**U.S. Environmental Protection Agency**
**Non-Time-Critical Removal Action Scope**
**Engineering Evaluation/Cost Analysis Fact Sheet**
**Kingston Ash Recovery Project**
**Harriman, Roane County, Tennessee**

January 2010

## INTRODUCTION

The **U.S. Environmental Protection Agency (EPA)** is issuing this fact sheet about the **non-time-critical removal action** activities at the Swan Pond Embayment and Dredge Cell areas (also known as the area west of Dike #2) at the Kingston Ash Recovery Project Site. This fact sheet presents the alternatives considered in the **Engineering Evaluation/Cost Analysis (EE/CA)** Report for restoring the Swan Pond Embayment Area impacted by the spilled **fly ash** and also addresses stabilization and closure of the former Dredge Cell. The EE/CA Report is available for review and the public is invited to comment on the EE/CA during the public comment period (see the box above on how to submit comments). Terms in **bold** print in the text are defined in the glossary on page 7.

**EE/CA Public Comment Period**
***January 19, 2010 through April 5, 2010***

Submit comments by e-mail:
kingstoncomm@tva.gov
OR mail: TVA P.O Box 40,
Kingston, TN 37763-0400

## SITE BACKGROUND

On December 22, 2008, at approximately 1:00 a.m., a failure of the northwest side of a dike used to contain fly ash occurred at the Tennessee Valley Authority (TVA) Kingston Fossil Plant, located at 714 Swan Pond Road in Harriman, Roane County, Tennessee. Subsequent to the dike failure, approximately 5.4 million cubic yards of fly ash was released into Swan Pond Embayment and three adjacent sloughs, eventually spilling into the main Emory River channel. The release extended approximately 300 acres outside of the fly ash and storage areas of the plant. Local emergency officials first responded to the scene, and then shortly thereafter, began to assist residents affected by the flows of fly ash. EPA responded to the scene on December 22, 2008 at the request of local and state emergency management agencies to monitor the clean up, provide water quality sampling, and help establish a unified command system. EPA remobilized to the site to begin work under the EPA/TVA Administrative Order and Agreement on Consent (AOC) after it was signed, on May 11, 2009.

**Find the complete EE/CA Report at:**
**www.epakingstontva.com**
**www.tva.gov/kingston**

## KINGSTON ASH RECOVERY PROJECT SITE EE/CA

The EE/CA Report was prepared to address the unacceptable risks posed by the fly ash release. It addresses the non-time-critical removal action in the embayment and Dredge Cell areas, describes and evaluates available alternatives for restoring the environment impacted by the spilled fly ash and identifies cleanup alternatives. The EE/CA Report for the Kingston Ash Recovery Project Site has been prepared in accordance with EPA's *Guidance on Conduction Non-Time-Critical removal Actions under the* ***Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)***. Once the EE/CA Report is approved by the regulatory agencies and finalized, TVA will implement the selected removal actions for the embayment and Dredge Cell areas.

The alternatives proposed in the EE/CA Report were developed to comply with the §404 (b) Clean Water Act (paragraph 34b of the Administrative Order and Agreement on Consent [AOC]) to restore the area west of Dike #2 to an aquatic environment. The EE/CA Report outlines how TVA will get the area west of Dike #2 back to pre-spill conditions, and mitigate any short and long term loss of natural resources due to the fly ash release.

## IMPLEMENTATION OF NON-TIME-CRITICAL REMOVAL ACTION

Currently the **time-critical removal action** activities are underway and anticipated to be completed in the Spring of 2010. Implementing the non-time-critical removal action now means there will be no delay in cleanup activities – this non-time-critical removal action will be "shovel ready" when the **time-critical removal action** activities are completed. The non-time-critical removal action is going to be split into two removal actions, one for the area west of Dike #2, which is addressed in the EE/CA Report discussed in this fact sheet. The non-time-critical removal action for the Emory, Clinch and Tennessee River system will be addressed separately. Another EE/CA Report will be prepared to address residual ash in the Emory, Clinch and Tennessee River systems that maybe left over from the time-critical dredging work.

## REMOVAL ACTION OBJECTIVES

**Removal action objectives (RAOs)** were established after the results of human health risk assessment show there is a potential risk to people and the environment due to exposure to naturally occurring metals and **radionuclides** in the ash. A removal action is needed to lessen the threat to the public and environment. The following RAOs have been established for this site:

- Minimize direct contact between ash material in the embayment and water flowing through the embayment area into Watts Bar Reservoir;
- Minimize migration of ash and its constituents from the embayment or Dredge Cell into affected waters due to erosion;
- Minimize direct contact exposure by human or ecological receptors to ash on the ground;
- Restore the embayment to pre-spill conditions;
- Close the former Dredge Cell in accordance with Tennessee Solid Waste Rule 1200-1-7; and
- Dispose of waste streams from the removal action.

