NELSON ENERGY LLC

RED RIVER HYDRO

LOUISIANA

Clean. Renewable. Power.

HYDROPOWER – A Dependable Renewable Energy Resource

Harnessing the power of falling water at existing dams is a valuable option for supplying a large part of our nation's growing demand for renewable energy. Many years of operational history have shown that hydropower facilities are both durable and efficient. They provide a predictable, proven power source that utility managers can rely upon to meet the power demands of consumers. Using the available networks of stream flow gages throughout the United States, the output from hydroelectric projects can be reliably predicted days in advance.

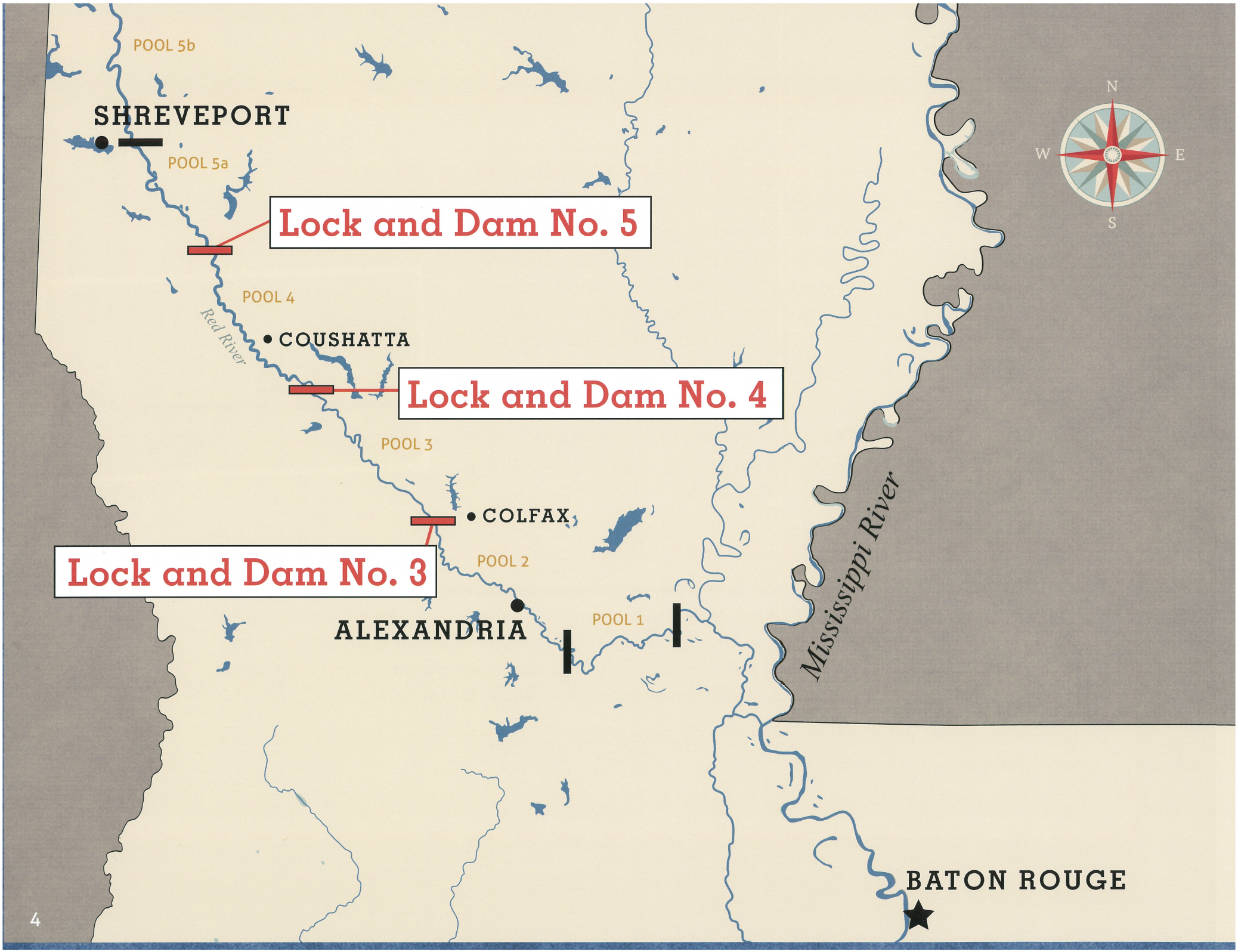
Many hydroelectric facilities in operation today are over 100 years old and continue to provide clean, economical energy. Installing a hydropower facility at an existing dam creates the opportunity to leverage an existing public investment to provide additional benefits to the public.

