

Table of Contents
SAB Science Integration for Decision Making Fact Finding Interviews
EPA Region 4
October 26, 2009

| | Page |
|---|------|
| Schedule for October 26, 2009 | 2 |
| Local logistics information for Region 4 visit provided by Region 4 | 3 |
| Agendas for fact finding interviews and biosketches available for interviewees | 4 |
| - Agenda for meeting with Acting Deputy Regional Administrator, Beverly Bannister | 4 |
| - Biosketch for Beverly Bannister | 5 |
| - Agenda for meeting with Senior Management Team | 6 |
| - Available Biosketches for Managers | 7 |
| - Agenda for meeting with Scientific and Technical staff | 8 |
| - Available Biosketches for Scientific and Technical Staff | 9 |
| Region 4 Snapshot | 11 |
| TVA Kingston Fossil Plant Coal Ash Spill | 33 |
| Region 4 Divisions and Offices - Organizational Chart | 95 |

Schedule for October 26, 2009
SAB Science Integration for Decision Making Fact Finding Interviews
EPA Region 4

| | |
|-------------------------|---|
| 11:00 a.m. - 12:00 p.m. | Interview with Acting Deputy Regional Administrator |
| 12:00 p.m. - 1:00 p.m. | Lunch |
| 1:00 p.m. - 2:30 p.m. | Meeting with Division Management |
| 2:30 p.m. - 2:45 p.m. | Break |
| 2:45 p.m. - 4:15 p.m. | Meeting with Scientific and Technical Staff |

Local Logistics Information for Region 4 Visit Provided by Region 4

EPA Region 4 is located in the Sam Nunn Atlanta Federal Center at 61 Forsyth St. SW, Atlanta. The location is right at the Five Points (MARTA) subway stop. Five Points subway stop represents the intersection of the North-South (Airport) line with the East-West line. If traveling from the Airport to the Sam Nunn Atlanta Federal Center, take any train leaving the Airport to Five Points. There are several exits from the Five Points subway stop----the Nunn Building is across the street from the southwest corner exit (You'll see a small McDonald's restaurant sitting in front of the large Nunn Building when you emerge from the subway station.) There's additional locational information on the Region 4 website ---epa.gov/region4.

Upon entry into the Federal Center, you'll first have to pass through building security in the lobby. After that, you'll be instructed to take the elevator to the 9th floor where you'll check in at EPA. Upon arrival at check-in, ask the receptionist to contact me at 8275. I'll come to the 9th floor to escort you.

About Embassy Suites at Centennial Olympic Park -

With respect to lodging, most visitors to the Atlanta Federal Center prefer to lodge at the Embassy Suites Atlanta at Centennial Olympic Park which is located about five blocks from the Federal Center. The address and telephone number is 267 Marietta St., Atlanta, GA 30313; 404-223-2300. If traveling from the Airport to Embassy Suites via subway, take any train departing the airport to the Five Points MARTA station. At Five Points, you must transfer to a West bound train on the East-West line. To transfer, you must ascend one level to the East-West line and then take a West bound train one stop to the Georgia Dome-Phillips Arena-CNN MARTA stop. For additional hotel choices, the Region 4 web site, epa.gov/region4, has a link to hotel options, click on about Region4, then click on Visitor Information (on the right side of the web page.) If there are lodging-related questions, people can contact me.

People lodging at Embassy Suites can either walk to the Nunn Building of the Atlanta Federal Center approximately five blocks or can take the East-West subway line one station east to Five Points station. If walking to the Federal Center, take Marrietta Street east approximately four blocks toward Downtown, turn right at Forsyth Street and continue one block. Nunn Building is on the right (behind McDonalds.) If taking the subway, take an East bound train one stop to the Five Points MARTA station.

SAB Science Integration for Decision Making Fact-Finding Interview
EPA Region 4 - Acting Regional Administrator and Deputy Regional Administrator
Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW, Atlanta, GA 30303-8960
Regional Administrator's Conference Room (14th Floor)
Call-in Number for SAB subgroup: 866-299-3188, access code 343-9981 and press the #
sign.)
October 26, 2009, 11:00 a.m. - 12:00 p.m.

Draft Agenda

Purpose of Interview: to help SAB Committee members learn about Region 4 Southeast's current and recent experience with science integration supporting EPA decision making so that the SAB can develop advice to support and/or strengthen Agency science integration efforts.

1. Introductions facilitated by the SAB Staff Office
2. Discussion facilitated by SAB Members
3. Identification of any follow-up actions

Planned participants

EPA Region 4

Ms. Beverly Banister, Acting Deputy Regional Administrator

SAB Committee on Science Integration Committee Members

Dr. Jill Lipoti, New Jersey Department of Environmental Protection

Dr. Gregory Biddinger, ExxonMobil Biomedical Sciences, Inc.

SAB Staff Office

Dr. Anthony Maciorowski, Deputy Director

Dr. Angela Nugent, Designated Federal Officer



Beverly Houston Banister
Acting Deputy Regional Administrator
U.S. Environmental Protection Agency
Region 4

Beverly is currently the Acting Deputy Regional Administrator at the Environmental Protection Agency (EPA) Region 4 in Atlanta, Georgia. She was appointed to this position on January 21, 2009, where she will remain until EPA's transition is complete.

Ms. Banister is normally the Director of the Air, Pesticides and Toxics Management Division. She is responsible for planning, coordinating, and implementing all Regional EPA Air, Pesticides, and Toxics programs. Ms. Banister has also provided management and leadership to both the Waste and Water Management Divisions. She has been with EPA for more than 25 years and has extensive experience in many EPA programs and offices including EPA Headquarters.

Ms. Banister has been recognized with many awards for her knowledge, skills, and leadership abilities which produced environmental results. She was the recipient of the Federal Executive Board EPA All Star Award, the Donald J. Guinyard Pioneer Achievement Award and the prestigious Lee M. Thomas Excellence in Management Award. In addition, to these career achievements and honors, Ms. Banister has provided leadership to numerous organizations within and outside EPA. Ms. Banister has a special interest in providing opportunities for disadvantaged children. She is a graduate of Auburn University with a degree in Chemical Engineering.

SAB Science Integration for Decision Making Fact-Finding Interview
EPA Region 4 - Senior Management Team
Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW, Atlanta, GA 30303-8960
Conference Room 13T50 (13MP)
Call-in Number for SAB subgroup: 866-299-3188, access code 343-9981 and press the #
sign.)
October 26, 2009, 1:00 p.m. - 2:30 p.m.

Draft Agenda

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1. Introductions facilitated by the SAB Staff Office
2. Discussion facilitated by SAB Members
3. Identification of any follow-up actions

Planned participants

EPA Region 4

Mr. Glenn Adams, Chief of Technical Services Section, Superfund Support Branch,
Superfund Division
Mr. Randall Chaffins, Deputy Director, Region 4 Superfund Division
Mr. John Deatrick, Chief, Ecological Evaluation Section; Ecological Assessment Branch;
Science and Ecosystem Support Division
Ms. Denisse Diaz, Acting Chief, Enforcement and Compliance Planning and
Management Branch; Office of Environmental Accountability
Mr. Doug Neeley, Chief, Air Toxics and Monitoring Branch; Air, Pesticides, and Toxics
Management Division
Mr. David Parker, Chief, Wetlands Planning and Coastal Protection Section; Wetlands,
Coastal, and Oceans Branch; Water Protection Division
Ms. Dee Stewart, Deputy Director, Region 4 Resource Conservation and Recovery Act
Division

SAB Committee on Science Integration Committee Members

Dr. Jill Lipoti, New Jersey Department of Environmental Protection
Dr. Gregory Biddinger, ExxonMobil Biomedical Sciences, Inc.

SAB Staff Office

Dr. Anthony Maciorowski, Deputy Director
Dr. Angela Nugent, Designated Federal Officer

Available Biosketches for Managers

Denisse Davila Diaz
Chief, Planning and Results Section
Enforcement and Compliance Planning and Analysis Branch
U.S. Environmental Protection Agency, Region 4

Denisse Diaz has been with the Environmental Protection Agency, Region 4 since 1991. She is currently the Section Chief of the Planning and Results Section in the Office of Environmental Accountability. Before becoming a manager she spent five years as a senior enforcement specialist/special assistant in the RCRA Enforcement and Compliance Branch, where she previously was an inspector and enforcement officer. She also worked with the Pesticides and Toxic Substances Branch in the Air Pesticides and Toxics Management Division, where she served as an enforcement officer since 1991 to 1993.

Denisse is a graduate of the University of Puerto Rico, Mayaguez Campus where she obtained her Bachelor of Science Degree in Chemical Engineering in 1991.

SAB Science Integration for Decision Making Fact-Finding Interview
EPA Region 4 - Scientific and Technical Staff
Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW, Atlanta, GA 30303-8960
Conference Room 13T50 (13MP)
Call-in Number for SAB subgroup: 866-299-3188, access code 343-9981 and press the #
sign.)
October 26, 2009, 2:45 p.m. - 4:15 p.m.

Draft Agenda

Purpose of Interview: to help SAB Committee members learn about Region 4 Southeast's current and recent experience with science integration supporting EPA decision making so that the SAB can develop advice to support and/or strengthen Agency science integration efforts.

1. Introductions facilitated by the SAB Staff Office
2. Discussion facilitated by SAB Members
3. Identification of any follow-up actions

Planned participants

EPA Region 4

Dr. Kenneth Mitchell, Office of the Regional Administrator
Dr. Egide Louis, Air, Pesticides, and Toxics Management Division
Mr. Doug Johnson, Water Protection Division
Mr. Leo Frandencese, Superfund Division
Mr. Craig Zeller, Superfund Division
Mr. Reggie Barrino, Office of Environmental Accountability
Mr. John E Johnston, RCRA Division

SAB Committee on Science Integration Committee Members

Dr. Jill Lipoti, New Jersey Department of Environmental Protection
Dr. Gregory Biddinger, ExxonMobil Biomedical Sciences, Inc.

SAB Staff Office

Dr. Anthony Maciorowski, Deputy Director
Dr. Angela Nugent, Designated Federal Officer

Available Biosketches: Scientific and Technical Staff

Leo Francendese USEPA R4 OSC

I graduated in 1992 from the University of Georgia's BSEH program, and am well published in peer review journal articles encompassing a number of issues from the treatment of oil contaminated soils, to the transgenerational effects of mercury and PCBs in fish fecundity, and to the identification of toxaphene degradation products in the environment. USEPA Region 4 nominated me for OSC of the Year 2008 for project management and leadership as OSC at numerous highly complex responses.

I support the Division's succession planning by mentoring junior staff as an advocate and leader of the mentoring program. I promote a team approach to mentoring, serving as the branch coordinator for the mentoring program to ensure consistent training and mentoring of the newly hired OSCs within the branch. I combine fundamental tools with practical application of the NCP for response actions in a field setting.

I received the 2008 National EPA Science Achievement Award for excellence in promotion of best available science in the analysis and risk assessment of toxaphene both regionally and nationally. I addressed a large complex dredging project and subsequent impacted fishery in the Brunswick, Ga. Area, a project which required extensive coordination nationally and with the EU to steer its resolution. The project was subsequently audited by the Office of Inspector General, the findings of which helped propel the concept of best available science as the 'gold standard' in decision making.

At the Barite Hill gold mine site, I led a team of national experts (including Bureau of Reclamation and US Department of the Interior) to develop and implement an innovative process to address the unique threats associated with mineral mining operations. The pit lake contains acidic water with elevated concentrations of toxic metals. The pit re-acidified due to weathering of exposed waste- rock. Investigations were conducted that identified a likely potential for catastrophic release. In addition, the pit lake and surrounding exposed waste rock were documented as creating potentially lethal sulfur dioxide atmospheric inversions. I developed effective low cost solutions for treatment of such pit lakes for restoring the environment and protecting human health. The results have attracted national attention within the mining industry as well as mining regulators. Publishing a peer review article is in the process for the mine site.

I received a team award in 2008 for the National Notable Achievement Award for Cross Program Land Revitalization Results at the Camilla Wood Preserving Site. A cross program effort was needed to conduct integrated in-depth, targeted site characterization and professionally conducted community land use coordination to arrive at a removal remedy that permanently addresses two thirds of the site while simultaneously converting that part of the remedied site into a city owned and county operated tri-county recreational complex. Savings to the government were more than 50 million dollars in securing a more reasonable and protective remedy within this environmental justice community.

From 1995 through 2000, I participated as the OSC in a complex PRP lead/EPA cost share chlor-alkali facility clean-up that impacted approximately 100 acres of upland as well as 400 acres of wetlands in a 12-mile stretch of a commercial fishing river in Brunswick, GA. The site was known as LCP Chemicals and recognized in it's time as the poster child for effective CERCLA clean-ups. Original cost estimates were in excess of \$250 million. Final clean-up costs were completed in under \$60 million. I was awarded Regional Superfund Clean-Up of the Year as well as PRP awarded excellence in project management.

John E. Johnston

Corrective Action Specialist

Restoration and Underground Storage Tank Branch, RCRA Division, USEPA Region 4

I have a Bachelor's Degree in Geology from the University of North Carolina-Wilmington and a Master's Degree in Geology from the University of Mississippi. Immediately after graduate school I worked for the Mississippi Office of Geology where I reviewed and issued surface mining permits, inspected surface mining operations, and provided oversight of restoration activities at closed surface mines. I then worked for the Mississippi Office of Pollution Control where I wrote Preliminary Assessments for Superfund sites to determine the need for additional investigations, prepared sampling investigation plans, and assisted in comprehensive sampling of Superfund sites for hazardous waste contamination. I have been in the EPA's RCRA program since 1992; although my duties have included issuing Federal permits for facilities to treat, store, or dispose of hazardous waste, my current role is as a Corrective Action Specialist and I am responsible for managing cleanup activities at EPA-lead RCRA facilities. While at EPA, I have also participated in two hazardous waste projects in Ukraine, conducted hazardous waste training in Moldova, and participated in the Embassy Science Fellows program in the Kyrgyz Republic where I conducted a limited environmental assessment of solid waste landfills, waste water, drinking water supplies, and radioactive tailings.

