DRAFT

DOWNSTREAM NAVIGATIONAL FLOW ASSESSMENT STUDY PLAN

PARR HYDROELECTRIC PROJECT

(FERC NO. 1894)

Prepared for:

South Carolina Electric & Gas Company
Cayce, South Carolina

Prepared by:

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Lexington, South Carolina
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December 2013

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SOUTH CAROLINA ELECTRIC & GAS COMPANY

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1.0 INTRODUCTION

South Carolina Electric & Gas Company (SCE&G) is the Licensee of the Parr Hydroelectric Project (FERC No. 1894) (Project). The Project consists of the Parr Hydro Development and the Fairfield Pumped Storage Development. Both developments are located along the Broad River in Fairfield and Newberry Counties, South Carolina.

The Project is currently engaged in a relicensing process which involves cooperation and collaboration among SCE&G, as licensee, and a variety of stakeholders including state and federal resource agencies, state and local government, non-governmental organizations (NGO), and interested individuals. The collaboration and cooperation is essential to the identification of and treatment of operational, economic, and environmental issues associated with a new operating license for the Project. SCE&G has established Technical Working Committees (TWC's) with members from among the interested stakeholders with the objective of achieving consensus regarding the identification and proper treatment of these issues in the context of a new license.

The Recreation TWC has requested that flows downstream of the Parr Shoals Dam (Parr Dam) be assessed during planned Instream Flow Incremental Methodology (IFIM) studies to determine if downstream flows currently facilitate one-way navigation at an identified point of constriction in the Broad River, downstream of the Project. Although the primary purpose of the IFIM study is to develop an understanding of key habitat-flow relationships for aquatic species in the Broad River, the IFIM study also provides an appropriate means of determining consistency with navigational goals under various flow scenarios.