Lock and Dam No. 3

THE OPPORTUNITY: Red River Hydroelectric Project

The development of the hydro potential at the Red River Locks and Dams Nos. 3, 4 and 5 will provide an affordable, reliable and substantial source of renewable energy. The projects are unique because of their size and location. The three Red River projects will be only the second hydroelectric development in the state of Louisiana. At a combined total generation capacity of 92 megawatts, the three projects are one of the largest conventional hydroelectric installation under development in the United States.

Nelson Energy, the developer of the project, is seeking investor or partners to share in the development and ownership of the projects.


POOL 5b
SHREVEPORT
POOL 5a
Lock and Dam No. 5
POOL 4
Red River
COUSHATTA
Lock and Dam No. 4
POOL 3
COLFAX
Lock and Dam No. 3
POOL 2
ALEXANDRIA
POOL 1
Mississippi River
N
W
E
S
BATON ROUGE

THE PROJECTS

The Red River in Louisiana has served as a transportation corridor for bulk cargo from the early 1800s to the present day. The river corridor provides a commercial water-born transportation route from the Mississippi River upstream to Shreveport, Louisiana. In the late 1980s and 1990s the U.S. Army Corps of Engineers (USACE) improved the navigation on the Red River by constructing five locks and dams and channelizing 230 miles of the river in north central Louisiana to create the J. Bennett Johnson Waterway. All of the locks and dams are of modern design and are very similar in configuration and operation.

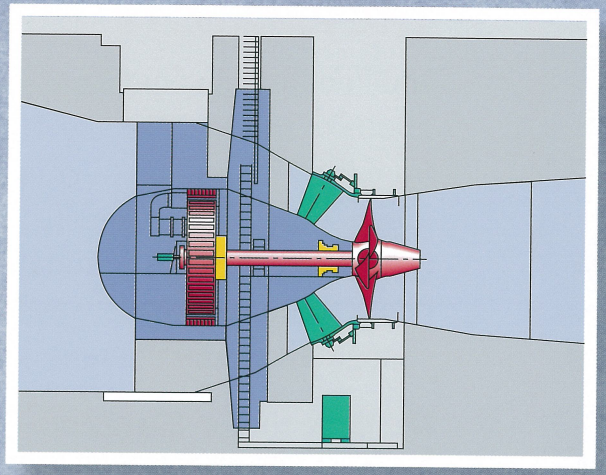
The three Nelson Energy projects are virtually identical to each other. Each project includes a powerhouse located in the abutment area adjacent to the spillway structure for each lock and dam. Each project also has a single 7.7 meter diameter bulb turbine which is capable of generating 28 to 36 MW of electrical energy depending on the head. This type of turbine has been used on many other major projects both within the United States and worldwide. The similarity of the turbines and dam structures at the three sites will provide economies of scale in the procurement, construction and long term operation of the projects.

The navigation pools upstream of the three projects are part of the Red River Waterway System and the land surrounding the projects and the reservoir are owned by the United States or the Red River Waterway Commission, the State sponsor of the navigation project. The three projects will utilize a total of 265 acres of federal property. Interconnection with the local transmission system will be via interconnection lines situated along existing road rights-of-way or existing transmission corridors.

Lock and Dam No. 4

SCHEDULE

Nelson Energy has managed the environmental and feasibility studies required to support license applications for each project which were submitted to the Federal Energy Regulatory Commission (FERC) in 2009 and 2010. Based on information obtained from the FERC, licenses are anticipated to be issued in 2013. Upon receipt of the licenses and execution of agreements for the purchase of project output, Nelson plans to proceed with detailed engineering, financing and construction of the three projects. These activities will include coordination with the USACE to receive design approval for the projects. Nelson has worked closely with the USACE during development of the preliminary design and licensing of the projects. The State of Louisiana has issued Section 401 Water Quality Certifications for all three projects. The construction of the projects is anticipated to take between three and four years with the commercial operation dates in 2017 or 2018.