Dee Stewart

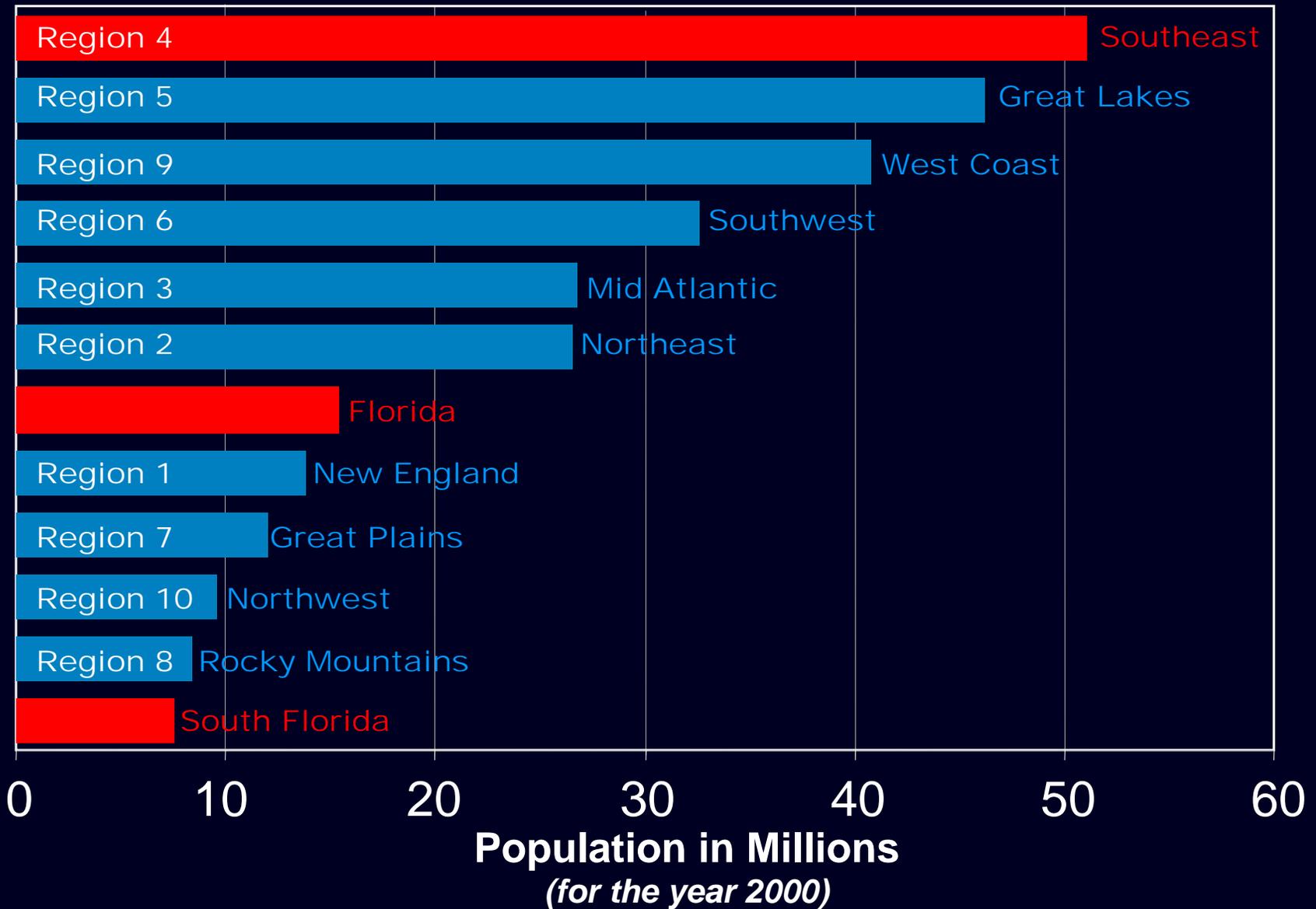
Dee Stewart is currently the Deputy Director for the Resource Conservation and Recovery Act Division, EPA Region 4, Atlanta, Georgia, and has worked at EPA for over 17 years in a variety of roles. These include the Deputy Director, Water Management Division, Director of External Affairs, and front-line supervision in EPA's Drinking Water and Grants programs, as well as several years in EPA's effluent discharge permitting program for industrial and municipal facilities. She is a graduate of the Georgia Institute of Technology with a Master's in Environmental Engineering and attended the University of Colorado where she obtained a Bachelor's in Civil Engineering.

A Region 4 Snapshot



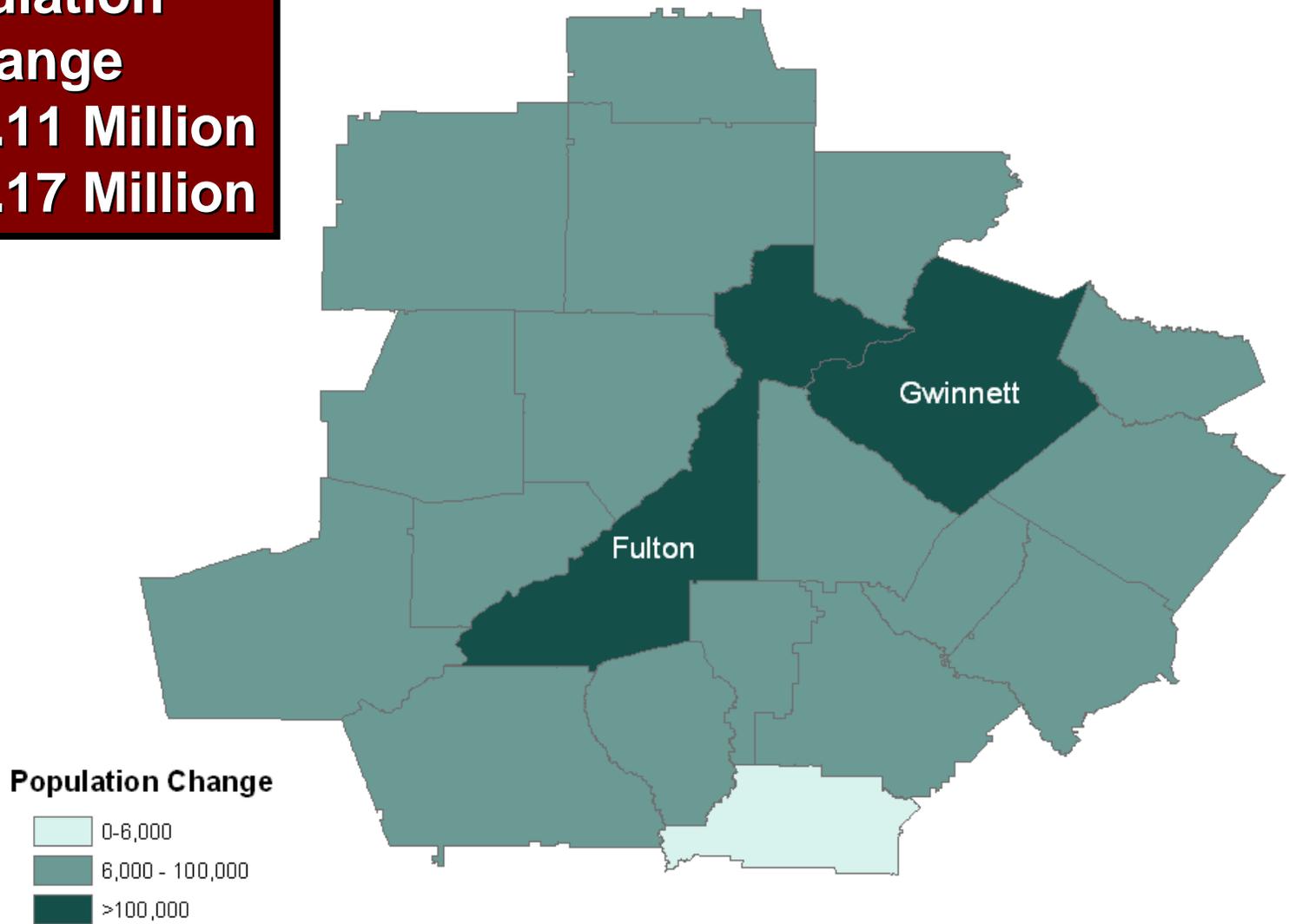
*Serving the
Southeast*

Just how big is Region 4?

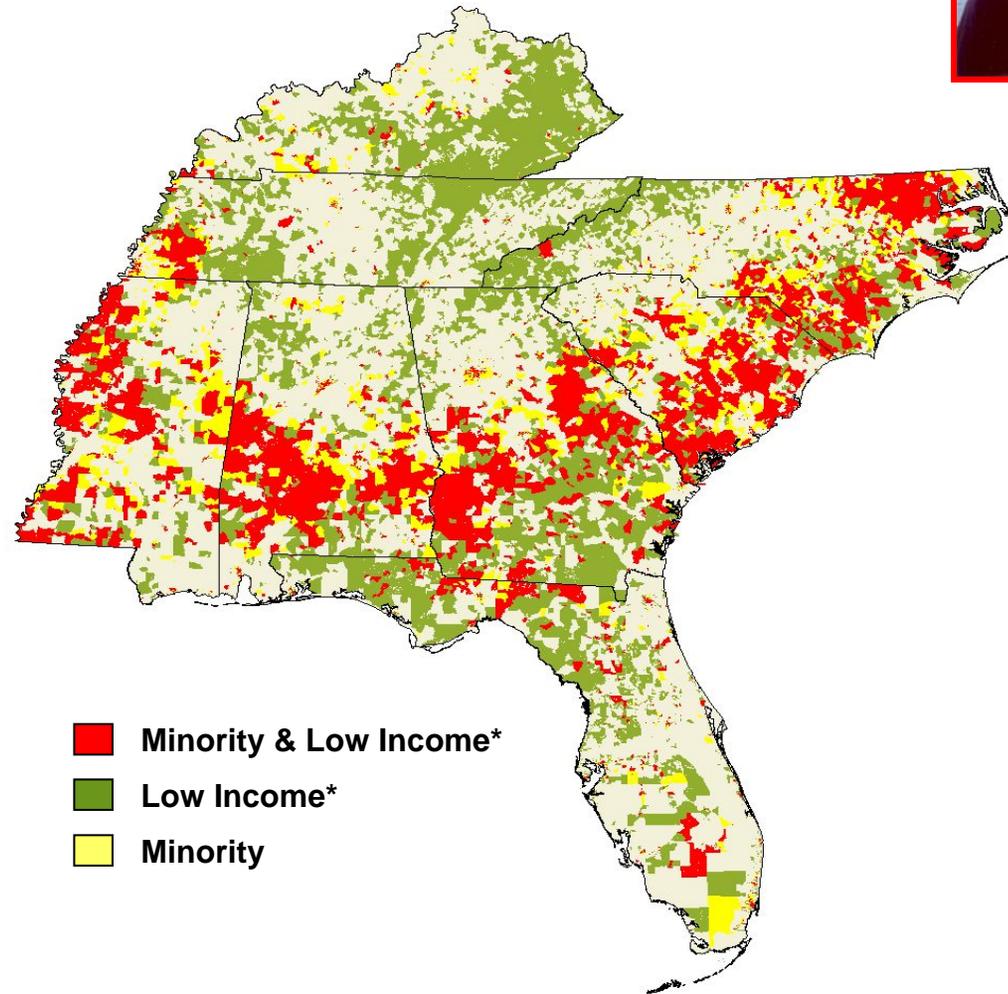


SOURCE: U.S. Census Bureau, Florida Bureau of Economic & Business Research

**Metro-Atlanta
Population
Change**
2000: 4.11 Million
2007: 5.17 Million



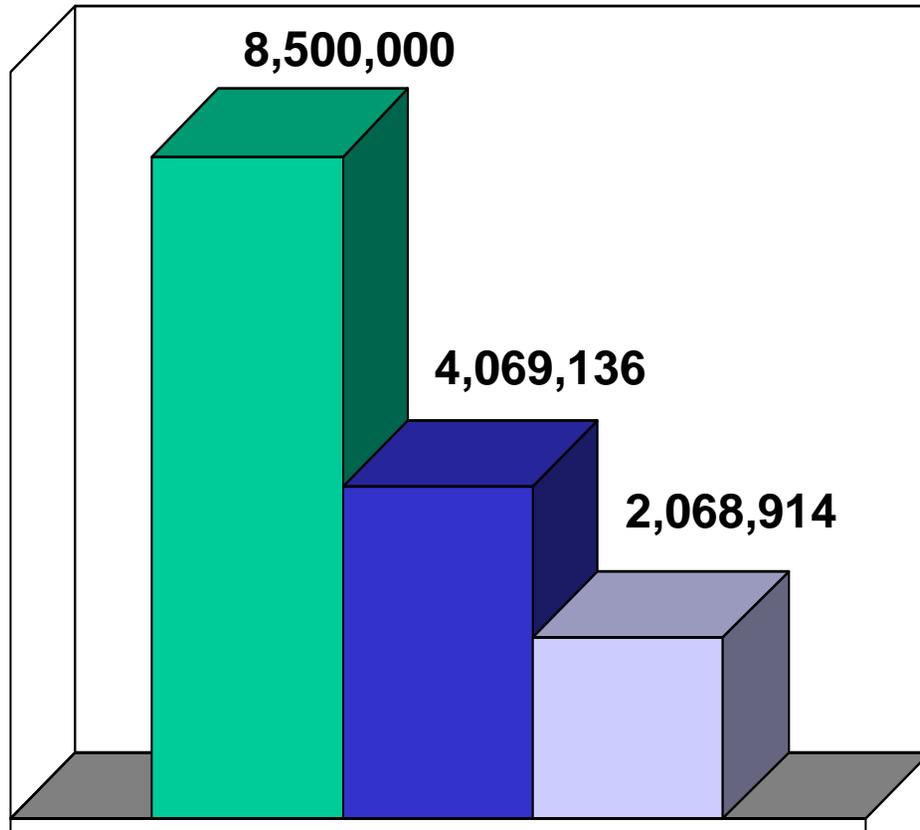
Environmental Justice



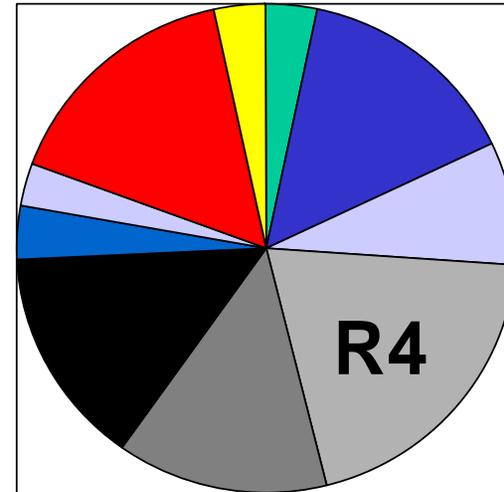
- Minority & Low Income*
- Low Income*
- Minority

*Low Income < \$15,000/year

Region 4: Children Under Five



Projected for 2009



Growing Pains?

Benefits

Economic Prosperity

Improved Quality of Life



Impacts

Environmental Changes

Social Change

Changing Economics

Traditional Industries

- **Paper & Wood**
(*Forestry*)
- **Chemical Manufacturing**
(*agribusiness & textiles*)
- **Food processing & Tobacco**
(*agricultural use*)
- **Military**



The “New” South

- **Motor vehicle production**
(*cheap land & labor*)
- **Transport**
(*military & shipping*)
- **Secondary supply**
(*fabricated materials/metals*)
- **High Tech & Space Industries**
- **Communications & Electronics**



Land Development -- Stressor

Rank/State

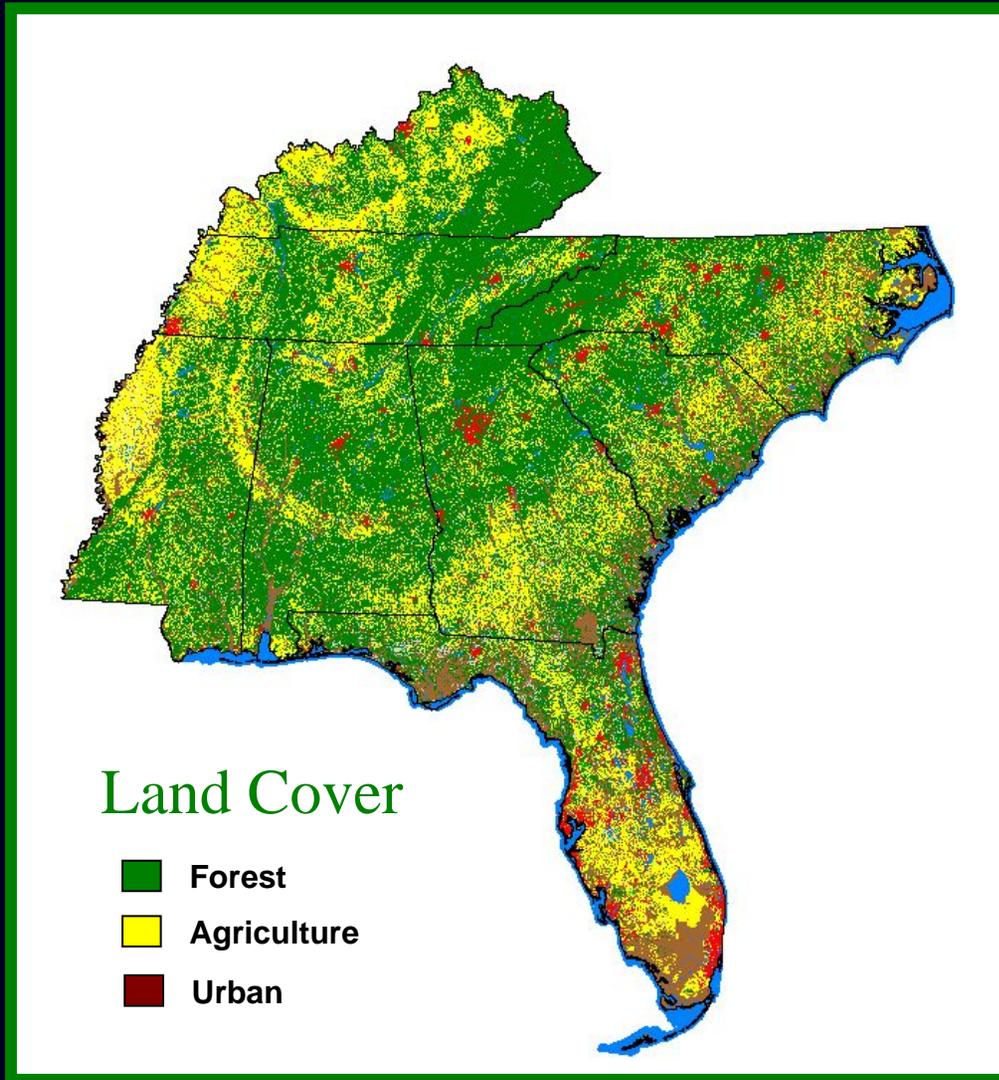
2. Georgia
3. Florida
6. North Carolina
7. Tennessee
10. South Carolina



