of Kansas Fish Collections 1855 – 1995. Kansas Biological Survey Technical Report 115. November 2003.

<sup>2</sup> Busby, Bill, Heritage Zoologist, Kansas Biological Survey. Personal communication. October 6, 2004. (Species abundance designations are made by the state’s Heritage Zoologist in consultation with experts from the relevant state agencies.)

<sup>3</sup> Tabor, Vernon, U.S. Fish and Wildlife Service. Personal communication. September 30, 2004. (Note that neither the 1994 nor the 1987 references to landings of American eel are reflected in the Kansas Biological Survey database, which only reflects “vouchered” specimens, i.e., those cataloged in a museum.)

**4) If C3 was not applicable:**

- a) Are upstream and downstream fish passage survival rates for anadromous and catadromous fish at the dam each documented at greater than 95% over 80% of the run using a generally accepted monitoring methodology? Or**
- b) If the Facility is unable to meet the fish passage standards in 4.a., has the Applicant demonstrated, and obtained a letter from the US Fish and Wildlife Service or National Marine Fisheries Service confirming that demonstration, that the upstream and downstream fish passage measures (if any) at the Facility are appropriately protective of the fishery resource?**

**YES**

In letters written in 2004 and in recent telephone conversations with agency staff<sup>4</sup> both KDWP and FWS confirmed that the absence of fish passage is appropriately protective of fishery resources at this time. However, diadromous fishery resources are not and have not been the fish species of concern to the resource agencies. See the discussion under section C5, below.

*Update 2009 – For the purposes of the Low Impact Hydropower Institute Certification for Bowersock Dam, the Kansas Department of Wildlife and Parks (after consultation with experts and other regulatory agencies) confirm that as of summer 2009, a fish passage structure or program at the Bowersock Dam is discouraged due to a desire to impede non-native species.*

*This determination is made with the best available science, but ongoing research may reveal new evidence regarding the effectiveness of Bowersock as a fish barrier. We may revisit this recommendation when new data becomes available. We recommend that any future structural changes to the Bowersock Dam include space or design elements appropriate for aquatic organism passage to be incorporated (e.g., retain space on the dam face to allow a structure to be installed in the future).*

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*In a June 22, 2009 letter the United States Fish and Wildlife Service said: For the purpose of the LIHI certification, and after consultation with the Kansas Department of Wildlife and Parks, Service staff, and others, the Service believes that installation of aquatic organism passage at the Bowersock Dam is discouraged at this time due to the presence of non-native, invasive Asian carp species (bighead carp and silver carp) downstream of the dam. Fish passage may allow silver carp access to upstream reaches and enhance the spread of bighead carp. Please be aware that we may recommend fish passage at this dam in the future if new information indicates these species have colonized the Kansas River upstream of the dam and fish passage would be beneficial to native species.*

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<sup>4</sup> See the records of conversations that appear at the conclusion of this report.



*We encourage you to include design elements as appropriate in any future structural changes to the dam to accommodate installation of aquatic organism fish passage in the future.*

*If YES, go to C5.*

**5) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of *Riverine* fish?**

**YES**

Article 2 of the project's 1985 FERC exemption requires the applicant to "comply with any terms and conditions that the United States Fish and Wildlife Service and any state fish and wildlife agencies have determined are appropriate to prevent loss of, or damage to, fish or wildlife resources..." At the time of the exemption FWS, KDWP, and the applicant reached an agreement to construct fish passage to benefit native riverine fish. Under the agreement FWS was to perform the engineering and design work, KDWP would install, maintain, and operate the passageway, and the project would permit construction and operation of the passageway and provide up to \$5,000 (the estimated cost in 1985 for the construction and installation work). Since that time FWS management has placed a low priority on the project and has not allocated funding to complete the necessary engineering work, with the result that passage was never installed. The requirement remains in effect, and the resource agencies believe the applicant remains committed to provide fish passage when required to do so.

**DISCUSSION**

In the intervening years since FERC's issuance of the project's license exemption, invasive Asian carp have emerged as a new threat to native and recreational fisheries. The carp are found in abundance below the facility, but in very low quantities above, leading KDWP to conclude in a March 5, 2004 letter that "construction of fish passage would most likely increase the spread of [Asian carp] upstream" and that the agency therefore recommends against the placement of fish passage. In a May 18, 2004 letter FWS also recommends against installation of unrestricted fish passage at the present time, stating that "...it appears that Bowersock dam is beneficial in terms of being relatively effective at restricting the dispersion of Asian carps upstream, while concurrently contributing negative impacts to native riverine fishes."

