EMERGENCY ACTION PLAN AND PROCEDURES

For the:

Ash Pond 1A/1B
VA ID #16703
and
Ash Pond 2
VA ID #16702

Located at:

AEP Clinch River Plant
Carbo, Russell County, Virginia

Owned by:

Appalachian Power Company
American Electric Power

Original Issue Date: October, 2009

Revision Date: April 26, 2021

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PART I - CERTIFICATIONS

This plan was originally prepared by Geo/Environmental Associates, Inc., for American Electric Power Service Corporation (AEPSC). American Electric Power certifies the revisions and updates to this plan.

Name	Title	Date
<Signed Original Signature		
Printed Name		

This plan has been approved by the Clinch River Plant Manager:

<Signed Original Rick Chafin, Plant Manager	Date

Signature and Distribution List

Signature:

The undersigned states he/she will distribute a copy of the Emergency Action Plan to the persons named in the Distribution List below:

Name	Title	Date
<Signed Original Signature		
Printed Name		

Distribution:

The following is a list of the persons and agencies that will receive a copy of this Emergency Action Plan:

UPDATED April 26, 2021

	Name	Address	No. of Copies
1.	Gary F. Zych*	AEP Geotechnical Engineering Section AEPSC	1
2.	Jess Powers, Coordinator	Russell County Office of Emergency Management 94 Russell Street P.O. Box 911 Lebanon, VA 24266	2
3.	Steven Dye	Russell County Sheriff P.O. Box 338 Lebanon, VA 24266	1
4.	Tim Estes	VA Department of Emergency Management Region 4 225 State Street Marion, VA 24354	1
5.	Central Office Staff	Dam Safety Central Office 600 E. Main Street, 24th Floor Richmond, VA 23219	1
6.	Lindsey Forhan*	AEP Environmental Services	1
7.	Justin Jent*	AEP Environmental Services	1
8.	Laura Coleman	AEP Clinch River Plant	1
9.	Karen Gilmer	AEP Clinch River Plant	1
10.	Edwin Shelton	AEP Clinch River Plant	1
11.	Ray Brown	AEP Clinch River Plant	1
12.	Rich Harless	AEP Clinch River Plant	1
13.	Tate Jackson	AEP Clinch River Plant	1
14.	Carmen Ortega*	AEP Internal Audits Department	1
15.	Earl Carter	St. Paul Water Department	1
16.	Maxie Skeen	Cleveland Lifesaving Crew	1
17.	Jennifer Chumbley	Town of Cleveland	1
18.	Mark Kidd	VDEQ – Solid Waste	1
19.	Daniel Glass/ Phyllis Woods	Dante Rescue Squad	1

*electronic distribution of plan

PART II – NOTIFICATION FLOWCHART

The Notification Flowchart is presented on the following page

Observer

Unit 1 Control Room
276-889-7301

Trained Inspector
276-889-7310

AEP On-Site Incident Manager
Name: Ray Brown
Operations Superintendent
Phone: 276-889-7329
Cell: 276-202-0018
Alternate: Tate Jackson Jr., See contact info below

Call 911
Emergency Response

Russell County Sheriff
Work: 276-889-8033
Emergency: 911

Russell County Fire and EMS
911

Cleveland Lifesaving
276-889-2382

Local Ambulance Company
911

Plant Manager
Name: Laura Coleman
Office Phone: 276-889-7352
Cell: 606-424-0910

Energy Production Superintendent
Name: Ed Shelton
Office Phone: 276-889-7323
Cell: 304-305-0758

Maintenance Superintendent
Name: Rich Harless
Office Phone: 276-889-7330
Cell: 276-608-2039

Plant Environmental Coordinator
Name: Karen Gilmer
Phone: 276-889-7314
Cell: 540-492-0199

VA DCR Dam Safety
Office: 540-394-2550
EOC Office: 800-468-8892

Russell County OEM
Coordinator: Jess Powers
Alternate: Betsy Summerfield
Office: 276-889-8247
276-889-8033
Cell: 276-701-9775
Emergency: 911

VDEM
Coordinator: Tim Estes
EOC Office: 800-468-8892
Cell: 804-212-5437

St. Paul VA Water Plant
Earl Carter
Office: 276-762-9683
Cell: 276-698-7699
Town Hall: 276-762-5297

Norfolk Southern
Emergency Number
800-453-2530

Plant System Owner
Tate Jackson Jr.
Phone: 276-889-7325
Cell: 276-608-8273

AEP Geotechnical
Name: Gary Zych
Phone: 614-716-2917
Cell: 614-202-7513

Name: Matthew Usher
Phone: 614-716-3262

AEP Environmental
Name: Lindsey Forhan
Phone: 614-716-2275
Home: 330-604-1058

Name: Justin Jent
Phone: 614-716-2259
Cell: 740-357-0688

NOTES:
EMERGENCY CONDITIONS A, B, AND C
A: NONFAILURE EMERGENCY
B: POTENTIAL FAILURE EMERGENCY
C: IMMINENT FAILURE OR FAILURE HAS OCCURRED EMERGENCY
PRIORITY OF CALLS IS FROM LEFT TO RIGHT.
CONDITION B/C CALLS HAVE THE HIGHEST PRIORITY TO A CALLER

LEGEND: ➡ Condition B/C → Condition A/B/C

AMERICAN ELECTRIC POWER

CLINCH RIVER PLANT
EMERGENCY ACTION PLAN
POND 1A/1B, POND 2

NOTIFICATION FLOWCHART
Updated: April 26, 2021

*For cell phone calls, text messages can also be utilized

PART III – STATEMENT OF PURPOSE

The purpose of this document is to provide monitoring guidelines for Ash Pond 1A/1B and Ash Pond 2 under various conditions and to specify a series of actions that must be implemented when confronted with a possible or imminent pond failure. The plan's implementation and use will help to ensure that an emergency situation at the pond will be observed promptly and reported to the appropriate agencies.

PART IV – PROJECT DESCRIPTION

Ash Pond 1A/1B and Ash Pond 2 are ash disposal impoundments located north of Appalachian Power Company's Clinch River Plant on the Clinch River near the mouth of Dumps Creek. The ponds are near Carbo in Russell County, Virginia. The nearest communities are Carbo (approximately 0.5 miles upstream) and Carterton (approximately 3.4 miles downstream).

Ash Pond 1A/1B is an inactive disposal pond formed by earthen embankments. The pond has a crest elevation of about 1570 feet. The embankments are about 60 feet high on the west, south, and east sides. Natural ground forms the north side. It is presently capped and closed.

Pond 2 has been inactive since about 1998, when it was filled. It is presently capped and closed.

The ponds are inspected annually by personnel from AEPSC's Geotechnical Engineering Section and a report prepared under the direction of a registered professional engineer.

PART V – EMERGENCY DETECTION, EVALUATION, AND CLASSIFICATION

Section A - NORMAL CONDITIONS

Ponds will be inspected according to the prescribed schedule and checked for items specified on the pond inspection checklist. Normal conditions are defined as weather that would not typically stress the pond and the adjoining land. This would include normal weather patterns and normal rainfall. In general, normal rainfall is rainfall not exceeding about 3 inches of rain over a 24 hour period (estimated) or 4 inches over a 7-day period (from weekly measurements). The areas to be inspected will include an examination of the structure for structural weaknesses, status of impounding capacity, excessive erosion, clogging of outlet works, and other potentially hazardous conditions, including whirlpools in the pond or an unexpected drop in the pond level. Reports shall be filed by the person performing the inspections. These reports shall be retained at the operations office, submitted to AEPSC Geotechnical Engineering Section, and shall be made available for inspection by authorized representatives of the Virginia Department of Emergency Management (VADEM).

Action	Responsibility*
1. Regular quarterly inspections of the pond.	Plant Personnel
2. Table 1, Inspection Response Table provides a partial list of potential deficient and unsafe features associated with the performance of the pond. If during the inspection a minor deficiency is found, report the deficiency on inspection checklist and write a job order, if appropriate.	Plant Personnel
3. If a marginal deficiency is found, contact AEPSC, report on inspection checklist and increase inspection frequency in accordance with AEPSC recommendations	Plant Personnel
4. If an unsafe, non-emergency feature is observed, proceed to Section C-Standby Alert	Plant Personnel
5. If an unsafe, emergency feature is observed, proceed to Section D– Evacuation Conditions	Plant Personnel
6. Annual geotechnical safety inspection	Registered Professional Engineer
*Appropriate names, addresses, and phone numbers are provided in Part VI	

TABLE 1.

INSPECTION RESPONSE TABLE

PERFORMANCE LEVEL OF POND	MALFUNCTIONS OR UNDESIRABLE FEATURES	ACTIONS TO BE TAKEN BY FIELD PERSONNEL (In Order Indicated)
Minor Deficiency	• Damaged instrumentation • Sloughing • Rodent burrows • Superficial erosion • Trees and tall vegetation • Poor vegetal cover • Deteriorated rip rap	1. Report on inspection checklist. 2. Write repair order, if appropriate.
Marginal Deficiency	• Cracks parallel or transverse to pond. • Soft zones in downstream face or toe. • Previously undetected springs with clear water and stable flow rate on face of pond or abutments. • Excessive settlement of crest. • Elevated water levels in piezometers or observation well.	1. Contact AEPSC Geotechnical Engineering Section. 2. Report on inspection checklist. 3. Increase frequency of inspection as necessary.
Unsafe Non-Emergency (Condition A)	• Springs on abutments or downstream face with muddy water but stable flow rate. • Pipes, cavities or holes, which could be attributed to internal erosion even without evidence of seepage. • Clogged drains. • Significant slide with no seepage and that does not reach the pond crest. • Noticeable increase in amount of foundation or abutment seepage or flow in drains without apparent reason.	1. Notify Operations Superintendent who in turn should issue a Standby Alert 2. Initiate daily or more frequent surveillance program. 3. Read all field instrumentation daily. 4. Report on inspection checklist. 5. Contact AEPSC Geotechnical Engineering Section.
Unsafe Emergency (Condition B or C)	• Overtopping or activation of the emergency spillway. • Breach or slide below the waterline which reaches the pond crest and/or seeps water. • Springs on abutment or downstream slope with muddy or cloudy water and progressively increasing flow rate.	1. Notify Operations Superintendent who in turn should issue a notification and evacuation order. 2. Continue 24 hr. surveillance program, if possible. 3. Read all field instrumentation daily, if possible. 4. Report on inspection checklist. 5. Contact AEPSC Geotechnical Engineering Section.

Section B - ADVERSE CONDITIONS

Ponds will be inspected within 24 hours of the conditions described, and daily while adverse conditions exist. Adverse Conditions are defined as weather that could be in anyway stressful to the pond and adjoining land. This would include rainfall greater than about three inches within 24 hours (estimated) or greater than 4 inches in 7 days (from weekly measurements), or heavy snow melt. Reports shall be filed by the person performing the inspections. These reports shall be retained at the operations office, submitted to AEPSC Geotechnical Engineering Section as soon as possible, and shall be made available for inspection by authorized representatives of VADEM.

If no potentially hazardous conditions are identified and adverse conditions no longer exist, then resume routine inspection schedule as outlined in section A - Normal Conditions.

Action	Responsibility
1. Inspect pond within 24 hours of adverse condition rainfall.	Plant Personnel
2. Table 1, Inspection Response Table provides a partial list of deficient and unsafe features associated with the performance of the pond. If during the monthly inspection a minor deficiency is found, report on inspection checklist and write a job order, if appropriate.	Plant Personnel
3. If a marginal deficiency is found, contact AEPSC, report on checklist and increase inspection frequency as per AEPSC recommendations.	Plant Personnel
4. If an unsafe, non-emergency feature is observed, proceed to Section C - Standby Alert	Plant Personnel
5. If an unsafe, emergency feature is observed, proceed to section D - Evacuation Conditions	Plant Personnel

Section C - STANDBY ALERT (Condition A – Non Emergency)

Pond has specific problem(s), which could lead to an unsafe, emergency condition requiring evacuation. Daily or more frequent surveillance is initiated and a Standby Alert is issued. Emergency repairs begin, if possible.

