

# Unlined Landfills?

The Story of Coal Ash Waste in our Backyard

Sierra Club, North Carolina Chapter

April 12, 2010

TABLE OF CONTENTS

**Page 3** Introduction

**Page 4** A River of Waste

**Page 5** Where does it all go?

**Page 6** Questionable Practices

**Page 9** Inadequate Regulation

**Page 12** Summary & Recommendations

**Page 13** Endnotes



## North Carolina Chapter

### INTRODUCTION

Coal-burning power plants across North Carolina produce a ceaseless river of coal ash waste. Coal ash contains toxic metals including mercury, selenium, cadmium and arsenic that can cause cancer and serious damage to the nervous system in humans. If not properly managed, coal ash may pose a threat to human health and the environment. Yet North Carolina is still permissive in its regulation of coal ash, allowing it to be used as a cheap substitute for fill dirt and deposited in the ground with virtually no oversight or monitoring.

In 2008, the spill of 1.1 billion gallons of coal ash slurry at the Kingston Power Plant in Tennessee caught the attention of the nation. The U.S. Environmental Protection Agency has since announced the agency was considering designating coal ash as hazardous waste and imposing new national standards on its disposal [1].

EPA's decision on new regulations, which may be announced at any time, could have a significant impact on North Carolina because of the millions of tons of coal ash generated and disposed within the state.

Recently the Perdue Administration has written EPA, saying it strongly opposes designation of coal ash as hazardous waste. The Administration says labeling coal ash as hazardous waste would undermine highway builders' ability to recycle ash as an inexpensive additive in concrete and as a base for roadbeds. The North Carolina Department of Transportation is a large user of coal ash. Opponents say a hazardous waste designation also could stop companies from using ash in wallboard production, as soil additives such as in potting soil and as structural fill material for building foundations and land development because of the stigma attached to hazardous waste.

But while some so-called "beneficial uses" of coal ash waste may be acceptable, a lack of federal controls and weak state regulations have created a gaping loophole allowing an unknown volume of coal ash to be disposed of with little oversight and uncertain impacts to public health. At a time when coal is receiving widespread unfavorable attention on a range of fronts, the problems with using coal ash for land development ("structural fill") have been a largely untold story.

## A RIVER OF WASTE

In 2008-2009, power plants in North Carolina, owned by Duke Energy, Progress Energy, small independent utilities such as Cogentrix as well as industrial boilers at manufacturers, generated approximately 3.8 million tons of dry coal ash and an unknown amount of wet ash, according to the N.C. Division of Waste Management [2]. They dispose of coal ash in three ways essentially— in landfills, in wet ponds and through recycling for beneficial uses including production of concrete, as soil amendments and to elevate land for development.

Of the total dry ash generated in that one year, approximately 1.7 million tons were disposed in landfills, 809,000 tons were used as fill material and more than 1 million tons went for other uses including as soil additives for agriculture, as road paving material, and as ingredients in the manufacture of other products. The total amount of wet ash produced is not reported by utilities; there is not a reporting requirement for wet ash. And, confusing the picture further, there have been instances of wet ash being added to structural (dry) fill as a secondary source when there isn't enough dry ash for a fill project. Wet fill has more ability to migrate and pollute groundwater [3].

The amount of dry coal ash waste fluctuates year to year but has generally increased by about 40 to 50 percent in the last decade.

**How can you be sure that the lot you are looking to buy is not a coal ash site?**

You can't. You are supposed to be able to tell, at least since 1994, when the state adopted new rules. But a review of files show that only 56 percent of the closed structural fill sites that held 1,000 cubic yards or more of coal ash had complied with the state requirement to record the presence of coal ash on the property deed, according to a 2002 interim report.

**Isn't someone testing this stuff before it's spread on land?**

Testing requirements are minimal and unsupervised by the state. Coal ash generators are required to have a representative sample of coal ash tested once annually for a project. The generators arrange for the tests and analysis. The state has no resources, no practice and no requirement to periodically check lab results for accuracy.

**WHERE DOES IT ALL GO?**

North Carolina regulations allows the use of coal ash for "beneficial" purposes including as fill material for land development. These projects are known as structural fills.

There are 75 structural fill sites across the state located in 21 counties, according to N.C. Division of Waste Management records. More than half are closed. Of those, only 69% of the projects had complied by submitting certified closure statements, according to a 2002 interim report.