Schematic of Bulb Turbine

GENERATION FACILITIES

The powerhouses at the three projects will be constructed adjacent to the USACE spillways on the opposite side of the river from the existing lock chambers. The powerhouses have been sited in a manner which will minimize the interference with the existing USACE structures. The normal head (difference in height between the normal reservoir level and the water outflow from the turbines) for the Red River Lock and Dam No. 3 Project is 31-feet. The normal heads at the Lock and Dams No. 4 and 5 Projects are 25-feet. Based upon the head and flow characteristics the maximum generation potential for the 7.7 M turbine at the Lock and Dam No. 3 Project is 36 MW while at the other two projects the generating potential at each is 28 MW at 25 ft. of head.

ENERGY PRODUCTION

The Red River has its headwaters in New Mexico and flows along the northern border of Texas to Louisiana. The drainage area upstream of the projects is over 60,000 square miles, which provides a reliable and generally consistent source of flow for hydropower generation. The normal operation of hydroelectric projects will be in a run-of-river mode to support the navigation requirements of the USACE. Based upon modeling using over 50 years of historic daily stream flow records, the total average annual generation for the three projects is over 450,000 MWh with an average capacity factor of over 55% at 92 MW. Historically the average generation has not varied significantly throughout the course of a year. The modeling using daily historic data indicated the maximum monthly average generation, which occurred in July, is only 17% greater than the minimum average monthly generation which occurred in February.

Lock and Dam No. 3

ELECTRICAL INTERCONNECTION

The projects will be interconnected with the existing utility system via single pole transmission lines extending from the powerhouses to the interconnection points that have been coordinated with the local utility, Central Louisiana Electric Company (CLECO). The interconnection lines for all three projects will be located along existing transmission corridors or along existing roadways owned by the USACE or the State of Louisiana. The interconnection of these projects will require studies related to the requirements of the local Independent System Operator.

CAPITAL COSTS

Nelson Energy estimates the construction costs of the three projects is $318.7 million. This estimate results in an average construction cost of $3,464 per kW. This is a relatively low cost for a base load, renewable energy resource. Whether publicly or privately financed, the projects can be expected to offer a competitive power costs compared to other new base load power resources, conventional or renewable.

SUMMARY OF ADVANTAGES

- Renewable base load power source
- Clean source of energy
- Minimal environmental impact due to construction at an existing dam
- Competitive capital costs compared to other conventional base load and renewable sources
- Higher capacity factors and more predictable output than wind and solar energy sources
- Low operation and maintenance costs—The dam itself will be maintained and operated by the USACE
- Long project life—The life of a hydroelectric plant can be 100 years or more
- Low cost power compared to other conventional base load and renewable sources—Once the debt incurred to finance the project has been repaid, the project will provide a very low cost source of renewable energy for its owner
- No long term fuel cost risk

DEVELOPER

BOST3 Hydroelectric LLC, BOST4 Hydroelectric LLC and BOST5 Hydroelectric LLC, the applicants for FERC licenses, are all wholly owned subsidiaries of Nelson Energy. Nelson previously developed the 10 MW Lower St. Anthony Falls project which is in operation in Minneapolis, Minnesota and the 36 MW Red Rock project which is currently under final design in Iowa.

