



# DWR - Coal Ash Activities Update

North Carolina Delegation

Roanoke River Basin Bi-State Commission

December 18, 2014



# Ponds & Coal Ash Tonnage

- All 14 facilities have at least one coal ash pond
- Also ash in areas external to ponds
- Total tonnage in ponds – 107,889,000
- Additional tonnage stored out of ponds – 43,350,000
- Total tons of coal ash – 151,239,000

Facility	Ash Pond Name	Status*	Aug 2014 ash inventory as per Duke (tons)**
Allen Power Station	Allen Active Ash Basin	Active	7,660,000
Allen Power Station	Allen Retired Ash Basin	Inactive	3,920,000
Asheville	Asheville 1982 Ash Pond	Inactive	800,000
Asheville	Asheville 1964 Ash Pond	Active	2,200,000
Belews Creek Steam Station	Belews Creek Active Ash Basin	Active	12,610,000
Buck Power Station	Buck Steam Station Basin 1	Inactive	2,840,000
Buck Power Station	Buck Steam Station Basin 2	Inactive	1,950,000
Buck Power Station	Buck Steam Station Basin 3	Inactive	270,000
Cape Fear Power Station	Cape Fear 1956 Ash Pond (Inactive)	Inactive	420,000
Cape Fear Power Station	Cape Fear 1963 Ash Pond (Inactive)	Inactive	760,000
Cape Fear Power Station	Cape Fear 1970 Ash Pond (Inactive)	Inactive	840,000
Cape Fear Power Station	Cape Fear 1978 Ash Pond	Inactive	830,000
Cape Fear Power Station	Cape Fear 1985 Ash Pond	Inactive	2,820,000
Cliffside Power Station	Cliffside Active Ash Basin	Active	5,410,000
Cliffside Power Station	Cliffside Inactive Ash Basin 1-4	Inactive	320,000
Cliffside Power Station	Cliffside Inactive Ash Basin #5	Inactive	810,000
Dan River Power Station	Dan River Active Primary Ash Basin	Inactive	960,000
Dan River Power Station	Dan River Active Secondary Ash Basin	Inactive	210,000
Lee Power Station	H.F. Lee Ash Pond 1 (Inactive)	Inactive	190,000
Lee Power Station	H.F. Lee Ash Pond 2 (Inactive)	Inactive	440,000
Lee Power Station	H.F. Lee Ash Pond 3 (Inactive)	Inactive	670,000
Lee Power Station	H.F. Lee Active Ash Pond	Inactive	4,590,000
Lee Power Station	H.F. Lee Ash Polishing Pond	Inactive	9,000
Marshall Steam Station	Marshall Active Ash Basin	Active	22,270,000
Mayo Power Station	Mayo Ash Pond	Active	6,900,000
Riverbend Power Station	Riverbend Active Ash Basin 1	Inactive	2,050,000
Riverbend Power Station	Riverbend Active Ash Basin 2	Inactive	680,000
Roxboro Power Station	Roxboro West Ash Pond	Active	7,310,000
Roxboro Power Station	Roxboro East Ash Pond	Inactive	9,130,000
Sutton Power Station	Sutton 1971 Ash Pond	Inactive	3,540,000
Sutton Power Station	Sutton 1984 Ash Pond	Inactive	2,780,000
Weatherspoon Power Station	Weatherspoon 1979 Ash Pond	Inactive	1,700,000

**107,889,000**

# Implementation of EO 62 and Session Law 2014 - 122

- Groundwater
- Unauthorized surface discharges
- Closure activities



# Groundwater - Receptor Survey

- Protection of public health is highest priority
- Duke required to identify wells w/i ½ mile
- Subset of these wells to be sampled for a wide range of constituents associated with coal ash
- Follow on sampling may be mandated based upon the results of the initial sampling

FACILITY	TOTAL WELLS < 2,640 ft.
Asheville	43
Allen	223
Belews Creek	50
Buck	170
Cape Fear	28
Cliffside	71
Dan River	4
Lee	95
Marshall	84
Mayo	22
Riverbend	4
Roxboro	65
Sutton	26
Weatherspoon	22
<b>TOTAL</b>	<b>907</b>

# Well Sampling

- Initial sampling for wells w/i 1000 feet
  - Includes private & public water supply wells
- Sampling conducted by independent laboratories
- Paid for by Duke Energy
- Coordinated by DWR
  - Letter to well owners
- Results analyzed against standards
- Well owners informed of results
  - Individual Health Risk Evaluation performed by DHHS for every well that exceeds standards



Print your name: \_\_\_\_\_

Print your address:  
(Street) \_\_\_\_\_

(City) \_\_\_\_\_ (State) \_\_\_\_\_ (Zip) \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Do you want your well tested? Yes:  No:

If yes, which laboratory do you prefer? (See the enclosed list)

I prefer the Division of Water Resources select the lab:

I prefer to use: \_\_\_\_\_

For more information, visit our website at: <http://goo.gl/NUZRLI>

FACILITY	Wells < 1,000 ft. (to be sampled)		Wells > 1,000 ft (to be sampled)		TOTAL WELLS TO BE SAMPLED
	Private	Public	Private	Public	
Asheville	8	0	4	0	12
Allen	114	2	0	2	118
Belews Creek	16	0	0	0	16
Buck	64	0	0	4	68
Cape Fear	1	0	0	0	1
Cliffside	10	0	11	0	21
Dan River	0	0	0	0	0
Lee	16	0	0	0	16
Marshall	27	0	0	3	30
Mayo	4	0	2	0	6
Riverbend	0	1	0	0	1
Roxboro	1	0	8	2	11
Sutton	3	0	23	0	26
Weatherspoon	1	0	7	0	8
<b>TOTAL</b>					<b>334</b>





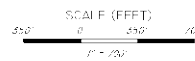
# Groundwater Assessment Plans (GAPs)

- Critical component of overall coal ash effort
- Used to determine vertical and horizontal extent of groundwater contamination underneath facilities
- This information is currently unknown
- Impossible to make classification/prioritization decisions on coal ash ponds without this info
- Used to determine if impacts to wells are from coal ash
- Used to determine extent groundwater contamination beyond compliance boundaries



- LEGEND:**
- DUKE ENERGY PROPERTY BOUNDARY
  - WASTE ENERGY
  - ASH STORAGE AREA BOUNDARY
  - COMPLIANCE BOUNDARY
  - COMPLIANCE BOUNDARY COINCIDENT WITH DUKE PROPERTY BOUNDARY
  - STREAM
  - TOPOGRAPHIC CONTOUR (4-FT INTERVAL)\*
  - ◆ ASH BASIN COMPLIANCE GROUNDWATER MONITORING WELL
  - ◆ ASH BASIN VOLUNTARY GROUNDWATER MONITORING WELL
  - ▲ ASH BASIN CLOSURE GROUNDWATER MONITORING WELL (HDR 2013)
  - ▲ ASH BASIN CLOSURE GROUNDWATER OBSERVATION WELL (HDR 2013)
  - ◆ PROPOSED SOIL BORING/GROUNDWATER MONITORING WELL LOCATION
  - PROPOSED SURFACE WATER SAMPLE LOCATION
  - SEEP SAMPLE LOCATION

- NOTES:**
1. PARCEL DATA FOR THE SITE WAS OBTAINED FROM DUKE ENERGY REAL ESTATE AND IS APPROXIMATE.
  2. WASTE BOUNDARY AND ASH STORAGE AREA BOUNDARY ARE APPROXIMATE.
  3. AS-BUILT MONITORING WELL LOCATIONS PROVIDED BY DUKE ENERGY AND WSP.
  4. COMPLIANCE SHALLOW MONITORING WELLS (S) ARE SCREENED ACROSS THE SURFICIAL WATER TABLE.
  5. COMPLIANCE DEEP MONITORING WELLS (D) ARE SCREENED IN THE TRANSITION ZONE BETWEEN COMPETENT BEDROCK AND THE REGOULTH.
  6. TOPOGRAPHY DATA FOR THE SITE WAS OBTAINED FROM WSP DATED NOVEMBER 2013.
  7. AERIAL PHOTOGRAPHY WAS OBTAINED FROM WSP DATED APRIL 17, 2014.
  8. THE COMPLIANCE BOUNDARY IS ESTABLISHED ACCORDING TO THE DEFINITION FOUND IN 15A NCA02C1-.0107 (a).
  9. PROPOSED WELL LOCATIONS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS.
  10. SEEP SAMPLE LOCATIONS WERE OBTAINED BY HDR USING A TRIANGLE-MANDED GPS UNIT.
- \* TOPOGRAPHIC CONTOURS LOCATED WITHIN THE WASTE BOUNDARY AND OTHERS SPECIFIC AREAS SUCH AS DAMS, DIKES, ETC. ARE 2-FT CONTOUR INTERVALS.



**PROPOSED WELL AND SAMPLE LOCATIONS**  
**DUKE ENERGY CAROLINAS, LLC**  
**BUCK COMBINED CYCLE STATION ASH BASIN**  
**NPDES PERMIT NO. NC0004774**  
 ROWAN COUNTY, NORTH CAROLINA