*5 of the Region 4 States
are in the Nation's Top 10*

Nat'l State Rank by Acreage & Rate of Non-Federal Land Developed (1992-1997)

The Farmland



Loss of “Prime” land –
GA, NC, TN, & AL among top ten
States losing the most Agricultural
land from 1992-1997

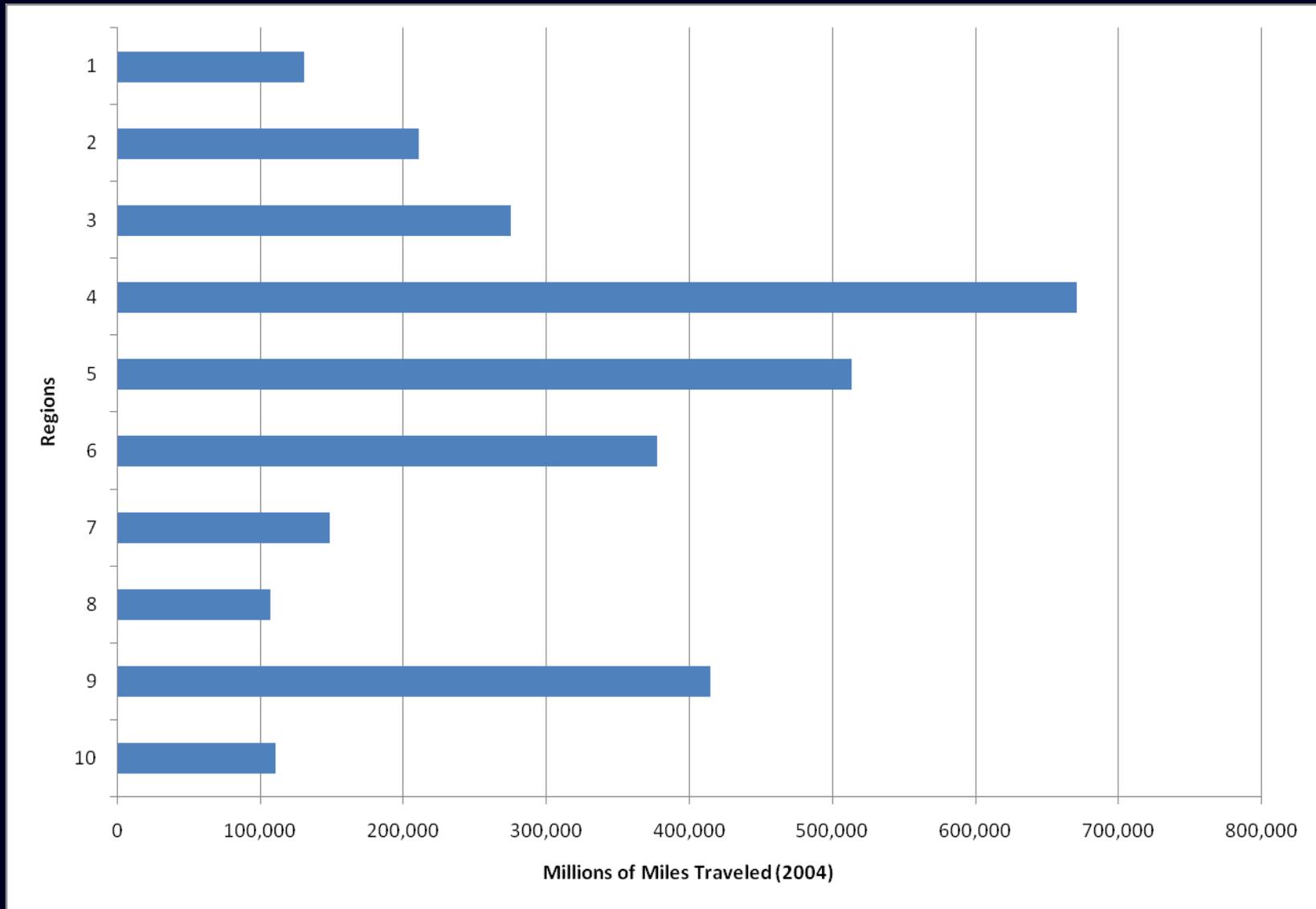
Intense Agriculture –
Pesticide Application
Uncontrolled Runoff
Stream Sedimentation
Animal Feeding Operations