Specific problems or undesirable features are summarized in Table 1.

Action	Responsibility
1. Notify Operations Superintendent and begin daily or more frequent surveillance of pond	Plant Personnel
2. Standby Alert shall be issued in accordance with wording and checklist below.	Plant Manager or Operations Superintendent in consultation with AEPSC Geotechnical Engineering Section
3. Start emergency communications network, if necessary based upon the continuing deterioration of site conditions. Request additional assistance as necessary	Russell Co. OEM (911) or (276-889-8247) or Russell Co. Sheriff (276-889-8033) or Plant Personnel
4. Evaluation of the pond and problem areas for corrective action	Plant Personnel & AEPSC Geotechnical Eng. section
5. Commence corrective/emergency repairs, if possible	Plant Personnel or Hired Contractor

The following Advisory will be issued to the agencies listed below by AEP. The responsible person notifying the agencies should note the date, time and name of the contact person.

ADVISORY

"This is _____(Name)_____of Appalachian Power Company advising you that we are starting constant surveillance of the ash ponds at the Clinch River Plant in accordance with the emergency action plan. We are notifying you, (see list below) of this condition, and will inform you if a decision to evacuate a potential flood area has been made, or when the cancellation of the surveillance is decided. Do you have a copy of the Emergency Action Plan?"

Check when notified		Telephone Number
__	Russell County OEM	911 or (276) 889-8247
__	VA Department of Emergency Management Emergency Operations Center	(800) 468-8892
__	VA DCR Regional Engineer	(800) 468-8892

The primary means of communication is digital radio system. Most plant personnel are equipped with radios so communication can be maintained with individuals inspecting the pond.

Section D - EVACUATION CONDITIONS

A pond failure is imminent or has occurred. Notification shall be initiated and an evacuation order shall be given, if warranted.

Features that would necessitate evacuation conditions are listed on Table 1 under Unsafe Emergency Performance Level.

Action	Responsibility
1. Continue constant surveillance of pond condition.	Plant Personnel or VADEM or AEPSC
2. If evacuation is deemed necessary proceed immediately with Section E.	Plant Manager, Plant PEC, or Russell County OEM

NOTE: The primary means of communication is digital radio system. Most plant personnel are equipped with radios so communication can be maintained with individuals inspecting the pond. Emergency Management personnel should utilize their means for communication.

Section E – EVACUATION (Condition B or C)

Action	Responsibility
1. Notify agencies according to checklist and wording below.	Plant Manager, Plant PEC, or Russell County OEM

NOTIFICATION

The responsible person shall phone the following agencies and deliver the following statement:

"This is _____(responsible person)_____ of Appalachian Power Company, notifying you that an evacuation order for the ash ponds at the Clinch River Plant has been given by _(person or agency issuing evacuation order)_ at _(time)_. Evacuation of people downstream will commence according to the Russell County Emergency Operations Plan."

Operators at 911 should contact OEM directors such that a coordinated notification process and appropriate emergency planning/preparation are implemented.

Check when notified		Telephone Number
__	Russell County OEM	911 or (276) 889-8247
__	Norfolk Southern	(800) 453-2530
__	VA DCR Regional Engineer	(800) 468-8892

Once notification has been given by AEP to the Russell County OEM/911/Sheriff's Office to begin evacuation procedures, the OEM/911/Sheriff's offices will follow their County Emergency Operations Plan. Roadblocks should be established to assist in the evacuation process. Notice to evacuate will be given personally to residents or by loudspeaker or bullhorn, or other means deemed necessary by the OEM. If possible, evacuation teams and roadblock personnel should utilize radio contact throughout the evacuation process. The Russell County OEM will be the agency in charge once evacuation orders have been issued to begin the implementation of evacuation procedures. The following measures will be implemented for an evacuation:

Action	Responsibility
1. Notification of downstream residents.	Plant Personnel, Russell County OEM, Russell County Sheriff and State Police.
2. Contact and transport downstream residents to point(s) of safety with priority to the infirm or disabled	Plant Personnel, Russell County OEM, Russell County Sheriff and State Police.
3. Establish a command post at the Clinch River Plant if necessary, direct emergency operations to organize recovery efforts and direct officials of cooperating agencies.	Planned by Russell County OEM Coordinator and executed by local officers.
4. Notify American Red Cross, or agencies in charge of evacuation centers, including food and medical facilities. Handle inquiries on the status of evacuees.	Planned by Russell County OEM Coordinator and executed by local officers.

5. Police security of area to maintain or initiate alternate vehicular traffic and to prevent looting.	Ranking local law enforcement officers.
6. VDOT to Establish roadblocks to prevent unauthorized entry. Potential road closures on VA 664, VA 665, VA 616, VA 614	Planned by Russell County OEM Director and executed by local officers and VDOT.
7. Locate additional or alternate evacuation centers, as needed.	Planned by the American Red Cross or county OEM Coordinator and executed by local officers.

Emergency Management personnel shall establish a command post. The command post shall be established outside of the inundation zone. Such proper locations include the plant main parking lot, the community of Carbo, at the plant landfill. AEP will establish its own separate command post which will be located within the plant offices at the direction of the plant manager.

Section F - NO FAILURE (Condition A or B or C)

Cancellation of evacuation order.

Action	Responsibility
1. Cancel Evacuation Notification	Plant Manager, Plant Environmental Coordinator, or Russell County OEM

Check when notified		Telephone Number
__	Russell County OEM	911 or (276) 889-8247
__	VA Department of Emergency Management Emergency Operations Center	(800) 468-8892
__	VA DCR Regional Engineer	(800) 468-8892

PART VI – GENERAL RESPONSIBILITIES UNDER THE EAP

Specific responsibilities regarding decisions, notifications, and evacuations are given in Part V. Listed below is contact information for those included in Part V.

The Clinch River Plant manager shall serve as the EAP Coordinator.

Plant Mailing Address – 3464 Power Plant Road, P.O. Box 370, Cleveland, VA 24225
Plant Physical Location – Intersection of State Routes 664 and 665
Plant Telephone – (276) 889-1540

Clinch River Plant Contacts:	Phone	
Unit 1 Control Room:	(276) 889-7301	
Laura Coleman, Plant Manager	(276) 889-7352 Office	(606) 424-0910 Cell
Ed Shelton, Energy Production Supt.	(276) 889-7323 Office	(304) 305-0758 Cell
Ray Brown, Operations Superintendent	(276) 889-7329 Office	(276) 202-0018 Cell
Rich Harless, Maintenance Supt.	(276) 889-7330 Office	(276) 608-2039 Cell
Karen Gilmer, Environmental Coord.	(276) 889-7314 Office	(540) 492-0199 Cell
Tate Jackson Jr., Plant System Owner	(276) 889-7325 Office	(276) 608-8273 Cell

AEP Service Corporation Contacts:

	Office	Cell
Gary Zych, P.E. ; Manager, Geotechnical Engineering	614-716-2917	614-202-7513
Pedro J. Amaya, P.E., Director, Civil Engineering	614-716-2926	614-595-6723
Lindsey Forhan, Engineer, Water & Ecological Resource Svcs	614-716-2275	330-604-1058
Justin Jent, Engineer, Land Env & Remediation Svcs	614-716-2259	740-357-0688

AEP Appalachian Power Company Contacts:

	Office
Chris Beam, President & COO	304-348-4152
Michael Zwick, VP Generating Assets APCO/KY	304-348-4194

Local and State Contacts:

	Office	Cell
Jess Powers, Coordinator Office of Emergency Management Russell County, VA	276- 889-8247	276-701-9775
Steven Dye, Sherriff Russell County, VA	276-889-8033	
Tim Estes, Coordinator Region 4 VA Department of Emergency Management	800-468-8892	804-212-5437
Central Office- Dam Safety VA Department of Conservation and Recreation	(800) 468-8892	

PART VII – PREPAREDNESS

Actions taken prior, during, and after an emergency condition are given in Part V.

PART VIII – INUNDATION MAP

The Emergency Evacuation/Inundation Map has been included in a map pocket following this page. This map shows the locations of Pond 1A, 1B, and 2, inundation area, and potential road blocks. The inundation area is conservatively based on the simultaneous breach of both Pond 1A and 1B.

It should be noted that, due to the method and procedure used to develop the flooded area, the limits of flooding shown are approximate and should be used solely as a guideline for establishing evacuation zones. Actual evacuation zones may be greater than the area covered by the flood areas shown and should be re-established by local officials based on their judgment and knowledge of local conditions. Evacuation of residents outside of the area shown may be warranted and shall be at the discretion of the Russell County OEM and/or sheriff's departments.

NOTES:

1. THE INFORMATION CONTAINED IN THIS MAP IS PREPARED FOR USE IN NOTIFICATION OF DOWNSTREAM PROPERTY OWNERS BY EMERGENCY MANAGEMENT PERSONNEL.
2. BASE MAP AND DAMBRK CROSS SECTIONS OBTAINED FROM CARBO (VA) AND ST. PAUL (VA) U.S.G.S. 7.5' SERIES TOPOGRAPHIC QUADRANGLES.

DISTANCE FROM POND (MILES)	MAXIMUM FLOW DEPTH (FT)	TIME OF MAXIMUM ELEVATION
0.000	23	26 MIN
0.701	17	34 MIN
2.103	8	1 HR 15 MIN
3.428	9	2 HR 18 MIN
6.080	7	4 HR 50 MIN
8.239	6	7 HR 5 MIN

PROPOSED ROADBLOCK (TYP)

ROUTE 600

DUMPS CREEK

ROUTE 615

POND 1A/1B

ROUTE 616

ROUTE 664

POND 2

CLINCH RIVER

M0.000

M2.103

CARBO Mile 0.416 15 Minutes

CROSS SECTION USED IN DAMBRK ANALYSIS (TYP)

M0.701

PROPOSED EVACUATION LIMITS

ROUTE 614

ROUTE 665

CLINCH RIVER PLANT

M3.428

CARTERTON Mile 3.546 1 Hour

M6.080

ROUTE 614

M8.239

M1.705

CARBO Mile 1.455 40 Minutes

LEGEND

DAMBREAK SECTION LOCATION, MILES DOWNSTREAM OF POND 1A/1B

– POINT OF INTEREST
– DISTANCE DOWNSTREAM
– ESTIMATED ARRIVAL TIME OF WATER/ASH

GRAPHIC SCALE

2000' 0 2000' 4000'

THESE DRAWINGS ARE PART OF A SET OF DESIGN DOCUMENTS WHICH ALSO CONTAINS A WRITTEN TEXT. THAT TEXT EXPLAINS SOME OF THE DETAILS SHOWN HEREIN AND THEREFORE THESE DRAWINGS SHOULD ONLY BE USED IN CONJUNCTION WITH THE TEXT.

COMMONWEALTH OF VIRGINIA
ROGER W. FOIL
Lic. No. 035722
9/24/09
PROFESSIONAL ENGINEER

DATE	REVISIONS	BY

EMERGENCY EVACUATION/ INUNDATION MAP

POND 1A/1B AND POND 2–CLINCH RIVER PLANT

RUSSELL COUNTY, VIRGINIA

SCALE: AS SHOWN | DR RAR | CHK SMA | REV RWC

PREPARED FOR:

AMERICAN ELECTRIC POWER SERVICE CORPORATION

PREPARED BY:

GA Geo/Environmental Associates, Inc.
5602 OVERLOOK CIRCLE • KNOXVILLE, TENNESSEE 37909 • (865) 584-0844

PROJ: 09-382 | DATE: 9-24-09 | SHEET 1 OF 1

PART IX – APPENDICES

Appendix A – Investigation and Analyses of Impounding Structure Failure Flood

A breach analysis was performed for Ash Pond 1A and 1B. (Pond 2 impounds no surface water) The geometry was conservatively simplified to assume there is one pond with a crest elevation of 1570 feet with an operating pool of elevation 1567 feet. For a high or significant dam, it is common that a breach analysis be performed to evaluate the downstream impacts from a failure under normal operating conditions and during the Probable Maximum Flood (PMF).