DATE  
9/25/2014

FIGURE  
3

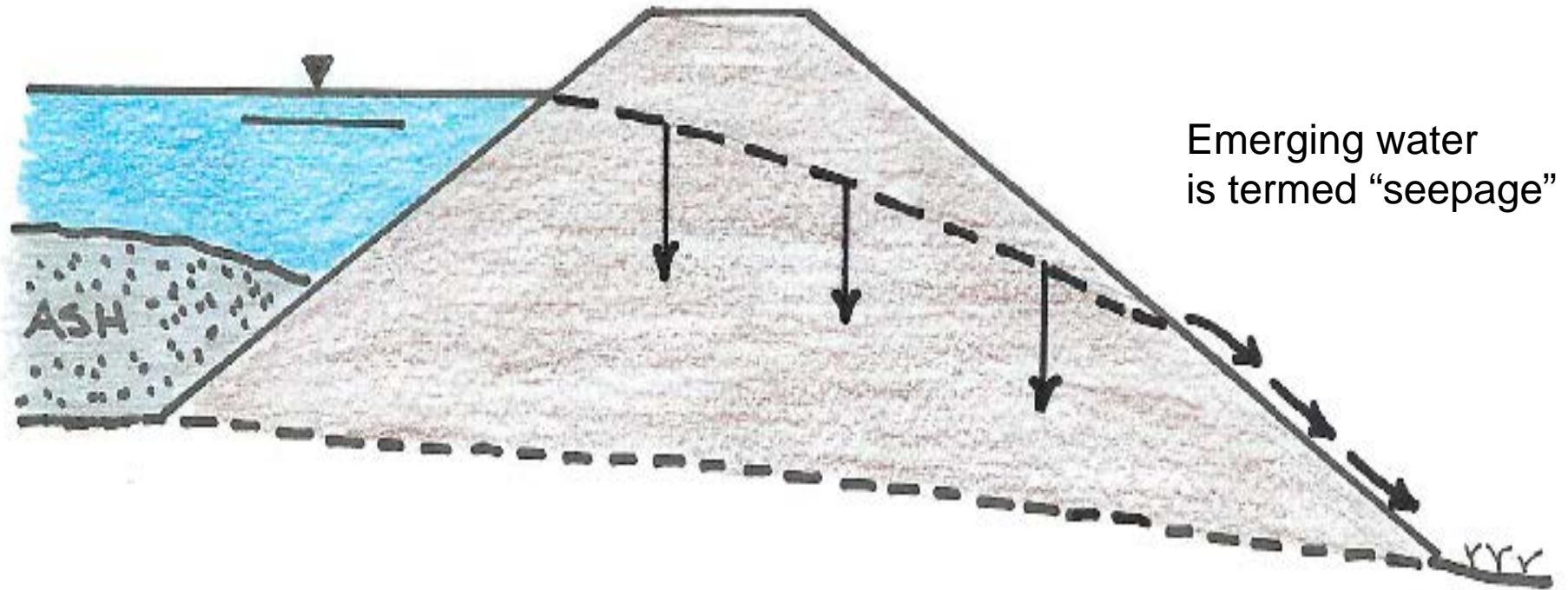
# Groundwater Assessment Plans

- Draft GAPs received from Duke on Oct 26
  - Date mandated by EO 62
- Draft plans received for all 14 facilities
- Reviewed extensively by DWR Staff
- DWR responded to all 14 plans requesting a wide range of additional information & modifications
- Duke currently in the process of modifying plans
  - Technical meeting with DWR Staff on Nov 21
- Modified plans due back to DWR by Dec 31

# Unauthorized Surface Discharges

- Unauthorized surface discharges include seeps, weeps, and engineered drains of coal ash dams
- These surface discharges are not presently included in discharge permits for these facilities
- Duke requesting modification of all NPDES Discharge Permits for all 14 facilities