SOURCE: American Farmland Trust

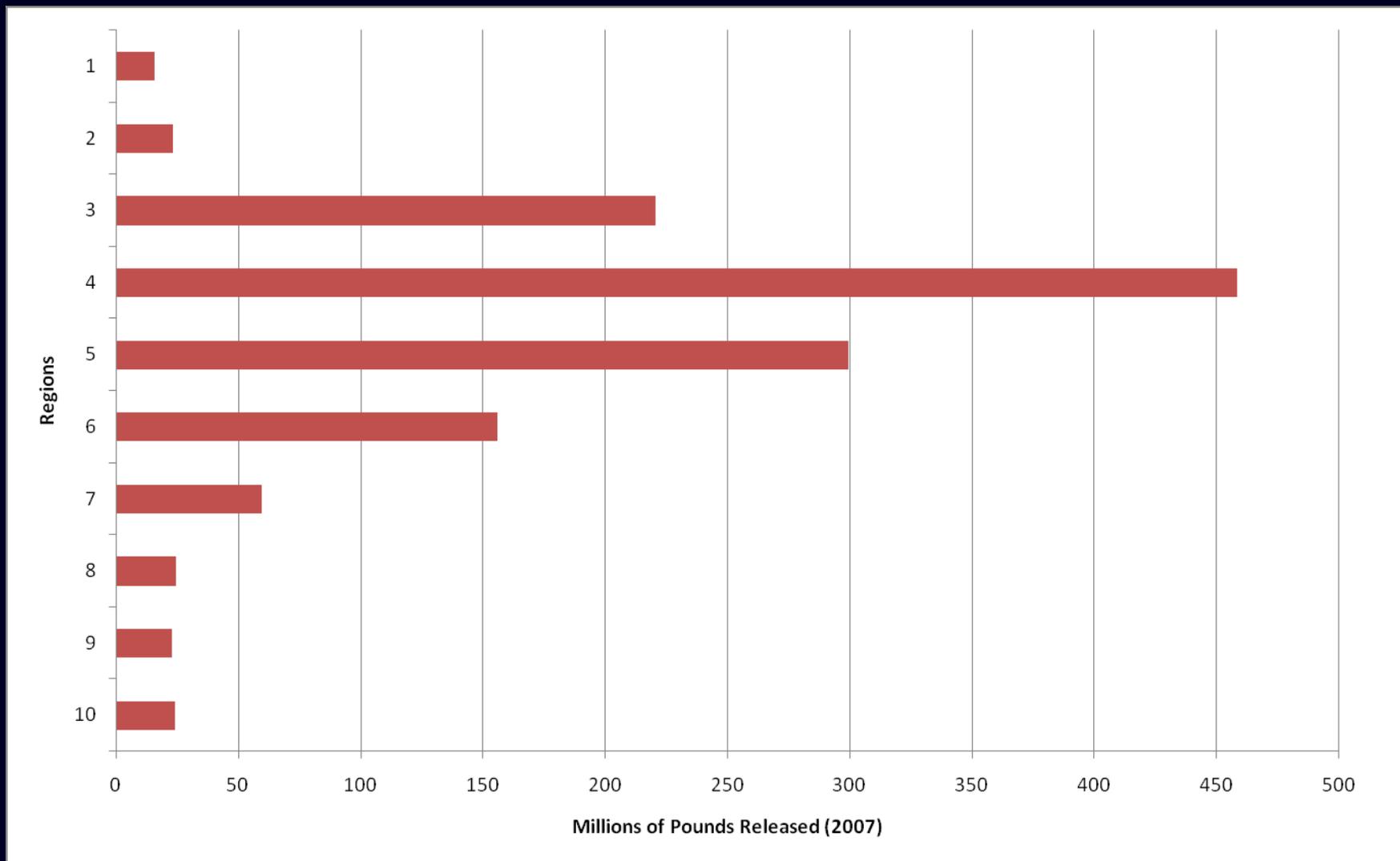


Air Resources

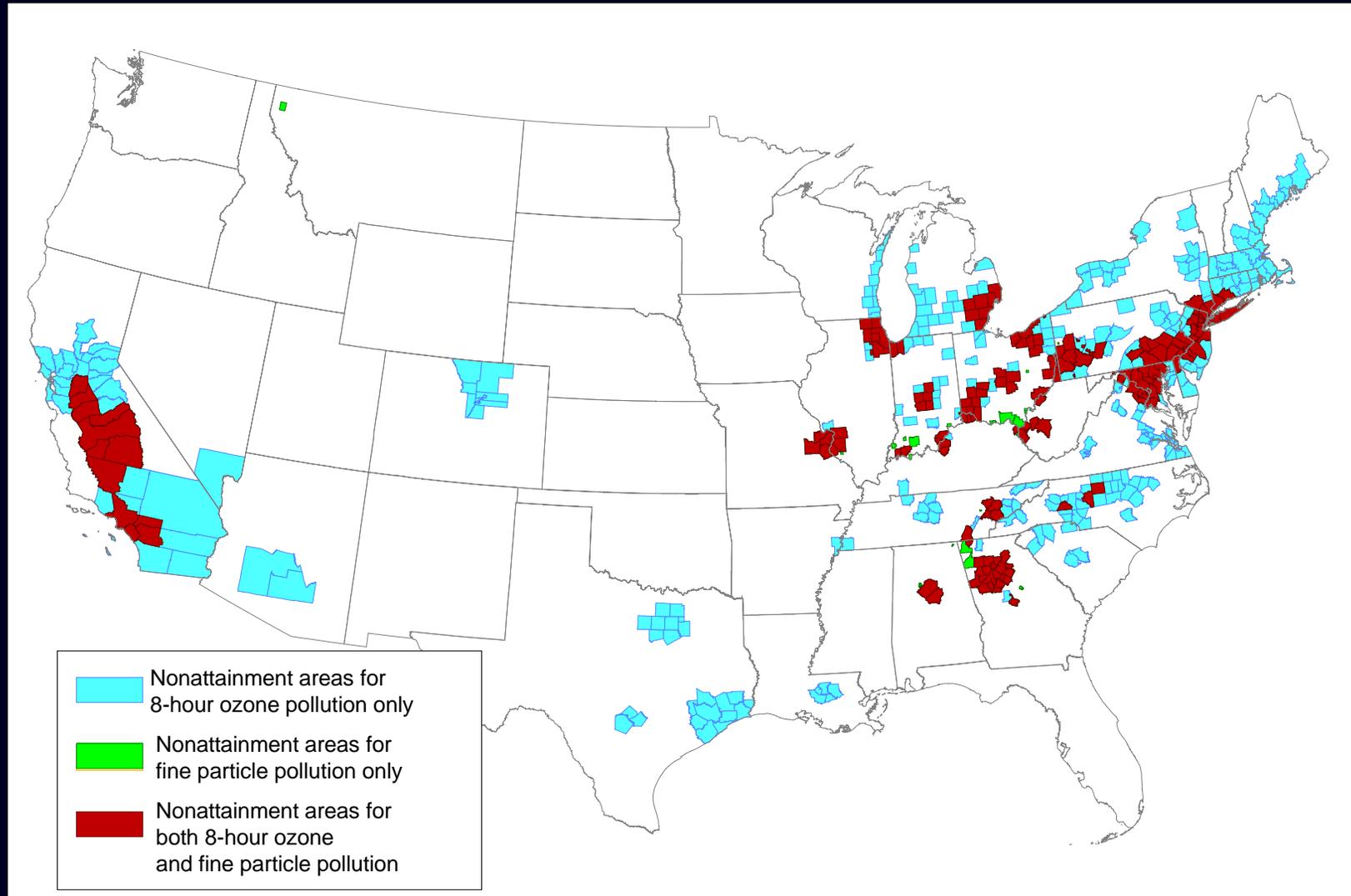
Annual Vehicle Miles Traveled



TRI Air Releases by Region



Nonattainment Areas

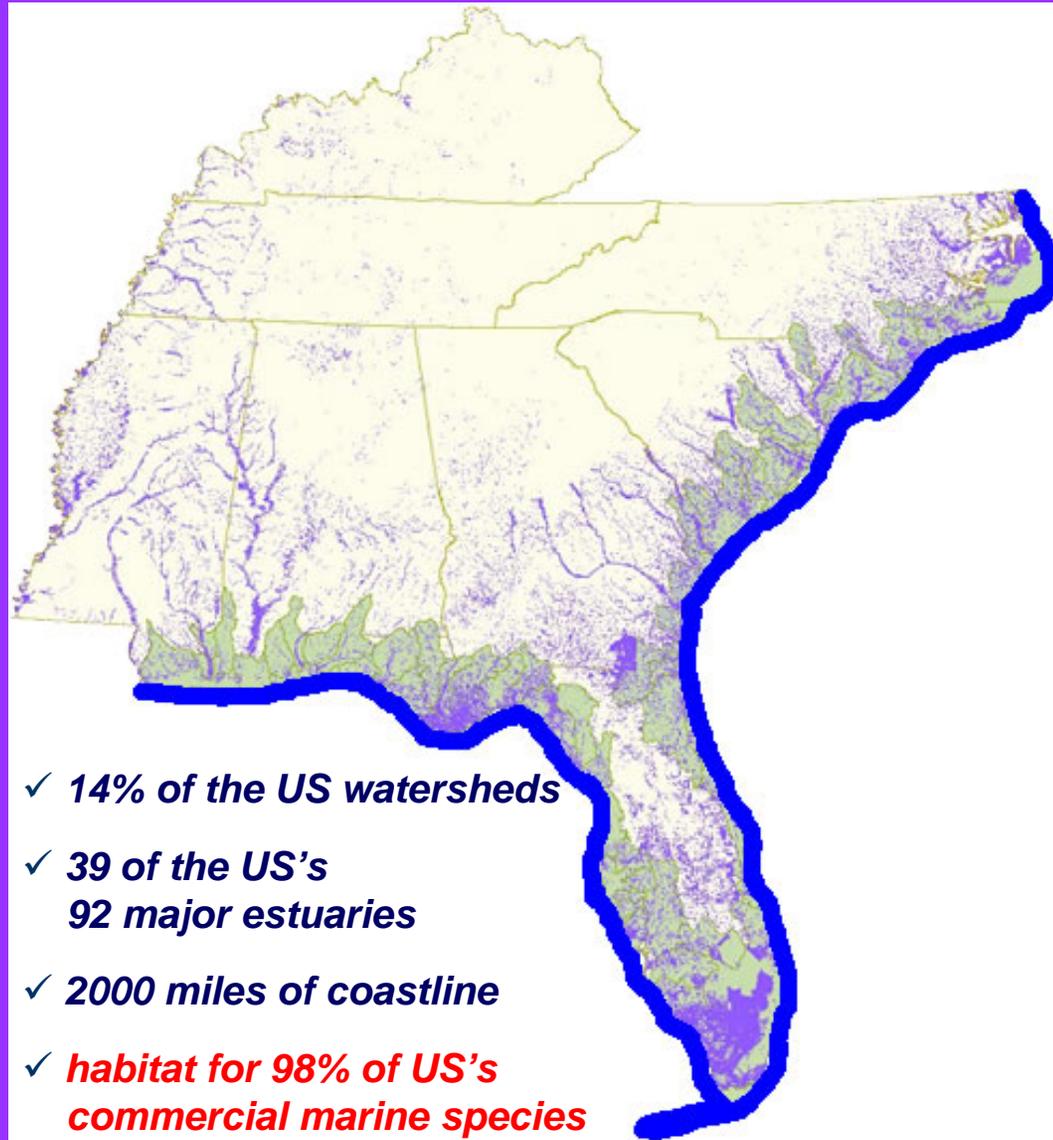


Areas Designated Nonattainment for Ozone and $PM_{2.5}$ NAAQS in 2004

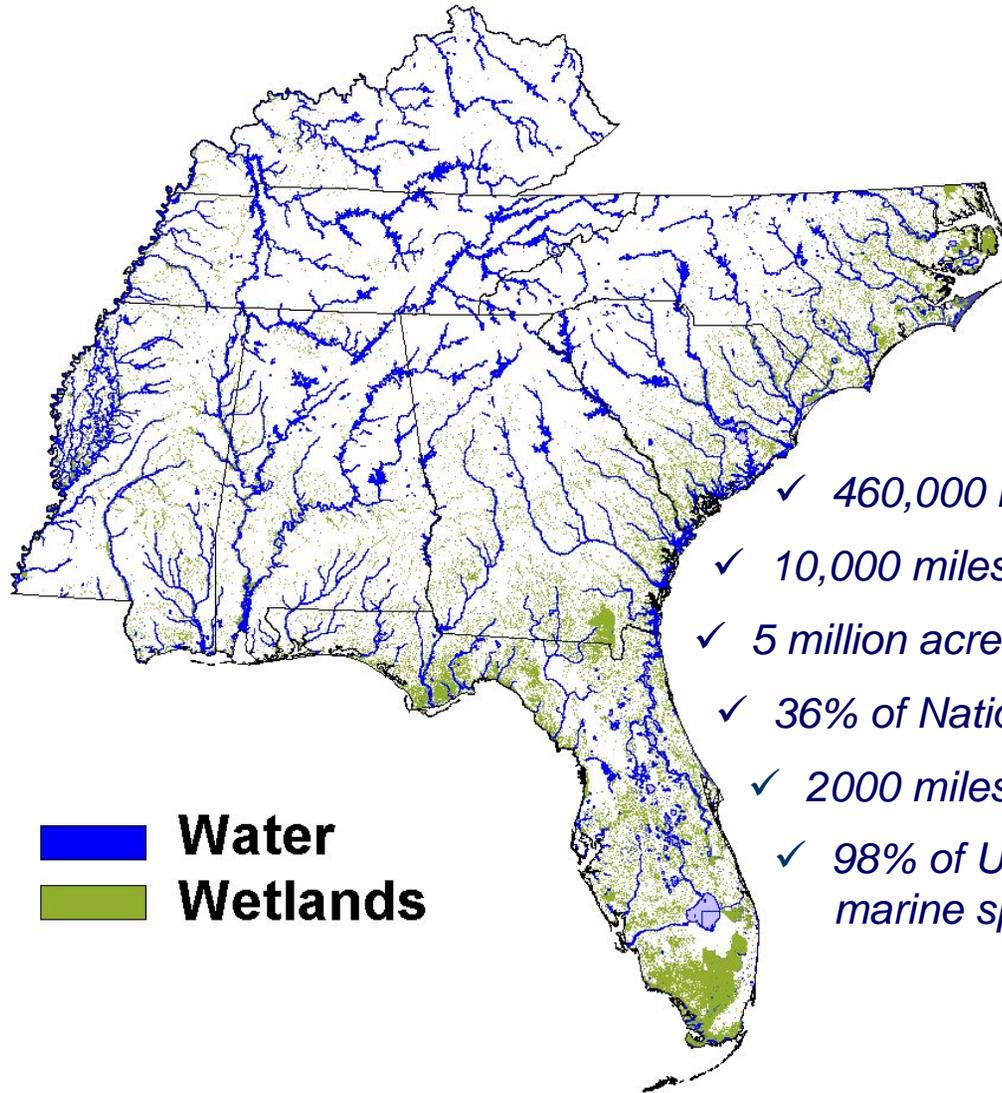


Water Resources

From the Mountains to the Sea...



Major Water Resources



- ✓ 460,000 miles of rivers
- ✓ 10,000 miles² of estuaries
- ✓ 5 million acres of lakes
- ✓ 36% of Nation's wetlands
- ✓ 2000 miles of coastline
- ✓ 98% of US's commercial marine species

Water Stressors



Water Quantity

Growth

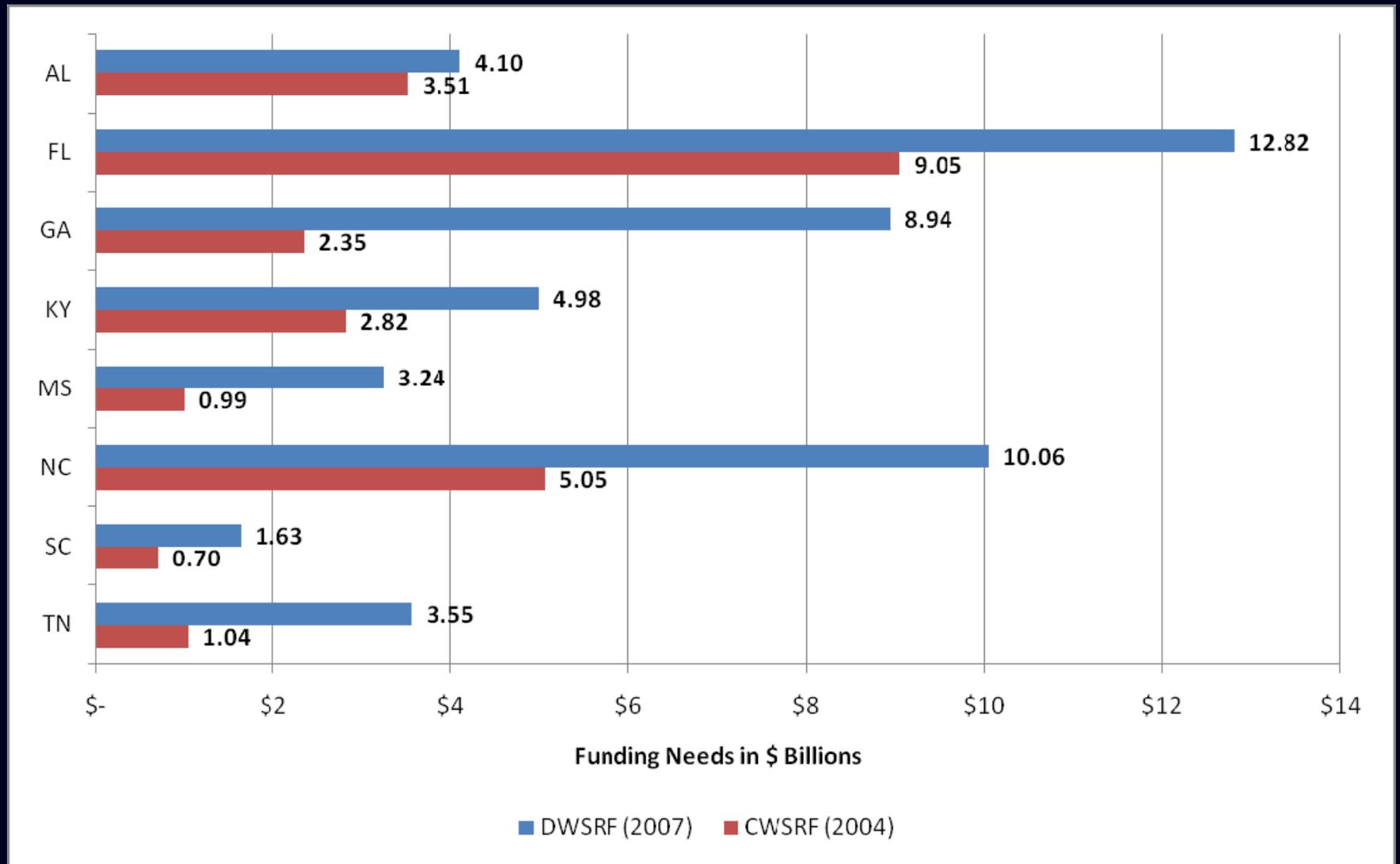


Drought

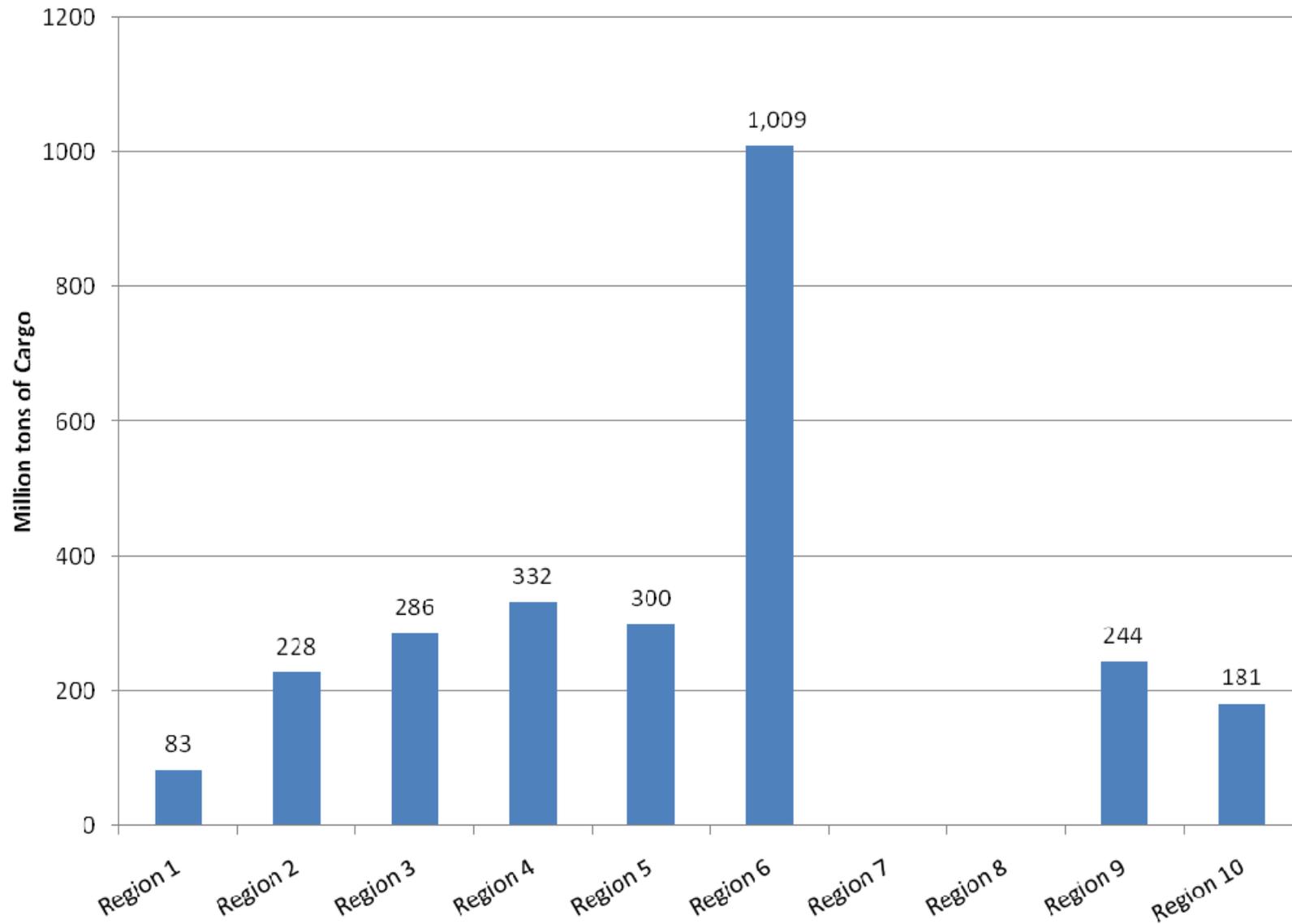
Infrastructure



Water & Wastewater Infrastructure Needs

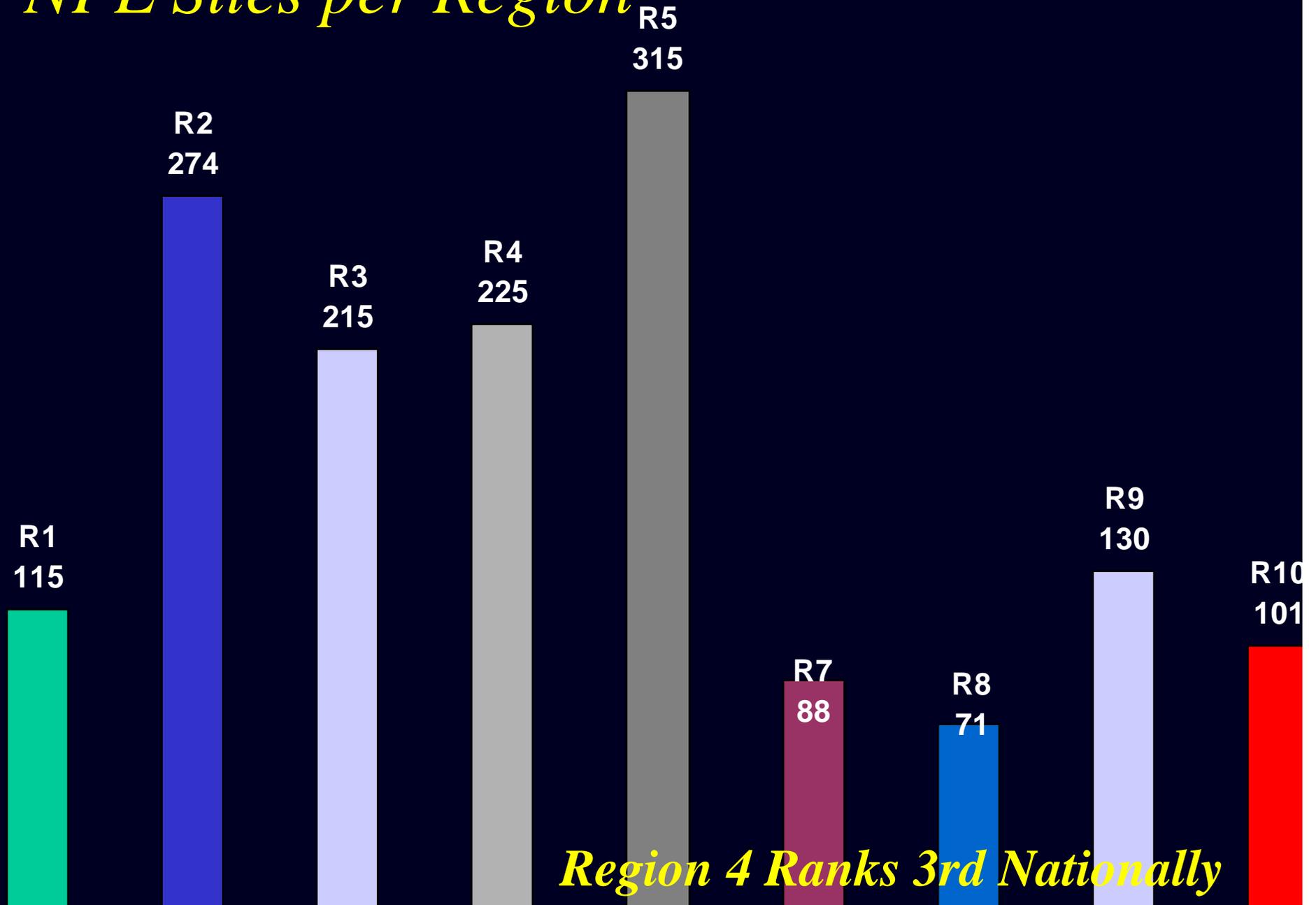


Port Capacity (2007)



