



LOUP POWER DISTRICT

"SERVING YOU ELECTRICALLY"

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Via Electronic Filing

September 23, 2011

Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Subject: Loup River Hydroelectric Project
FERC Project No. 1256
Updated Study Report Meeting Summary

Dear Secretary Bose:

Loup River Public Power District (Loup Power District or District) herein electronically files its Updated Study Results (USR) Meeting Summary for relicensing the Loup River Hydroelectric Project, FERC Project No. 1256 (Project). The District is the owner, operator, and original licensee of the Project. The existing license was effective on December 1, 1982, for a term ending April 15, 2014. Loup Power District is utilizing the Integrated Licensing Process (ILP) for this relicensing effort.

In accordance with 18 CFR §5.15, the District presented the remaining Updated Study Results (Updated Study Report) to FERC and other relicensing participants during the Updated Study Results Meeting held on September 8, 2011. The attached Meeting Summary summarizes the discussion at the meeting. The District also prepared a transcript of the meeting proceedings which is available on the District's relicensing website: www.loup.com/relicense.

Electronic copies of the USR Meeting Summary are available on the District's relicensing website: www.loup.com/relicense, as well as on the Commission's eLibrary. Notice of the availability of this document is being provided to all relicensing participants, including federal and state resource agencies, local governments, and Native American tribes. A distribution list of those parties is attached. Additionally, copies of the USR Meeting Summary will be available at the District's office in Columbus, Nebraska.

If you have any questions regarding the USR or any information provided by the District, please contact me at (402) 564-3171 ext. 268.

Respectfully submitted,

Neal D. Suess
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Attachments: Distribution List
Updated Study Results Meeting Summary

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Updated Study Results Meeting Summary

Project:	Loup River Hydroelectric Project FERC Project No. 1256		
Subject:	Updated Study Results Meeting Summary		
Meeting Date:	September 8, 2011, 8:30 am – 2:30 pm	Meeting Location:	New World Inn, Columbus, NE
Notes by:	Loup Power District		

Loup River Public Power District (Loup Power District or the District) filed its Updated Study Report (USR) with the Federal Energy Regulatory Commission (FERC) on August 26, 2011 and subsequent Addendum on September 7th, 2011, as part of relicensing the Loup River Hydroelectric Project (FERC Project No. 1256) and in accordance with the regulations of FERC's Integrated Licensing Process (ILP) (18 Code of Federal Regulations [CFR] 5). Subsequently, the Updated Study Results were presented to FERC and other relicensing participants during the Updated Study Results Meeting held on September 8, 2011, at the New World Inn (265 33rd Street) in Columbus, Nebraska. The proceedings of that meeting are presented in this Updated Study Results Meeting Summary, which follows the organization of the agenda for the meeting.

The meeting agenda and handout of the slide presentation are included as Attachments A and B, respectively.

Welcome and Introductions

Neal Suess (Loup Power District) and Stephanie White (HDR) provided those attending the Updated Study Results Meeting with an overview of the agenda and the goals for the meeting. The meeting goals and the list of attendees are provided below.

Meeting Goals

The goals of the Updated Study Results Meeting were the following:

- To present the updated results of the studies identified in the Revised Study Plan and Study Plan Determination.
- To discuss any proposals to modify the study plan (by the District or other participants) in light of study progress and data collected.

Attendees:

The following agency and District representatives attended the Updated Study Results Meeting:

Name	Organization	Name	Organization
John Bender	NDEQ	Janet Hutzel (via phone)	FERC
Shuhai Zheng	NDNR	Isis Johnson (via phone)	FERC
Frank Albrecht	NGPC	Paul Makowski (via phone)	FERC
Richard Holland	NGPC	Bob Clausen	Loup Power District
Joel Jorgensen	NGPC	Jim Frear	Loup Power District
Michelle Koch	NGPC	Thomas Kumpf	Loup Power District
Dave Tunink	NGPC	Theresa Petr	Loup Power District
Jim Jenniges	NPPD	Neal Suess	Loup Power District
John Shadle	NPPD	Ron Ziola	Loup Power District
Tom Econopouly	USFWS	Pat Engelbert	HDR
Robert Harms	USFWS	Marcus Grant (via phone)	HDR
Jeff Runge	USFWS	Dennis Grennan	HDR
Mary Bomberger-Brown	Tern and Plover Conservation Partnership	George Hunt	HDR
		Gary Lewis	HDR
		Matt Pillard	HDR
Mike Gutzmer	New Century Environmental LLC	Lisa Richardson	HDR
		Wendy Thompson	HDR
		George Waldow	HDR
		Stephanie White	HDR

Integrated Licensing Process Overview

Lisa Richardson (HDR) discussed the overall relicensing process for the Loup River Hydroelectric Project (Project). She reviewed the previous meetings held to get to this point and gave a brief summary of the studies completed to date and the study modifications required related to those studies.

