North Carolina Department of Environment and Natural Resources
Division of Energy, Mineral and Land Resources
Land Quality Section

Tracy E. Davis, PE, CPM
Director

Pat McCrory, Governor
John E. Skvarla, III, Secretary

NOTICE OF INSPECTION

March 11, 2014

CERTIFIED RECEIPT **7003 2260 0001 3551 6360**
RETURN MAIL REQUESTED

Duke Energy Corporation
Attention: Sean DeNeale
526 South Church Street, ECI-013
Charlotte, North Carolina 28202

RE: Buck Steam Station Basin 1 to Basin 2 Dam
ROWAN-069 – High Hazard Potential
Rowan County

Dear Mr. DeNeale:

The "Dam Safety Law of 1967," as amended, provides for the certification and inspection of dams in the interest of public health, safety, and welfare, in order to reduce the risk of failure of such dams; to prevent injuries to persons, damage to property; and to insure the maintenance of stream flows.

Our record indicates that you are the owner and/or responsible for the referenced dam, which is located off Dukeville Road and was inspected on February 26, 2014 by personnel of the Land Quality Section. This inspection revealed the conditions outlined below. Please note that references to "right" and "left" in descriptions of the dam structure are referenced while looking in the downstream direction.

1. An area of erosion visually estimated 15 feet by 15 feet has occurred in the discharge channel. While this erosion does not pose an immediate threat to the integrity of the dam, it is recommended that you repair the area to prevent the progression of erosion.

We recommend that you retain the services of a registered professional engineer to make a study of the condition outlined above. Plans and specifications for repair or breach of the dam based on the results of the study should be

filed with the Division of Energy, Mineral and Land Resources for approval pursuant to the North Carolina Administrative Code, Title 15A, Subchapter 2K – Dam Safety (15A NCAC 2K).

Please submit a written response as quickly as possible, but no later than ten (10) days following receipt of this letter of your intended actions in this matter.

2. A bare area was observed in the area of a bore location. It is recommended that you reestablish vegetation in the area to prevent surface erosion.

Additionally, the following general maintenance procedures are recommended:

1. Maintain a ground cover sufficient to restrain accelerated erosion on all earthen portions of the structure.

2. Periodically remove undergrowth, woody vegetation, and trees less than six inches in diameter from the slopes and crest of the dam and establish a good grass cover. All limb debris should be removed as well. This will serve to:

   a. prevent the formation of a root system which might significantly increase seepage through the dam which could ultimately result in failure of the structure;

   b. reduce the possibility of damage to the dam due to the uprooting of trees by wind or other natural causes; and

   c. facilitate ease of inspection and increase the likelihood of early detection of more serious problems connected with the dam.

   Additional information on the problems associated with undesirable vegetation on dams can be found in free publications such as FEMA 534, *Impacts of Plants on Earthen Dams*. This document can be viewed online at http://www.damsafety.org/media/Documents/PDF/fema-534.pdf.

3. Periodically check the operation of all drain valve facilities. This will ensure satisfactory operation of the drains should an emergency situation arise.

4. Periodically monitor the subject dam and appurtenant works with respect to elements affecting its safety. This is in light of the legal duties, obligations, and liabilities arising from the ownership and/or operation of a dam.

During this inspection we also investigated the potential for property damage and loss of life in the event that your dam fails. This investigation determined that failure of your dam could result in significant environmental damage to the Yadkin River and possible interruption of utility service. Therefore, we are listing your dam in the "High Hazard Potential" Note that all hazard classifications are subject to change due to downstream conditions.

Please be advised that the Division of Energy, Mineral and Land Resources must approve any excavation, modification, or major repair work to this dam before the work commences. Also, note that this dam may not be breached, meaning the dam may not be drained by cutting a notch in the dam, without prior engineered breach plans being submitted to and approved by the Division of Energy, Mineral and Land Resources.

The "Dam Operation Maintenance and Inspection Manual" published by this Division provides inspection guidelines and recommended routine dam maintenance activities for the owner as well as emergency procedures in the event of possible dam failure. This document may be viewed online at http://portal.ncdenr.org/web/lr/dams.