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center

NPL Sites per Region



Region 4 Ranks 3rd Nationally



Region 4

*Doing our Part to Protect
Human Health and the Environment*

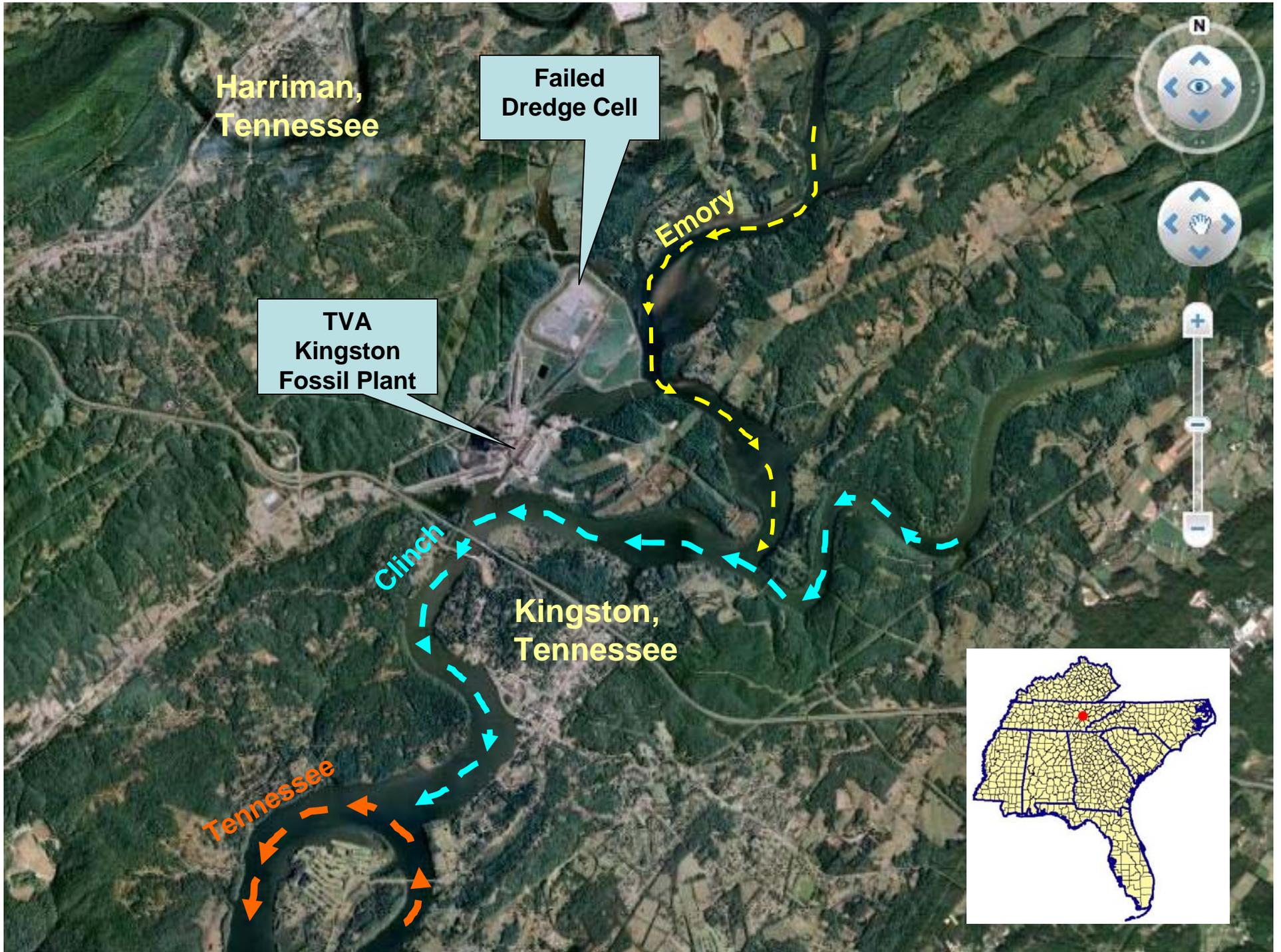
TVA KINGSTON FOSSIL PLANT COAL ASH SPILL

**BRIEFING FOR
EPA ADMINSTRATOR
LISA JACKSON
JULY 29, 2009**



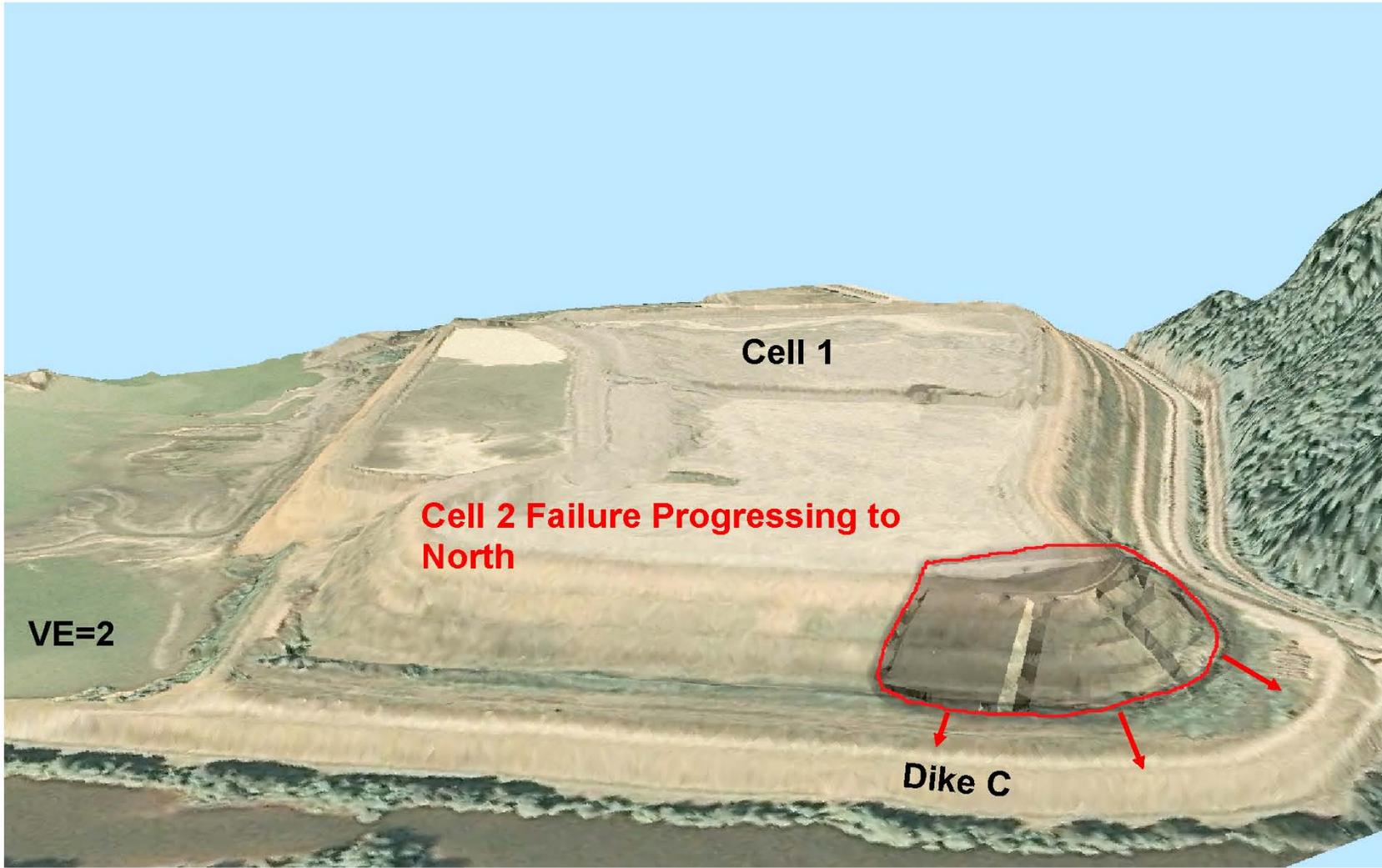
Outline of Briefing

- **December 22, 2008 Incident**
- **Fly Ash Characteristics and Environmental Media Monitoring**
- **Enforcement actions**
- **Time-Critical Removal**
- **Off-Site Disposal**
- **Non Time-Critical Removal**
- **Selenium Issue**



December 22, 2008 Incident

- ❖ Catastrophic failure of Dredge Cell 2 and Dike C began at approximately 01:00 hrs EST.
- ❖ Event occurred over a span of about one hour.
- ❖ Approximately 5.4M cubic yards (CYs) of ash released.
 - Covered about 300 acres
 - Damage to 40 homes (3 condemned)
 - Displaced 22 residents
 - Gas line and power line rupture
 - Road and rail line damage
- ❖ Estimated 3M cubic yards of total entered Emory River and its tributaries.



December 22, 2008 Expected Failure Mode at NW Corner of Cell 2

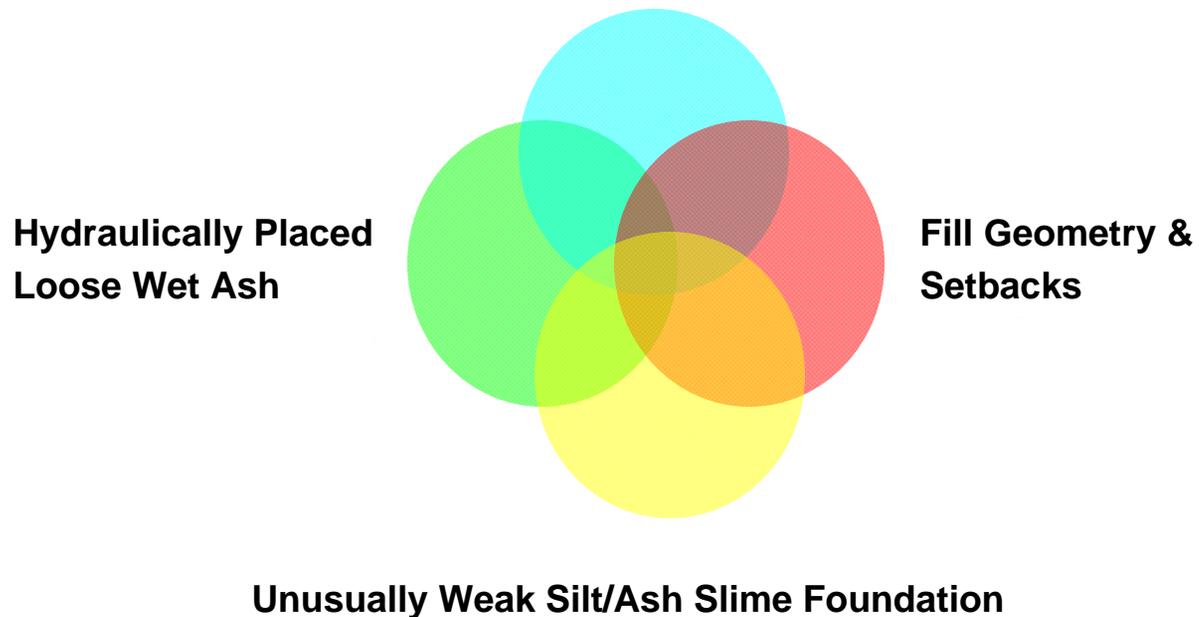
Source: Root Cause Analysis
AECOM. June 25, 2009

TVA KINGSTON DREDGE CELL FAILURE 12-22-2008
KINGSTON FOSSIL PLANT
HARRIMAN, TENNESSEE

Root Cause Analysis: AECOM June 25, 2009

Kingston Dredge Cell Failure Conditions

Increased Loads Due to Higher Fill



Source: Figure 1.8. Root Cause Analysis
AECOM. June 25, 2009

TVA KINGSTON DREDGE CELL FAILURE 12-22-2008
KINGSTON FOSSIL PLANT
HARRIMAN, TENNESSEE

FIGURE No. 1.8_1

6

December 2008 Incident





Fly Ash Characteristics

- ❖ Fly ash is the residue from combustion of powdered coal. Non-flammable constituents are concentrated in the ash. Though primarily silica, contains a number of hazardous substances.

- ❖ Metals
 - Constituents include arsenic, lead, cadmium, selenium.
 - Arsenic concentrations (87 mg/kg max) above EPA R4 Residential Removal Action Levels (39 mg/kg), but below Industrial RAL (160 mg/kg).

 - Residential soils, except those with direct ash deposition, were within RALs.

 - TCLP analysis indicates that fly ash from Kingston spill does not leach metals in excess of hazardous waste thresholds

- ❖ Radionuclides
 - Radium 226 and 228. TVA analysis of ash indicates a slight elevation above background but within expected range for fly ash and not above EPA action level of background + 5 pCi/g.

Environmental Media Monitoring

❖ Drinking Water

- Public water supplies
 - 3 drinking water treatment plants (Kingston, Rockwood & Cumberland) were sampled immediately after event - none of the results exceeded any MCLs.
 - Currently plant personnel collect daily samples of untreated and treated water at Kingston WTP. TDEC collects samples twice weekly.
 - Samples analyzed for metals – no exceedances of State or Federal standards.
- Private water supplies
 - Approximately 100 residential wells located within 4 miles of the site were sampled and none of the results exceeded any drinking water MCLs (used as the benchmark for safe water)

❖ Surface Water

- TDEC began bi-weekly sampling on January 2, 2009.
 - Certain metals including thallium, arsenic, and lead have exceeded TN water quality criteria (majority of violations in Emory near spill site and were highest immediately after the spill).