Counties that have structural fills include Brunswick, Cabarrus, Catawba, Columbus, Craven, Cumberland, Duplin, Edgecombe, Forsyth, Gaston, Halifax, Iredell, Mecklenburg, Nash, Northampton, Person, Robeson, Rowan, Stokes and Washington.

Five counties have more than five sites including Halifax County, which has nine sites; Nash County which has 10; and Iredell County which has 17 sites.

Records show Duke Energy sought unsuccessfully to have the deed recordation requirement dropped from state rules, which were adopted in 1994 [4]

**How can you be sure that the lot you are looking to buy is not a coal ash site?**

You can't. You are supposed to be able to tell, at least since 1994, when the state adopted new rules. But a review of files show that only 56 percent of the closed structural fill sites that held 1,000 cubic yards or more of coal ash had complied with the state requirement to record the presence of coal ash on the property deed, according to a 2002 interim report.

QUESTIONABLE PRACTICES

While some processes may bind the dangerous contaminants in coal ash into a solid structure and therefore reduce the potential for exposure to toxic chemicals, such as use as an additive in concrete, North Carolina's current practice of allowing coal ash to be placed on the ground as fill material for land development with minimal oversight has led to numerous problems. These problems include groundwater contamination, surface water contamination, sham landfills, environmental violations and failure to track locations of coal ash fills. For many years, state personnel visited the sites primarily in response to neighbors' complaints about coal ash blowing off trucks delivering to the sites.

**At least three sites have shown water contamination.**

*Groundwater Contamination, Robeson and Nash counties*

Groundwater contamination has been found at two structural fill sites to date —at Alamac Road in Robeson County and at the Highway 301/Swift Creek structural fill site in Nash County. ReUse Technology, a Georgia-based company that handles coal ash produced by utilities, was operating the Robeson County site without authorization. Ash had been placed in the groundwater at the Robeson County site, creating elevated sulfate and arsenic levels. After the state began enforcement actions in the 1990s, ReUse Technology removed the ash from the Robeson County site. At the Nash County site, state regulators issued a compliance order in 2006 requiring Full Circle Solutions LLC, a spinoff company of ReUse Technology to determine of the extent of groundwater contamination, clean up contamination and conduct groundwater monitoring [5].

*Surface Water Contamination, Northampton County*

In 2009, state environmental inspectors discovered high levels of arsenic, iron and selenium in wetlands near Arthurs Creek in Northampton County at a 21-acre coal ash structural fill site off Highway 46 near Garysburg. The Arthurs Creek site is one of the largest structural fills in the state based on the submitted plan to deposit half million tons of coal ash waste. The stated beneficial use for the Arthur's Creek structural fill site is "pasture."

**Tracking and Notification Failure**

There have also been instances of dwellings being placed on old coal ash sites, raising questions about human exposure. These instances flag the importance of recording coal ash sites on property deeds.

*Hurricane Floyd*

A portion of the Fountain Industrial Park site in Edgecombe County was used by Federal Emergency Management Agency in 1999-2000 as a temporary trailer park to house 150 to 200 homeless families mostly from Princeville after Hurricane Floyd, unbeknown to the residents that they were living on coal ash. At its peak, the site housed 370 trailers. The site, now closed, has exposed ash in many areas and ash possibly running off into a nearby stream, according to a state inspector's notes. Because of the potential exposure of residents to toxic metals that can be present in coal ash, state health regulators in July 2000 tested the soil after concerns arose about the location of the trailer park. The state said the soil posed no significant risk to residents. The Division of Emergency Management relocated most of the families to another trailer park within a month of the testing.

#### *Apartments and Superfund sites*

Though not structural fill sites, two older ash disposal sites in Harnett County and Transylvania County are on the federal Superfund list of contaminated sites. The sites provide a cautionary tale of the importance of controlling the future uses of closed structural fill sites. The EPA placed both sites on the national priority list for cleanup because of concern about direct exposure of people to the contamination. A duplex apartment sits on a portion of the Transylvania County site, while the Harnett County site is within the town limits of Erwin.

#### **Sham landfills: extreme excavation**

State inspectors have identified at least three sites where mass soil excavation occurred in recent years and suspect others. State rules do not expressly prohibit excavation as part of structural fills projects, but such activity--if carried too far-- would appear to create unauthorized and unlined landfills.