The following studies were completed for the First and Second Initial Study Reports, submitted on August 26, 2010 and February 11, 2011:

- Sedimentation
- Hydrocycling
- Water Temperature in Loup River Bypass Reach
- Flow Depletion and Flow Diversion
- Fish Passage
- Recreation Use
- Land Use Inventory
- Section 106 Compliance
- Ice Jam Flooding on the Loup River
- PCB Fish Sampling (a full study was not required, sampling results were presented)

FERC's Determination after the Initial Study Results Meetings included:

- Studies Requiring No Revisions:
 - Study 4.0, Water Temperature in Loup River Bypass Reach
 - Study 5.0, Flow Depletion and Flow Diversion
 - Study 7.0, Fish Passage

- Study 8.0, Recreation Use
- Study 10.0, Land Use Inventory
- Study 11.0, Section 106 Compliance
- Study 12.0, Ice Jam Flooding on the Loup River

- Studies Requiring Revisions:
 - Study 1.0, Sedimentation
 - Add confidence limits for sediment rating curves.
 - Add aggradation/degradation analysis for Duncan, North Bend, Ashland, and Louisville (from Pre-Application Document [PAD]).
 - Add aggradation/degradation analysis for Genoa.
 - Complete the Kendall tau test to assess aggradation/degradation trends.
 - Perform supplemental spatial analysis of channel geomorphologic characteristics.
 - Complete additional statistical analysis related to interior least tern and piping plover nesting.
 - Provide additional references (Chen et al., 1999, and Missouri River Basin Commission [MRBC] report) to FERC.
 - Study 2.0, Hydrocycling
 - Conduct sediment transport analysis using HEC-RAS.
 - Add species summary for Interior Least Tern and Piping Plover.

Finally, Richardson briefly discussed the next steps in the process, which include preparation of this Updated Study Results Meeting Summary and an opportunity for relicensing participants to submit comments.

Presentation of Study Results

Members of the Project team from HDR provided results for the study determination modifications:

- Study 1.0, Sedimentation
- Study 2.0, Hydrocycling
- Species Summary for Interior Least Tern and Piping Plover

After the results of each study were given, the other meeting attendees had an opportunity to ask questions and offer comments on the respective studies.

Study 1.0, Sedimentation

Study Results:

Pat Engelbert (HDR), George Hunt (HDR), Lisa Richardson (HDR) and Marcus Grant (HDR) presented the study results of the sedimentation study. The key points were as follows:

- Consistent with results of the spatial analysis in the ISR and SISR, there is a strong relationship between channel geomorphologic characteristics and effective discharge (Q_e) (and dominant discharge [Q_d]).
- A percent change in Q_e corresponds to a proportionate change in flow width and flow area.
- The Loup River has no change between Genoa and Columbus for all four channel geomorphologic characteristics, revealing dynamic equilibrium
- The Platte River has a strong relationship between Q_e (and Q_d) and flow width consistent with Kircher findings that relate Q_e and width. In addition, there is a strong relationship between Q_e and flow area.
- Kendall Tau analysis showed no overall aggradational or degradational trends.

- Statistical analysis of interior least tern nest counts and hydrologic parameters showed the following:
 - Nest counts were weakly associated with number of data collection visits per year.
 - Nest counts were strongly associated with number of adult terns.
 - No measurable relationship between nest counts and distance from tailrace.
 - No measurable relationship between presence of nests and distance from tailrace, year, PMDF, percent diverted.
 - Potential relationship identified between nest counts and low flow years preceded by high flow years.
 - No significant changes in flow between river miles in a given year.