## SUMMARY OF REMOVAL ACTION ALTERNATIVES

Three alternatives were developed for this non-time-critical removal action. These alternatives are intended to represent a range of possibilities for restoration of the embayment and Dredge Cells areas. Each alternative has distinctive advantages and disadvantages so that tradeoffs between them are clearly defined and evaluated. The alternatives have been evaluated against criteria, as required by CERCLA (see box on page 5 for an explanation of the criteria). Alternatives have not yet been evaluated for state and community acceptance because these criteria are typically judged after a plan is proposed and comments are received from the public. The options presented here provide the best balance of the criteria and meet the requirements of CERCLA. They protect public health and the environment over the long term, comply with state and local regulations and are cost-effective. The three alternatives are described below. Please note that the Swan Pond Road elevation is approximately 765 feet above mean sea level (msl) and the height of the Dredge Cell before failure was approximately 820 feet msl.

**Alternative 1: Excavate Embayment and Dispose Offsite (2.8 million cubic yards [cy]); Grade and Close Dredge Cell**

The actions under Alternative 1 are designed to avoid returning any spilled ash back into the Dredge Cell and to close the remainder of the Dredge Cell in place. Alternative 1 includes removal of approximately 2.8 million cubic yards of ash and other materials in the embayment and dispose of it offsite. A dike would be installed to keep the ash in the cell from entering the embayment in the future and the Dredge Cell would be graded for drainage. The height of the closed cell would be approximately 790 feet msl. The embayment would be restored to its pre-spill condition. This alternative would take about 2.8 years to complete. **Cost: $439.6 to $455.3 Million**

**Alternative 2: Excavate Embayment and Portions of Dredge Cell and Dispose Offsite (6.8 million cy); Grade and Close Remainder of Dredge Cell**

The actions under Alternative 2 are designed to minimize long-term reliance on a dike containment system by removing much of the ash from the Dredge Cell above the surrounding ground level. Alternative 2 would remove approximately 6.8 million cy of ash and other materials in the embayment, plus enough ash from the Dredge Cell to limit long-term reliance on a dike between the cell and the embayment, yet would leave enough ash to provide reinforcement for the remaining dikes. The removed material would be disposed of offsite. The Dredge Cell would be graded to gradual slope, with a maximum height of the closed cell of approximately 780 ft msl at its highest point, although most of the Dredge Cell would be around 765 ft msl. The embayment would be restored to its pre-spill condition. This alternative would take about 4 years to complete. **Cost: $719.3 to $741.1 Million**

Subalternatives were developed for Alternatives 1 and 2 to compare the costs of transporting approximately 760,000 cy of ash from the north embayment area by truck instead of rail. Although hauling by truck costs less then by rail, the unit costs of disposal in Alabama (transported by rail) can be higher due to less material volume, which offsets some of that savings.

**Alternative 3: Excavate Embayment and Dispose Onsite; Close the Dredge Cell**

The actions under this alternative are designed to minimize any further hauling of ash offsite. Alternative 3 would use the Dredge Cell as a disposal facility for the 2.5 million cy of ash from the embayment. No material would be taken offsite. The ash and other material in the embayment would be removed and placed in compacted lifts in the Dredge Cell. A dike would be installed to keep the ash in the cell from entering the embayment in the future and the Dredge Cell would be graded for drainage. The height of the closed cell would be approximately 805 ft msl. This alternative would take about 3.8 years to complete. **Cost: $268.2 to $315.5 Million**

A subalternative was developed for Alternative 3 that would close the Ash Pond at the same time as the Dredge Cell instead of closing it at a later date. Closing the two areas at the same time would cost less, primarily because of reducing the foundation dike containment, eliminating imported fill material to close the Ash Pond, and schedule efficiencies.

**EE/CA PUBLIC MEETING**

A public meeting was held Tuesday, Jan. 26, 2010 at the Roane County High School (540 West Cumberland Street, Kingston, TN). EPA, TDEC, and TVA personnel were present to make presentations and answer questions.