Both agencies reserve the right to require fish passage at a future time when circumstances warrant, such as if Asian carp do become widely established upstream of the facility or if additional scientific information supporting a different recommendation becomes available.

Another consideration relating to fish passage at the project site is the role of the facility relative to other river developments. Construction of numerous flood control structures (both dams and levees) upstream of the project from the 1950s to the 1970s reduced high flows and cut access to floodplain channels that likely previously allowed for fish passage at the facility. While resource agency staff are clear that the facility does present an obstacle to fish passage, they

acknowledged in conversation that the relative impact of the facility over time has likely been increased due to these external factors.

**Update 2009** – In a May 5, 2009 letter from the Kansas Department of Wildlife and Park’s Secretary, J. Michael Hayden, summarizes the fish passage issue:

*Since 2004, discussions regarding fish passage on the Kansas River have continued among parties interested in the health of the Kansas River fish community. Based on these discussions, there appears to be increasing evidence that Bowersock does not function as a complete barrier to non-native organism passage as evidenced by the continued presence of Asiatic carp upstream of the dam. In addition, although the dam may not prevent all aquatic organism passage, it may obstruct the movement of some native species sufficiently to prevent adequate distribution and reproduction within the river. For example, seasonally large numbers of migratory Blue Suckers (*Cyprinus elongates*) tend to occur immediately below Bowersock.*

*At this time, the Department is not recommending construction of a fish passage structure in association with Bowersock Dam because sufficient information regarding benefits and detriments of such an action is not available. However, we hope that results of on-going and planned research will provide the information necessary to make an informed decision in the near future. If this new information indicates the dam does not prevent the spread of non-native species upstream and may hinder recovery of threatened or endangered species the Department would recommend that a fish passage structure be considered for installation.*

*If YES, go to C6.*

**6) Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?**

**NOT APPLICABLE**

There are no such recommendations.

*If NOT APPLICABLE, go to D*

**PASS**

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**D. Watershed Protection**

**1) Is the Facility in Compliance with Resource Agency Recommendations, or, if none, with license conditions, regarding protection, mitigation or enhancement of lands inundated**

**by the Facility or otherwise occupied by the Facility, and regarding other watershed protection, mitigation and enhancement activities?**

**NOT APPLICABLE**

There are no such recommendations or exemption conditions; the river remains within its natural confines upstream of the facility.

*NOT APPLICABLE, go to E.*

**PASS**

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**E. Threatened and Endangered Species Protection**

**1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?**

**YES**

*If YES, go to E2.*

**2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in Compliance with all recommendations in the plan relevant to the Facility?**

**NOT APPLICABLE**

*If NOT APPLICABLE, go to E3.*

**3) If the Facility has received authority to incidentally *Take* a listed species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental Take statement; (ii) Obtaining an incidental Take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authority pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authority?**

**NOT APPLICABLE**

*If NOT APPLICABLE, go to E5.*

**5) If E.2. and E.3. are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?**

**YES**

In a May 18, 2004 letter FWS stated that it “does not have significant concerns, at this time, regarding the impact of Bowersock dam on the Pallid sturgeon, or any other federally listed species.” Aquatic species listed by the state as endangered or threatened are the sturgeon chub, flathead chub, silver chub, and sicklefin chub; those designated as “species in need of conservation” are blue sucker, river shiner, plains minnow, and highfin carpsucker. At the present time, the state has taken the position that the benefits conferred by the facility in blocking passage to invasive non-native Asian carp outweigh the negative impacts of the facility to the listed species. (See discussion under C5, above.) The state believes the facility does not negatively impact any other listed species.

*If YES, go to F.*

**PASS**

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**F. Cultural Resource Protection**

**1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?**

**YES**

The FERC exemption contains no requirements regarding cultural resource protection. However, the applicant has obtained a letter dated April 16, 2003 from the Kansas State Historical Society stating that continued operation of the facility “will not adversely affect any property listed on the National Register of Historic Places or otherwise identified in our files as having historical significance.”