Upon review of the downstream area, it became apparent that the PMF occurring over the watershed would inundate the downstream area whether the dam breached or not. Therefore, since the failure of the dam during a PMF does not cause significant additional impact upon the downstream area, the breach analysis was performed for the normal operating conditions or a "sunny day" breach.

The breach analysis was performed using Army Corps of Engineers' *HEC-1* Flood Hydrograph Package, 1990, and the National Weather Services' NWS DAMBRK model, 1988. The *HEC-1* analysis was performed to estimate the breach flows from the dam. The failure analysis used the following breach parameters:

1) a base width of 94 feet (i.e., 2 times the breach height),
2) side slopes of 1.0 horizontal to 1.0 vertical,
3) time to breach of 0.5 hour (the recommended range for a well-constructed earth dam is 0.5 to 3.0 hours),
4) a breach height of 47 feet was used (i.e., bottom elevation of 1520 feet), and
5) the pool was set at elevation 1567 feet for the beginning of the breach.

The resulting flows from the *HEC-1* dam breach were used as the discharge hydrograph in the DAMBRK analysis. The following parameters were used in the DAMBRK analysis:

1) flow could be either subcritical or supercritical,
2) 6 cross sections were selected over a distance of 8.239 miles downstream
3) Manning's coefficient “n” ranged from 0.06 for the flow area within the main channel to 0.10 for the flow area in the floodplain where vegetation would retard flow.

Cross sections were taken from 1" = 2000' USGS Quadrangle Maps or topographic mapping provided by AEP. The analysis results are included in this appendix.

We utilized DAMBRK to estimated flow conditions along the Clinch River to a distance approximately 8.239 miles downstream of Ash Pond 1A/1B, where DAMBRK flows were estimated to be 1,361 cfs for a breach of the dam. According to the Tennessee Valley Authority, the 100-year flow in the Clinch River at approximately this location is approximately 37,000 cfs. Since the flow estimated by DAMBRK was less than the estimated 100-year flow, the DAMBRK analyses were discontinued (the point 8.239 miles downstream is the furthest upstream point where a 100-year was available).

The flows and water elevations from the DAMBRK analyses have been used to estimate the extent of flooding. A map is included in Part VIII to show the areas where inundation is predicted, which would need to be evacuated in the event of a "sunny day" breach of the dam. It should be noted that, due to the method and procedure used to develop the flooded area, the limits of flooding shown are approximate and should be used solely as a guideline for establishing evacuation zones. Actual evacuation zones may be greater than the area covered by the flood areas shown and should be reestablished by local officials based on their judgment and knowledge of local conditions. Evacuation of residents outside of the area shown may be warranted and shall be at the discretion of the affected counties’ offices of emergency services and/or sheriff’s department.

Appendix B – Plans for Training, Exercising, Updating, and Posting EAP

A drill shall be conducted annually. The drill should include a face-to-face meeting with the Russell County Office of Emergency Management and any other local officials or agencies deemed necessary by the OEM Director. A table-top exercise shall be conducted once every six years. Drills and table-top exercises for other structures at the Clinch River Plant may be performed in combination. Appalachian Power, or its representative, shall certify to the DCR that a drill, a table-top exercise, or both has been completed and provide any revisions or updates to the EAP or a statement that no revisions or updates are needed.

In accordance to the regulations of the state of Virginia, an EAP shall be submitted every six years. Additionally, this EAP shall be updated and resubmitted when there are necessary changes to keep the EAP workable.

This EAP, and subsequent updates, shall be submitted to local and state officials according to the distribution list included in Part I.

Appendix C – Site-Specific Concerns and Supplemental Information

```
*****************************************
*                                       *
*  OOD HYDROGRAPH PACKAGE  (HEC-1)      *
*        SEPTEMBER 1990                 *
*         VERSION 4.0                   *
*                                       *
*  RUN DATE  08/14/2009  TIME  14:23:47 *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104               *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT PAGE 1

```
      LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

** FREE ***
         1          ID  ********************************************************************************
         2          ID  *                                                                              *
         3          ID  *      Clinch River Plant Ponds 1A/1B    File: cr1br.inp                       *
         4          ID  *      Computation of Dambreak Hydrograph                                      *
         5          ID  *      GA Project No. 09-382                                                   *
         6          ID  *                                                                              *
         7          ID  *      Analyses by: Geo/Environmental Associates                               *
         8          ID  *                   Knoxville, TN                                              *
         9          ID  *                   August 2009                                                *
        10          ID  *                                                                              *
        11          ID  ********************************************************************************
        12          IT       3       0       0     300
        13          IO       3       0
        14          VS     IMP     IMP     IMP
        15          VV    2.11    6.11    7.11

        16          KK     IMP
        17          RS       1    ELEV    1567
        18          SA      10      12      14      16      18      20
        19          SQ       0       0       0       0       0       0
        20          SE    1520    1530    1540    1550    1560    1567
        21          ST    1570    1000     3.0     1.5
        22          SB    1520      94     0.5     0.5    1567
        23          ZZ
```

```
*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*        SEPTEMBER 1990                 *
*         VERSION 4.0                   *
*                                       *
*  RUN DATE  08/14/2009  TIME  14:23:47 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104               *
*                                       *
*****************************************
```

```
********************************************************************************
*                                                                              *
*      Clinch River Plant Ponds 1A/1B    File: cr1br.inp                       *
*      Computation of Dambreak Hydrograph                                      *
*      GA Project No. 09-382                                                   *
*                                                                              *
*      Analyses by: Geo/Environmental Associates                               *
*                   Knoxville, TN                                              *
*                   August 2009                                                *
*                                                                              *
********************************************************************************
```

13 IO OUTPUT CONTROL VARIABLES

```
                    IPRNT           3  PRINT CONTROL
                    IPLOT           0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

  IT         HYDROGRAPH TIME DATA
                     NMIN           3  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1    0  STARTING DATE
                    ITIME        0000  STARTING TIME
                       NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1    0  ENDING DATE
                   NDTIME        1457  ENDING TIME
                    ICENT          19  CENTURY MARK

               COMPUTATION INTERVAL     .05 HOURS
                    TOTAL TIME BASE   14.95 HOURS

       ENGLISH UNITS
            DRAINAGE AREA         SQUARE MILES
            PRECIPITATION DEPTH   INCHES
            LENGTH, ELEVATION     FEET
            FLOW                  CUBIC FEET PER SECOND
            STORAGE VOLUME        ACRE-FEET
            SURFACE AREA          ACRES
            TEMPERATURE           DEGREES FAHRENHEIT

             USER-DEFINED OUTPUT SPECIFICATIONS

       TABLE 1
  VS       STATION        IMP        IMP        IMP
  VV VARIABLE CODE       2.11       6.11       7.11        .00        .00        .00        .00        .00        .00        .00

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 16 KK    *     IMP    *
          *            *
          **************

            HYDROGRAPH ROUTING DATA

  / RS        STORAGE ROUTING
                   NSTPS           1  NUMBER OF SUBREACHES
                    ITYP        ELEV  TYPE OF INITIAL CONDITION
                  RSVRIC     1567.00  INITIAL CONDITION
                       X         .00 WORKING R AND D COEFFICIENT

 18 SA               AREA       10.0       12.0       14.0       16.0       18.0       20.0

 19 SQ          DISCHARGE         0.         0.         0.         0.         0.         0.

 20 SE          ELEVATION    1520.00    1530.00    1540.00    1550.00    1560.00    1567.00

 21 ST          TOP OF DAM
                    TOPEL     1570.00  ELEVATION AT TOP OF DAM
                   DAMWID     1000.00  DAM WIDTH
                     COQD        3.00  WEIR COEFFICIENT
                     EXPD        1.50  EXPONENT OF HEAD

 22 SB          BREACH DATA
                     ELBM     1520.00  ELEVATION AT BOTTOM OF BREACH
                    BRWID       94.00  WIDTH OF BREACH BOTTOM
                        Z         .50  BREACH SIDE SLOPE
                    TFAIL         .50  TIME FOR BREACH TO DEVELOP
                   FAILEL     1567.00  W.S. ELEVATION TO TRIGGER FAILURE

                                                         ***

                                            COMPUTED STORAGE-ELEVATION DATA

         STORAGE        .00     109.85     239.72     389.61     559.51     692.45
       ELEVATION    1520.00    1530.00    1540.00    1550.00    1560.00    1567.00