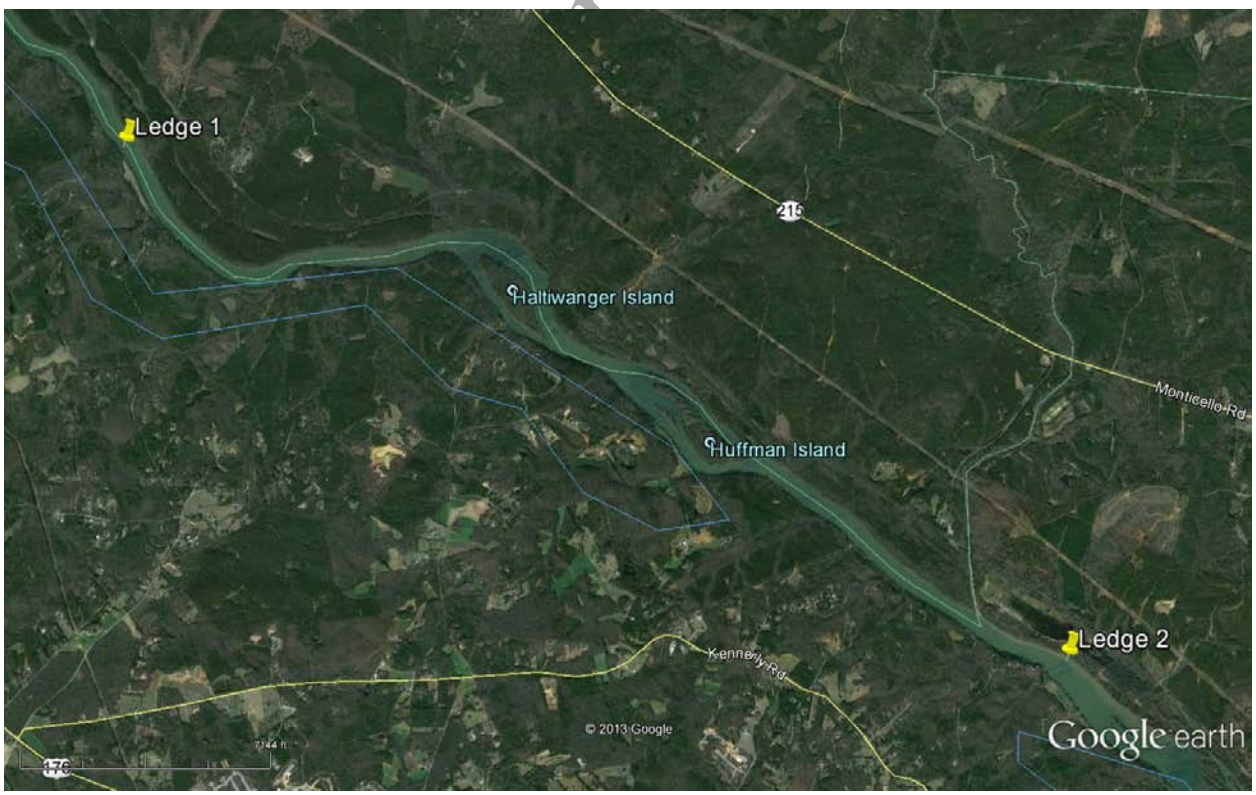
2.0 STUDY OBJECTIVE

The objective of the navigational analysis is to assess the flow levels within the Broad River, at identified points of constriction, needed to facilitate one-way navigation. The criteria for one-way navigation can be defined as a "minimum depth of one foot across a channel 10 feet wide or across 10 percent of the total stream width, whichever is greater. Minimum depth does not need to occur across a continuous 10 percent of the stream width, but each point of passage must be at least 10 feet wide."(SCWRC, 1988)

3.0 GEOGRAPHIC AND TEMPORAL SCOPE

The navigational analyses will evaluate flows within the Broad River at points of navigational constriction downstream of the Parr Dam. Recreation TWC participants initially identified two points of potential constriction. These points, identified as "Ledge 1" and "Ledge 2", were further investigated during Parr mesohabitat studies and are defined below. See Figure 1 for location of the two points of navigational constriction.

FIGURE 1 POTENTIAL POINTS OF NAVIGATIONAL CONSTRICTION



Ledge 1. Ledge 1 is located at a lat/long of 81°15'46.507"W, 34°12'49.999"N, approximately 2.4 miles upstream of Haltiwanger Island. Field investigations have identified a navigational passage point on river right (looking downstream) that is approximately 45 ft wide with an approximate elevation change of 1.5 feet. Please see Figure 2; the passage point is within the red circle.

FIGURE 2 LEDGE 1 IDENTIFICATION AND AREA OF NAVIGATIONAL PASSAGE

Ledge 2. Ledge 2 is located 1.3 miles upstream of Hickory Island and approximately 0.5 miles downstream of the mouth of Little River. Ledge 2 has a lat/long of 81°10'15.941"W, 34°10'18.154"N, and an approximate elevation change of 1.5 to 2.0 feet. Field investigations have identified a navigational passage point on river right (looking downstream) that is approximately 60 ft wide. Please see Figure 3; the passage point is within the red circle.

FIGURE 3 LEDGE 2 IDENTIFICATION AND AREA OF NAVIGATIONAL PASSAGE

The navigational analyses will be conducted during the summer of 2015 concurrent with IFIM study efforts.

4.0 METHODOLOGY

IFIM study transects will include the representative locations of navigational constriction identified in Section 3.0, to allow the characterization of hydraulics (wetted depth and width) during a range of flows. The transect locations will be field blazed with flagging, recorded via GPS, or other appropriate means. The study sites will be mapped sufficiently to quantify the areas represented by the transects. Consistent with IFIM survey protocol, transect headpin and tailpin ends will be located at or above the top-of-bank elevation, and secured by steel rebar or other similar means. A measuring tape accurate to 0.1-foot will be secured at each transect to enable repeat field measurements, if necessary. Stream bed and water elevations tied to a local datum will be surveyed to the nearest 0.1-foot using standard optical surveying instrumentation and methods. If USGS gage data is not available, a staff gage may be placed at the study site to confirm stable flow during measurements. Survey activities are anticipated to take place at a flow of 400 cfs. A water level logger will also be placed at the transect locations to gather water surface elevation data under various flow events. Water surface elevations will be used to develop stage-discharge relationships for the site and the stage-discharge relationships will be assessed on whether one-way navigation is achieved.

Information obtained during survey activities will be included within the draft IFIM report that will be submitted to the study team for review and comment. The report will document the methods and results as encountered in the field. Supporting data will be presented in graphic and tabular form and appendices will include cross-sectional survey data and reference photographs of study sites.

The methodology for this analysis may be revised or supplemented based on consultation with the Instream Flow TWC and other interested stakeholders, or if field efforts so dictate.

5.0 SCHEDULE AND REPORTING

Data will be gathered during the IFIM study, anticipated to occur in 2015. A final report summarizing IFIM study findings, including an analysis of impediments to one-way navigation under various flow conditions, will be issued subsequent to the completion of field work.

6.0 USE OF STUDY RESULTS

Study results will be used as an information resource during discussion of relicensing issues and developing potential Protection, Mitigation and Enhancement measures with the South Carolina Department of Natural Resources, USFWS, the Instream Flows TWC, and other relicensing stakeholders.

7.0 REFERENCES

South Carolina Water Resources Commission (SCWRC). 1988. Instream Flow Study Phase II: Determination of Minimum Flow Standards to Protect Instream Uses in Priority Stream Segments: A Report to the South Carolina General Assembly. Available Online. [URL]: http://scwaterlaw.sc.gov/Instream%20Flow%20Study%20ph2.pdf. Accessed August 2013.