*If YES, go to G.*

**PASS**

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**G. Recreation**

**1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?**

**YES**

There are no recreational requirements included in the applicant's FERC exemption. As noted earlier, a public comment in the form of a letter from the Kansas Whitewater Association supports the facility's application for certification. The association commended Bowersock as "a very good steward of the river giving back to the community at every opportunity," citing its co-sponsorship of a river clean up and its support for a whitewater kayak park on the Kansas River.

*If YES, go to G3.*

**2) Does the Facility allow access to the reservoir and downstream reaches without fees or charges?**

**YES**

The facility, which is in an urban area, does not restrict public access to upstream or downstream areas.

*If YES, go to H.*

**PASS**

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**H. Facilities Recommended for Removal**

**1) Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?**

**NO**

*If NO, facility is low impact.*

**PASS.**

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**FACILITY IS LOW IMPACT**

## RECORD OF CONTACTS

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Date of Conversation: September 15, 2004  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Nate Davis, Kansas Dept. of Wildlife and Parks  
Telephone/email: 620-672-5911  
Areas of Expertise: Aquatic ecologist

In response to my questions about diadromous fisheries, and in particular the American eel which had been mentioned in written comments submitted by Vernon Tabor of the FWS, Mr. Davis stated that eels were not a species of concern, that there was no evidence of the presence of eel in the vicinity of the project. He offered the opinion that the downstream river region (the Kansas River flows into the Missouri River) is so highly developed that if eels could make it as far as the Bowersock facility, they could make it over. While the facility might have contributed to the reduction of any historic populations of eels that may have existed, it would not have been a significant contributor. He suggested contacting Jennifer DeLisle of the Kansas Biological Survey and Ed Miller of the Kansas Department of Wildlife and Parks, Fish and Wildlife Division to ask about any records of eel in the Kansas River. He confirmed that there were four species of chub that are threatened or endangered in the Kansas River that are adversely affected by lack of fish passage at the facility, however, it is the state, and now also the federal government's position that installation of fish passage facilities would create an avenue for invasive Asian carp. Though the carp are found upstream, it is thought that the facility acts as an obstacle to rapid increases in their populations. At this point in time the state and federal governments believe benefits of preventing or reducing the spread of the carp outweigh the benefits that improved fish passage would confer on native fisheries. If carp ultimately do

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Date of Conversation: September 15, 2004  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Jennifer DeLisle, Kansas Biological Survey  
Telephone/email: 785-864-1538  
Areas of Expertise: biodiversity data

The Kansas Biological Survey maintains a database populated with known biological information through a data sharing agreement with state and federal agencies. Ms. DeLisle did a search of the KBS database which yielded no information on any American eel specimens found. In the KBS database the species is designated as "S-2" which means it is "relatively rare." (1 = very rare, 5 = very common). If the eel were known to be extirpated it would have an "X" designation. However, she believed no one had done any fish surveys in recent years.

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Date of Conversation: September 15, 2004  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Ed Miller, Kansas Department of Wildlife and Parks, Fish and Wildlife Division

Telephone/email: 620-331-6820  
Areas of Expertise: Fish biology, T&E/sensitive species

Mr. Miller said that there is no evidence that eel is a viable species in the Kansas River. He found in a reference book (Cross and Collins, Fishes of Kansas) mention of a large eel found in 1987, although there was no information about where the specimen was obtained. He said the species is not listed or tracked by his agency.

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Date of Conversation: September 30, 2004  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Michael Tate, Bureau of Water, Div. of Environment, Kansas Dept of Health and Environment  
Telephone/email: 785-296-5504  
Areas of Expertise: Water Quality

Mr. Tate confirmed that the facility is in compliance with water quality standards and is not a contributor to the impaired water quality of the Kansas River in the vicinity of the facility, consistent with his December 2002 letter. (He apparently also submitted a letter to that effect July 17, 2004, but I do not have a copy.)