:GIN DAM FAILURE AT     .00 HOURS

    ***            ***             ***             ***             ***

                    HYDROGRAPH AT STATION       IMP

   JTFLOW IS     22746. AT TIME     .44 HOURS


-AK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      14.95-HR
 (CFS)        (HR)
                         (CFS)
 22704.        .45                 1404.         564.         564.         564.
```

	(INCHES)	.000	.000	.000	.000
	(AC-FT)	696.	697.	697.	697.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	14.95-HR
692.	.05	52.	21.	21.	21.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	14.95-HR
1567.00	.01	1523.84	1521.56	1521.56	1521.56

CUMULATIVE AREA = .00 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
ROUTED TO	IMP	22704.	.45	1404.	564.	564.	.00	1567.00	.01

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION IMP
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1567.00	1570.00	1570.00
STORAGE	692.	754.	754.
OUTFLOW	0.	0.	0.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	1567.00	.00	692.	22746.	.00	.44	.00

	PLAN 1	STATION	IMP FLOW	IMP STORAGE	IMP STAGE
	DAY	MON HRMN			
1	1	0000	.00	692.45	1567.00
2	1	0003	88.59	692.39	1567.00
3	1	0006	1198.69	690.21	1566.89
4	1	0009	3871.70	680.26	1566.39
5	1	0012	7931.69	656.24	1565.16
6	1	0015	12669.09	613.74	1562.95
7	1	0018	17118.26	551.95	1559.58
8	1	0021	20478.68	473.82	1555.10
9	1	0024	22352.50	384.81	1549.70
0	1	0027	22703.52	291.24	1543.59
1	1	0030	21792.03	198.95	1537.02
2	1	0033	12212.80	130.95	1531.73
3	1	0036	7366.17	91.51	1528.45
4	1	0039	4717.40	67.04	1526.32
5	1	0042	3174.76	50.99	1524.87
6	1	0045	2226.20	39.98	1523.85
7	1	0048	1615.47	32.12	1523.12
8	1	0051	1206.40	26.35	1522.57
9	1	0054	923.05	21.98	1522.15
0	1	0057	721.14	18.60	1521.83
1	1	0100	573.62	15.94	1521.57
2	1	0103	463.43	13.81	1521.36
3	1	0106	379.56	12.08	1521.19
4	1	0109	314.60	10.64	1521.05
5	1	0112	263.64	9.45	1520.94
6	1	0115	223.08	8.45	1520.84
7	1	0118	190.40	7.60	1520.75
8	1	0121	163.80	6.87	1520.68
9	1	0124	141.88	6.24	1520.62
0	1	0127	123.67	5.69	1520.57
1	1	0130	108.39	5.21	1520.52
2	1	0133	95.55	4.79	1520.48
3	1	0136	84.68	4.42	1520.44
	1	0139	75.40	4.09	1520.41
	1	0142	67.41	3.79	1520.38
	1	0145	60.50	3.53	1520.35
	1	0148	54.52	3.29	1520.33
	1	0151	49.28	3.08	1520.31
9	1	0154	44.71	2.88	1520.29
0	1	0157	40.67	2.71	1520.27
1	1	0200	37.11	2.55	1520.25
2	1	0203	33.97	2.40	1520.24

43	1	0206	31.15	2.27	1520.23
	1	0209	28.66	2.14	1520.21
	1	0212	26.41	2.03	1520.20
	1	0215	24.38	1.92	1520.19
	1	0218	22.57	1.83	1520.18
	1	0221	20.93	1.74	1520.17
	1	0224	19.45	1.65	1520.17
	1	0227	18.10	1.58	1520.16

TABLE 1 (CONT.)		STATION	IMP FLOW	IMP STORAGE	IMP STAGE
PER	DAY MON	HRMN			
51	1	0230	16.88	1.50	1520.15
52	1	0233	15.76	1.44	1520.14
53	1	0236	14.74	1.38	1520.14
54	1	0239	13.81	1.32	1520.13
55	1	0242	12.95	1.26	1520.13
56	1	0245	12.17	1.21	1520.12
57	1	0248	11.44	1.16	1520.12
58	1	0251	10.78	1.12	1520.11
59	1	0254	10.16	1.07	1520.11
60	1	0257	9.56	1.03	1520.10
61	1	0300	9.06	.99	1520.10
62	1	0303	8.56	.96	1520.10
63	1	0306	8.09	.92	1520.09
64	1	0309	7.69	.89	1520.09
65	1	0312	7.30	.86	1520.09
66	1	0315	6.91	.83	1520.08
67	1	0318	6.56	.80	1520.08
68	1	0321	6.27	.78	1520.08
69	1	0324	5.97	.75	1520.08
70	1	0327	5.68	.73	1520.07
71	1	0330	5.40	.70	1520.07
72	1	0333	5.13	.68	1520.07
73	1	0336	4.93	.66	1520.07
74	1	0339	4.73	.64	1520.06
75	1	0342	4.52	.63	1520.06
76	1	0345	4.33	.61	1520.06
77	1	0348	4.13	.59	1520.06
	1	0351	3.94	.57	1520.06
	1	0354	3.75	.55	1520.06
	1	0357	3.60	.54	1520.05
	1	0400	3.48	.53	1520.05
	1	0403	3.36	.51	1520.05
	1	0406	3.24	.50	1520.05
84	1	0409	3.12	.49	1520.05
85	1	0412	3.01	.48	1520.05
86	1	0415	2.89	.46	1520.05
87	1	0418	2.78	.45	1520.05
88	1	0421	2.67	.44	1520.04
89	1	0424	2.56	.43	1520.04
90	1	0427	2.45	.42	1520.04
91	1	0430	2.34	.40	1520.04
92	1	0433	2.24	.39	1520.04
93	1	0436	2.17	.38	1520.04
94	1	0439	2.12	.38	1520.04
95	1	0442	2.07	.37	1520.04
96	1	0445	2.02	.37	1520.04
97	1	0448	1.97	.36	1520.04
98	1	0451	1.92	.35	1520.04
99	1	0454	1.87	.35	1520.03
00	1	0457	1.82	.34	1520.03

ABLE 1 CONT.)		STATION	IMP FLOW	IMP STORAGE	IMP STAGE
ER	DAY MON	HRMN			
01	1	0500	1.77	.33	1520.03
02	1	0503	1.72	.33	1520.03
03	1	0506	1.68	.32	1520.03
04	1	0509	1.63	.32	1520.03
05	1	0512	1.58	.31	1520.03
06	1	0515	1.53	.30	1520.03
07	1	0518	1.49	.30	1520.03
08	1	0521	1.44	.29	1520.03
09	1	0524	1.40	.29	1520.03
10	1	0527	1.35	.28	1520.03
11	1	0530	1.31	.27	1520.03
	1	0533	1.27	.27	1520.03
	1	0536	1.22	.26	1520.03
	1	0539	1.18	.26	1520.03
	1	0542	1.14	.25	1520.02
16	1	0545	1.10	.24	1520.02
17	1	0548	1.06	.24	1520.02
18	1	0551	1.01	.23	1520.02
19	1	0554	.97	.22	1520.02
20	1	0557	.94	.22	1520.02

121	1	0600	.90	.21	1520.02
[illegible]	1	0603	.86	.21	1520.02
[illegible]	1	0606	.82	.20	1520.02
[illegible]	1	0609	.78	.19	1520.02
[illegible]	1	0612	.75	.19	1520.02
	1	0615	.75	.19	1520.02
	1	0618	.75	.19	1520.02
	1	0621	.75	.19	1520.02
129	1	0624	.75	.19	1520.02
130	1	0627	.75	.19	1520.02
131	1	0630	.75	.19	1520.02
132	1	0633	.75	.19	1520.02
133	1	0636	.75	.19	1520.02
134	1	0639	.75	.19	1520.02
135	1	0642	.75	.19	1520.02
136	1	0645	.75	.19	1520.02
137	1	0648	.75	.19	1520.02
138	1	0651	.75	.19	1520.02
139	1	0654	.75	.19	1520.02
140	1	0657	.75	.19	1520.02
141	1	0700	.75	.19	1520.02
142	1	0703	.75	.19	1520.02
143	1	0706	.75	.19	1520.02
144	1	0709	.75	.19	1520.02
145	1	0712	.75	.19	1520.02
146	1	0715	.75	.19	1520.02
147	1	0718	.75	.19	1520.02
148	1	0721	.75	.19	1520.02
149	1	0724	.75	.19	1520.02
150	1	0727	.75	.19	1520.02

ABLE 1 CONT.)	STATION	IMP FLOW	IMP STORAGE	IMP STAGE

ER	DAY	MON	HRMN			
151	1		0730	.75	.19	1520.02
152	1		0733	.75	.19	1520.02
153	1		0736	.75	.19	1520.02
154	1		0739	.75	.19	1520.02
155	1		0742	.75	.19	1520.02
[illegible]	1		0745	.75	.19	1520.02
[illegible]	1		0748	.75	.19	1520.02
	1		0751	.75	.19	1520.02
	1		0754	.75	.19	1520.02
	1		0757	.75	.19	1520.02
.	1		0800	.75	.19	1520.02
152	1		0803	.75	.19	1520.02
153	1		0806	.75	.19	1520.02
154	1		0809	.75	.19	1520.02
155	1		0812	.75	.19	1520.02
156	1		0815	.75	.19	1520.02
157	1		0818	.75	.19	1520.02
158	1		0821	.75	.19	1520.02
159	1		0824	.75	.19	1520.02
170	1		0827	.75	.19	1520.02
171	1		0830	.75	.19	1520.02
172	1		0833	.75	.19	1520.02
173	1		0836	.75	.19	1520.02
174	1		0839	.75	.19	1520.02
175	1		0842	.75	.19	1520.02
176	1		0845	.75	.19	1520.02
177	1		0848	.75	.19	1520.02
178	1		0851	.75	.19	1520.02
179	1		0854	.75	.19	1520.02
180	1		0857	.75	.19	1520.02
181	1		0900	.75	.19	1520.02
182	1		0903	.75	.19	1520.02
183	1		0906	.75	.19	1520.02
184	1		0909	.75	.19	1520.02
185	1		0912	.75	.19	1520.02
186	1		0915	.75	.19	1520.02
187	1		0918	.75	.19	1520.02
188	1		0921	.75	.19	1520.02
189	1		0924	.75	.19	1520.02
190	1		0927	.75	.19	1520.02
191	1		0930	.75	.19	1520.02
192	1		0933	.75	.19	1520.02
193	1		0936	.75	.19	1520.02
194	1		0939	.75	.19	1520.02
195	1		0942	.75	.19	1520.02
[illegible]	1		0945	.75	.19	1520.02
[illegible]	1		0948	.75	.19	1520.02
	1		0951	.75	.19	1520.02
	1		0954	.75	.19	1520.02
0	1		0957	.75	.19	1520.02

BLE 1 ONT.)	STATION	IMP FLOW	IMP STORAGE	IMP STAGE

PER	DAY	MON	HRMN			
2	1		1000	.75	.19	1520.02
202	1		1003	.75	.19	1520.02
3	1		1006	.75	.19	1520.02
	1		1009	.75	.19	1520.02
	1		1012	.75	.19	1520.02
	1		1015	.75	.19	1520.02
207	1		1018	.75	.19	1520.02
208	1		1021	.75	.19	1520.02
209	1		1024	.75	.19	1520.02
210	1		1027	.75	.19	1520.02
211	1		1030	.75	.19	1520.02
212	1		1033	.75	.19	1520.02
213	1		1036	.75	.19	1520.02
214	1		1039	.75	.19	1520.02
215	1		1042	.75	.19	1520.02
216	1		1045	.75	.19	1520.02
217	1		1048	.75	.19	1520.02
218	1		1051	.75	.19	1520.02
219	1		1054	.75	.19	1520.02
220	1		1057	.75	.19	1520.02
221	1		1100	.75	.19	1520.02
222	1		1103	.75	.19	1520.02
223	1		1106	.75	.19	1520.02
224	1		1109	.75	.19	1520.02
225	1		1112	.75	.19	1520.02
226	1		1115	.75	.19	1520.02
227	1		1118	.75	.19	1520.02
228	1		1121	.75	.19	1520.02
229	1		1124	.75	.19	1520.02
230	1		1127	.75	.19	1520.02
231	1		1130	.75	.19	1520.02
232	1		1133	.75	.19	1520.02
233	1		1136	.75	.19	1520.02
234	1		1139	.75	.19	1520.02
235	1		1142	.75	.19	1520.02
236	1		1145	.75	.19	1520.02
237	1		1148	.75	.19	1520.02
238	1		1151	.75	.19	1520.02
239	1		1154	.75	.19	1520.02
2	1		1157	.75	.19	1520.02