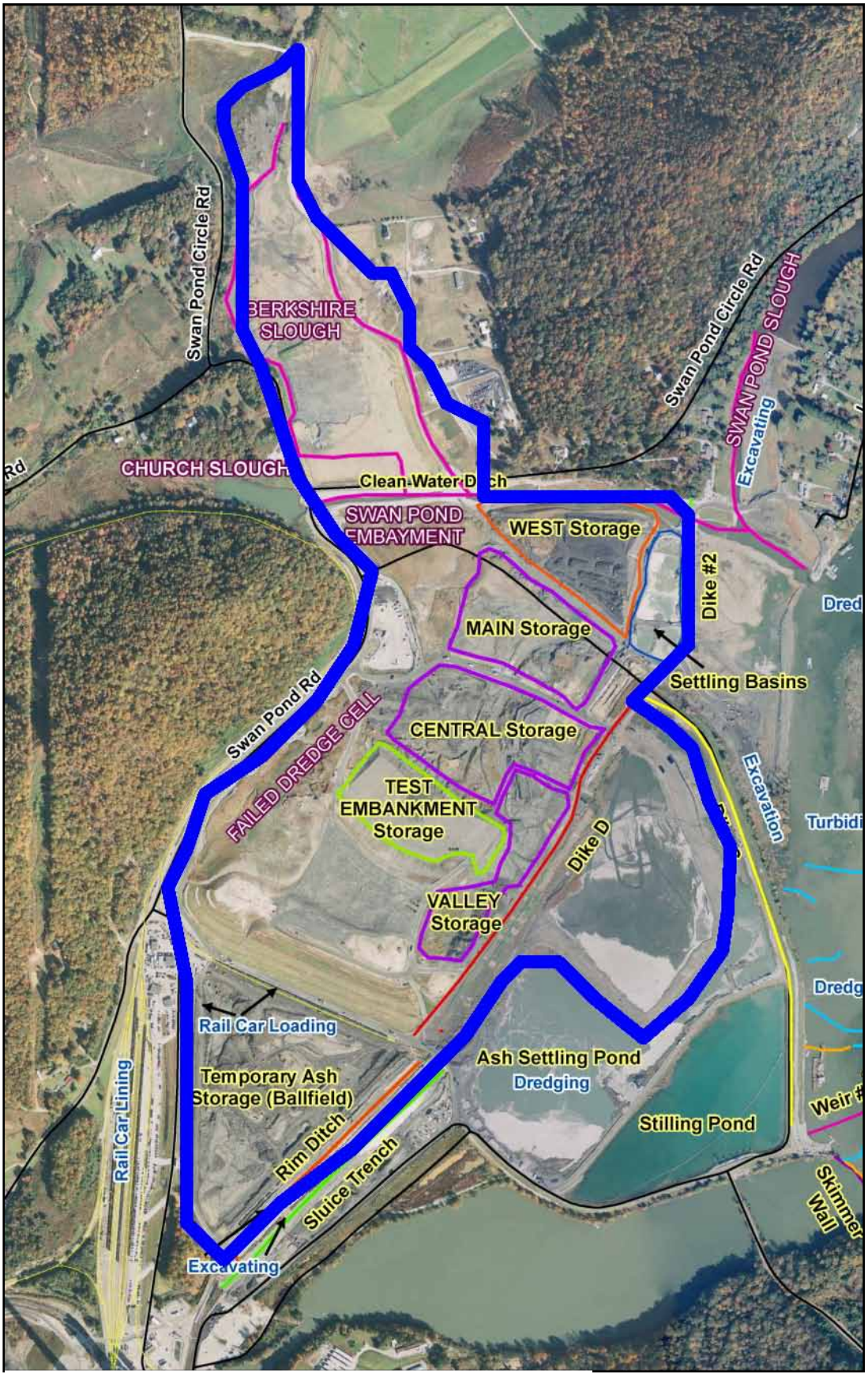


***Figure shows non-time-critical removal area in blue.***


***Photo shows Swan Pond Embayment and failed dredge cell.***

**EVALUATION CRITERIA**

The criteria described below are used to compare alternatives:

1. **Effectiveness** of each technology to meet the RAOs is evaluated in terms of overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements (ARARs), long-term effectiveness and permanence, and short-term effectiveness. Long-term effectiveness considers the magnitude of residual risk, degree of reduction expected in waste toxicity, mobility or volume; the adequacy and reliability of controls; the degree to which treatment is irreversible; and the type and quantity of residuals remaining after treatment. Short-term effectiveness considers protection of workers and the community during the action, environmental impacts, and the time until RAOs are achieved.
2. **Implementability** addresses the technical and administrative feasibility of implementing an alternative and the availability of materials, equipment, or services required during implementation. This criterion considers the ability to construct and operate the technology within the site and time constraints for the non-time-critical removal action, the time to procure and install necessary equipment and specialists, ability to monitor effectiveness, ease of implementing additional technologies (if necessary), and ability to obtain approval from other agencies.
3. **Cost** - the relative cost of each technology is estimated, considering capital cost of material, equipment and installation, as well as the annual operating and maintenance (O&M) costs such as mowing, erosion repair, or dike repair. The capital costs are estimated in 2009 dollars with no adjustment for inflation due to the short time frame associated with the removal action. Costs are considered planning-level estimates within an accuracy of -30 to +50 percent.