Although every reasonable effort is made to determine the safety of each dam, our resources generally limit us to a surficial inspection of the dam and its appurtenant structures. This letter carries no implication regarding the internal stability of the dam. Dams, and especially their spillways and conduits, deteriorate with age. You are therefore advised to keep a close watch on the dam and notify us if you detect any changes, especially cracks, ground movements, or changes in seepage rate or color.

Please notify this office in writing if you wish to assert that you have no ownership or otherwise are not responsible for maintenance or repairs to the subject dam. If you have an emergency situation during non-office hours, you should notify 911 and the State Emergency Operations Center at 1 (800) 858-0368. They will notify the appropriate personnel in this Office of the situation.

Your cooperation and consideration in maintaining a safe dam is appreciated. Should you have any questions concerning our inspection, please contact me at (704) 663-1699.

Sincerely,

Zahid S. Khan, CPM, CPESC, CPSWQ
Regional Engineer
Land Quality Section

THE/cys

cc: Steven M. McEvoy, PE, State Dam Safety Engineer

DAM SAFETY INSPECTION REPORT

BMP GHAZALE

NAME	COUNTY	NO.	INSPECTED BY	DATE
BUCK STEAM STATION BASIN 1 TO BASIN 2 DAM	ROWAN	069	BROADWAY EPLIN, KORMANIK	2/26/2014

OWNER	ADDRESS	PHONE
Duke Energy	See file	

TYPE DAM: ☐ Concrete gravity ☐ Concrete arch ☒ Other ☒ Embankment ☐ Concrete buttress ☐ Stone masonry Ash Basin

TYPE INSPECTION: ■ Periodic ☐ Initial ☐ Followup ☐ Other

SITE CONDITIONS: ■ Wet ☐ Dry ☐ Snowcover ☐ Other

HAZARD DESCRIPTION: See file

HAZARD CLASS: ☐ Intermediate (B) ■ High (C) ☐ Low (A)

REMARKS: Alex Papp, Sean De Neale, Opie Wooten, Scott Nordgren, Tim Bailey, Mike Miller, Max Gardner, Henry Batkins in attendance

ACTION: ☐ None ■ Maintenance ☐ Monitoring ■ Minor repair ☐ Engineering

RECOMMENDATIONS: ■ Inspection letter ☐ Deficiency letter ☐ RE notice ☐ Engineering study ☐ Inspection by RE ☐ Inspection by DSE ☐ Dam safety order ☐ Enforcement ■ Periodic reinspection ☐ Other reinspection

UPSTREAM SLOPE / FACE

PROBLEMS:
☐ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Wave erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Sparse rip rap ☐ 11.Displaced rip rap ☐ 12.Cracks ☐ 13.Undermining ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ■ 19.Other

COVER: ■ Vegetation ☐ Rip rap ☐ Concrete ☐ Asphalt ☐ Other

COMMENTS: 19) SURFACE / REESTABLISHMENT OF VEGETATION IN AREA OF BORE

TOP OF DAM

PROBLEMS:
■ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Ruts ☐ 6.Livestock damage ☐ 7.Depressions ☐ 8.Unlevel ☐ 9.Misalignment ☐ 10.Has overtopped ☐ 11.Cracks ☐ 12.Spalling ☐ 13.Deteriorated joints ☐ 14.Displaced joints ☐ 15.Exposed reinforcement ☐ 16.Other

COVER: ■ Vegetation ☐ Gravel ☐ Concrete ☐ Asphalt ☐ Other

DOWNSTREAM SLOPE / FACE

PROBLEMS:
■ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Wetness ☐ 11.Seepage ☐ 12.Boils ☐ 13.Cracks ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Other