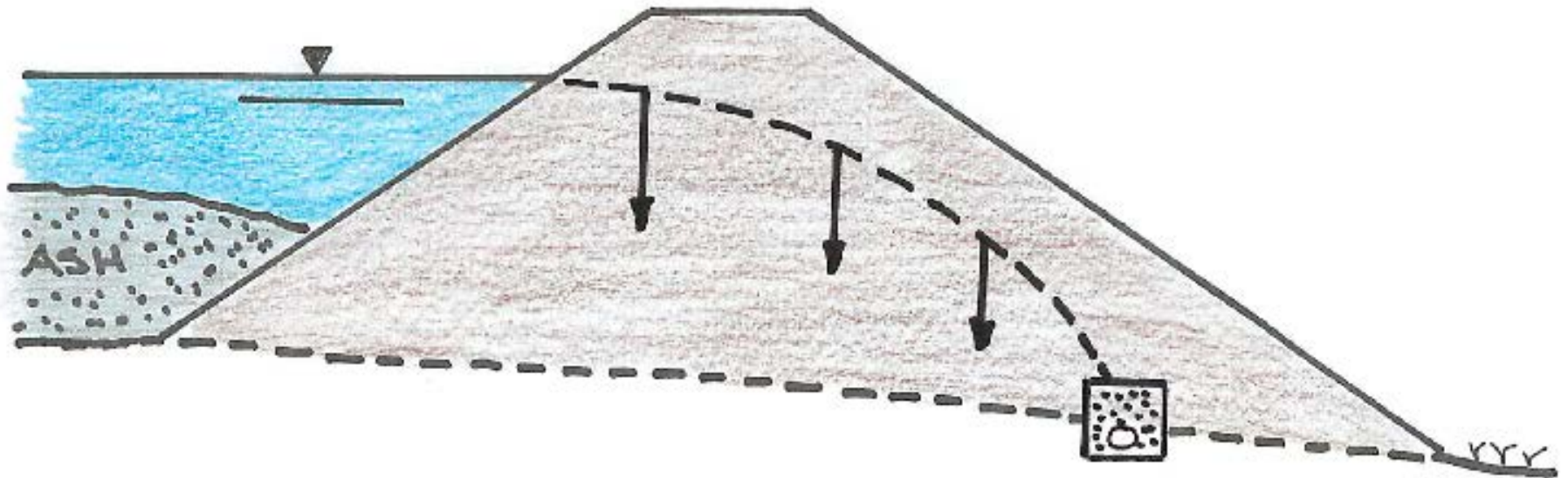
# Basic Seep Diagram



Emerging water  
is termed "seepage"



# Toe Drain



## Internal Drain System

- An aggregate encased perforated collector pipe system
- With solid pipe outfall
- Often referred to as a “toe drain”



2014/03/11





# NPDES Permit Modifications

- Draft modification requests for all 14 facilities
  - To account for any unauthorized surface discharges
- Only 2 have been deemed complete
  - Cape Fear
  - Marshall
- Currently in pre-review
- Public notice, comment, and hearing will follow review
- All 14 permits will eventually be released for public notice, comments, and hearing
- Further modification required for decanting/dewatering

# New Seeps Identification Plan

- Required plan for Duke to routinely inspect dams & identify new seeps and other discharges
- Draft plan submitted by Duke on October 1
- Reviewed by DWR regional & central office staff
- Response letter currently undergoing review
  - Will request some modifications and additional information