Discussion:

- Q: Jeff Runge (USFWS) asked why looking at Site 2 and comparing to Genoa and Columbus (referencing Figure 5.13) effective (Q_e) and dominant discharge (Q_d) were pretty equal, but other variables were different.
A: Pat Engelbert (HDR) explained that one reason is the difference in data record. Genoa has long term gage data, but Site 2 is based on data obtained in 2010.
- Q: Runge also asked why the widths/velocity/depths/areas were different between Site 2 and Genoa/Columbus when Q_e and Q_d are very similar.
A: Gary Lewis (HDR) replied that HEC-RAS requires fixed bed evaluation. The actual river bed changes constantly, but HEC-RAS assumes a rigid bed. The single set of cross-sections gave intermediate morphology; if more data were available then the measurements would be more similar. As shown in the ISR graphs, the effective discharges each year of the seven year period vary from 1,500 to 3,000 cfs, and there are high fluctuations at the Genoa station so the morphology is constantly changing. The bed geometry from the 2010 data would not be likely to match the equilibrium geometry.
- Q: Paul Makowski (FERC) asked if the relationships plotted for the Platte River between Q_e and flow width and flow area were plotted for the Loup River as well
A: Lewis stated that the locations were plotted for the Loup but didn't show much because 3 of 4 locations had the same Q_e , and there is only one gaged site. To develop the defining morphology curve, more than one gaged site on a river is needed. When the 3 points were plotted, they all show up as the same data point and the only other data point is at ungaged site 1. He said there was a proportional change in channel width and area from Site 1 to 2 with effective discharge, but the effective discharges at Site 2, Loup at Genoa, and Columbus were within 100 cfs of each other.
- Q: Runge asked if the team saw similar relationships with the Platte or whether the relationships are very generalized and have a similar linear form regardless of the river systems and asked if the Loup could be overlaid with the Platte.
A: Lewis explained that there is a steeper slope between Sites 1 and 2 on the Loup, and that it's flatter on the Platte. He stated that in addition to needing more than one gaged site, the morphology-defining Q_e versus width relationship is for a truly unconstrained river, and that the Loup and the Platte are both affected by lateral constraints. Site 3 was found to have lateral restraints on both sides, which was not the case at adjacent study sites up or down the river. The Q_e versus width relationship does aid in defining the morphology, but cannot be translated between rivers.
- Q: Joel Jorgenson (NGPC) asked how the data were summarized for analysis and if the data was adjusted for effort intensity?
A: Richardson responded that for the analysis of nest counts vs. data collection visits, the data was not changed but that for the subsequent analysis compared to year, river mile, flow, etc., that only the highest nest count at a specific location within a year was used.
- Q: Mary Bomberger-Brown (Tern and Plover Conservation Partnership) asked what statistics were being looked at and whether the statistic is r (correlation) or r^2 (regression).

- A: Marcus Grant (HDR) responded that the slides were generalized but are reporting the coefficient of determination, r^2 .
- Q: Jorgenson asked if the analysis performed was a regression analysis.
A: Grant responded, yes, this was a regression analysis - multiple regression using two independent variables.
 - Q: Jorgenson asked why river miles from 72 to 102 were chosen for analysis of distance from the tailrace.
A: Richardson stated that this area was chosen in order to limit the effects of inflows and other factors not associated with the project, this is the area closest to the tailrace. River mile 72 (North Bend) was chosen because that is a USGS gaging station and hydrology data is available. She also explained that limiting the analysis to the area closest to the tailrace was discussed during the March meeting with NGPC and TPCP.
 - C: Jorgenson noted that if an effect was identified it would be attenuated downstream and analysis further downstream would show that, but he agreed that decisions have to be made regarding limiting the analysis.
 - C: With respect to the significant change in nest count number pre- and post-1995, Jorgenson noted that there are numerous other variables that affect tern and plover nesting numbers in this system.
C: Richardson agreed but noted that there was also an analysis performed beyond river mile 72 when it appeared there was something significant happening, but that the additional analysis did not show a significant difference in nest counts pre- and post-1995.
 - Q: Bomberger-Brown asked if the District could send her the test statistics.
A: Richardson noted that all of the SPSS output from the statistical analysis is available in Attachment H of the Updated Sedimentation Study Report and that she would provide that attachment directly to Mary and Joel.
 - C: Jorgenson commented that he thought the District was making a conclusion that a constant variable (the project) isn't affecting the terns and he reiterated that there are a number of variables to look at, but that the data is too noisy and there are other variables at play, so a concise conclusion cannot be made.
C: Richardson agreed that many factors affect nesting habits but noted that this is the best data available and that several types of analysis were done and nothing identified something that could be attributed the Project.
 - Q: Runge asked why this portion of the Sedimentation Study used peak mean daily flow instead of Q_e that was used in the other analyses.
A: Richardson/Grant explained that the correlation and factor analysis of the hydrologic data indicated that Q_e , Q_d and peak mean daily flow were loaded on the same factor, indicating they were very similar. However, for analysis by river mile, Q_e and Q_d were not available, so the flow data was used.
 - Q: Runge asked if the fact that the three factors were determined to be similar for this analysis but other analyses in sedimentation identified them to be different with respect to other parameters, if this means that the statistical analysis isn't a good measure of project effects.
A: Richardson answered that analysis of Q_e and Q_d could not be done for the statistical analysis because the data isn't available to do a calculation at each river mile – that is essentially the course spatial analysis that was done in the Initial Study Report. She also noted that sediment transport is related to flow and that was the only variable that could be used at a more refined spatial scale. Engelbert added that Q_e and Q_d is the long-term analysis relative to sediment transport based on a long term analysis of the river.
 - Q: Runge asked if there was an aggregate comparison that looks at changes in the Q_e and Q_d on the longitudinal, and does that affect nesting over the long-term as well?
A: Richardson/Hunt responded that the factor analysis used the annual flow, Q_e and Q_d , not the long term Q_e and Q_d and analysis of changes in Q_e and Q_d on the longitudinal were not done for this