Environmental Media Monitoring

❖ Air Quality

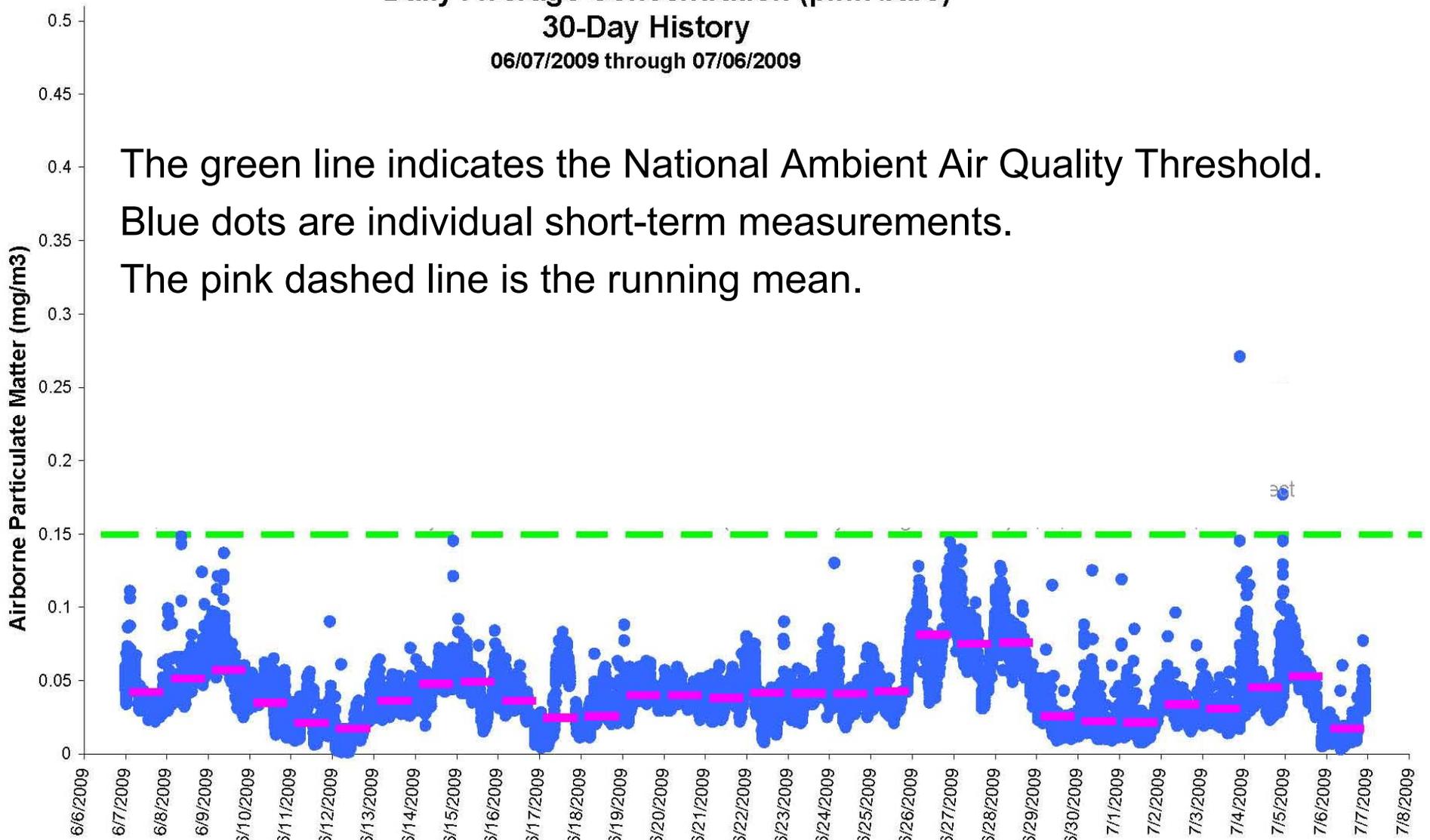
- Worker Protection
 - More than 3,000 integrated air samples have been collected for total dust, respirable dust, crystalline silica, and metals.
 - None exceeded currently established limits for occupation exposure.
 - Samples collected to represent exposure in activities including: heavy equipment, truck drivers, laborers, and flaggers.
 - If an action level is met:
 - Engineering controls (Action Level 25 ug/m³ silica)
 - Personal protective equipment upgrades (Action Level 50 ug/m³ silica)
- Off-site
 - Approximately 60,000 real-time PM₁₀ samples taken throughout community. and compared to NAAQS of Approximately 150 ug/m³. Results demonstrate that site controls are effective.

TVA Kingston Air Sampling Results (blue dots)

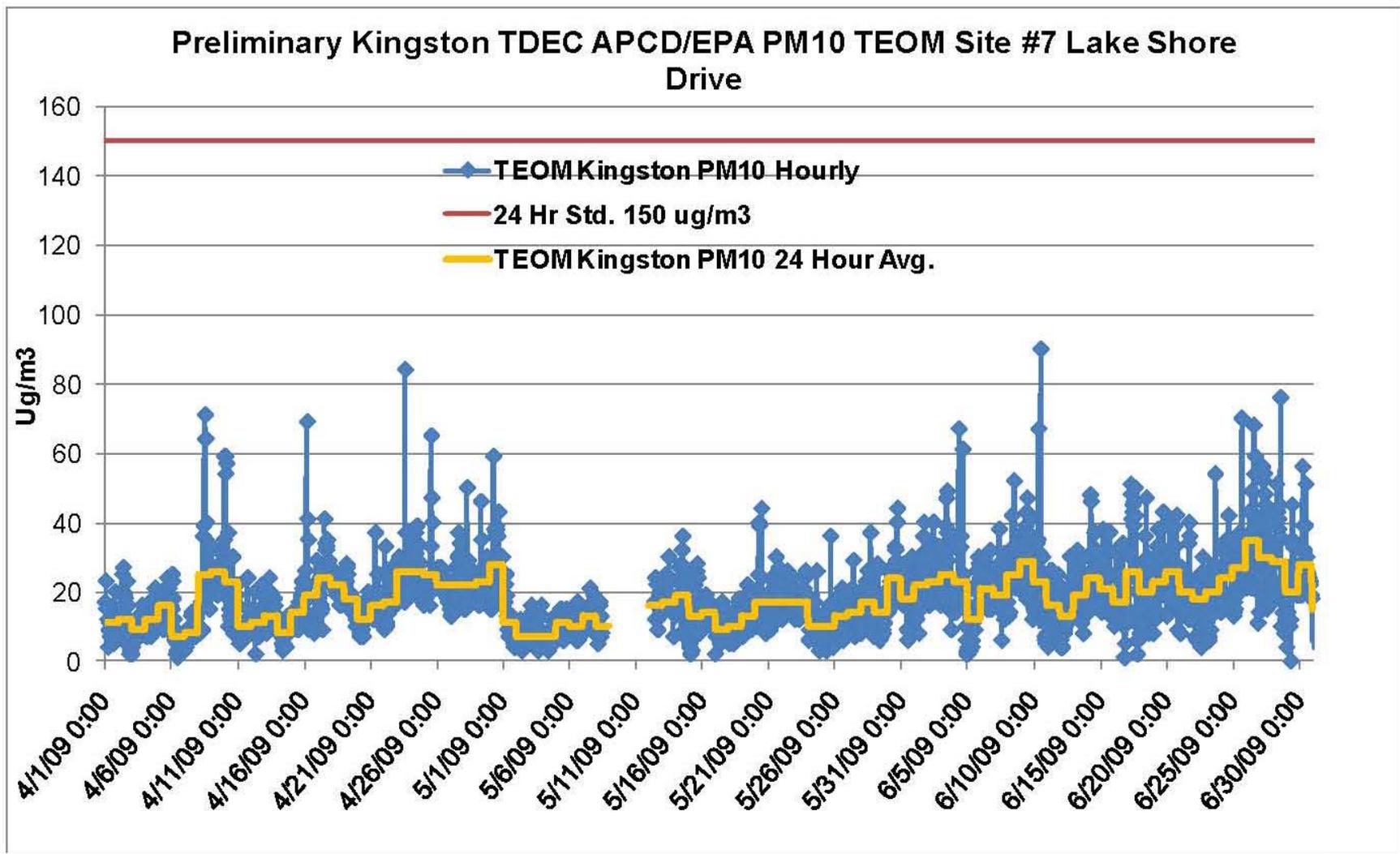
Daily Average Concentration (pink bars)

30-Day History

06/07/2009 through 07/06/2009



The green line indicates the National Ambient Air Quality Threshold.
Blue dots are individual short-term measurements.
The pink dashed line is the running mean.



The red line indicates the National Ambient Air Quality Threshold of 150 ug/m3.

Blue line/dots are individual short-term measurements (hourly).

The yellow line is the running mean 24-hour average concentration

Direct Contact Issues

❖ On-Site

- Workers receive HAZWOPER training. Level D protection employed for site activities (with air monitoring).
- Task specific upgrades determination for Tyvek (eg. workers at truck wash stations required to wear Tyvek as over-garment to protect against splash).
- Decon includes inside and outside of vehicle entering site.
- Coast Guard Gulf Strike Team on-site for daily Health and Safety oversight.
- HASP went through extensive ERT review prior to full implementation.

❖ Off-Site

- Areas where fly ash deposited on ground have restricted access.
- Homes and property directly impacted have been purchased by TVA.
- Multiagency swimming advisory set for portion of Emory River where dredging operations likely to produce suspended sediment containing ash.
- Multiagency outreach to educate public to identify ash in water. Advised to use normal soap and water should suspected contact occur.

Worker Health and Safety

❖ HAZWOPER TRAINING

- Workers receive HAZWOPER training. Level D protection employed for site activities (with air monitoring).
- Coast Guard Gulf Strike Team on-site for daily Health and Safety oversight.
- HASP went through extensive ERT review prior to full implementation.

❖ July 20, 2009 Fatality

- 55-year old Truck Driver working for W.W. Transport, Inc., Burlington IA
- Delivering dredge pipe to Site was injured on-site and died of injuries at University of Tennessee Medical Center
- Reportedly dredge pipe rolled off the truck while driver was unfastening tie straps.
- TVA is investigating incident and will take whatever measures necessary to prevent such an event for occurring again.

Enforcement Actions

- ❖ Tennessee Department of Environment and Conservation issues Commissioner's Order on January 12, 2009:
 - Contain release and minimize downstream migration
 - Assist TDEC in determining the cause of dike failure
 - Support TDEC assessment of current and future impacts of release
 - Develop and implement Corrective Action Plan (CAP)
 - Restore natural resources damaged by the release
 - Assume financial responsibility for TDEC expenses
 - Review all TVA coal ash impoundments in TN

Enforcement Actions

- ❖ EPA and TVA enter into an Administrative Order on Consent (AOC) on May 11, 2009
 - Time-Critical Removal Action
 - Removal of major portion of ash from Emory River east of Dike 2
 - Non Time-Critical Removal Action
 - Address remaining ash in Emory, embayments, and other impacted areas
 - CERCLA remedial evaluation process to follow

Time-Critical Removal

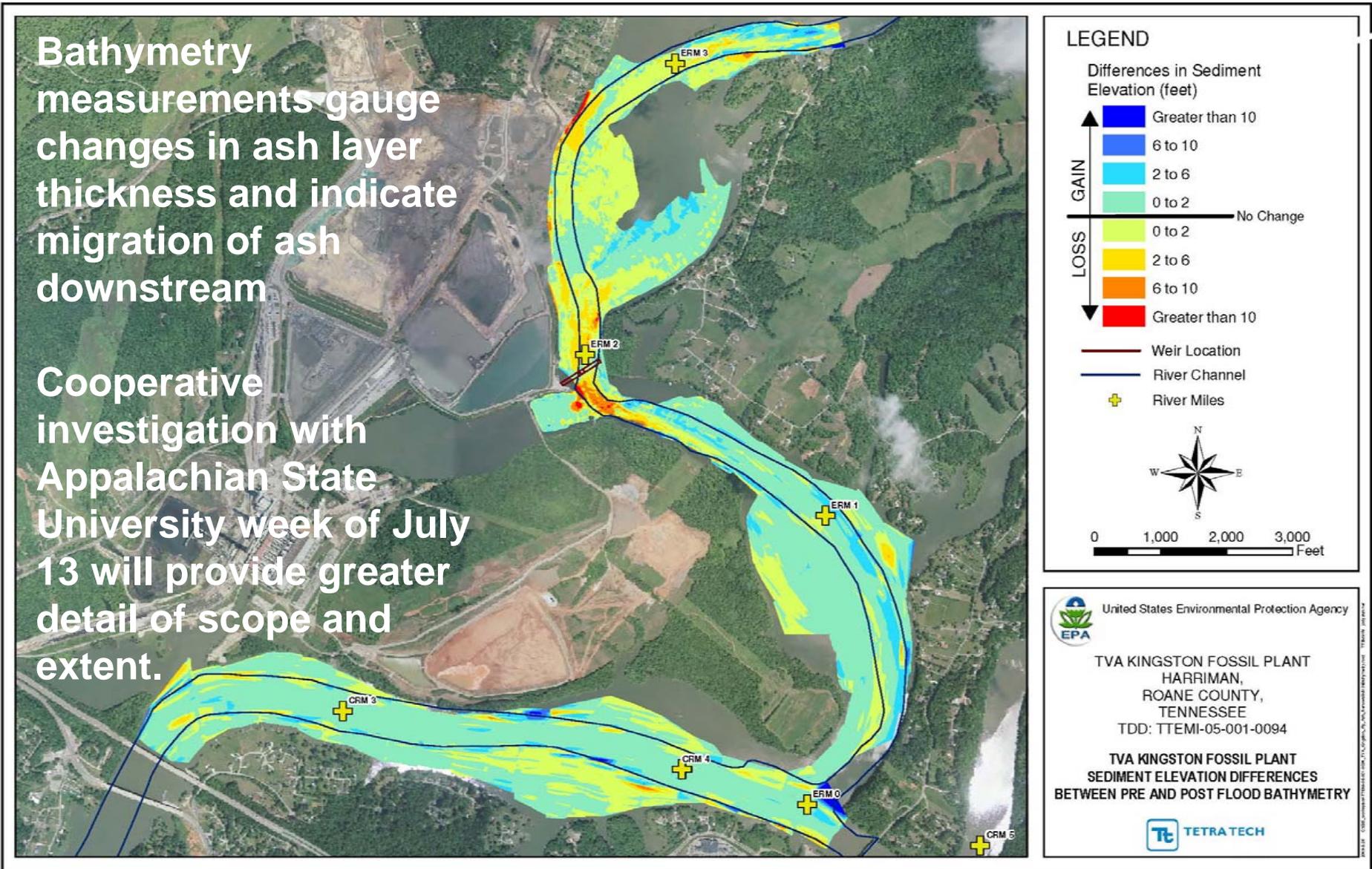
❖ Objectives and Operations

- Excavation and dredging to native sediment of ash from Emory River.
- Dewatering and temporary stockpile of ash.
- Off-site disposal.
- Oversight and monitoring.
 - Full time oversight of TVA operations by EPA OSC.
 - Air monitoring (through R4 and SESD).
 - Water quality monitoring (through TDEC oversight).
 - CG GST Health and Safety oversight.
- Community outreach.
 - Assignment of Community Involvement Coordinator.
 - Establish Community Outreach Center.
 - Multiple fact sheets, press releases, and public meetings.
- Coordination and outreach with Local, State, Federal officials.
 - Numerous workplan approvals coordination through TDEC
 - Nature and extent required evaluation.

Bathymetry Changes: Pre and Post Flood Event

Bathymetry measurements gauge changes in ash layer thickness and indicate migration of ash downstream

Cooperative investigation with Appalachian State University week of July 13 will provide greater detail of scope and extent.



Dredging Operations



Looking southwest across Emory River across portion of Site. Dredge operating in foreground. Middle ground, left are two debris barges. Background, center, fly ash choking tributary is being pushed into temporary stockpile for movement to larger stockpile cell. Portion of Dike 2 visible between stockpile and debris barges.



Ash recovery and Dewatering



Ash recovery and Dewatering

Looking west across southern portion of temporary staging area for dewatered fly ash. Foreground is Sluice Trench which channels TVA process water. Just west (above) is a portion of Rim Ditch where dredged ash is being dewatered. Excavators are windrowing ash for drying. Trucks in background are shuttling ash to stockpile.