Current state rules require a minimum of two feet of separation between the coal ash and the seasonal high groundwater level. But excessive excavation makes it nearly impossible for hydrologists to determine the seasonal high groundwater level, meaning that coal ash could be placed in groundwater, causing contamination.

#### *Wake and Halifax Counties*

Inspectors observed excessive excavation at the Race Park USA structural fill site in Mooresville and the J.S. Turner Lumber Yard in Halifax County.

The stated beneficial purpose for the J.S. Turner Lumber Yard structural fill site was to raise the elevation of the lumber drying yard. Inspectors noted the Turner lumber yard fill site had been excavated to a depth of 40 feet, when the submitted plans showed no excavation.

The greater depth would provide much more capacity for storage of coal ash, creating a de-facto landfill with no liner or monitoring requirement and a threat to groundwater [6].

#### *Full Circle Solutions*

In 2006, state inspectors found that Full Circle Solutions, a company that recycles coal ash from power plants in North Carolina and Virginia, had conducted mass soil excavations at structural fill sites, creating de-facto landfills. Excessive excavation allows sites to hold much more ash than the amount needed to make a site level and buildable. The state issued a notice of violation for violations at the Brandywine site in Nash County and directed the company to stop excessive excavation, saying mass excavation violated the spirit of the “beneficial fill” rules. The company challenged the state's position and threatened legal action, arguing the state didn't have the legal standing to enforce no mass excavation. State rules do not expressly prohibit mass excavation. No penalties were assessed for the excavation and the Brandywine site was closed in 2008..

Full Circle Solutions and its predecessor company, ReUse Technology, Inc., have placed more than 2 million tons of coal ash in structural fill sites since 1991 [7].



**How is structural fill coal ash treated differently than other potentially hazardous waste?**

- No groundwater monitoring required.
- No regular inspections
- No permit required, even for the largest sites
- No liners required, even for the largest sites
- The stated beneficial purpose can change, and state can comment but not deny site.

**INADEQUATE REGULATION**

State solid waste regulations permitting use of coal ash for structural fills are inadequate and need updating because they fail to protect the public from the contamination of their drinking water, streams and soil. The 15A NCAC 13B.1700 et seq rules (Requirements for Beneficial Use of Coal By-Products) were adopted in 1994 and have not been updated despite growing public awareness and concern about coal ash. By the time the rules were written, 18 structural fill sites already had been established [8].

According to state and federal (Clean Water Act) regulations-- as with all development-- coal ash cannot be placed within 50 feet of wetlands unless the U.S. Army Corps of Engineers approves. Structural fill sites must be set back from streams at least 50 feet. They must be 100 feet from water wells.

But beyond that, the state's rules for beneficial use of coal ash--and especially for structural fill-- are overly permissive, provide inadequate state oversight, and fail to require minimum, commonsense safeguards.

In recent months, following heightened public scrutiny of coal ash, state solid waste personnel have stepped up inspections of structural fill sites. In 2009, they visited 48 structural fill sites and found violations at 28 sites (about 60% of the sites), prompting the state to start enforcement actions. The most frequent violations involved lack of vegetation or soil cover on the sites that could allow the ash to blow off or run off into rivers and streams, or leak toxic chemicals into the underlying groundwater.

Here are some of the biggest differences in how North Carolina manages beneficial use of coal ash from how other potentially harmful wastes are managed:

***No groundwater monitoring required***

The problem of groundwater contamination at coal ash structural fill sites is likely much more widespread than presently known. Unfortunately, state law does not require monitoring of groundwater at structural fills sites, no matter the size, to detect pollution.

The only two structural fill sites for which the state has data from groundwater monitors both showed groundwater contamination in Nash County (near Battleboro) and Robeson County. State officials requested groundwater monitoring data from a third structural fill site at Fountain Industrial Park in Rocky Mount, a large site in Edgecombe County, after the site operator, ReUse Technology said they had voluntarily installed groundwater monitoring wells. ReUse Technology declined the state's request to provide the monitoring data, according to Solid Waste officials, and subsequently abandoned the wells.

In comments on draft state structural fill rules in 1992, a representative of ReUse Technology commented that very little coal ash produced in North Carolina would consistently comply if the state required that coal ash leachate cause no degradation to groundwater quality. He said such monitoring requirements would essentially prohibit the use of coal ash in structural fills and composting.