analysis [NOTE: Longitudinal analysis of Q_e and Q_d was conducted for the Initial Study Report at a course longitudinal scale (between USGS gage stations)]

Study 2.0: Hydrocycling

Study Results:

Pat Engelbert (HDR) presented the study results of the hydrocycling study. The key points were as follows:

- Model Conclusions:
 - Reaches are stable – consistent with prior findings – dynamic equilibrium.
 - Modeled Sediment Transport Rate matched previous sediment discharge rating curve.
 - Transport rate at capacity in all cases – not supply limited.
- Considerations: Model can be unstable. Great care must be taken when making simulations. Modifying and executing between 32-bit and 64-bit machines can produce different results. In addition, modifying the plan or quasi unsteady flow file on different computers would at times produce differing results. Finally, differing end of simulation dates can produce different results.

Discussion:

- Q: Runge noted that he thought the USGS report on gradation only described methods and not sediment gradation results. He thought a contractor had been hired to sort the data, but he did not find the data in the PDF when he reviewed the information.
A: Engelbert noted that the report he received has the results and he will look up the information after this meeting and provide it to Jeff.
- Q: Runge asked if the sediment gradation line was the average over the length of the simulation.
A: Engelbert explained it was the sediment gradation at end of the simulation.
- Q: Runge asked if the transport rate was higher than the capacity.
A: Engelbert explained that there are times during the simulation where the transport rate is greater than transport capacity at a given cross section, and there are times where the transport rate is less than the transport capacity at a given cross section. However, over the entire simulation the rates and capacity are all clustered around the sediment discharge rating curve using Yang's equation, suggesting the system is transporting at capacity.
- C: George Waldow (HDR) stated that the scenario Runge suggests is consistent with dynamic equilibrium; a braided system will show both aggradational and degradational sections over time.
- Q: Runge asked if the sites looked at an aggregate average elevation of all the cross sections.
A: Engelbert explained that, yes, it was an average of the cross sections within the study area.
- Q: Runge asked if any model could evaluate supply from the basin as well as evaluate the capacity of the river to transport sediment.
A: Engelbert said he was not aware of a single model that would evaluate the sediment supply from the basin as well as the transport capacity of the river.

Species Summary: Interior Least Terns and Piping Plovers

Study Results:

Matt Pillard (HDR) presented the results of the species summary for the Interior Least Terns and Piping Plovers. The key points were as follows:

- Sandbar formation:
 - System is not-supply limited.
 - Sediment removal from canal does not limit sediment supply for potential sandbar creation.
 - Sediment removal does not create a sediment deficit that would erode sandbars at a rate faster than normal.

- System in a state of dynamic equilibrium indicates that channel morphology, that is a braided channel, exists under current operations and has shown to provide tern and plover habitat.
- As a result of a not-supply limited system and a system seated in a braided river system, effects of hydrocycling was not shown to effect sediment supply available for sandbar creation.
- Suitable Habitat Availability
 - Nest distribution variability not related to proximity to Tailrace Return; appears that Tailrace is not a factor for nest site selection
 - A period of relatively high nest counts from 1987 to 1995 was followed by a period of lower but also static nest counts from 1995 to 2008 between RM 102 and RM 72; Project operations have remained the same during this period.
 - Daily fluctuations in stage due to hydrocycling affect the wetted fringe of sandbars that serve as habitat. This effect is greatest when upstream Platte River flows are the lowest. This effect is expected to be the most evident nearest the Tailrace return. However, location to the Tailrace return was not a factor in explaining nest count variability.
 - Many factors in determining suitable habitat on a year-to-year basis (flows, predation, recreational disturbance, nesting success)
- Loup River Physical Characteristics
 - Differences in channel widths above and below the Diversion Weir (wider above and narrower below).
 - Project operational changes are limited with respect to altering physical parameters
 - No morphological changes in last 25 years
 - No change in morphology is expected