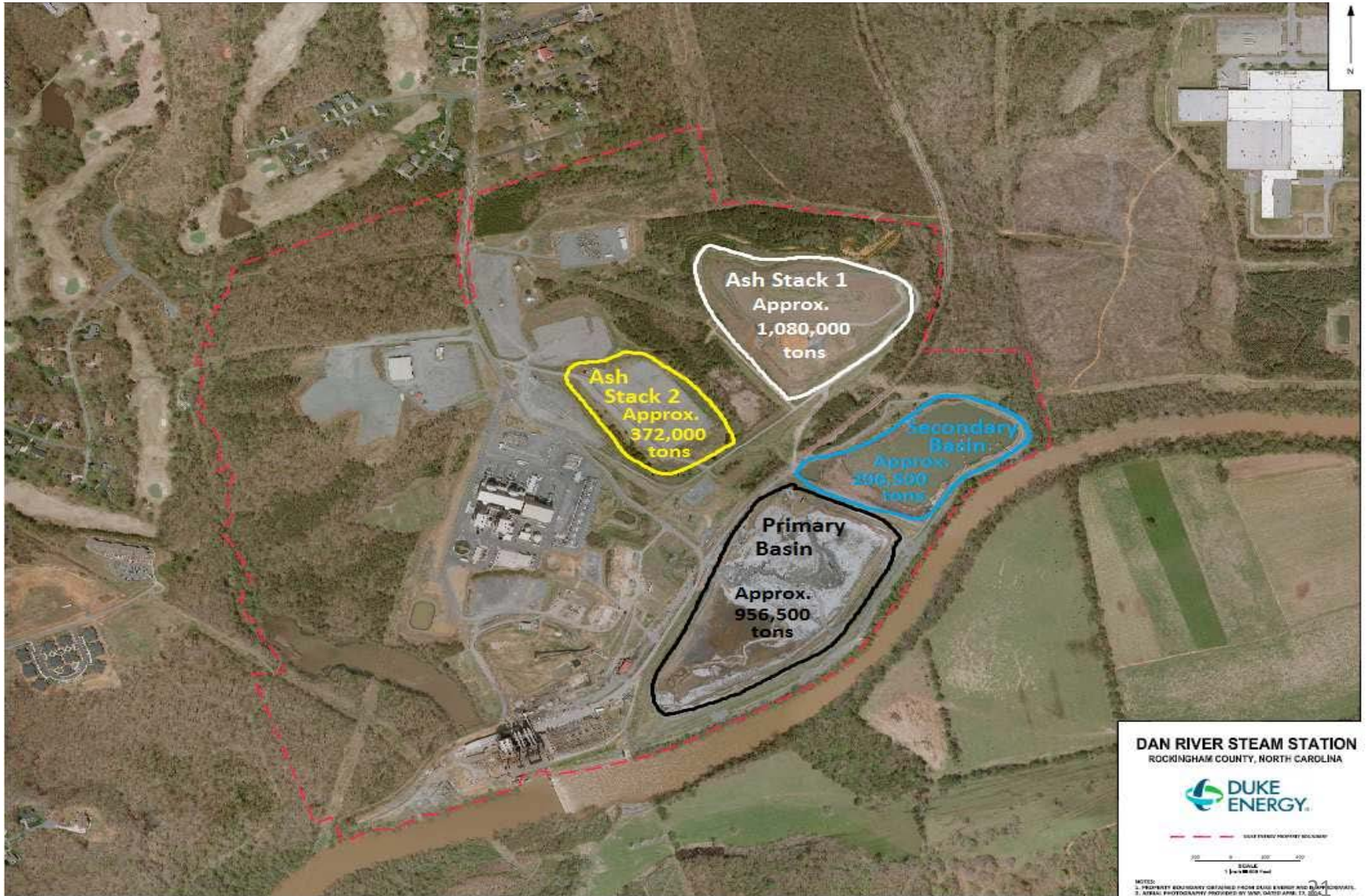
# Closure Activities


- EO 62 required excavation plans for 4 facilities
- Move forward with ash removal at “Big 4” facilities
  - Dan River
  - Sutton
  - Riverbend
  - Asheville
- Draft excavation plans submitted on Nov 15
- Currently undergoing DENR review

# Excavation Plans

- Common elements of all four plans
  - Covers next 12 to 18 months (Phase 1)
  - Initial closure activities for ponds & ash removal
  - Finalize and obtain required permits
  - Commence decanting/dewatering activities
  - Conduct planning for subsequent closure phases

# Dan River





# Dan River – Phase 1

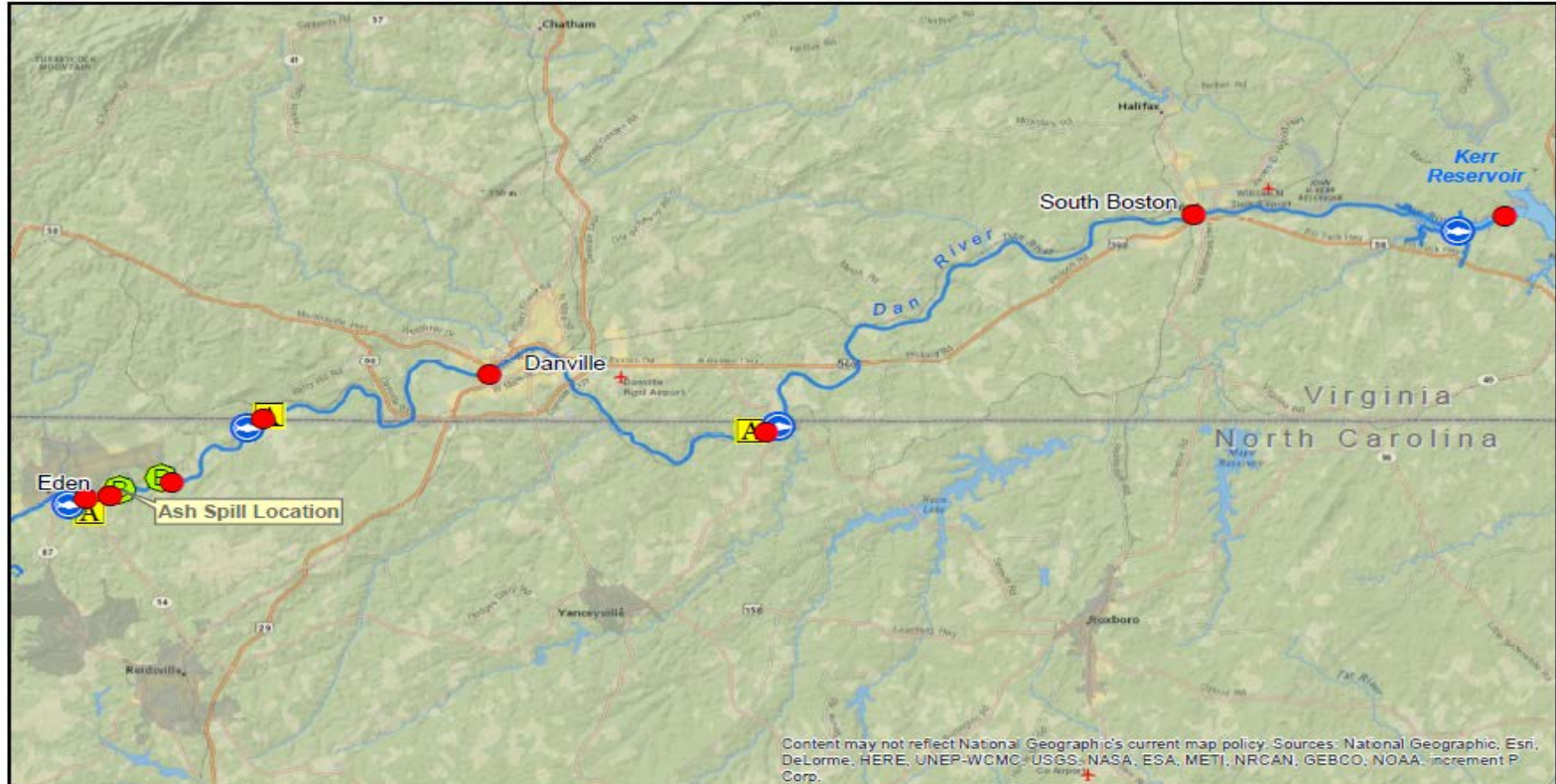
- Excavate & transport approx. 1.2M tons of ash from primary secondary ash basins / ash stacks
  - Install rail spur for transport
  - Disposal at Maplewood Landfill – Jetersville, VA
  - Transport by rail car
  - 2.5 to 3 trains per week of 65 gondola cars
- Obtain permit to construct on-site landfill
  - October 24, 2015