	1		1200	.75	.19	1520.02
	1		1203	.75	.19	1520.02
	1		1206	.75	.19	1520.02
	1		1209	.75	.19	1520.02
245	1		1212	.75	.19	1520.02
246	1		1215	.75	.19	1520.02
247	1		1218	.75	.19	1520.02
248	1		1221	.75	.19	1520.02
249	1		1224	.75	.19	1520.02
250	1		1227	.75	.19	1520.02

ABLE 1 CONT.)	STATION	IMP FLOW	IMP STORAGE	IMP STAGE

ER	DAY	MON	HRMN			
251	1		1230	.75	.19	1520.02
252	1		1233	.75	.19	1520.02
253	1		1236	.75	.19	1520.02
254	1		1239	.75	.19	1520.02
255	1		1242	.75	.19	1520.02
256	1		1245	.75	.19	1520.02
257	1		1248	.75	.19	1520.02
258	1		1251	.75	.19	1520.02
259	1		1254	.75	.19	1520.02
260	1		1257	.75	.19	1520.02
261	1		1300	.75	.19	1520.02
262	1		1303	.75	.19	1520.02
263	1		1306	.75	.19	1520.02
264	1		1309	.75	.19	1520.02
265	1		1312	.75	.19	1520.02
266	1		1315	.75	.19	1520.02
267	1		1318	.75	.19	1520.02
268	1		1321	.75	.19	1520.02
269	1		1324	.75	.19	1520.02
270	1		1327	.75	.19	1520.02
271	1		1330	.75	.19	1520.02
272	1		1333	.75	.19	1520.02
273	1		1336	.75	.19	1520.02
2	1		1339	.75	.19	1520.02
	1		1342	.75	.19	1520.02
	1		1345	.75	.19	1520.02
	1		1348	.75	.19	1520.02
278	1		1351	.75	.19	1520.02
279	1		1354	.75	.19	1520.02
280	1		1357	.75	.19	1520.02
281	1		1400	.75	.19	1520.02
282	1		1403	.75	.19	1520.02

83	1	1406	.75	.19	1520.02
	1	1409	.75	.19	1520.02
	1	1412	.75	.19	1520.02
8[illegible]	1	1415	.75	.19	1520.02
	1	1418	.75	.19	1520.02
	1	1421	.75	.19	1520.02
	1	1424	.75	.19	1520.02
	1	1427	.75	.19	1520.02
	1	1430	.75	.19	1520.02
92	1	1433	.75	.19	1520.02
93	1	1436	.75	.19	1520.02
94	1	1439	.75	.19	1520.02
95	1	1442	.75	.19	1520.02
96	1	1445	.75	.19	1520.02
97	1	1448	.75	.19	1520.02
98	1	1451	.75	.19	1520.02
99	1	1454	.75	.19	1520.02
00	1	1457	.75	.19	1520.02
		MAX	22703.52	692.45	1567.00
		MIN	.00	.19	1520.02
		AVE	562.02	22.12	1521.63

** NORMAL END OF HEC-1 ***

ANALYSIS OF THE DOWNSTREAM FLOOD HYDROGRAPH

PRODUCED BY THE DAM BREAK OF

AEP Clinch Riv 1A/1B

ON

Clinch River

ANALYSIS BY

GeoEnvironmental Associates, Inc.
AEP Appalachaina Power GA FILE NO. 09
-382 (crpldb.inp)

BASED ON PROCEDURE DEVELOPED BY
DANNY L. FREAD, PH.D., SR. RESEARCH HYDROLOGIST

QUALITY CONTROL TESTING AND OTHER SUPPORT BY
JANICE M. LEWIS, RESEARCH HYDROLOGIST

HYDROLOGIC RESEARCH LABORATORY
W23, OFFICE OF HYDROLOGY
NOAA, NATIONAL WEATHER SERVICE
SILVER SPRING, MARYLAND 20910

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*** SUMMARY OF INPUT DATA ***
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INPUT CONTROL PARAMETERS FOR AEP Clinch Riv 1A/1B

PARAMETER	VARIABLE	VALUE
NUMBER OF DYNAMIC ROUTING REACHES	KKN	9
TYPE OF RESERVOIR ROUTING	KUI	0
MULTIPLE DAM INDICATOR	MULDAM	0
PRINTING INSTRUCTIONS FOR INPUT SUMMARY	KDMP	5
NO. OF RESERVOIR INFLOW HYDROGRAPH POINTS	ITEH	20
INTERVAL OF CROSS-SECTION INFO PRINTED OUT WHEN JNK=9	NPRT	0

FLOOD-PLAIN MODEL PARAMETER	KFLP	0
METRIC INPUT/OUTPUT OPTION	METRIC	0

PUT= 1 0 0 0 1 1 1 1 0 1 0 15

DHF(INTERVAL BETWEEN INPUT HYDROGRAPH ORDINATES) = .00 HRS.

TEH(TIME AT WHICH COMPUTATIONS TERMINATE)= 20.0000 HRS.

BREX(BREACH EXPONENT) = 1.000

MUD(MUD FLOW OPTION) = 0

IWF(TYPE OF WAVE FRONT TRACKING) = 0

KPRES(WETTED PERIMETER OPTION) = 0

KSL(LANDSLIDE PARAMETER) = 0

DFR(WINDOW FOR CRITICAL FROUDE NO. IN MIX FLOW ALGORITHM)= .050

INFLOW HYDROGRAPH TO AEP Clinch Riv 1A/1B

89.00	1199.00	3872.00	7932.00	12669.00	17118.00	20479.00	22352.00
22704.00	21792.00	12213.00	7366.00	4717.00	3175.00	2226.00	1615.00
574.00	223.00	108.00	37.00				

TIME OF INFLOW HYDROGRAPH ORDINATES

.0000	.0500	.1000	.1500	.2000	.2500	.3000	.3500
.4000	.4500	.5000	.5500	.6000	.6500	.7000	.7500
1.0000	1.2500	1.5000	2.0000				

CROSS-SECTIONAL PARAMETERS FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

PARAMETER	VARIABLE	VALUE
NUMBER OF CROSS-SECTIONS	NS	6
MAXIMUM NUMBER OF TOP WIDTHS	NCS	4
NUMBER OF CROSS-SECTIONAL HYDROGRAPHS TO PLOT	NTT	5
TYPE OF OUTPUT OTHER THAN HYDROGRAPH PLOTS	JNK	4
CROSS-SECTIONAL SMOOTHING PARAMETER	KSA	0
DOWNSTREAM SUPERCRITICAL OR NOT	KSUPC	3
NO. OF LATERAL INFLOW HYDROGRAPHS	LQ	0
NO. OF POINTS IN GATE CONTROL CURVE	KCG	0

NUMBER OF CROSS-SECTION WHERE HYDROGRAPH DESIRED
(MAX NUMBER OF HYDROGRAPHS = 6)

21 49 96 150 193

CROSS-SECTIONAL VARIABLES FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

PARAMETER	UNITS	VARIABLE
LOCATION OF CROSS-SECTION	MILE	XS(I)
ELEVATION(MSL) OF FLOODING AT CROSS-SECTION	FEET	FSTG(I)
ELEV CORRESPONDING TO EACH TOP WIDTH	FEET	HS(K,I)
TOP WIDTH CORRESPONDING TO EACH ELEV (ACTIVE FLOW PORTION)	FEET	BS(K,I)
TOP WIDTH CORRESPONDING TO EACH ELEV (OFF-CHANNEL PORTION)	FEET	BSS(K,I)
NUMBER OF CROSS-SECTION		I
NUMBER OF ELEVATION LEVEL		K

CROSS-SECTION NUMBER 1

XS(I) = .000 FSTG(I) = .00

HS ...	1490.0	1491.0	1520.0	1560.0
BS ...	10.0	10.0	850.0	1000.0
BSS ...	.0	.0	.0	.0

CROSS-SECTION NUMBER 2

XS(I) = .701 FSTG(I) = .00

HS ...	1488.0	1489.0	1520.0	1560.0
BS ...	125.0	125.0	500.0	800.0
BSS ...	.0	.0	.0	.0

CROSS-SECTION NUMBER 3

XS(I) = 2.103 FSTG(I) = .00

HS ...	1482.0	1483.0	1520.0	1560.0
BS ...	400.0	400.0	550.0	900.0
BSS ...	.0	.0	.0	.0

CROSS-SECTION NUMBER 4

XS(I) = 3.428 FSTG(I) = .00

HS ...	1476.0	1477.0	1480.0	1520.0
BS ...	125.0	125.0	200.0	650.0
BSS ...	.0	.0	.0	.0

CROSS-SECTION NUMBER 5

XS(I) = 6.080 FSTG(I) = .00

HS ...	1466.0	1467.0	1480.0	1520.0
BS ...	150.0	150.0	300.0	800.0
BSS ...	.0	.0	.0	.0

CROSS-SECTION NUMBER 6

XS(I) = 8.239 FSTG(I) = .00

HS ...	1458.0	1459.0	1480.0	1520.0
BS ...	150.0	150.0	400.0	750.0
BSS ...	.0	.0	.0	.0

MANNING N ROUGHNESS COEFFICIENTS FOR THE GIVEN REACHES
(CM(K,I),K=1,NCS) WHERE I = REACH NUMBER

REACH 1 ...	.060	.100	.100	.100
REACH 2 ...	.060	.100	.100	.100
REACH 3 ...	.060	.100	.100	.100
REACH 4 ...	.060	.100	.100	.100
REACH 5 ...	.060	.100	.100	.100

CROSS-SECTIONAL VARIABLES FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

PARAMETER	UNITS	VARIABLE
MINIMUM COMPUTATIONAL DISTANCE USED BETWEEN CROSS-SECTIONS	MILE	DXM(I)
CONTRACTION - EXPANSION COEFFICIENTS BETWEEN CROSS-SECTIONS		FKC(I)

REACH NUMBER	DXM(I)	FKC(I)
1	.035	.000
2	.050	.000
3	.028	.000
4	.049	.000
5	.050	.000

DOWNSTREAM FLOW PARAMETERS FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

PARAMETER	UNITS	VARIABLE	VALUE
MAX DISCHARGE AT DOWNSTREAM EXTREMITY	CFS	QMAXD	.0
MAX LATERAL OUTFLOW PRODUCING LOSSES	CFS /FEET	QLL	.000
INITIAL SIZE OF TIME STEP	HOUR	DTHM	.0000
DOWNSTREAM BOUNDARY PARAMETER	FEET	YDN	.000000
SLOPE OF CHANNEL DOWNSTREAM OF DAM	FPM	SOM	.00
THETA WEIGHTING FACTOR		THETA	.00
CONVERGENCE CRITERION FOR STAGE	FEET	EPSY	.000000
TIME AT WHICH DAM STARTS TO FAIL	HOUR	TFI	.00

AT REACH= 3 DXM SHOULD BE CHANGED TO .028 DUE TO EXP/CONTRACT CRITERIA

COMPUTATIONS WILL USE THE FOLLOWING DXM VALUES

.035 .050 .028 .049 .050

TOTAL NUMBER OF CROSS SECTIONS (ORIGINAL+INTERPOLATED) (N) = 193 (MAXIMUM ALLOWABLE = 200

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*** SUMMARY OF OUTPUT DATA ***
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CROSS-SECTION NO.	MILE	BOTTOM ELEVATION FEET	REACH NO.	REACH LENGTH MILE	SLOPE FPM	MESAGE
1	.00	1490.00				
2	.70	1488.00	1	.70	2.85	
3	2.10	1482.00	2	1.40	4.28	
4	3.43	1476.00	3	1.33	4.53	
5	6.08	1466.00	4	2.65	3.77	
6	8.24	1458.00	5	2.16	3.71	

INITIAL CONDITIONS

I=	1	X=	.000	YN=	1494.05	DEPN=	4.05	YC=	1491.48	DEPC=	1.48	IFR= 0	ITN=	14 ITC= 14
I=	2	X=	.035	YN=	1493.73	DEPN=	3.83	YC=	1490.90	DEPC=	1.00	IFR= 0	ITN=	14 ITC= 14
I=	3	X=	.070	YN=	1493.42	DEPN=	3.62	YC=	1490.61	DEPC=	.81	IFR= 0	ITN=	14 ITC= 14
I=	4	X=	.105	YN=	1493.11	DEPN=	3.41	YC=	1490.39	DEPC=	.69	IFR= 0	ITN=	14 ITC= 14
I=	5	X=	.140	YN=	1492.82	DEPN=	3.22	YC=	1490.21	DEPC=	.61	IFR= 0	ITN=	14 ITC= 14

I=	6	X=	.175	YN=	1492.53	DEPN=	3.03	YC=	1490.05	DEPC=	.55	IFR=	0	ITN=	14	ITC= 14
	7	X=	.210	YN=	1492.25	DEPN=	2.85	YC=	1489.90	DEPC=	.50	IFR=	0	ITN=	14	ITC= 14
	8	X=	.245	YN=	1491.99	DEPN=	2.69	YC=	1489.76	DEPC=	.46	IFR=	0	ITN=	14	ITC= 14
	9	X=	.280	YN=	1491.75	DEPN=	2.55	YC=	1489.63	DEPC=	.43	IFR=	0	ITN=	14	ITC= 14
	10	X=	.315	YN=	1491.51	DEPN=	2.41	YC=	1489.50	DEPC=	.40	IFR=	0	ITN=	14	ITC= 14
	11	X=	.351	YN=	1491.29	DEPN=	2.29	YC=	1489.38	DEPC=	.38	IFR=	0	ITN=	14	ITC= 14
	12	X=	.386	YN=	1491.08	DEPN=	2.18	YC=	1489.26	DEPC=	.36	IFR=	0	ITN=	14	ITC= 14
	13	X=	.421	YN=	1490.88	DEPN=	2.08	YC=	1489.14	DEPC=	.34	IFR=	0	ITN=	14	ITC= 14