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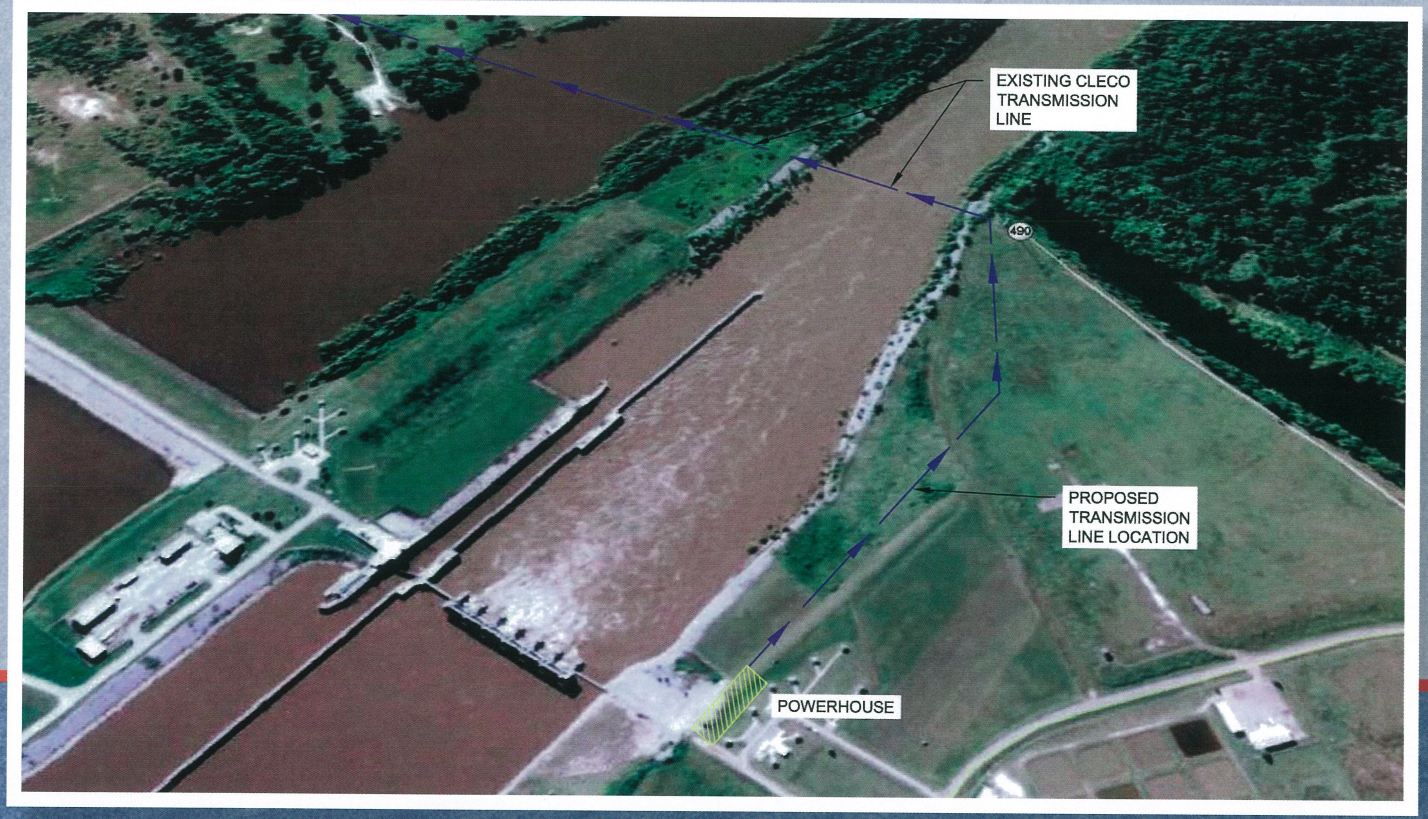