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Date of Conversation: September 30, 2004  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Vernon Tabor, Kansas Ecological Field Station, U.S. Fish and Wildlife Service  
Telephone/email: 785-539-3474 ext 110  
Areas of Expertise: Fisheries

Mr. Tabor said that an American eel specimen had been documented by the state wildlife and parks department 120 miles upstream of Bowersock in 1994, in a tributary to the Kansas River, in the wake of the massive 1993 floods in the Midwest. He said that there was anecdotal information from time to time from fishers on the Kansas River of eel caught below the Bowersock facility. He acknowledged that the eel is not being tracked, is not a species of concern for FWS. In regards to other fisheries issues, he noted that there are numerous species found below, but not above Bowersock. However, several of these species were present above Bowersock prior to the construction of large dams above the facility in the 1950s and 1960s which moderated previously large flows over the dam that would have permitted regular fish passage. Today there are still occasions of very high flows that could permit passage of various species, but not on a regular basis. Regarding the installation of fish passage facilities at Bowersock, and the state's position that passage benefits to native fish would be outweighed by negative impacts of allowing the spread of invasive Asian carp upstream of Bowersock, FWS is deferring to the state's position absent evidence regarding the risks and benefits of installing such passage. The Kansas Fish and Wildlife Research Cooperative Unit (U.S. Geological Survey,

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Kansas Dept. of Wildlife and Parks, and Kansas State University) was turned down in a recent bid for federal funding of a project to research fish passage and Asian carp at the Bowersock dam site. With regard to the FWS role in deferring installation of fish passage, he confirmed that FWS management placed and continues to place a low priority on allocating the FWS resources (staff and/or funding) needed to carry out the engineering and design work that are a prerequisite to fulfilling the agreement between FWS, KDWP, and Bowersock to install fish passage.

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Date of Conversation: September 15, 2004  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Bill Busby, Heritage Zoologist, Kansas Biological Survey  
Telephone/email: 785-864-1530  
Areas of Expertise: zoology

Dr. Busby confirmed that the “S-2” (“relatively rare”) designation for the American Eel in the Kansas Biological Survey is a state designation applied by the state’s Heritage Zoologist (him) in consultation with state agency experts. He believes the ranking was assigned in the late 1980s. He believes the report of a 1987 specimen of American eel cited to me by state agency staff is not reflected in the database because it was not “vouchered” (i.e., not cataloged in a museum). He confirmed that the eel has not been a focus of study.

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Date of Conversation: October 1, 2004  
Application Reviewer: Gabriela Goldfarb, Consultant  
Person Contacted: Steve Haslouer, Environmental Scientist III, Bureau of  
Environmental Field Services, Kansas Department of Health and  
Environment  
Telephone/email: shasloue@kdhe.state.ks.us (785) 296 - 0079  
Areas of Expertise: fisheries

[From a 10/01/04 email:]

*You are correct in your assumption that a number (but not all) of the literature citations refer to the historic presence of American Eels in the upper Kansas River basin (above the dam at Lawrence).*

*I have copies of most of these references and will happily send them to you. Unfortunately, I am currently quite busy with fieldwork and it may be several weeks before I have the time to do so.*

*Let me assure you, however, that only the most determined eel would currently be able to pass the fish barrier presented by Bowersock dam (at all but the highest, 50 or 100 year-type flows). Although not a “high dam”, as you would recognize on the west coast, it is a formidable obstacle to our native species of fishes. I believe you can find pictures of it on the internet.*



*I might also mention that I have co-authored a manuscript, recently submitted for publication, suggesting that *A. rostrata* (along with several other species) should be considered as endangered in Kansas. Here is the relevant passage:*

*“Anguillidae—Freshwater Eels*

*American Eel, *Anguilla rostrata*. Current status: not listed. Proposed status: E. Formerly ranging nearly statewide as migrants from the Gulf of Mexico, the last catalogued specimen of an American Eel from Kansas in the KU collection (KU 18680) is from 1979. Cross and Collins (1995) also noted a non-vouchered specimen taken in the Kansas River in 1987. Dams and flow diversions have rendered a good deal of the formerly documented range of this species inaccessible during its migrations. This taxon was included in a 1998 list of fishes believed by Frank Cross (unpubl. observ.) to be “significantly reduced in range or abundance” in Kansas. The KNHI lists this species as “imperiled” in Kansas (NatureServe 2004).”*

*As this is a manuscript currently undergoing review for publication, I would appreciate your conferring with me before citing it, if you choose to do so.*

*If your local university library cannot supply you with copies of the papers referenced in my “Taxonomic Synonymy” paper, let me know and I will endeavor to send you copies of the relevant papers.*