Discussion:

- C: Jorgenson referred to slide 153, and commented that he felt this was just an exploratory analysis and that there is too much variability and noise in the data that interferes with making a judgment. He noted that stating nest site selection implies habitat availability and noted that the analysis did not look at habitat.
- Q: Isis Johnson (FERC) referred to slide 151 and asked if there was any analysis of how the current equilibrium might change if the sediment was not removed. She asked if the river might be in a different state than it would be without hydrocycling and/or without removal of sediment and how might things change in the future. Is there any difference in what is happening above and below (the Tailrace return) and whether that difference is either beneficial, detrimental, or having no effect on terns and plovers? She noted that it would be helpful to understand the differences on the Platte River above and below the Tailrace return and how alternatives may affect bird habitat and then how they might be mitigated.

A: Engelbert replied that the hydraulics associated with Site 3 differ from Site 4, but the survey results showed no long-term degradational trends. However, how it would respond without the elimination of sediment wasn't evaluated.

C: Richard Holland (NGPC) noted that agency understanding was that a no-project scenario was not being considered.

Q: Johnson stated that the assumption that the project would be there is correct, but she would like to have the information about no diversion or what happens if sediment removal is reduced.

A: Richardson and Neal Suess (LPD) explained that removing less sediment at the headworks is not an option. The sediment that comes into the settling basin must be removed or the basin would fill up with sediment within a year or two and the District would not be able to take water into the canal and the project would not longer be able to operate.
- C: Runge noted that additional integration of the study results would be helpful - how do geomorphic effects affect habitat and how does that habitat then affect the species.

- C: Holland commented that the analysis that was done may be at too large of a scale to identify short stretches of river that may be impacted, but that a study at that scale is cost prohibitive.
- C: Runge noted that effects are not necessarily limited to only the areas studied and specifically noted activities on the North Sand Management Area.
- C: Pillard noted that information beyond the studies would be covered in the biological assessment that is being prepared.
- C: Runge commented that when the biological assessment is developed, that effects to any individuals of a species should be considered in an affect determination in relation to Section 7. The District will need to quantify the significance of the effect and FWS will review the significance related to the recovery of the species and analyze the rest of the species and cumulative effects.
- Q: Johnson requested clarification on the statement on slide 155 that “Project Operational Changes are limited with respect to altering physical parameters.”
A: Pillard explained that the intent of that statement is to note that although characteristics are different below the diversion weir, that there aren’t any operational changes that could be made that would alter those current conditions.

Next Steps

Lisa Richardson (HDR) discussed the next steps in the relicensing process.

In relation to studies:

- September 23, 2011 – District submits meeting summary
- October 24, 2011– Agencies file meeting summary disagreements and submit requests for modification to on-going studies
- November 23, 2011 – District responds to summary comments and study modification requests
- December 23, 2011 – FERC resolves comments and study modification requests

In relation to the License Application:

- November 18, 2011 – District files Draft License Application
- April 16, 2012 – District files License Application

In relation to Section 7 Consultation:

- November 18, 2011 – District submits Draft Biological Assessment with Draft License Application
- February 16, 2012 – Agency Comments on Draft BA/Draft License Application due
- April 16, 2012 – District submits Biological Assessment with License Application
- July 1, 2012 – Application accepted and Ready for Environmental Analysis (REA)
- 60 days after REA – Comments, recommendations and preliminary terms and conditions or preliminary fishway prescriptions due
- May 2013 – FERC issues Environmental Assessment
- 135 days after EA issued – Biological Opinion due

Discussion:

- Q: Holland asked what is meant by Fishway prescriptions.
A: Janet Hutzel (FERC) explained that it is related to the FWS Section 18 authority to prescribe fishways – basically it’s FWS’s ability to require structures or other structures for fishways.
- C: Makowski noted that any proposed mitigation measures the District wanted to suggest should be included in the Draft Application.

- C: Makowski noted that any references requested by individuals should also be submitted to FERC so they are available to all.
- C: Richardson told Runge that the USGS report would be emailed to him after the meeting.
- C: Richardson told Bomberger-Brown and Jorgensen that Appendix H information would be emailed to them after the meeting.