	14	X=	.456	YN=	1490.70	DEPN=	2.00	YC=	1489.02	DEPC=	.32	IFR=	0	ITN=	14	ITC= 14
I=	15	X=	.491	YN=	1490.52	DEPN=	1.92	YC=	1488.91	DEPC=	.31	IFR=	0	ITN=	14	ITC= 14
I=	16	X=	.526	YN=	1490.34	DEPN=	1.84	YC=	1488.80	DEPC=	.30	IFR=	0	ITN=	14	ITC= 14
I=	17	X=	.561	YN=	1490.17	DEPN=	1.77	YC=	1488.69	DEPC=	.29	IFR=	0	ITN=	14	ITC= 14
I=	18	X=	.596	YN=	1490.01	DEPN=	1.71	YC=	1488.58	DEPC=	.28	IFR=	0	ITN=	14	ITC= 14
I=	19	X=	.631	YN=	1489.86	DEPN=	1.66	YC=	1488.47	DEPC=	.27	IFR=	0	ITN=	14	ITC= 14
I=	20	X=	.666	YN=	1489.70	DEPN=	1.60	YC=	1488.36	DEPC=	.26	IFR=	0	ITN=	14	ITC= 14
I=	21	X=	.701	YN=	1489.38	DEPN=	1.38	YC=	1488.25	DEPC=	.25	IFR=	0	ITN=	14	ITC= 14
I=	22	X=	.751	YN=	1489.10	DEPN=	1.32	YC=	1488.03	DEPC=	.24	IFR=	0	ITN=	14	ITC= 14
I=	23	X=	.801	YN=	1488.83	DEPN=	1.26	YC=	1487.80	DEPC=	.23	IFR=	0	ITN=	14	ITC= 14
I=	24	X=	.851	YN=	1488.57	DEPN=	1.21	YC=	1487.58	DEPC=	.22	IFR=	0	ITN=	14	ITC= 14
I=	25	X=	.901	YN=	1488.31	DEPN=	1.16	YC=	1487.35	DEPC=	.21	IFR=	0	ITN=	14	ITC= 14
I=	26	X=	.951	YN=	1488.05	DEPN=	1.12	YC=	1487.13	DEPC=	.20	IFR=	0	ITN=	14	ITC= 14
I=	27	X=	1.001	YN=	1487.80	DEPN=	1.08	YC=	1486.91	DEPC=	.19	IFR=	0	ITN=	14	ITC= 14
I=	28	X=	1.051	YN=	1487.55	DEPN=	1.05	YC=	1486.69	DEPC=	.19	IFR=	0	ITN=	14	ITC= 14
I=	29	X=	1.102	YN=	1487.30	DEPN=	1.02	YC=	1486.47	DEPC=	.18	IFR=	0	ITN=	14	ITC= 14
I=	30	X=	1.152	YN=	1487.06	DEPN=	.99	YC=	1486.25	DEPC=	.17	IFR=	0	ITN=	14	ITC= 14
I=	31	X=	1.202	YN=	1486.81	DEPN=	.95	YC=	1486.03	DEPC=	.17	IFR=	0	ITN=	14	ITC= 14
I=	32	X=	1.252	YN=	1486.56	DEPN=	.92	YC=	1485.81	DEPC=	.17	IFR=	0	ITN=	14	ITC= 14
I=	33	X=	1.302	YN=	1486.32	DEPN=	.89	YC=	1485.59	DEPC=	.16	IFR=	0	ITN=	14	ITC= 14
I=	34	X=	1.352	YN=	1486.08	DEPN=	.87	YC=	1485.37	DEPC=	.16	IFR=	0	ITN=	14	ITC= 14
I=	35	X=	1.402	YN=	1485.84	DEPN=	.84	YC=	1485.15	DEPC=	.15	IFR=	0	ITN=	14	ITC= 14
I=	36	X=	1.452	YN=	1485.60	DEPN=	.81	YC=	1484.93	DEPC=	.15	IFR=	0	ITN=	14	ITC= 14
I=	37	X=	1.502	YN=	1485.37	DEPN=	.79	YC=	1484.72	DEPC=	.15	IFR=	0	ITN=	14	ITC= 14
I=	38	X=	1.552	YN=	1485.13	DEPN=	.77	YC=	1484.50	DEPC=	.14	IFR=	0	ITN=	14	ITC= 14
I=	39	X=	1.602	YN=	1484.90	DEPN=	.76	YC=	1484.28	DEPC=	.14	IFR=	0	ITN=	14	ITC= 14
I=	40	X=	1.652	YN=	1484.66	DEPN=	.74	YC=	1484.07	DEPC=	.14	IFR=	0	ITN=	14	ITC= 14
I=	41	X=	1.702	YN=	1484.43	DEPN=	.72	YC=	1483.85	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	42	X=	1.753	YN=	1484.21	DEPN=	.71	YC=	1483.63	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	43	X=	1.803	YN=	1483.98	DEPN=	.69	YC=	1483.41	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	44	X=	1.853	YN=	1483.75	DEPN=	.67	YC=	1483.20	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
I=	45	X=	1.903	YN=	1483.52	DEPN=	.66	YC=	1482.98	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
I=	46	X=	1.953	YN=	1483.29	DEPN=	.65	YC=	1482.76	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
	47	X=	2.003	YN=	1483.07	DEPN=	.64	YC=	1482.55	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
	48	X=	2.053	YN=	1482.84	DEPN=	.62	YC=	1482.33	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
	49	X=	2.103	YN=	1482.60	DEPN=	.60	YC=	1482.12	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
	50	X=	2.131	YN=	1482.48	DEPN=	.61	YC=	1481.99	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
	51	X=	2.159	YN=	1482.36	DEPN=	.61	YC=	1481.86	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
	52	X=	2.188	YN=	1482.24	DEPN=	.62	YC=	1481.73	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
I=	53	X=	2.216	YN=	1482.12	DEPN=	.63	YC=	1481.61	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
I=	54	X=	2.244	YN=	1482.00	DEPN=	.64	YC=	1481.48	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
I=	55	X=	2.272	YN=	1481.88	DEPN=	.65	YC=	1481.36	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
I=	56	X=	2.300	YN=	1481.76	DEPN=	.65	YC=	1481.23	DEPC=	.12	IFR=	0	ITN=	14	ITC= 14
I=	57	X=	2.329	YN=	1481.64	DEPN=	.66	YC=	1481.10	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	58	X=	2.357	YN=	1481.52	DEPN=	.67	YC=	1480.98	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	59	X=	2.385	YN=	1481.40	DEPN=	.68	YC=	1480.85	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	60	X=	2.413	YN=	1481.28	DEPN=	.68	YC=	1480.73	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	61	X=	2.441	YN=	1481.16	DEPN=	.69	YC=	1480.60	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	62	X=	2.469	YN=	1481.04	DEPN=	.70	YC=	1480.47	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	63	X=	2.498	YN=	1480.92	DEPN=	.71	YC=	1480.35	DEPC=	.13	IFR=	0	ITN=	14	ITC= 14
I=	64	X=	2.526	YN=	1480.81	DEPN=	.72	YC=	1480.22	DEPC=	.14	IFR=	0	ITN=	14	ITC= 14
I=	65	X=	2.554	YN=	1480.69	DEPN=	.73	YC=	1480.10	DEPC=	.14	IFR=	0	ITN=	14	ITC= 14
I=	66	X=	2.582	YN=	1480.57	DEPN=	.74	YC=	1479.97	DEPC=	.14	IFR=	0	ITN=	13	ITC= 14
I=	67	X=	2.610	YN=	1480.45	DEPN=	.75	YC=	1479.84	DEPC=	.14	IFR=	0	ITN=	14	ITC= 14
I=	68	X=	2.639	YN=	1480.34	DEPN=	.76	YC=	1479.72	DEPC=	.15	IFR=	0	ITN=	13	ITC= 13
I=	69	X=	2.667	YN=	1480.23	DEPN=	.78	YC=	1479.59	DEPC=	.14	IFR=	0	ITN=	13	ITC= 13
I=	70	X=	2.695	YN=	1480.10	DEPN=	.79	YC=	1479.47	DEPC=	.15	IFR=	0	ITN=	13	ITC= 13
I=	71	X=	2.723	YN=	1479.99	DEPN=	.80	YC=	1479.34	DEPC=	.15	IFR=	0	ITN=	13	ITC= 13
I=	72	X=	2.751	YN=	1479.88	DEPN=	.81	YC=	1479.22	DEPC=	.15	IFR=	0	ITN=	13	ITC= 13
I=	73	X=	2.780	YN=	1479.77	DEPN=	.83	YC=	1479.09	DEPC=	.15	IFR=	0	ITN=	13	ITC= 13
I=	74	X=	2.808	YN=	1479.65	DEPN=	.84	YC=	1478.97	DEPC=	.16	IFR=	0	ITN=	13	ITC= 13
I=	75	X=	2.836	YN=	1479.54	DEPN=	.86	YC=	1478.84	DEPC=	.16	IFR=	0	ITN=	13	ITC= 13
I=	76	X=	2.864	YN=	1479.43	DEPN=	.87	YC=	1478.71	DEPC=	.16	IFR=	0	ITN=	13	ITC= 13
I=	77	X=	2.892	YN=	1479.32	DEPN=	.89	YC=	1478.59	DEPC=	.17	IFR=	0	ITN=	13	ITC= 13
I=	78	X=	2.921	YN=	1479.21	DEPN=	.91	YC=	1478.46	DEPC=	.16	IFR=	0	ITN=	13	ITC= 13
I=	79	X=	2.949	YN=	1479.10	DEPN=	.93	YC=	1478.34	DEPC=	.17	IFR=	0	ITN=	13	ITC= 13
I=	80	X=	2.977	YN=	1478.99	DEPN=	.95	YC=	1478.22	DEPC=	.17	IFR=	0	ITN=	13	ITC= 13
I=	81	X=	3.005	YN=	1478.88	DEPN=	.97	YC=	1478.09	DEPC=	.18	IFR=	0	ITN=	13	ITC= 13
I=	82	X=	3.033	YN=	1478.78	DEPN=	.99	YC=	1477.97	DEPC=	.18	IFR=	0	ITN=	13	ITC= 13
I=	83	X=	3.062	YN=	1478.67	DEPN=	1.01	YC=	1477.85	DEPC=	.19	IFR=	0	ITN=	13	ITC= 13
I=	84	X=	3.090	YN=	1478.56	DEPN=	1.03	YC=	1477.72	DEPC=	.18	IFR=	0	ITN=	13	ITC= 13
I=	85	X=	3.118	YN=	1478.45	DEPN=	1.04	YC=	1477.59	DEPC=	.19	IFR=	0	ITN=	13	ITC= 13
I=	86	X=	3.146	YN=	1478.34	DEPN=	1.07	YC=	1477.47	DEPC=	.20	IFR=	0	ITN=	13	ITC= 13
	87	X=	3.174	YN=	1478.24	DEPN=	1.09	YC=	1477.35	DEPC=	.20	IFR=	0	ITN=	13	ITC= 13
	88	X=	3.202	YN=	1478.13	DEPN=	1.11	YC=	1477.22	DEPC=	.20	IFR=	0	ITN=	13	ITC= 13
	89	X=	3.231	YN=	1478.03	DEPN=	1.14	YC=	1477.10	DEPC=	.21	IFR=	0	ITN=	13	ITC= 13
	90	X=	3.259	YN=	1477.93	DEPN=	1.16	YC=	1476.98	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	91	X=	3.287	YN=	1477.83	DEPN=	1.19	YC=	1476.86	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	92	X=	3.315	YN=	1477.73	DEPN=	1.22	YC=	1476.74	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	93	X=	3.343	YN=	1477.63	DEPN=	1.25	YC=	1476.61	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	94	X=	3.372	YN=	1477.54	DEPN=	1.28	YC=	1476.49	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	95	X=	3.400	YN=	1477.45	DEPN=	1.32	YC=	1476.37	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13

I=	96	X=	3.428	YN=	1477.45	DEPN=	1.45	YC=	1476.25	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
	97	X=	3.477	YN=	1477.26	DEPN=	1.44	YC=	1476.07	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
	98	X=	3.526	YN=	1477.07	DEPN=	1.44	YC=	1475.88	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
I=	99	X=	3.575	YN=	1476.88	DEPN=	1.43	YC=	1475.69	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
=	100	X=	3.624	YN=	1476.69	DEPN=	1.43	YC=	1475.51	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
=	101	X=	3.674	YN=	1476.50	DEPN=	1.42	YC=	1475.32	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
=	102	X=	3.723	YN=	1476.31	DEPN=	1.42	YC=	1475.13	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
=	103	X=	3.772	YN=	1476.12	DEPN=	1.42	YC=	1474.95	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