# Enforcement Activities

- Joint enforcement action with EPA
  - Still ongoing
  - Dan River release & unauthorized surface discharges
- DENR issued separate NOV to Duke for groundwater contamination at Sutton facility
  - Issued on August 26, 2014
  - Independent of joint enforcement with EPA
  - Contamination of aquifer by coal ash constituents
    - Boron, thallium, selenium, iron, manganese
  - Final disposition still pending

# Dan River Monitoring Update

## Duke Power Eden Coal Ash Spill and Monitoring Locations for Dan River, NC



0 5 10 20 Miles



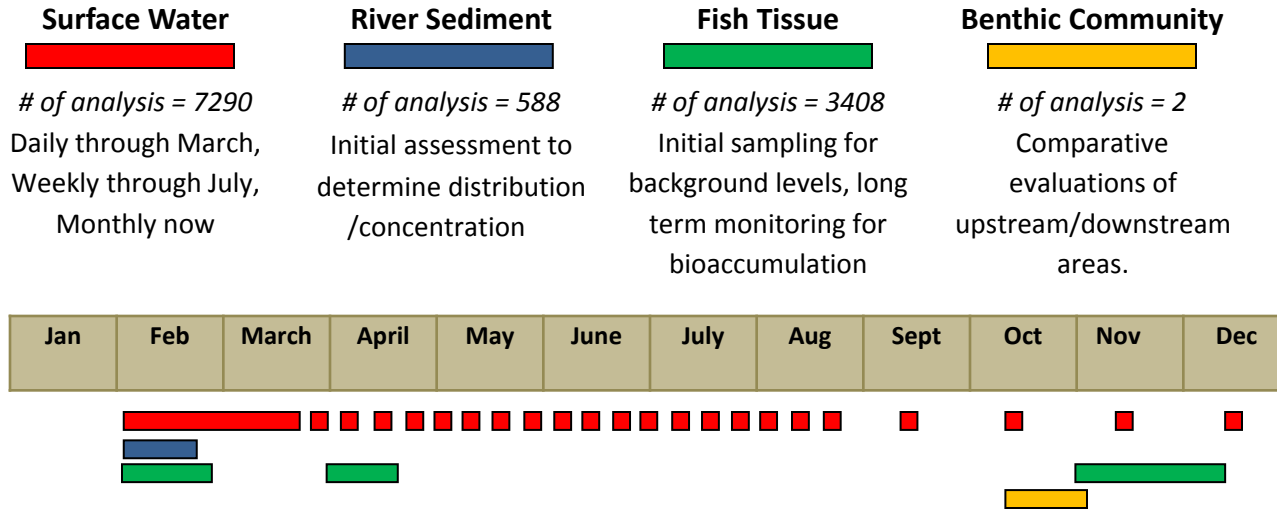
- DWR Sediment and Water Sample Stations
- ⓑ Macroinvertebrate Stations
- 🐟 Fish Tissue Station
- ⓐ Ambient Water Quality Station





# NC DWR Activities Related to Dan River Coal Ash Spill

## 2014 Monitoring



## Results

### Surface Water

Winston Salem Regional Office and Water Sciences Staff  
 Arsenic decreased from 40µg/L to <2.0µg/L by mid March 5 miles downstream of spill.  
 Aluminum and iron remain high due to natural watershed conditions.

### River Sediment

Water Sciences Staff  
*100yds downstream of spill* Aluminum, arsenic, barium, copper, iron and mercury were above EPA screening values.  
*Danville* Aluminum, boron, iron, and strontium were above EPA screening values.

### Fish Tissue

Water Sciences Staff  
 First round of background monitoring showed nothing above state guidelines.  
 Second round of extended background monitoring showed  
     10% of samples exceeded mercury fish consumption advisory action levels (NCDPH)  
     12% of samples exceeded arsenic fish tissue screening levels (NCDPH)  
 Third round of tissue collection is under way.