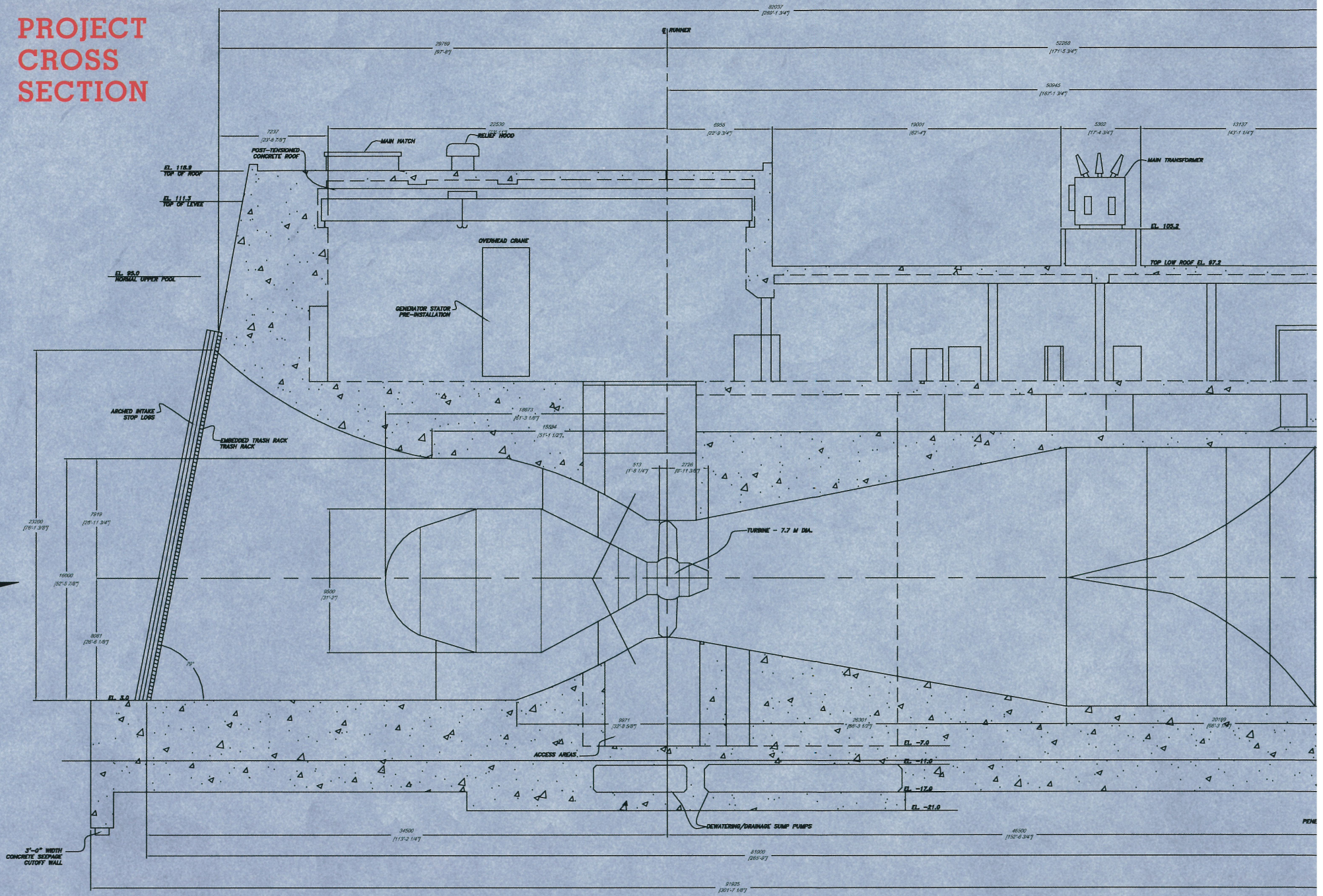
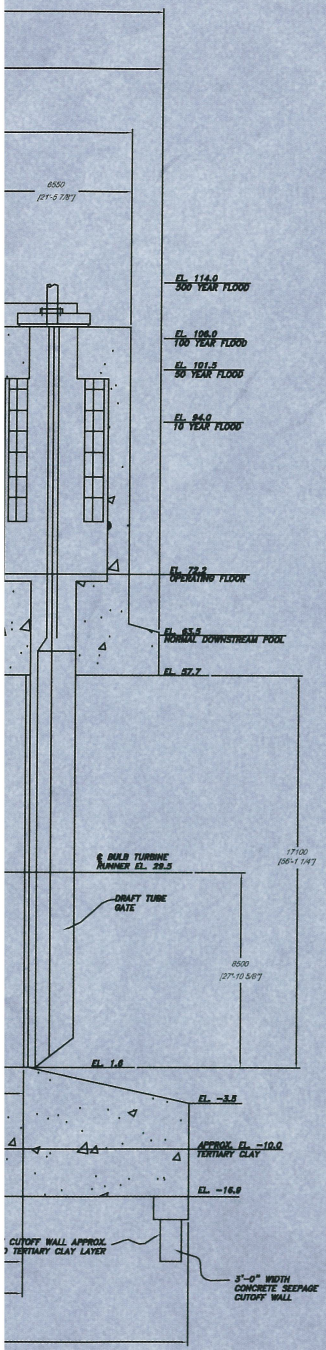