I=	104	X=	3.821	YN=	1475.93	DEPN=	1.41	YC=	1474.77	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
I=	105	X=	3.870	YN=	1475.74	DEPN=	1.41	YC=	1474.58	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	106	X=	3.919	YN=	1475.56	DEPN=	1.41	YC=	1474.39	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	107	X=	3.968	YN=	1475.37	DEPN=	1.40	YC=	1474.21	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	108	X=	4.017	YN=	1475.17	DEPN=	1.40	YC=	1474.02	DEPC=	.25	IFR=	0	ITN=	13	ITC= 13
I=	109	X=	4.066	YN=	1474.99	DEPN=	1.40	YC=	1473.83	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	110	X=	4.116	YN=	1474.80	DEPN=	1.39	YC=	1473.65	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	111	X=	4.165	YN=	1474.61	DEPN=	1.39	YC=	1473.46	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	112	X=	4.214	YN=	1474.42	DEPN=	1.38	YC=	1473.28	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	113	X=	4.263	YN=	1474.24	DEPN=	1.38	YC=	1473.09	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	114	X=	4.312	YN=	1474.04	DEPN=	1.38	YC=	1472.91	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	115	X=	4.361	YN=	1473.86	DEPN=	1.38	YC=	1472.72	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	116	X=	4.410	YN=	1473.67	DEPN=	1.37	YC=	1472.54	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	117	X=	4.459	YN=	1473.48	DEPN=	1.37	YC=	1472.35	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	118	X=	4.508	YN=	1473.29	DEPN=	1.36	YC=	1472.16	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	119	X=	4.558	YN=	1473.10	DEPN=	1.36	YC=	1471.98	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	120	X=	4.607	YN=	1472.92	DEPN=	1.36	YC=	1471.80	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	121	X=	4.656	YN=	1472.73	DEPN=	1.36	YC=	1471.60	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	122	X=	4.705	YN=	1472.54	DEPN=	1.36	YC=	1471.42	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	123	X=	4.754	YN=	1472.35	DEPN=	1.35	YC=	1471.24	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	124	X=	4.803	YN=	1472.16	DEPN=	1.35	YC=	1471.05	DEPC=	.24	IFR=	0	ITN=	13	ITC= 13
I=	125	X=	4.852	YN=	1471.98	DEPN=	1.35	YC=	1470.86	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	126	X=	4.901	YN=	1471.78	DEPN=	1.34	YC=	1470.68	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	127	X=	4.950	YN=	1471.60	DEPN=	1.34	YC=	1470.49	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	128	X=	5.000	YN=	1471.41	DEPN=	1.34	YC=	1470.31	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	129	X=	5.049	YN=	1471.23	DEPN=	1.34	YC=	1470.12	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	130	X=	5.098	YN=	1471.03	DEPN=	1.33	YC=	1469.93	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	131	X=	5.147	YN=	1470.85	DEPN=	1.33	YC=	1469.75	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	132	X=	5.196	YN=	1470.66	DEPN=	1.33	YC=	1469.57	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	133	X=	5.245	YN=	1470.47	DEPN=	1.33	YC=	1469.38	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	134	X=	5.294	YN=	1470.28	DEPN=	1.32	YC=	1469.19	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	135	X=	5.343	YN=	1470.09	DEPN=	1.32	YC=	1469.01	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	136	X=	5.392	YN=	1469.91	DEPN=	1.31	YC=	1468.82	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
	137	X=	5.442	YN=	1469.72	DEPN=	1.31	YC=	1468.64	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
	138	X=	5.491	YN=	1469.53	DEPN=	1.31	YC=	1468.45	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
	139	X=	5.540	YN=	1469.34	DEPN=	1.30	YC=	1468.26	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
=	140	X=	5.589	YN=	1469.15	DEPN=	1.30	YC=	1468.08	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
=	141	X=	5.638	YN=	1468.97	DEPN=	1.30	YC=	1467.89	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
=	142	X=	5.687	YN=	1468.78	DEPN=	1.30	YC=	1467.71	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	143	X=	5.736	YN=	1468.59	DEPN=	1.30	YC=	1467.52	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	144	X=	5.785	YN=	1468.41	DEPN=	1.29	YC=	1467.33	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	145	X=	5.834	YN=	1468.22	DEPN=	1.29	YC=	1467.15	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	146	X=	5.884	YN=	1468.03	DEPN=	1.29	YC=	1466.96	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	147	X=	5.933	YN=	1467.84	DEPN=	1.29	YC=	1466.78	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	148	X=	5.982	YN=	1467.66	DEPN=	1.29	YC=	1466.60	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	149	X=	6.031	YN=	1467.46	DEPN=	1.28	YC=	1466.41	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	150	X=	6.080	YN=	1467.28	DEPN=	1.28	YC=	1466.22	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	151	X=	6.130	YN=	1467.10	DEPN=	1.29	YC=	1466.04	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	152	X=	6.180	YN=	1466.91	DEPN=	1.28	YC=	1465.85	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	153	X=	6.231	YN=	1466.72	DEPN=	1.28	YC=	1465.67	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	154	X=	6.281	YN=	1466.54	DEPN=	1.29	YC=	1465.48	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	155	X=	6.331	YN=	1466.35	DEPN=	1.28	YC=	1465.29	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	156	X=	6.381	YN=	1466.17	DEPN=	1.29	YC=	1465.11	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	157	X=	6.431	YN=	1465.98	DEPN=	1.29	YC=	1464.92	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	158	X=	6.482	YN=	1465.80	DEPN=	1.28	YC=	1464.73	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	159	X=	6.532	YN=	1465.61	DEPN=	1.29	YC=	1464.55	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	160	X=	6.582	YN=	1465.43	DEPN=	1.29	YC=	1464.36	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	161	X=	6.632	YN=	1465.24	DEPN=	1.28	YC=	1464.18	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	162	X=	6.683	YN=	1465.05	DEPN=	1.29	YC=	1463.99	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	163	X=	6.733	YN=	1464.87	DEPN=	1.28	YC=	1463.81	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	164	X=	6.783	YN=	1464.68	DEPN=	1.29	YC=	1463.62	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	165	X=	6.833	YN=	1464.50	DEPN=	1.29	YC=	1463.43	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	166	X=	6.883	YN=	1464.31	DEPN=	1.28	YC=	1463.24	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	167	X=	6.934	YN=	1464.12	DEPN=	1.29	YC=	1463.06	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	168	X=	6.984	YN=	1463.94	DEPN=	1.28	YC=	1462.87	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	169	X=	7.034	YN=	1463.75	DEPN=	1.29	YC=	1462.69	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	170	X=	7.084	YN=	1463.56	DEPN=	1.29	YC=	1462.50	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	171	X=	7.134	YN=	1463.38	DEPN=	1.28	YC=	1462.32	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	172	X=	7.185	YN=	1463.19	DEPN=	1.29	YC=	1462.13	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	173	X=	7.235	YN=	1463.01	DEPN=	1.28	YC=	1461.95	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	174	X=	7.285	YN=	1462.82	DEPN=	1.29	YC=	1461.76	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	175	X=	7.335	YN=	1462.63	DEPN=	1.29	YC=	1461.57	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13
I=	176	X=	7.385	YN=	1462.44	DEPN=	1.28	YC=	1461.38	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
	177	X=	7.436	YN=	1462.26	DEPN=	1.29	YC=	1461.20	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
	178	X=	7.486	YN=	1462.07	DEPN=	1.28	YC=	1461.01	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
=	179	X=	7.536	YN=	1461.89	DEPN=	1.29	YC=	1460.83	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
=	180	X=	7.586	YN=	1461.70	DEPN=	1.28	YC=	1460.64	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	181	X=	7.636	YN=	1461.52	DEPN=	1.29	YC=	1460.46	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	182	X=	7.687	YN=	1461.33	DEPN=	1.28	YC=	1460.27	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	183	X=	7.737	YN=	1461.15	DEPN=	1.29	YC=	1460.08	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	184	X=	7.787	YN=	1460.96	DEPN=	1.29	YC=	1459.90	DEPC=	.22	IFR=	0	ITN=	13	ITC= 13