COVER: ■ Vegetation ☐ Rip rap ☐ Concrete ☐ Other

TOE CONTACT

PROBLEMS:
■ 1.None ☐ 2.Trees ☐ 3.High bushes ☐ 4.Burrows ☐ 5.Erosion ☐ 6.Livestock damage ☐ 7.Slides ☐ 8.Depressions ☐ 9.Bulges ☐ 10.Wetness ☐ 11.Seepage ☐ 12.Boils ☐ 13.Cracks ☐ 14.Holes ☐ 15.Spalling ☐ 16.Displaced joints ☐ 17.Deteriorated joints ☐ 18.Exposed reinforcement ☐ 19.Undermining ☐ 20.Other

COVER: ■ Vegetation ☐ Rip rap ☐ Concrete ☐ Other

AREA	PROBLEMS		COMMENTS
ABUTMENT CONTACTS	■ 1.None	☐ 11.Seepage	COVER: ☐ Vegetation ☐ Rip rap ☐ Concrete ☐ Other
	☐ 2.Trees	☐ 12.Boils	
	☐ 3.High bushes	☐ 13.Cracks	
	☐ 4.Burrows	☐ 14.Holes	
	☐ 5.Erosion	☐ 15.Spalling	
	☐ 6.Livestock damage	☐ 16.Displaced joints	
	☐ 7.Slides	☐ 17.Deteriorated joints	
	☐ 8.Depressions	☐ 18.Exposed reinforcement	
	☐ 9.Bulges	☐ 19.Undermining	
	☐ 10.Wetness	☐ 20.Other	
PRINCIPAL SPILLWAY	☐ 1.None	☐ 11.Joint displacement	TYPE/SIZE: 10'x10' CONCRETE RISER w/ 36" RCP BARREL
	☐ 2.No trashguard	☐ 12.Undermined	WOODEN FLOATING TRASH RACK ASKEW, SITTING ON EMBANKMENT FLOOR ON THE RIGHT SIDE
	☐ 3.Obstructed	☐ 13.Voids	
	☐ 4.Plugged	☐ 14.Erosion	IMPOUNDMENT LEVELS LOWERED IN ANTICIPATION OF DECOMMISHONING THE ASH POND
	☐ 5.Rusted	☐ 15.Holes	
	☐ 6.Damaged	☐ 16.Conduit collasped	
	☐ 7.Gates leaking	☐ 17.Spalling	
	☐ 8.Joints leaking	☐ 18.Outlet undercutting	
	☐ 9.Cracks	☐ 19.Misalignment	
	☐ 10.Joint deterioration	☐ 20.Other	☒ SEE COMMENTS ☆
EMERGENCY SPILLWAY	☐ 1.None	☐ 11.Joint displacement	TYPE/SIZE: SAME AS PSPWY
	☐ 2.No ES	☐ 12.Undermining	
	■ 3.Same as PS	☐ 13.Voids	
	☐ 4.Obstructed	☐ 14.Holes	
	☐ 5.Erosion	☐ 15.Exposed reinforcement	
	☐ 6.Displaced rip rap	☐ 16.Spalling	
	☐ 7.Sparse rip rap	☐ 17.Outlet erosion	
	☐ 8.Joints leaking	☐ 18.Misalignment	
	☐ 9.Cracks	☐ 19.Inadequate capacity	
	☐ 10.Joint deterioration	☐ 20.Other	
DRAINS / OTHER OUTLETS	■ 1.None		TYPE: None
	☐ 2.No bottom drain		
	☐ 3.Bottom drain inoperable		
	☐ 4.Subsurface drain dry		
	☐ 5.Subsurface drain muddy flow		
	☐ 6.Subsurface drain obstructed		
	☐ 7.No animal guard		
	☐ 8.Other		

SKETCHES/COMMENTS

RECOMMEND REMOVAL OF DEBRIS IN DISCHARGE CHANNEL

WASHOUT JUST BEYOND RIP-RAP SECTION OF DISCHARGE CHANNEL TO RIGHT OF CHANNEL, BEYOND MAIN SECTION OF DAM

RECOMMEND REPAIR OF THE AREA, AT LEAST 5 FT DEEP, 15 FT x 15 FT AREA AFFECTED - WILL DISCUSS W/ ZAHID KHAN FOR FURTHER RECOMMENDATIONS.