## COMMUNITY PARTICIPATION

Information regarding this non-time-critical removal action for cleaning up the fly ash spill at the Kingston Ash Recovery Project Site is available to the public through this fact sheet and at the **information repositories** (listed below). You may also visit the following Web sites to get information on the EE/CA Report and other site documents and activities:

- www.epakingstontva.com
- www.tva.gov/kingston
- www.roanecag.com

EPA encourages the public to provide comments on the EE/CA Report during the thirty-day public comment period, which began January 19 and continues through April 5, 2010.

Comments may be emailed to kingstoncomm@tva.gov or mailed to:

TVA
P.O. Box 40,
Kingston, TN 37763-0400

**Written comments must be postmarked by April 5, 2010.**

## NEXT STEPS

Comments from the public will be reviewed and taken into consideration before a final decision is made on a selected cleanup plan. EPA encourages you to review and comment on the EE/CA Report.

Written responses to comments on the EE/CA Report will be published in a document called a "**responsiveness summary**" and placed into the **Administrative Record.**

## INFORMATION SOURCES

**TVA Kingston Cleanup Website: www.epakingstontva.com**

### EPA Project Team Contacts

| On-Scene Coordinator | Community Involvement Coordinator | Remedial Project Manager |
|---|---|---|
| Leo Francendese<br>865-717-1634<br>Francendese.Leo@epa.gov | Stephanie Y. Brown<br>678-575-8505 or 800-564-7577<br>Brown.StephanieY@.epa.gov | Craig Zeller<br>404-562-8827<br>Zeller.Craig@epa.gov |

### Tennessee Department of Environment and Conservation Contact

Barbara Scott
865-696-9614
Barbara.Scott@tn.gov

### Information Repositories

| TVA Outreach Center | Harriman Public Library | Kingston Public Library | U.S. EPA Region 4 |
|---|---|---|---|
| 509 N. Kentucky St.<br>Kingston, TN 37763<br>865-632-1700 | 601 Walden St.<br>Harriman, TN 37748<br>865-882-3195 | 1004 Bradford Way<br>Kingston, TN 37763<br>865-376-9905 | Sam Nunn Atlanta Federal Center<br>61 Forsyth Street, SW<br>Atlanta, GA 30303 |

## GLOSSARY OF TERMS

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| **Administrative Order and Agreement on Consent (AOC) –** A legal agreement signed by EPA and TVA documenting TVA's agreement to conduct the cleanup with oversight from EPA. |
| **Administrative Record –** A set of documents which form the basis for selection of a response action under Section 113(j) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). |
| **Comprehensive Environmental Response, Compensation, and Liability Act (CERLA)** – A Federal law passed in 1980 and modified in 1986 by the Superfund Amendment and Reauthorization Act (SARA); the act created a trust fund, known as Superfund, to investigate and cleanup abandoned or uncontrolled hazardous waste sites. |
| **Engineering Evaluation/Cost Analysis (EE/CA)** – Study under the non-time-critical removal actions to evaluate various cleanup alternatives for the fly ash in upland areas and surface soils. |
| **Environmental Protection Agency (EPA) –** The United States Environmental Protection Agency, providing regulatory oversight for the project. |
| **Fly ash** – A byproduct of burning finely ground coal to produce electricity. It is a fine, powdery material, composed mostly of silica, with nearly all particles being spherical in shape. |
| **Information Repository** – Location where documents related to the cleanup are stored. Typically in a convenient location for the community. |
| **Non-time-critical removal actions** – A mid-term response requiring action taken to address the release of hazardous substances. Actions may begin later than six months after it is determined that a response is necessary. |
| **Radionuclide –** Radioactive particle, man-made or natural with a distinct atomic weight number; can have a long life as soil or water pollutant. |
| **Remedial Action Objectives (RAOs)** – Specific goals for protecting human health and the environment. |
| **Responsiveness summary –** A summary of oral and/or written public comments received during a comment period and the response to those comments. |
| **Time-critical removal actions** – A short-term response requires immediate action to address threats to human health and the environment due to the release of hazardous substances. Unlike non-time-critical removals, action must be taken within six months of the determination that a response is necessary. |
| **Tennessee Department of Environment and Conservation (TDEC)** – State agency also providing oversight on the project. |

**EE/CA Report Public Comment Period**

***January 19, 2010 through***

***April 5, 2010***

Submit comments by e-mail:
kingstoncomm@tva.gov
OR mail: TVA P.O Box 40,
Kingston, TN 37763-0400

More details inside

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Environmental Protection
Agency

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RETURN ADDRESS REQUESTED

FIRST CLASS

# TVA Kingston Fly Ash Release Site: Engineering Evaluation/Cost Analysis Report Released