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Date of Conversation:	October 7, 2004
Application Reviewer:	Gabriela Goldfarb, Consultant
Person Contacted:	Nate Davis, Kansas Dept. of Wildlife and Parks
Telephone/email:	620-672-5911
Areas of Expertise:	Aquatic ecologist

I telephoned Mr. Davis to clarify a discrepancy between the species he discussed with me last month as being state-listed as endangered, threatened, or “species in need of conservation” and the greater number of species noted in his December 2003 letter to the applicant. He explained that the additional species named in the letter were “species in need of conservation.” He agreed with the following statement as accurately characterizing the state’s position: “At the present time, the state has taken the position that the benefits conferred by the facility in blocking passage to invasive non-native Asian carp outweigh the negative impacts of the facility to the listed species.”

**Application Reviewers Note:** The following Letters from agencies are a response to the LIHI re-certification and confirm the Applicant's representation that nothing has changed that would affect the certifiability of the project. I personally spoke with representatives of the state and federal agencies to confirm that the position taken in their letters is still valid. To a person they confirmed at this time they were.



Kathleen Sebelius, Governor  
J. Michael Hayden, Secretary

www.kdwp.state.ks.us

May 5, 2009

Track: 20020763  
DG  
Reference: D5.0303

Sarah Hill-Nelson  
P.O. Box 66  
Lawrence, KS 66044

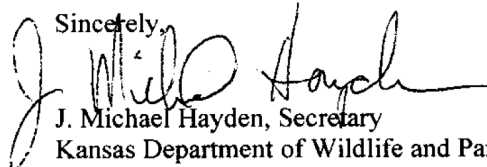
RE: *Bowersock Mills and Power Company Low Impact Status*

Dear Sarah Hill-Nelson:

Thank you for the opportunity to comment on the re-certification of Bowersock's operations as a Low Impact Hydropower Project. Like all impoundments, the many benefits of Bowersock dam must be weighed against potential negative environmental impacts. To date, potential environmental impacts of Bowersock have primarily centered on aquatic organism passage. In 2004, the Department recommended against installing a fish passage structure on Bowersock Dam due to concerns that the potential movement of invasive species (specifically species of Asiatic carp) upstream would be more detrimental than the potential benefits derived for native species. This recommendation was based on conversations with other state and federal agencies, as well as experts in the state and elsewhere.

Since 2004, discussions regarding fish passage on the Kansas River have continued among parties interested in the health of the Kansas River fish community. Based on these discussions, there appears to be increasing evidence that Bowersock does not function as a complete barrier to non-native organism passage as evidenced by the continued presence of Asiatic carp upstream of the dam. In addition, although the dam may not prevent all aquatic organism passage, it may obstruct movement of some native species sufficiently to prevent adequate distribution and reproduction within the river. For example, seasonally large numbers of migratory Blue Suckers (*Cycleptus elongates*) tend to occur immediately below Bowersock.

At this time, the Department is not recommending construction of a fish passage structure in association with Bowersock Dam because sufficient information regarding benefits and detriments of such an action is not available. However, we hope that results of on-going and planned research will provide the information necessary to make an informed decision in the near future. If this new information indicates the dam does not prevent the spread of non-native species upstream and may hinder recovery of Threatened or Endangered species, the Department would recommend that a fish passage structure be considered for installation.

Sincerely,  
  
J. Michael Hayden, Secretary  
Kansas Department of Wildlife and Parks



Mark Parkinson, Governor  
Roderick L. Bremby, Secretary

DEPARTMENT OF HEALTH  
AND ENVIRONMENT

[www.kdheks.gov](http://www.kdheks.gov)

Division of Environment

May 13, 2009

Ms. Sarah Hill-Nelson  
Bowersock Mills and Power Company  
P.O. Box 66  
Lawrence, Kansas 66044

Re: Low Impact Hydropower

Dear Ms. Hill-Nelson:

As per your April 30, 2009 letter regarding the Low Impact Hydropower Institute certification, the Kansas Department of Health and Environment (KDHE) has reviewed information regarding the Kansas River near Lawrence and finds no indication that Bowersock Mills & Power Company has been identified as impacting water quality. Specifically:

- The facility is not required to have either a state or federal wastewater disposal permit. As such, a §401 water quality certification is not required. Additionally, your facility has not been identified as causing or contributing to an impairment of any designated uses for the Kansas River. Therefore, KDHE considers your facility to be in compliance with state water quality standards.
- The Kansas River in this area has been listed on the 303d list (impaired waters list) for chlordane, bacteria, ammonia, and biological impairments. Your facility has not been identified as contributing any of these impairments.

