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 MAIL **7003 2260 0001 3551 2812**
RETURN RECEIPT REQUESTED

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

RE: Marshall Active Ash Basin Dam
CATAW-054 – High Hazard Potential
Catawba County

Dear Ms. Hutchinson:

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 records indicate that you are the owner and/or responsible for the referenced dam, which is located off NC HWY 150 in Catawba County. The dam was inspected on February 25, 2014 and March 1, 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. Several areas of non-uniformity, equipment damage, bare areas and steep slope were observed on the upstream and downstream slopes. It is recommended that you maintain a ground cover sufficient to restrain accelerated erosion on all earthen portions of the dam.

   On March 6, 2013, our Division issued a request for additional information or revision to a repair plan for multiple anticipation erosion (washout) areas of the downstream embankment with a typical repair procedure. The letter was issued in response to your submittal received on February 15, 2013. To date, this

office does not have record of a response or approval of the proposed repair plan.
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. This response must include a written response with an anticipated date by which we can expect the additional information and revisions to the repair plan.

2. The second slope drain from the east side of the dam was filled with sediment. Please perform maintenance to the slope drain and associated catch basin so that this drain may function as intended.

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. 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 remove all trees from the emergency spillway. This will minimize the possibility of its capacity being reduced by the entrapment of debris, should the emergency spillway become active.

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

5. 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 possible interruption of utility service and significant environmental damage to Lake Norman. Therefore, we are listing your dam in the "High

Hazard Potential". Note that all hazard classifications are subject to change due to downstream conditions and/or plant operating procedures.

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

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

NAME	COUNTY	NO.	INSPECTED BY	DATE
MARSHALL STEAM STATION ASH BASIN	CATAWBA	054	EPLIN, KORMANIK, HOOD	2/25/2014

OWNER	ADDRESS	PHONE
Duke Energy	See file	

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

TYPE INSPECTION: ☐ Initial ☐ Followup ☒ Periodic ☐ Other

SITE CONDITIONS: ☒ Wet ☐ Dry ☐ Snowcover ☐ Other

HAZARD DESCRIPTION: See file

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

REMARKS: 50's, impounding, normal pool
Scott Parks, Alex Rapp, Scott Nordgren, Kim Hutchinson, Sherri Christopher 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

AREA	PROBLEMS	COMMENTS
UPSTREAM SLOPE / FACE	☑ 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 Vegetation has been removed from rip rap Non-uniform in area right of primary dam embankment, appears historical
TOP OF DAM	☒ 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 Railroad spurs
DOWNSTREAM SLOPE / FACE	☐ 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 Burrows were previously noted in area D/S near powerpole 3-45 The burrows have been filled w/ concrete, No active burrows observed, Mower ruts Non-uniform No new areas of sloughing observed, Some bare areas exposed / continue to establish vegetation.
TOE CONTACT	☐ 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 Haul road Stormwater discharge point mid length @ toe has slight undermining Per prior discussions w/ Steve McEvoy, toe of dam will be considered @ inflection point of main embankment

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: Concrete box riser 5'x5' w/30" Ø HDPE barrel
	☐ 2.No trashguard	☐ 12.Undermined	Outlet submerged
	☐ 3.Obstructed	☐ 13.Voids	
	☐ 4.Plugged	☐ 14.Erosion	
	☐ 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	
EMERGENCY SPILLWAY	☒ 1.None	☐ 11.Joint displacement	TYPE/SIZE: Veg trapezoidal channel ~300 ft wide of lt abutment
	☐ 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: Various stormwater inlets/outlets
	☐ 2.No bottom drain		Storm outlets located 12/7/2010
	☐ 3.Bottom drain inoperable		1) 35.60328, -80.9625
	☐ 4.Subsurface drain dry		2) 35.60333, -80.9622
	☐ 5.Subsurface drain muddy flow		3) ~100' RT OF POLE 46
	☐ 6.Subsurface drain obstructed		4) ~20' LT OF POLE 32 D/S OF TRACKS
	☐ 7.No animal guard		5) 4 DRAINS IN TOE TOE CONTACT
	☐ 8.Other		

SKETCHES/COMMENTS

A dam modification plan is forthcoming to address drainage off the rail car area of crest. Will also include measures to address non-uniformity of d/s slope to aid in mowing / stabilization.

E-mailed NOIs requested.

No response in file to DEMLR's request for additional information dated 3/6/2013 in the file

DAM SAFETY INSPECTION REPORT

NAME	COUNTY	NO.	INSPECTED BY	DATE
Marshall Active Ash Basin Dam	CATAW	054	LEPLIN, KORMANK	3/1/2014

OWNER	ADDRESS	PHONE
See file	See file	

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

TYPE INSPECTION: ☐ Periodic ☐ Initial ☒ Followup ☒ Other

SITE CONDITIONS: ☒ Wet ☐ Dry ☐ Snowcover ☐ Other

HAZARD DESCRIPTION: See file

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

REMARKS: Tim Russell, Scott Parks, George Tolbert in attendance
Partial inspection for outfall characterization

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

AREA	PROBLEMS		COMMENTS
UPSTREAM SLOPE / FACE	☐ 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 DNI
TOP OF DAM	☐ 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 DNI
DOWNSTREAM SLOPE / FACE	☐ 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 DNI
TOE CONTACT	☐ 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 6 drains observed, see next page

AREA	PROBLEMS	COMMENTS
ABUTMENT CONTACTS	☐ 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 DNI
PRINCIPAL SPILLWAY	☐ 1.None ☐ 2.No trashguard ☐ 3.Obstructed ☐ 4.Plugged ☐ 5.Rusted ☐ 6.Damaged ☐ 7.Gates leaking ☐ 8.Joints leaking ☐ 9.Cracks ☐ 10.Joint deterioration ☐ 11.Joint displacement ☐ 12.Undermined ☐ 13.Voids ☐ 14.Erosion ☐ 15.Holes ☐ 16.Conduit collapsed ☐ 17.Spalling ☐ 18.Outlet undercutting ☐ 19.Misalignment ☐ 20.Other	TYPE/SIZE: CIP riser, barrel is 42" CMP s/p lined w/ 30" O.D. polyethylene pipe outlet submerged, not visible
EMERGENCY SPILLWAY	☐ 1.None ☐ 2.No ES ☐ 3.Same as PS ☐ 4.Obstructed ☐ 5.Erosion ☐ 6.Displaced rip rap ☐ 7.Sparse rip rap ☐ 8.Joints leaking ☐ 9.Cracks ☐ 10.Joint deterioration ☐ 11.Joint displacement ☐ 12.Undermining ☐ 13.Voids ☐ 14.Holes ☐ 15.Exposed reinforcement ☐ 16.Spalling ☐ 17.Outlet erosion ☐ 18.Misalignment ☐ 19.Inadequate capacity ☐ 20.Other	TYPE/SIZE: earthen channel DNI
DRAINS / OTHER OUTLETS	☐ 1.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	TYPE: 6 drains discharge to dam toe All are 8" - see comments 1 - CMP 8", no flow 2 CMP 8", no flow 3 CMP 8", no flow 4 CMP 8", no flow 5 drop catch basin, full of sediment + active flow, material not observed due to sediment 6 HDPE culvert to concrete no flow

SKETCHES/COMMENTS