***No regular inspections***

An important feature of the state rules is they were designed to be self-supervising with no surveillance of the projects by the Division of Waste Management. There are no regularly scheduled inspections. Traditionally, state regulators have visited the sites only in response to complaints from neighbors. Complaints usually dealt with coal ash blowing from the site or off uncovered truck delivering to the site.

***No permit required, even for the largest sites***

There is no required solid waste permit for companies that want to build a structural fill, regardless of the size. A producer of coal ash or a coal waste recycler simply must give the state Division of Waste Management 30 days written notice that it plans to start dumping coal ash at a site as fill material, estimate the amount that will be deposited and state the intended beneficial purpose of the fill.

For example, Duke Energy has created a 20-acre structural fill site off State Road 1908 in Stokes County near the Belews Creek Steam Station designed to hold 600,000 tons of coal ash waste. The proposed end use for the structural fill is as a *parking lot*, according to the application. But a state inspector's notes say, "From visual inspection, there seems no way for such use to be possible."

***No liners required for large sites***

Unlike landfills, there is no requirement that larger structural fill sites have plastic liners to help prevent groundwater contamination. There is no limit to how long the sites can remain open. This greatly increases the potential for the migration of dangerous chemicals from the ash.

***The stated beneficial purpose can change, and state can comment but not deny site***

The "beneficial uses" for structural fill sites include road extensions and airport runways, and developing land for warehouses, offices and other uses. If the ash handler proposes to

dispose of more than 10,000 cubic feet of coal ash, it must submit an engineering plan to the state showing the design of the site. State Solid Waste staff may comment on the engineering plan, but do not have authority to stop it.

## SUMMARY AND RECOMMENDATIONS

Across the country, and here in North Carolina, the need to maintain “beneficial use” of coal ash has been used as a defense against tougher overall regulation of coal ash.

But in the “beneficial use” category appears to be a loophole that has allowed largely unregulated dumping of potentially harmful coal ash waste, resulting in documented problems with groundwater and surface water contamination and lack of notice to landowners and neighbors. Despite spotty records and lack of monitoring data, a review of state records nonetheless found widespread problems. State regulators have little authority in law to ensure safe management of structural fill sites and no funding to perform regular inspections. Public officials do not have the basic tools they need to ensure that public health and the environment are protected.

US EPA's pending announcement of regulatory changes for management of coal ash waste may address the issues raised in this report. But if EPA does not act, North Carolina must.

The Perdue Administration should act to:

- 1) discontinue the practice of allowing coal ash to be used for land development and require instead that coal ash be disposed of in landfills that comply with state regulations requiring liners and other precautions to prevent pollutants from leaching into ground or surface water. [Note: Exceptions may be considered where the ash is fully encapsulated.]
- 2) require groundwater monitoring at existing active structural fill sites and for at least 30 years after a structural fill is closed, and make this groundwater monitoring data available to the public.
- 3) require cleanup by developers if monitoring data reveal that groundwater or surface water has been contaminated by coal ash.
- 4) identify a funding source to enable adequate oversight and enforcement of closed sites.
- 5) require that the use of coal ash as structural fill be permanently recorded on the deed for the affected property.

## ENDNOTES

1. Environmental Protection Agency press releases, 3/9/2009 - "EPA Announces New Action to Prevent Coal Ash Releases;" 12/17/2009 - "Statement from EPA on Coal Ash."
2. N.C. Division of Solid Waste annual report of coal ash .
3. Correspondence between Duke Energy and N.C. Division of Waste Management, 8/18/1998, 8/21/1998, 10/7/1998, 10/22/1998
4. Memoranda and correspondence between state Division of Waste Management and Duke Power from 1994-96, including 9/20/1994 letter from Duke Power and 10/2/1996 Duke Power proposed revisions to solid waste management section, 1700 requirements.
5. The state required groundwater monitoring in these case because the operators had failed to follow state specifications for development of the structural fill sites.
6. Interim Report on the Beneficial Use of Coal Combustion By-Products, N.C. Department of Environment and Natural Resources, Division of Waste Management, 2002
7. Draft petition for declaratory ruling on excessive excavation policy dated 9/20/2006 sent to state Division of Waste Management by Full Circle Solutions in response to state notice to cease excavation of structural fill sites.
8. March 2000 status report by Division of Solid Waste on structural fills

NC Sierra Club  
112 South Blount St  
Raleigh, NC 27601-1444

**T** 919-833-8467

**F** 919-833-8460

info@sierraclub-nc.org  
nc.sierraclub.org