Aerial view of proposed development at Lock and Dam No. 3

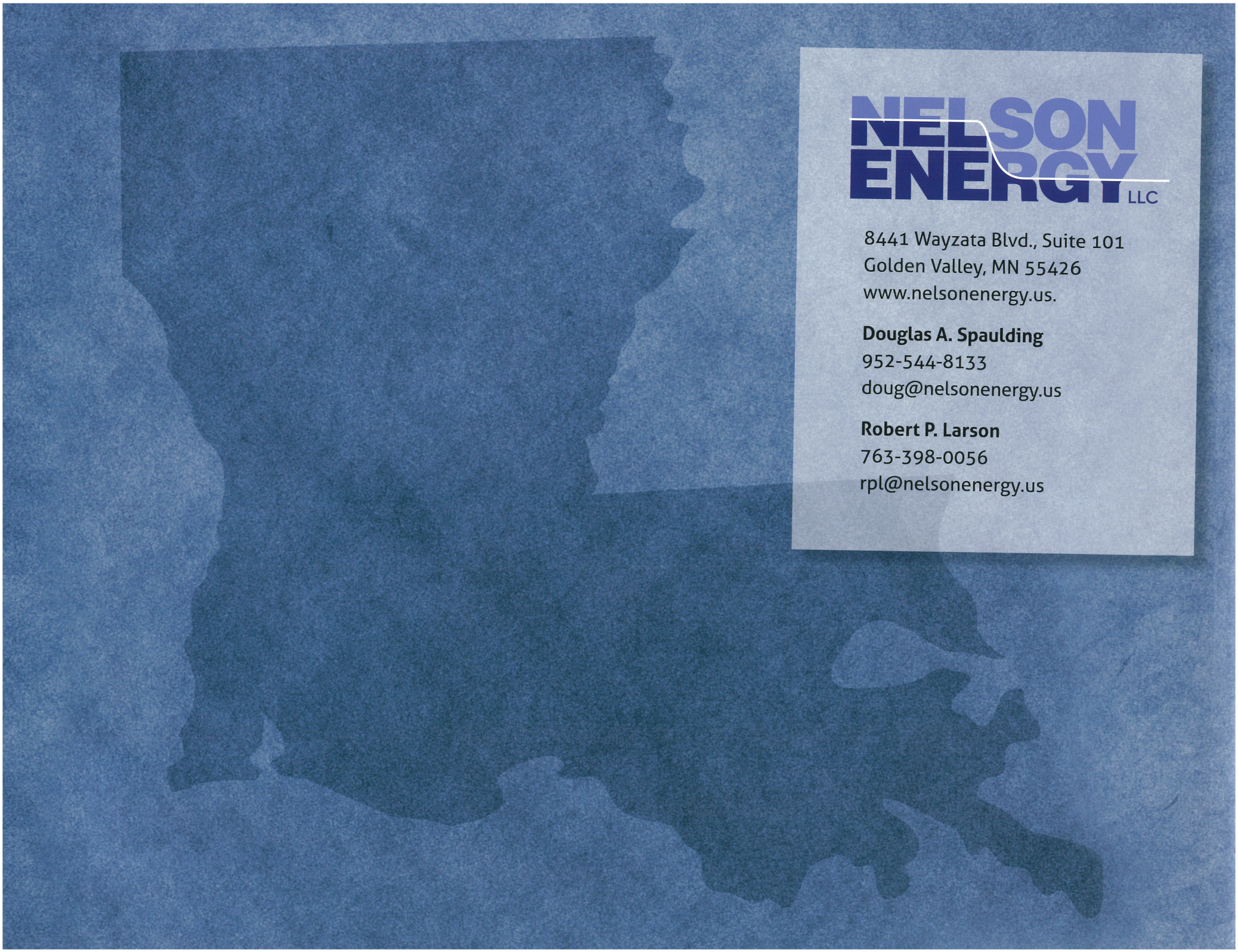
PROJECT CROSS SECTION





PROJECT DATA

	Lock and Dam No. 3	Lock and Dam No. 4	Lock and Dam No.5
Location—River Mile	116	169	200
Generating Capacity—MW	36.24	28.13	28.13
Head—feet	31	25	25
Avg. Annual Power Production—MWH	177,247	136,642	137,290
Capacity Factor—%	55.8	55.4	55.7
Turbine	1-7.7 M Bulb	1-7.7 M Bulb	1-7.7 M Bulb
Estimated Cost—$2010	$115,927,635	$107,062,635	$95,667,635
FERC Licensing Status	License Anticipated 2013	License Anticipated 2013	License Anticipated 2013



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