### Benthic Community

Water Sciences Staff  
 Data suggest no significant difference between upstream of spill site and downstream of spill site benthic communities.

### Plan Development/Public Information

Winston Salem Regional Office and Water Sciences Staff  
 DWR staff represented NCDENR during all phases of the Dan River event through participating in and/or presenting information at Public Information Sessions, weekly/monthly interagency meetings, and initial response daily/hourly situation briefings (approx 65).

# Fish Tissue Sampling

- Background analyses complete – no surprises
- Mercury elevated - statewide
- All similar to historic data

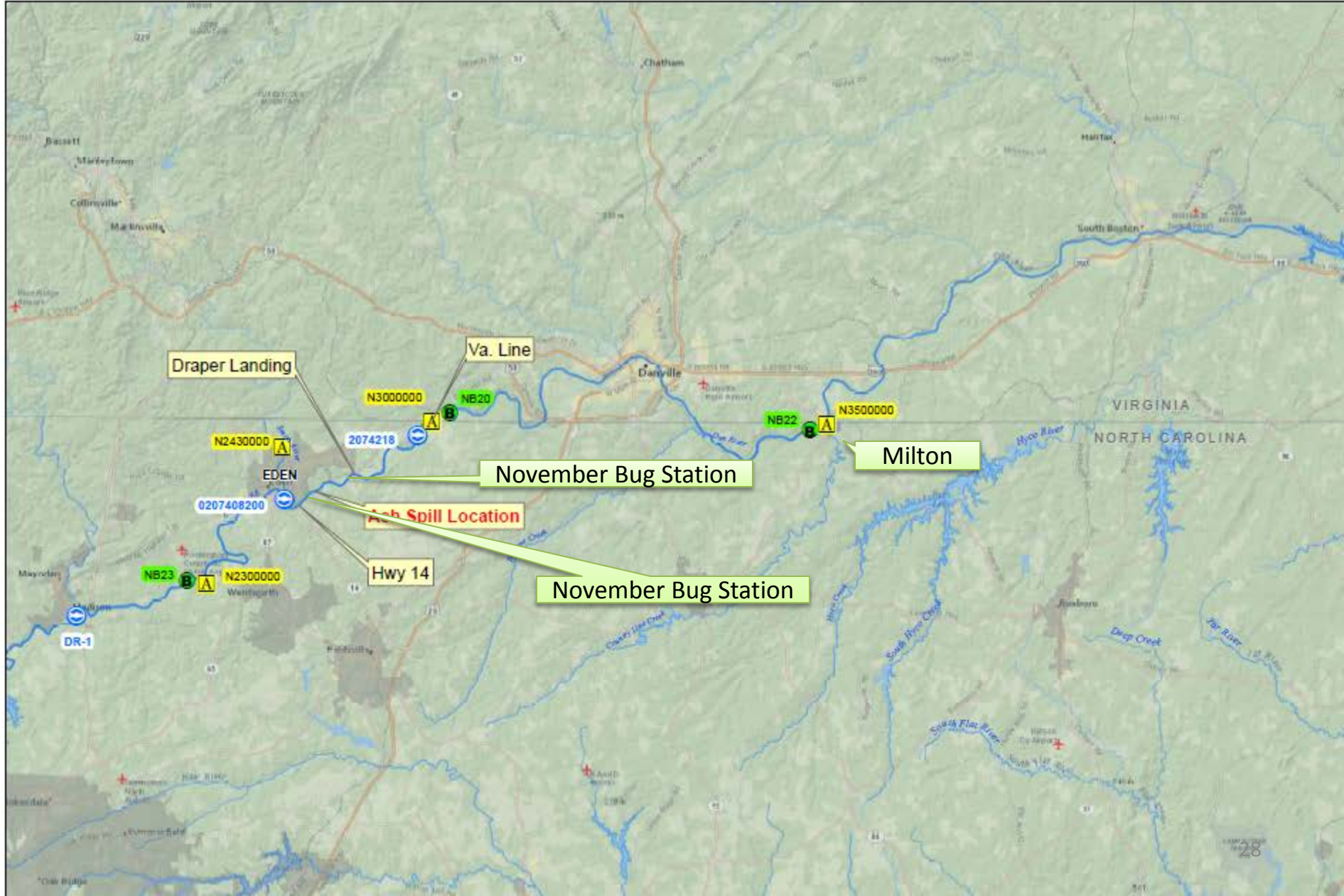


# Sediment Sampling

- Sediment
  - 100 yards from release:
    - Aluminum, Arsenic, Barium, Copper, Iron, Mercury Above EPA Screening Values
  - Danville:
    - Aluminum, Boron, Iron & Strontium Above EPA Screening Values