Temporary Storage of Ash

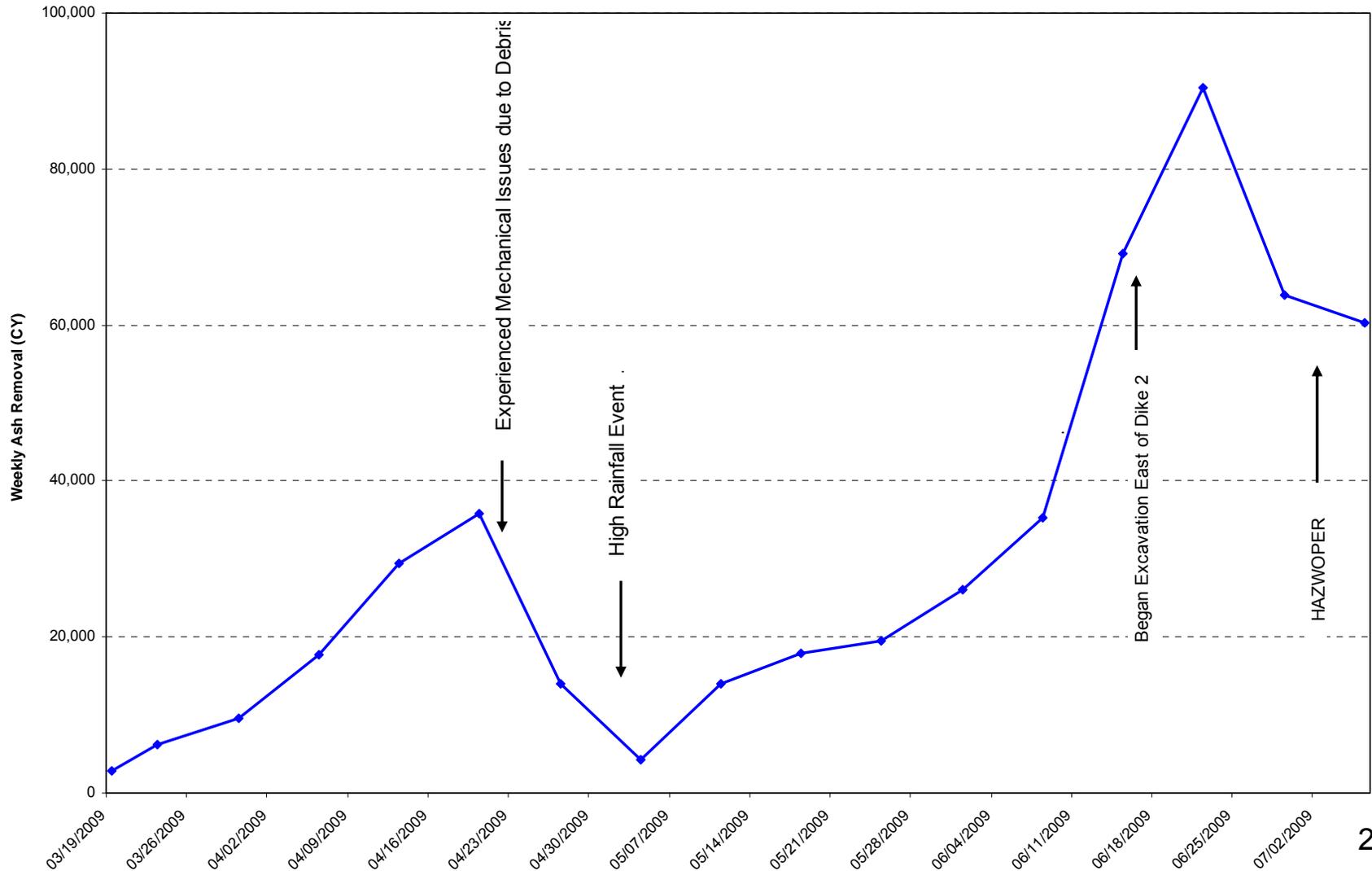
Loading Railcars for Transport to Arrowhead Landfill



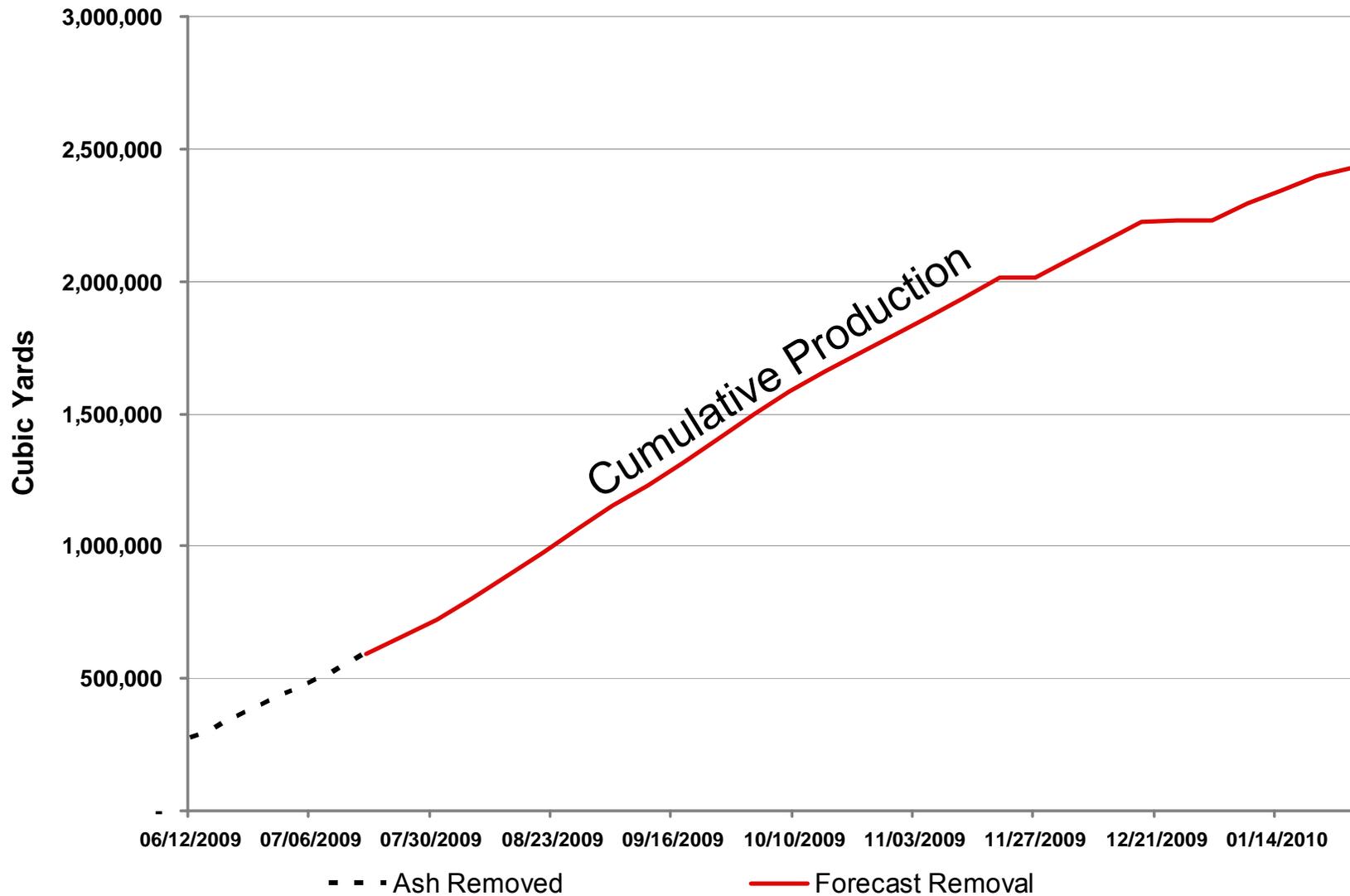
07/06/2009

Weekly Production Rate

Weekly Time Critical Ash Removal

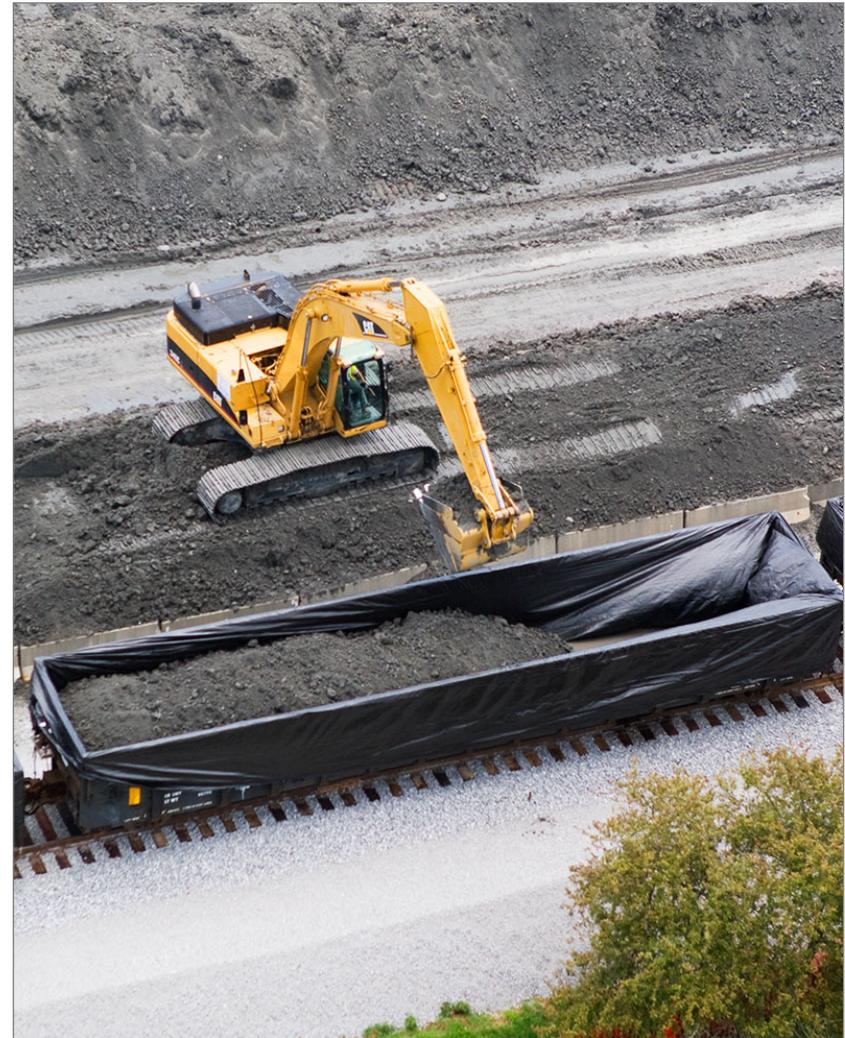


Forecasted Ash Recovery



Transportation and Disposal Stats

- Shipped ~ 82,000 tons in 10 trains to approved landfill in Uniontown, Perry County, Alabama
- Contract with Phillips and Jordan for 3 million cubic yards
- Transportation, Disposal, and Tipping Fees
 - Loading (Mactec) - \$3-\$5/ton
 - Transportation (Norfolk Southern) - \$16-\$19/ton
 - Disposal (Arrowhead Landfill) - \$14-\$16/ton
 - Total - \$33-\$40/ton



Environmental Monitoring

•Water

- Over 2,000 tests by TVA, TDEC and EPA confirm that water continues to meet drinking water standards

•Ash

- Required to characterize all ash transported offsite
- Concentrations below EPA Region 4 Removal Action Levels, except for arsenic
- Kingston ash less radioactive than table salt

•Air

- More than 64,000 air sampling and monitoring results

•Biota

- Fish (whole body and tissue)
- Benthic invertebrates (bottom of food chain)
- Birds and eggs (food chain effects)
- Insects (food source)
- Aquatic Life Toxicity



Before...

- Failed Cell and Former Dike Area



Progress

- Embayment and Dredge Cell



30

30

Before...

- Emory River



Progress

- Emory River



Before...

- Emory River



Progress

- Emory River



Before...

- Tracks and Swan Pond Road



Progress

- Failed Dredge Cell from Swan Pond Road



Before...

- Connector Swan Pond Road and Circle



Progress

- Connector Swan Pond Road and Circle



Before...

- Church Slough



Progress

- Church Slough



Time-Critical Removal: Current Status

- ❖ Dredging and excavation
 - Current dredge production is approx. 8,000 CY/day.
 - Target dredge production is 15,000 CY/day.
 - Excavation being employed in areas where ash accessible.
- ❖ Dredge material being stored in 33-acre, 10-acre temporary storage cells, dredge cell test area, and peninsula borrow area.
- ❖ Disposal
 - Each shipment consists of 85 railcars (~100 ton capacity per car).
 - Six shipments to Perry County Arrowhead Landfill to date.

| Activity | Total to Date (7/23/09) |
|------------------------|------------------------------------|
| Dredging est. | 475,000 (CY) |
| Excavation est. | 216,000 (CY) |
| Disposal | 116,000 tons |

Time-Critical Removal: Current Status

- ❖ Over six million gallons of cenosphere slurry collected.
- ❖ Almost 70,000 bags of shoreline debris collected.
- ❖ Over 64,000 air samples collected.
- ❖ Over 2,000 water samples collected.
- ❖ Over 350 acres of Flexterra applied for dust control.
- ❖ Approximately eight miles of road rebuilt or repaved.
- ❖ Clean water ditch from west embayment opened.

Time-Critical Removal: Current Status

❖ Flood Control and Stormwater Management

- Drainage and water diversion channels to prevent upland flooding and separate dirty water (water that flows across site) from clean water (water coming from further up watershed, 3,000 acres).
 - Clean water ditch completed in early July. TSS reduced from 10,000 ppm to 10 ppm.
- Air Emissions Management
 - Air monitoring stations installed to measure PM
 - Mitigation Plan

Communication and Outreach

- ❖ Overall goal to ensure that all Stakeholders are well informed and fully aware of and engaged in all activities related to the clean-up of the site
 - EPA R4 CIC working with local community groups
 - CERCLA awareness orientation and joint public meetings with TVA and TDEC.
 - TVA/EPA Communication Strategy
 - OSC instituted Saturday morning “open-door” for community member issues and updates
 - OSC participates in bimonthly county commissioner public meeting.
 - Outreach to community leaders.
 - OSC outreach to Kingston area and Perry County
 - R4 Superfund management outreach to Perry County area community leaders (including holding public meeting).
 - TVA improving outreach through co-participation in CERCLA training and improvements in information dissemination
 - OSC maintains a dedicated public site www.epakingstontva.com

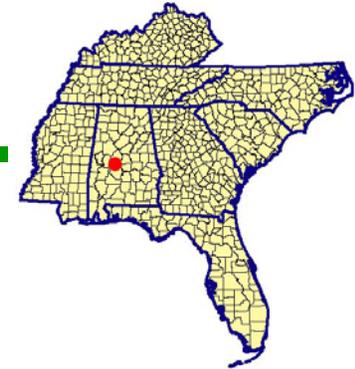
Off-Site Disposal

- ❖ AOC requires that TVA submit a detailed analysis of off-site disposal options to be reviewed by EPA.
 - Expedited removal of ash from river necessary
 - Minimize downstream migration of ash.
 - Mitigate flood hazard due to ash-choked river and tributaries.
 - Dredging of 15,000 CY/day of ash established as target to complete time-critical phase of removal by Spring 2010.
 - Off-site disposal necessary to maintain pace of cleanup.
 - On-site temporary storage capacity limited to 1.5 million CY
 - Order requires Subtitle D facility at minimum
 - No such facility available on-site.
 - 25 companies responded to request for proposals for disposal
 - Analysis and review included: waste handling methods, containment processes, volume that could be handled, transportation service to facility, surface water and groundwater issues, Environmental Justice, and cost.
 - **TVA selected Perry County, Alabama facility pending EPA approval**

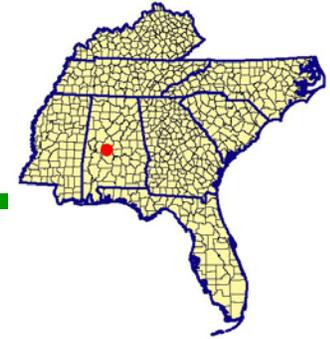
Off-Site Disposal

❖ Perry County Arrowhead Landfill

- Located near Uniontown, Alabama.
- New facility. Began accepting waste in 2007.
- Capacity 7,500 tons/day with modification pending for 15,000 tons/day (3rd week of July).
- In compliance with CERCLA Off-Site Rule.
- Meets requirements of AOC.