If you should have further questions, please call me at 785.296.5504.

Sincerely,

Michael B. Tate, PE, Chief  
Bureau of Water, Technical Services Section

c - Julie Coleman - NEDO



Mark Parkinson, Governor  
J. Michael Hayden, Secretary

[www.kdwp.state.ks.us](http://www.kdwp.state.ks.us)

Track: 20020763  
DG  
Reference: D5.0303

Sarah Hill-Nelson  
P.O. Box 66  
Lawrence, KS 66044

RE: *Low-Impact Hydropower Institute Certification of Bowersock Dam*

Dear Sarah Hill-Nelson:

For the purposes of the Low-Impact Hydropower Institute Certification for Bowersock Dam, the Kansas Department of Wildlife and Parks (after consultation with experts and other regulatory agencies) confirm that as of summer 2009, a fish passage structure or program at the Bowersock Dam is discouraged due to a desire to impede the spread of non-native species.

This determination is made with the best available science, but on-going research may reveal new evidence regarding the effectiveness of Bowersock as a fish barrier. We may re-visit this recommendation when new data becomes available. We recommend that any future structural changes to Bowersock Dam include space or design elements appropriate for aquatic organism passage to be incorporated (e.g., retain space on the dam face to allow a structure to be installed in the future).

Sincerely,

A handwritten signature in black ink, appearing to read "James Larson", followed by a horizontal line.

James Larson, Aquatic Ecologist  
Environmental Services Section



Mark Parkinson  
~~Kathleen Sebelius~~, Governor  
Adrian J. Polansky, Secretary

www.ksda.gov/dwr

May 15, 2009

Sarah Hill-Nelson  
Bowersock Mills & Power Co  
P O Box 66  
Lawrence, KS 66044

Re: WSN: SDG-0022  
Bowersock Mills and Power Company Dam

Dear Ms. Hill-Nelson:

The Division of Water Resources, Water Structures Program is in receipt of your letter dated April 30, 2009, requesting an update on the status of your dam with respect to your Low Impact Hydropower Institute certification.

This letter is to let you know that our comments in our December 24, 2002 letter regarding the "Flows" category questions remain unchanged.

If you need more complete documentation from this agency, please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt A. Scherer III".

Matt A. Scherer III, P.E.  
Water Structures Program Manager  
(785) 296-2933

pc: Earl Lewis, Kansas Water Office



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Kansas Ecological Services Office  
2609 Anderson Avenue  
Manhattan, Kansas 66503-6172

June 22, 2009

Ms. Sarah Hill-Nelson  
The Bowersock Mills and Power Company  
P. O. Box 66  
Lawrence, KS 66044

RE: Low-Impact Hydropower Institute Certification of Bowersock Dam

Dear Ms. Hill-Nelson:

This is in response to your June 10, 2009 letter, requesting the U.S. Fish and Wildlife Service's position concerning The Bowersock Mills and Power Company's certification from the Low-Impact Hydropower Institute (LIHI).

For the purposes of the LIHI Certification, and after consultation with the Kansas Department of Wildlife and Parks, Service staff, and others, the Service believes that installation of aquatic organism passage at the Bowersock Dam is discouraged at this time due to the presence of non-native, invasive Asian carp species (bighead carp and silver carp) downstream of the dam. Fish passage may allow silver carp access to upstream reaches and enhance the spread of bighead carp. Please be aware that we may recommend fish passage at this dam in the future if new information indicates these species have colonized the Kansas River upstream of the dam and passage would be beneficial to native species.

We encourage you to include design elements as appropriate in any future structural changes to the dam to accommodate installation of aquatic organism fish passage in the future.

If you have any questions, please feel free to contact me at 785-539-3474, ext 105. Thank you for the opportunity to comment.

Sincerely,

Michael J. LeValley  
Field Supervisor

cc: KDWP, Pratt, KS (Environmental Services)  
KDWP, Secretary's Office (Steve Adams)