



## **Purkeypile Consulting, LLC**

**Richard Dee Purkeypile, P.E.**

**Texas Firm No. 11617, Texas P.E. No. 68027**

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**Dam Safety Engineering & Water Resources Consulting**

December 4, 2017

Lee W. Mueller, Architect & Co-Member Manager  
Boyce Hydro, LLC  
6000 South M-30 (P.O. Box 15)  
Edenville, MI 48620

Re: Focused Spillway Inspection of Boyce Hydro Power, LLC Hydroelectric Projects:  
Sanford Hydroelectric Project FERC No. 2785  
Edenville Hydroelectric Project FERC No. 10808  
Secord Hydroelectric Project FERC No. 10809  
Smallwood Hydroelectric Project FERC No. 10810  
Licensee: Boyce Hydro Power, LLC

Mr. Mueller:

Per your request, I have developed a proposed plan to address the items listed in the FERC's letter of April 28, 2017 regarding the requirement for a Focused Spillway Inspection of the following Boyce Hydroelectric Projects:

1. Sanford Hydroelectric Project FERC No. 2785
2. Edenville Hydroelectric Project FERC No. 10808
3. Secord Hydroelectric Project FERC No. 10809
4. Smallwood Hydroelectric Project FERC No. 10810

### **Schedule of Focused Spillway Inspections**

In my previous letter dated December 1, 2017, wherein I provided a plan and schedule to address the FERC request for a Gated Spillway Rating Curve Update for each project; I indicated that the focused spillway inspections should best be performed in July of 2018 at the same time as the investigations are undertaken regarding the maximum gate openings and when the gate measurements will be obtained. As you have duly noted, July would be the earliest time to observe the spillways without the occurrence of spring runoff events interfering with the inspections.

### **Plan for Close Visual Inspection of Spillway Slabs**

The requirements for the spillway assessments include a "close visual inspection" of the spillway slabs among other activities. In order to perform the inspections, each of the reservoirs below three of the Boyce Hydro dams (Smallwood, Wixom, and Sanford) must be lowered approximately four feet in order to expose the tailrace slabs for visual inspection. This depth was determined when the Sanford Reservoir was lowered during the slab repair at the Edenville

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project in 2016. The optimal time to do this would be after the spring runoff is completed and the dry weather season begins in July. It is estimated that it will take approximately six days to draw down the affected reservoirs four feet based upon a drawdown rate of 8-inches per 24-hour day. It may take as long as 10 days depending on inflow conditions at the time.

The Sanford tailrace will be exposed by shutting off all flow through the dam after the upstream tail races have been lowered for inspection. Exposing the Sanford tailrace slab under this condition should take approximately one day, or two at the most, through closure of the flow through the dam. Recordation of Visual Inspections of Spillway Slabs shall be done with extensive photographs and videography.

As specified in the April 28, 2017 FERC letter of instruction, relevant information for review will include:

1. General foundation rock/soil composition and quality
2. Geotechnical investigation reports
3. Underdrain system details
4. Inspection reports
5. Performance monitoring
6. Construction photographs


Areas of focus for visual inspection will include typical failure modes associated with concrete spillways, i.e.:

1. Cavitation potential and/or slab-jacking such as cracking or other evidence of subsidence
2. Hammer sounding for possible sub-slab voids
3. Construction joint conditions for spalling concrete or cavitation
4. Adverse joint offsets
5. Condition of joint fillers
6. Non-destructive slab uniformity where technically feasible
7. Downstream end cutting potential
8. Gate operations and procedures

**Review of Original Construction Plans & Prior Documentation Currently Available**

Original construction plans are on file with the licensee and will be reviewed and compared with current conditions as inspected.

A summary of the findings will be submitted to the Chicago regional Office on or before December 28, 2018.

Sincerely, 

12-4-2017  
Date

**Richard Dee Purkeypile, P.E., President, Purkeypile Consulting, LLC**

# *BOYCE HYDRO POWER LLC*

A W.D. Boyce Trusts Legacy Enterprise

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5 December, 2017

Mr. John Zygaj, P.E. Regional Engineer  
Chicago Regional Office  
**Federal Energy Regulatory Commission**  
230 S Dearborn St Ste 3130  
Chicago, IL 60604

**RE: Sanford Dam P-2785  
Edenville Dam P-10808  
Smallwood Dam P-10810  
Secord Dam P-10809**

## **Plan & Schedule for Focused Spillway Assessments**

Mr. Zygaj: As directed in your letter of 28 April, 2017, Boyce Hydro Power, LLC herewith submits its Plan & Schedule for conducting "Focused Spillway Assessments" of the above-referenced hydroelectric dams.

Sincerely yours,



Lee W. Mueller, Architect  
Co-Member Manager  
Boyce Hydro Power, LLC.

Cc: R.D. Purkeypile, P.E.

Document Content(s)

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