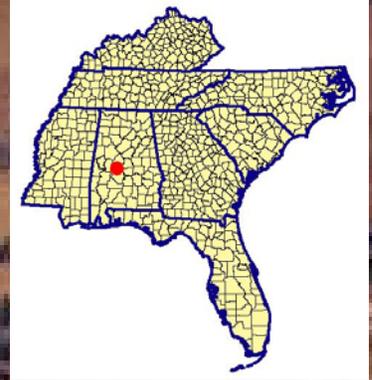
Off-Site Disposal



❖ Perry County Arrowhead Landfill

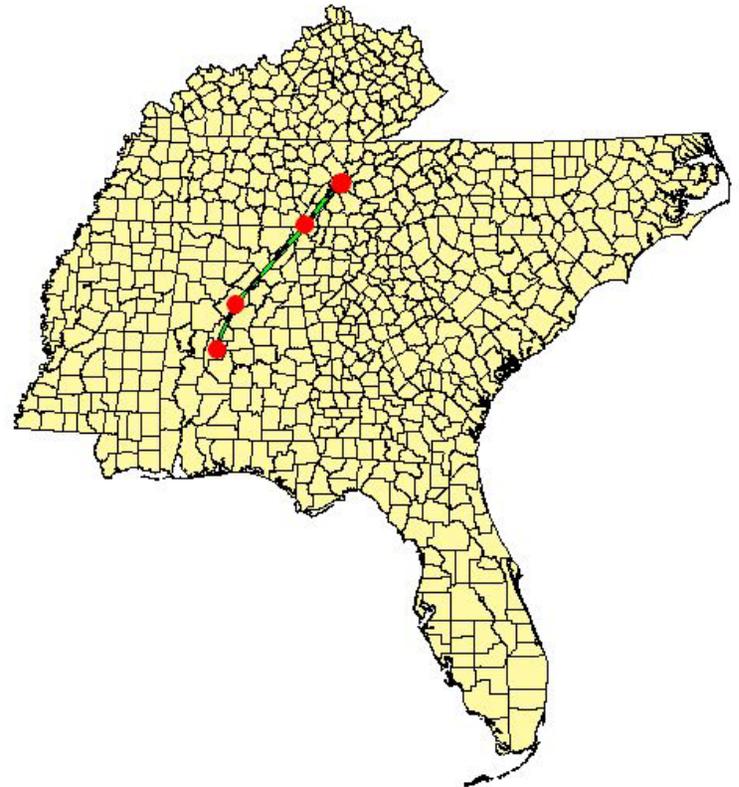
- R4 RCRA personnel visited facility on 06/10/09.
 - 977 acre facility with 256 acres permitted for disposal
 - Has 8000 ft. rail spur off main line on facility grounds.
 - Fully lined, leachate collection, groundwater monitoring.
 - Underlain by Selma Chalk Group. Depth to uppermost aquifer averages 600 ft.
- County and State receive \$1.05 and \$1.00 per ton, respectively
- County estimates that ~50 jobs will be created due to disposal of fly ash at Arrowhead.

Perry County Arrowhead Landfill



Off-Site Transportation

- ❖ Norfolk Southern Railroad
 - Direct line from TVA to Perry County. No transfer of cars during trip.
 - Fly ash shipped moist and fully wrapped to prevent air emissions.
 - Route from Kingston, through Chattanooga and Birmingham, to Uniontown, Alabama.
 - Total distance about 325 miles.



EE/CA & Non Time-Critical Removal

- ❖ AOC Requires Submittal of EE/CA Work Plan 90 days from effective date (due 8/10/09).
- ❖ EE/CA Technical Work Group has formed. Built upon Interagency Review Team.
- ❖ Initial EE/CA Technical Work Group meetings held at the site on 6/22 and 6/23/09.
- ❖ ≈ 40 participants from TVA, TDEC (Water/Solid Waste), TWRA, USFWS/DOI, TN DOH, and support contractors.
- ❖ Stressed need to form a separate Natural Resource Trustee Council.

EE/CA & Non Time-Critical Removal

- ❖ EE/CA Work Plan will layout Data Quality Objectives and process for comprehensive/quantitative human health and ecological risk assessment.
 - Conceptual Site Exposure Models (Terrestrial and Aquatic Systems)
 - Development of COCs
 - Algorithms for HH exposure assessment
 - Potential measurement endpoints for ecological receptors (survival, growth, reproduction)
 - Proposed multi media sampling design

- ❖ Sediment (Fly Ash) Fate and Transport Modeling Team is working concurrently with EE/CA TWG. Meetings scheduled at site on Thursday, 7/15/09.

EE/CA – NonTime Critical Removal

- ❖ Need to have EE/CA ready for implementation when Time Critical Actions are nearing completion. Therefore, EE/CA will be split into two components: 1) Embayments west of Dike 2; and 2) Emory River (aquatic systems that need more data).

- ❖ Preliminary Alternatives Retained for Embayments West of Dike 2:
 - Alternative 1: Grade dredge cell and embayments to elevation 780' (not compliant with TDEC Commissioners Order)
 - Alternative 2: Grade dredge cell, reconstruct dike, and remove ash from embayments. 2 Million CY disposed off-site.
 - Alternative 3: Grade dredge cell and remove ash from embayments (no reconstructed dikes). 6 Million CY disposed off-site.
 - Alternative 4: Stack dredge cell (with reconstructed dikes) and remove ash from embayments. No off-site disposal. Final elevation \approx 800' (20' lower than height that failed).

Other Issues

Selenium

Selenium Issue

- ❖ Concerns have been raised related to potential selenium (Se) contamination that could be released into the environment as a result of the coal ash spill and subsequent dredging.
- ❖ Some have suggested that fish in the Kingston area had selenium concentrations near toxic levels before the spill.
- ❖ They have expressed concern that any additional selenium release to river may cause loss of fishery.

Selenium Monitoring at Kingston

- ❖ Surface water monitoring for Se and other metals has been conducted on a routine basis by TVA and TDEC (results posted on the TVA and TDEC websites).
- ❖ Surface water monitoring for Se has also been conducted by several independent researchers (Appalachian State University and Duke University).
- ❖ Tennessee Wildlife Resources Agency (TWRA), TDEC, and TVA have conducted tissue sampling from fish collected in the Emory and Clinch Rivers as well as the Coal Ash Stilling Pond (results posted on the TVA and TDEC websites).

Selenium Workgroup

- ❖ May 22, 2009 charge memo from Stan Meiburg & Barry Breen directing an internal EPA Science Panel to *“ensure that any selenium contamination that could be released into the environment is thoroughly investigated and assessed for its impacts to human health, wildlife and the ecosystem”*.
- ❖ The Panel is working to produce a final report by July 31, 2009.

Selenium Results

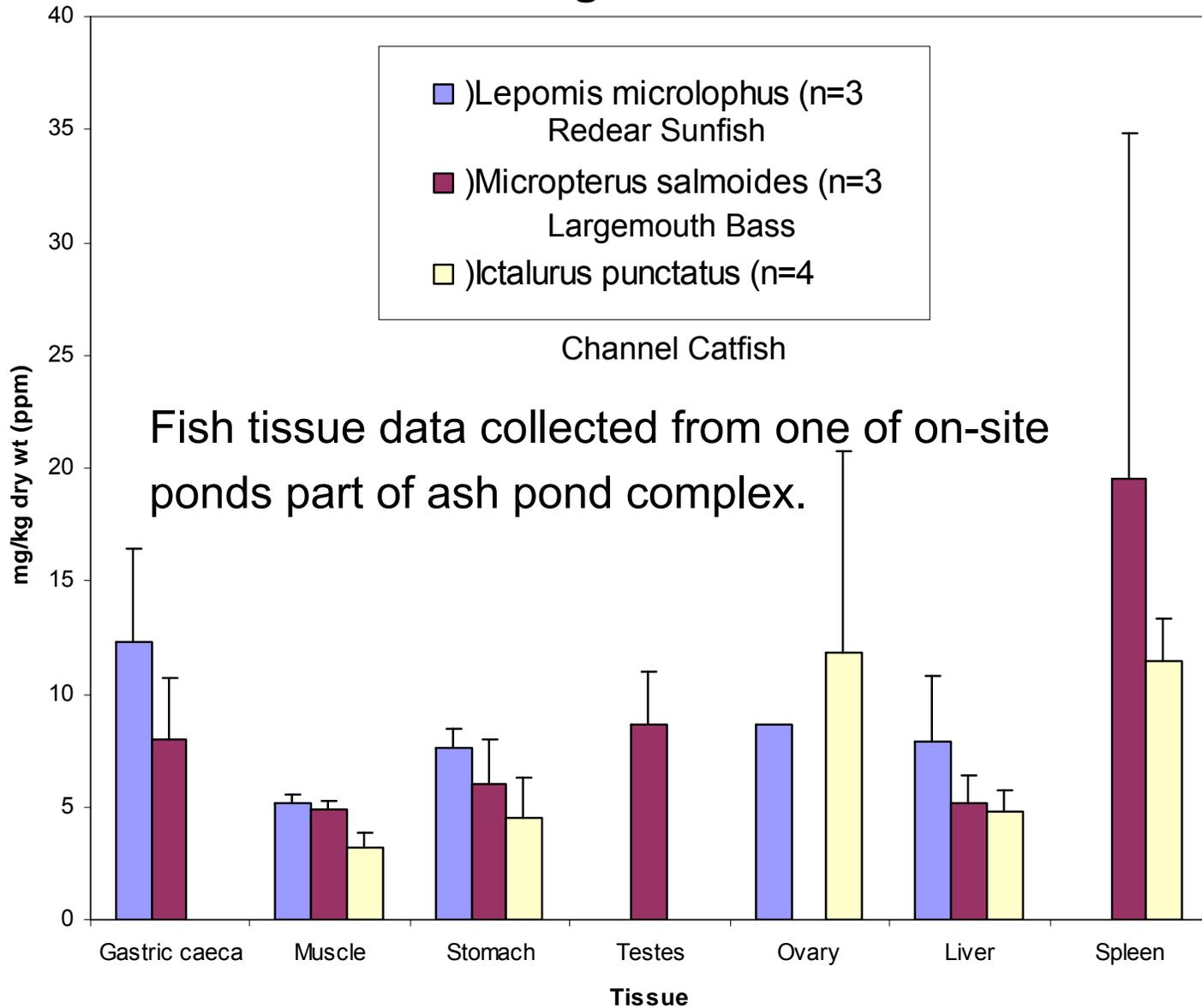
Comparison Criteria

- ❖ Proposed EPA and TN criterion:
 - 7.9 mg/kg dry weight, whole fish
- ❖ Fish Consumption Screening Conc.
 - 6.76 mg/kg dry weight, whole fish
- ❖ TN Fish and Aquatic Life Criterion
 - 5 ug/l (water)
- ❖ MCL (drinking water)
 - 50 ug/l

Analytical Data

- ❖ Stilling Pond Data (on-site ash pond)
 - Blue Gill Fillets: 12 - 37 mg/kg dry weight
 - Carp Fillets: 19 – 34 mg/kg dry weight
- ❖ Appalachian State Data (see graph next slide)
- ❖ Emory River. Per TDEC, existing data do not appear to indicate a preexisting or current selenium toxicity problem in the Emory River.

Mean Selenium - January 8&9, 2009 Stilling Pond Data

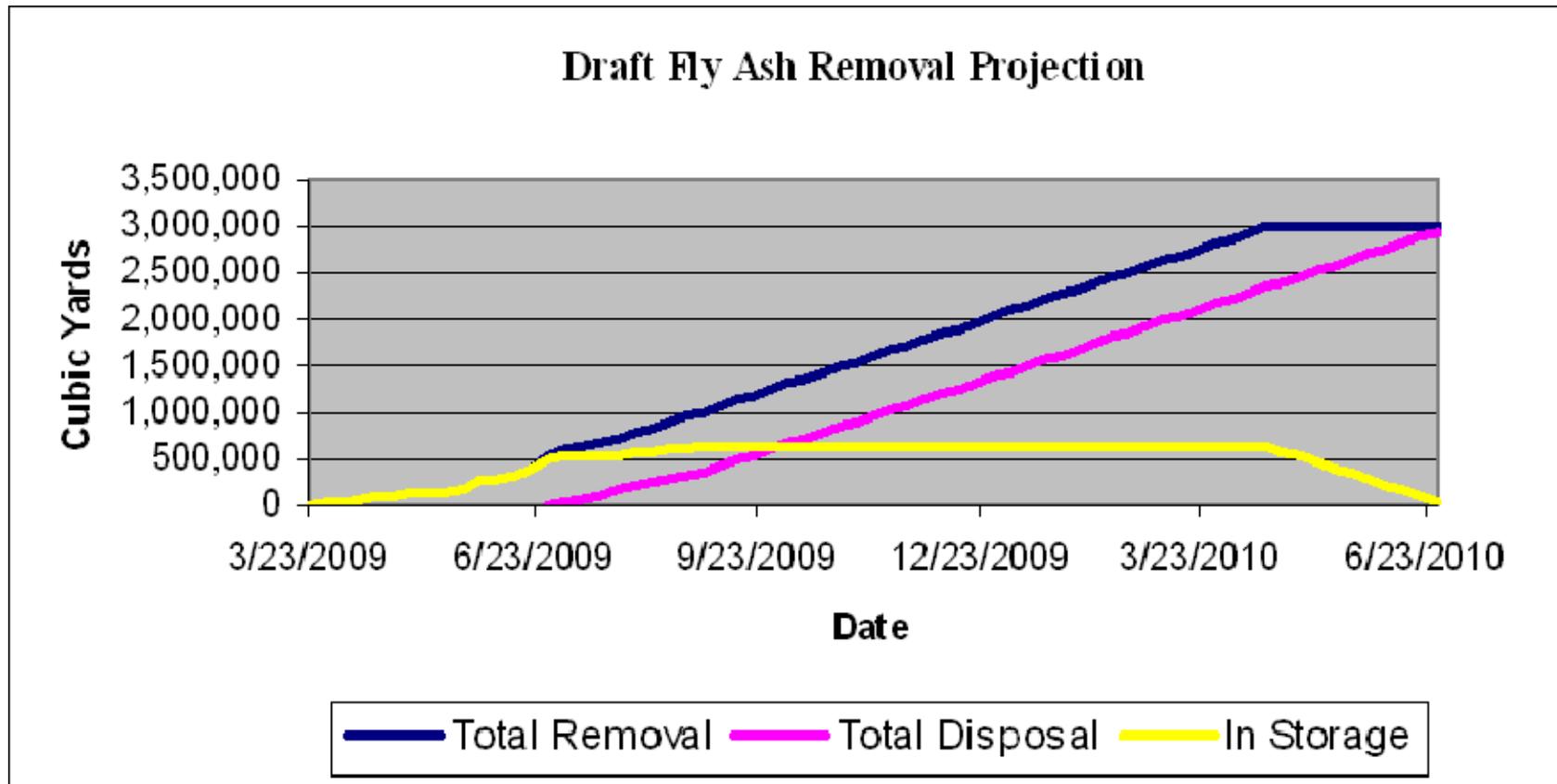


Additional Research

- ❖ USACE Engineer Research and Development Center (ERDC) is conducting studies in conjunction with USGS/Columbia Environmental Research Center (CERC) to evaluate the short- and long-term impacts of fly ash on the geochemistry, water quality, and aquatic biota of the Emory River.

- ❖ Anticipated Results
 - Concentration and species of metals released during the suspension and oxidation of fly ash
 - Biological responses for evaluating effects of potential toxic contaminants
 - Time-dependent release of metals to predict the potential for metals release from fly ash particles
 - Physical and chemical parameters to estimate releases to the Emory River

Projected Path Forward: Time-Critical Removal Action



Projection based on constant removal and disposal rate of 10 to 15 K cubic yards per day. Estimate subject to change based on conditions

Projected Path Forward: Time-Critical Removal Action

❖ Other On-going EPA Activities

- Maintain continuous oversight of TVA cleanup efforts.
- Continue environmental monitoring oversight and independent monitoring to insure protection of public health and the environment.
- Maintain community outreach and education efforts in Kingston and Perry County Areas.
- Continue coordination and partnership with other federal, state, and local agencies and elected officials and community leaders.
- Maintain up-to-date website as primary transparent means of information and data dissemination.

QUESTIONS

TVA KINGSTON FOSSIL PLANT COAL ASH SPILL



EPA Region 4 Divisions and Offices

US EPA, Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303
404-562-9900
1-800-241-1754

Regional Administrator: A. Stanley Meiburg, Acting
Deputy Regional Administrator: Beverly Banister, Acting
Chief of Staff: Scott Gordon, Acting

The diagram below illustrates the offices and divisions of EPA Region 4.