# Duke Power Eden Coal Ash Spill and DWR Monitoring Locations for I

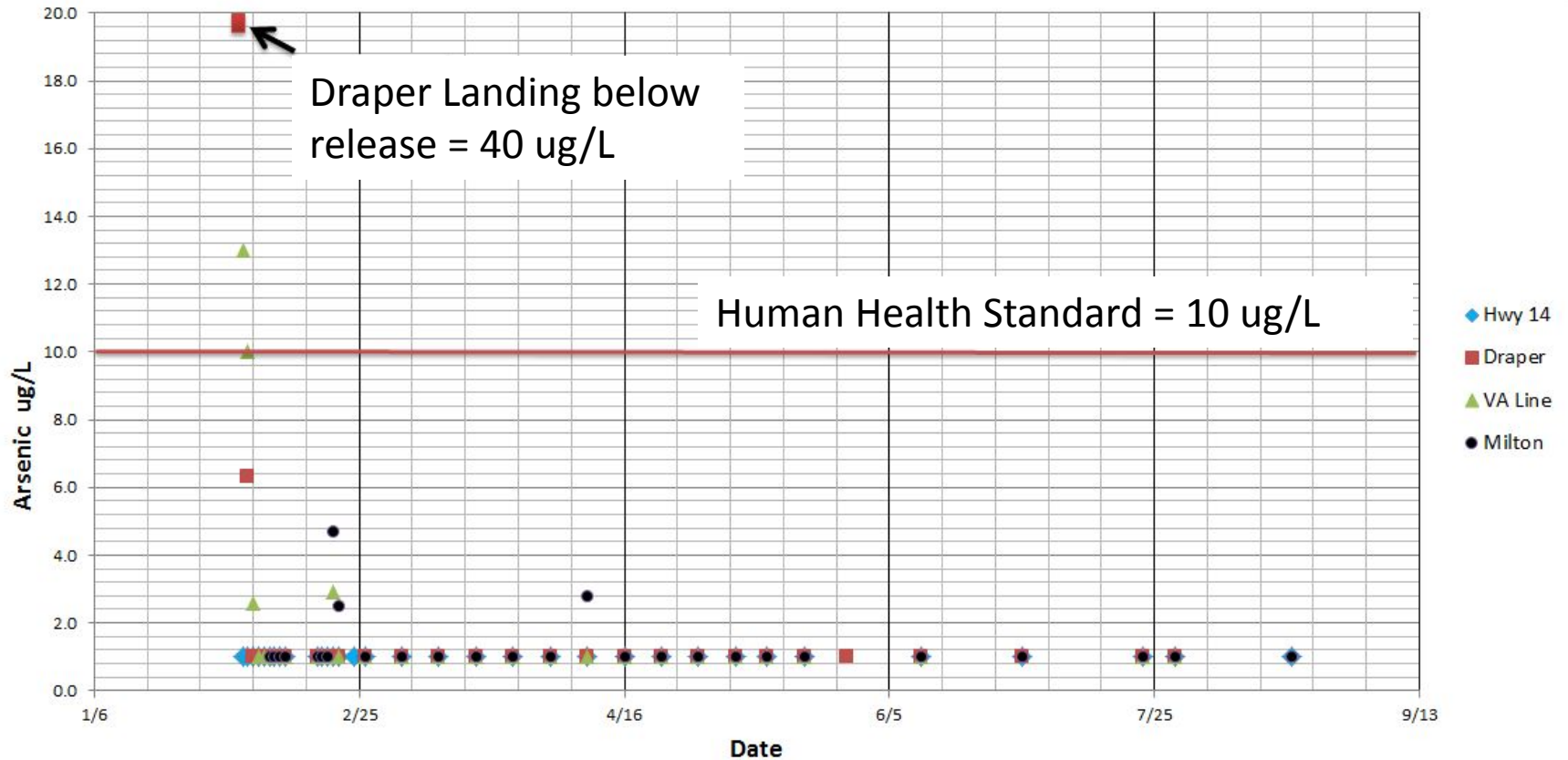


# October 28<sup>th</sup> Benthic Macroinvertebrate Sampling Results

- Upstream ~1/2 mile above release
- Downstream ~ 2 miles below release
- Similar habitats
- Excellent Water Quality



# Water Quality Sampling Results - Arsenic



All values below 2 ug/L were reported as non-detect

# On-Going Monitoring

- NC
  - 3 Stations – Hwy 14, VA Line & Milton
    - Monthly surface water
    - Yearly fish tissue
    - Yearly benthos



# Next Steps

- Well sampling to protect public health
- Approval & implementation of groundwater assessment plans
  - Critical information needed to classify facilities
- Public notice & hearings for NPDES permit modifications
- Implementation of excavation plans at “Big 4”
- Classification & prioritization of remaining facilities
  - Due December 2015



# Questions