I=	185	X=	7.837	YN=	1460.77	DEPN=	1.28	YC=	1459.71	DEPC=	.23	IFR=	0	ITN=	13	ITC= 13

I= 186	X= 7.888	YN= 1460.59	DEPN= 1.29	YC= 1459.52	DEPC= .22	IFR= 0	ITN= 13	ITC= 13
187	X= 7.938	YN= 1460.40	DEPN= 1.28	YC= 1459.34	DEPC= .22	IFR= 0	ITN= 13	ITC= 13
188	X= 7.988	YN= 1460.22	DEPN= 1.29	YC= 1459.15	DEPC= .22	IFR= 0	ITN= 13	ITC= 13
I= 189	X= 8.038	YN= 1460.03	DEPN= 1.28	YC= 1458.96	DEPC= .22	IFR= 0	ITN= 13	ITC= 13
= 190	X= 8.088	YN= 1459.84	DEPN= 1.29	YC= 1458.78	DEPC= .22	IFR= 0	ITN= 13	ITC= 13
191	X= 8.139	YN= 1459.65	DEPN= 1.28	YC= 1458.59	DEPC= .22	IFR= 0	ITN= 13	ITC= 13
= 192	X= 8.189	YN= 1459.47	DEPN= 1.29	YC= 1458.41	DEPC= .22	IFR= 0	ITN= 13	ITC= 13
= 193	X= 8.239	YN= 1459.28	DEPN= 1.28	YC= 1458.22	DEPC= .22	IFR= 0	ITN= 13	ITC= 13

(IFR(I),I=1,N)

0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0							

IN= 193 YNN= 1459.28 DEP= 1.28

I= 192	X= 8.189	QIL= 89.	YIL= 1459.47	DEP= 1.28	ITB= 4
I= 191	X= 8.139	QIL= 89.	YIL= 1459.66	DEP= 1.29	ITB= 4
I= 190	X= 8.088	QIL= 89.	YIL= 1459.84	DEP= 1.29	ITB= 4
I= 189	X= 8.038	QIL= 89.	YIL= 1460.03	DEP= 1.29	ITB= 4
I= 188	X= 7.988	QIL= 89.	YIL= 1460.22	DEP= 1.29	ITB= 4
I= 187	X= 7.938	QIL= 89.	YIL= 1460.40	DEP= 1.29	ITB= 4
I= 186	X= 7.888	QIL= 89.	YIL= 1460.59	DEP= 1.29	ITB= 4
I= 185	X= 7.837	QIL= 89.	YIL= 1460.78	DEP= 1.29	ITB= 4
I= 184	X= 7.787	QIL= 89.	YIL= 1460.96	DEP= 1.29	ITB= 4
I= 183	X= 7.737	QIL= 89.	YIL= 1461.15	DEP= 1.29	ITB= 4
I= 182	X= 7.687	QIL= 89.	YIL= 1461.33	DEP= 1.29	ITB= 4
I= 181	X= 7.636	QIL= 89.	YIL= 1461.52	DEP= 1.29	ITB= 4
I= 180	X= 7.586	QIL= 89.	YIL= 1461.71	DEP= 1.29	ITB= 4
I= 179	X= 7.536	QIL= 89.	YIL= 1461.89	DEP= 1.29	ITB= 4
I= 178	X= 7.486	QIL= 89.	YIL= 1462.08	DEP= 1.29	ITB= 4
I= 177	X= 7.436	QIL= 89.	YIL= 1462.26	DEP= 1.29	ITB= 4
I= 176	X= 7.385	QIL= 89.	YIL= 1462.45	DEP= 1.29	ITB= 4
I= 175	X= 7.335	QIL= 89.	YIL= 1462.64	DEP= 1.29	ITB= 4
I= 174	X= 7.285	QIL= 89.	YIL= 1462.82	DEP= 1.29	ITB= 4
I= 173	X= 7.235	QIL= 89.	YIL= 1463.01	DEP= 1.29	ITB= 4
I= 172	X= 7.185	QIL= 89.	YIL= 1463.19	DEP= 1.29	ITB= 4
I= 171	X= 7.134	QIL= 89.	YIL= 1463.38	DEP= 1.29	ITB= 4
I= 170	X= 7.084	QIL= 89.	YIL= 1463.57	DEP= 1.29	ITB= 4
I= 169	X= 7.034	QIL= 89.	YIL= 1463.75	DEP= 1.29	ITB= 4
I= 168	X= 6.984	QIL= 89.	YIL= 1463.94	DEP= 1.29	ITB= 4
I= 167	X= 6.934	QIL= 89.	YIL= 1464.12	DEP= 1.29	ITB= 4
I= 166	X= 6.883	QIL= 89.	YIL= 1464.31	DEP= 1.29	ITB= 4
I= 165	X= 6.833	QIL= 89.	YIL= 1464.50	DEP= 1.29	ITB= 4
I= 164	X= 6.783	QIL= 89.	YIL= 1464.68	DEP= 1.29	ITB= 4
I= 163	X= 6.733	QIL= 89.	YIL= 1464.87	DEP= 1.29	ITB= 4
I= 162	X= 6.683	QIL= 89.	YIL= 1465.05	DEP= 1.29	ITB= 4
I= 161	X= 6.632	QIL= 89.	YIL= 1465.24	DEP= 1.29	ITB= 4
I= 160	X= 6.582	QIL= 89.	YIL= 1465.43	DEP= 1.29	ITB= 4
I= 159	X= 6.532	QIL= 89.	YIL= 1465.61	DEP= 1.29	ITB= 4
I= 158	X= 6.482	QIL= 89.	YIL= 1465.80	DEP= 1.29	ITB= 4
I= 157	X= 6.431	QIL= 89.	YIL= 1465.98	DEP= 1.29	ITB= 4
I= 156	X= 6.381	QIL= 89.	YIL= 1466.17	DEP= 1.29	ITB= 4
I= 155	X= 6.331	QIL= 89.	YIL= 1466.36	DEP= 1.29	ITB= 4
I= 154	X= 6.281	QIL= 89.	YIL= 1466.54	DEP= 1.29	ITB= 4
I= 153	X= 6.231	QIL= 89.	YIL= 1466.73	DEP= 1.29	ITB= 4
I= 152	X= 6.180	QIL= 89.	YIL= 1466.92	DEP= 1.29	ITB= 4
I= 151	X= 6.130	QIL= 89.	YIL= 1467.10	DEP= 1.29	ITB= 4
I= 150	X= 6.080	QIL= 89.	YIL= 1467.29	DEP= 1.29	ITB= 4
I= 149	X= 6.031	QIL= 89.	YIL= 1467.47	DEP= 1.29	ITB= 4
I= 148	X= 5.982	QIL= 89.	YIL= 1467.66	DEP= 1.28	ITB= 4
I= 147	X= 5.933	QIL= 89.	YIL= 1467.84	DEP= 1.29	ITB= 4
I= 146	X= 5.884	QIL= 89.	YIL= 1468.03	DEP= 1.29	ITB= 4
I= 145	X= 5.834	QIL= 89.	YIL= 1468.21	DEP= 1.29	ITB= 4
I= 144	X= 5.785	QIL= 89.	YIL= 1468.40	DEP= 1.29	ITB= 4
I= 143	X= 5.736	QIL= 89.	YIL= 1468.59	DEP= 1.29	ITB= 4
I= 142	X= 5.687	QIL= 89.	YIL= 1468.78	DEP= 1.30	ITB= 4
I= 141	X= 5.638	QIL= 89.	YIL= 1468.96	DEP= 1.30	ITB= 4
I= 140	X= 5.589	QIL= 89.	YIL= 1469.15	DEP= 1.30	ITB= 4
I= 139	X= 5.540	QIL= 89.	YIL= 1469.34	DEP= 1.30	ITB= 4
I= 138	X= 5.491	QIL= 89.	YIL= 1469.53	DEP= 1.31	ITB= 4
I= 137	X= 5.442	QIL= 89.	YIL= 1469.72	DEP= 1.31	ITB= 4

I=	136	X=	5.392	QIL=	89.	YIL=	1469.90	DEP=	1.31	ITB=	4
I=	135	X=	5.343	QIL=	89.	YIL=	1470.09	DEP=	1.31	ITB=	4
I=	134	X=	5.294	QIL=	89.	YIL=	1470.28	DEP=	1.32	ITB=	4
I=	133	X=	5.245	QIL=	89.	YIL=	1470.47	DEP=	1.32	ITB=	4
I=	132	X=	5.196	QIL=	89.	YIL=	1470.66	DEP=	1.32	ITB=	4
I=	131	X=	5.147	QIL=	89.	YIL=	1470.84	DEP=	1.32	ITB=	4
I=	130	X=	5.098	QIL=	89.	YIL=	1471.03	DEP=	1.33	ITB=	4
I=	129	X=	5.049	QIL=	89.	YIL=	1471.22	DEP=	1.33	ITB=	4
I=	128	X=	5.000	QIL=	89.	YIL=	1471.41	DEP=	1.33	ITB=	4
I=	127	X=	4.950	QIL=	89.	YIL=	1471.59	DEP=	1.34	ITB=	4
I=	126	X=	4.901	QIL=	89.	YIL=	1471.78	DEP=	1.34	ITB=	4
I=	125	X=	4.852	QIL=	89.	YIL=	1471.97	DEP=	1.34	ITB=	4
I=	124	X=	4.803	QIL=	89.	YIL=	1472.16	DEP=	1.34	ITB=	4
I=	123	X=	4.754	QIL=	89.	YIL=	1472.35	DEP=	1.35	ITB=	4
I=	122	X=	4.705	QIL=	89.	YIL=	1472.54	DEP=	1.35	ITB=	4
I=	121	X=	4.656	QIL=	89.	YIL=	1472.72	DEP=	1.35	ITB=	4
I=	120	X=	4.607	QIL=	89.	YIL=	1472.91	DEP=	1.36	ITB=	4
I=	119	X=	4.558	QIL=	89.	YIL=	1473.10	DEP=	1.36	ITB=	4
I=	118	X=	4.508	QIL=	89.	YIL=	1473.29	DEP=	1.36	ITB=	4
I=	117	X=	4.459	QIL=	89.	YIL=	1473.48	DEP=	1.36	ITB=	4
I=	116	X=	4.410	QIL=	89.	YIL=	1473.66	DEP=	1.37	ITB=	4
I=	115	X=	4.361	QIL=	89.	YIL=	1473.85	DEP=	1.37	ITB=	4
I=	114	X=	4.312	QIL=	89.	YIL=	1474.04	DEP=	1.37	ITB=	4
I=	113	X=	4.263	QIL=	89.	YIL=	1474.23	DEP=	1.38	ITB=	4
I=	112	X=	4.214	QIL=	89.	YIL=	1474.42	DEP=	1.38	ITB=	4
I=	111	X=	4.165	QIL=	89.	YIL=	1474.61	DEP=	1.38	ITB=	4
I=	110	X=	4.116	QIL=	89.	YIL=	1474.79	DEP=	1.39	ITB=	4
I=	109	X=	4.066	QIL=	89.	YIL=	1474.98	DEP=	1.39	ITB=	4
I=	108	X=	4.017	QIL=	89.	YIL=	1475.17	DEP=	1.39	ITB=	4
I=	107	X=	3.968	QIL=	89.	YIL=	1475.36	DEP=	1.40	ITB=	4
I=	106	X=	3.919	QIL=	89.	YIL=	1475.55	DEP=	1.40	ITB=	4
I=	105	X=	3.870	QIL=	89.	YIL=	1475.74	DEP=	1.40	ITB=	4
I=	104	X=	3.821	QIL=	89.	YIL=	1475.93	DEP=	1.41	ITB=	4
I=	103	X=	3.772	QIL=	89.	YIL=	1476.11	DEP=	1.41	ITB=	4
I=	102	X=	3.723	QIL=	89.	YIL=	1476.30	DEP=	1.41	ITB=	4
I=	101	X=	3.674	QIL=	89.	YIL=	1476.49	DEP=	1.42	ITB=	4
I=	100	X=	3.624	QIL=	89.	YIL=	1476.68	DEP=	1.42	ITB=	4
I=	99	X=	3.575	QIL=	89.	YIL=	1476.87	DEP=	1.43	ITB=	4
I=	98	X=	3.526	QIL=	89.	YIL=	1477.06	DEP=	1.43	ITB=	4
I=	97	X=	3.477	QIL=	89.	YIL=	1477.25	DEP=	1.43	ITB=	4
I=	96	X=	3.428	QIL=	89.	YIL=	1477.44	DEP=	1.44	ITB=	4
I=	95	X=	3.400	QIL=	89.	YIL=	1477.54	DEP=	1.42	ITB=	4
I=	94	X=	3.372	QIL=	89.	YIL=	1477.65	DEP=	1.39	ITB=	4
I=	93	X=	3.343	QIL=	89.	YIL=	1477.74	DEP=	1.36	ITB=	4
I=	92	X=	3.315	QIL=	89.	YIL=	1477.84	DEP=	1.33	ITB=	4
I=	91	X=	3.287	QIL=	89.	YIL=	1477.94	DEP=	1.30	ITB=	4
I=	90	X=	3.259	QIL=	89.	YIL=	1478.03	DEP=	1.27	ITB=	4
I=	89	X=	3.231	QIL=	89.	YIL=	1478.13	DEP=	1.24	ITB=	4
I=	88	X=	3.202	QIL=	89.	YIL=	1478.23	DEP=	1.21	ITB=	4
I=	87	X=	3.174	QIL=	89.	YIL=	1478.33	DEP=	1.18	ITB=	4
I=	86	X=	3.146	QIL=	89.	YIL=	1478.43	DEP=	1.15	ITB=	4
I=	85	X=	3.118	QIL=	89.	YIL=	1478.53	DEP=	1.12	ITB=	4
I=	84	X=	3.090	QIL=	89.	YIL=	1478.63	DEP=	1.10	ITB=	4
I=	83	X=	3.062	QIL=	89.	YIL=	1478.73	DEP=	1.07	ITB=	4
I=	82	X=	3.033	QIL=	89.	YIL=	1478.84	DEP=	1.05	ITB=	4
I=	81	X=	3.005	QIL=	89.	YIL=	1478.95	DEP=	1.03	ITB=	5
I=	80	X=	2.977	QIL=	89.	YIL=	1479.05	DEP=	1.01	ITB=	5
I=	79	X=	2.949	QIL=	89.	YIL=	1479.16	DEP=	.99	ITB=	5
I=	78	X=	2.921	QIL=	89.	YIL=	1479.27	DEP=	.97	ITB=	5
I=	77	X=	2.892	QIL=	89.	YIL=	1479.38	DEP=	.95	ITB=	5
I=	76	X=	2.864	QIL=	89.	YIL=	1479.49	DEP=	.93	ITB=	5
I=	75	X=	2.836	QIL=	89.	YIL=	1479.60	DEP=	.91	ITB=	5
I=	74	X=	2.808	QIL=	89.	YIL=	1479.70	DEP=	.90	ITB=	5
I=	73	X=	2.780	QIL=	89.	YIL=	1479.82	DEP=	.88	ITB=	5
I=	72	X=	2.751	QIL=	89.	YIL=	1479.93	DEP=	.86	ITB=	5
I=	71	X=	2.723	QIL=	89.	YIL=	1480.04	DEP=	.85	ITB=	5
I=	70	X=	2.695	QIL=	89.	YIL=	1480.15	DEP=	.83	ITB=	5
I=	69	X=	2.667	QIL=	89.	YIL=	1480.26	DEP=	.82	ITB=	5
I=	68	X=	2.639	QIL=	89.	YIL=	1480.38	DEP=	.80	ITB=	5
I=	67	X=	2.610	QIL=	89.	YIL=	1480.49	DEP=	.79	ITB=	5
I=	66	X=	2.582	QIL=	89.	YIL=	1480.60	DEP=	.77	ITB=	5
I=	65	X=	2.554	QIL=	89.	YIL=	1480.72	DEP=	.76	ITB=	5
I=	64	X=	2.526	QIL=	89.	YIL=	1480.83	DEP=	.75	ITB=	5
I=	63	X=	2.498	QIL=	89.	YIL=	1480.95	DEP=	.74	ITB=	5
I=	62	X=	2.469	QIL=	89.	YIL=	1481.07	DEP=	.73	ITB=	5
I=	61	X=	2.441	QIL=	89.	YIL=	1481.18	DEP=	.72	ITB=	5
I=	60	X=	2.413	QIL=	89.	YIL=	1481.30	DEP=	.71	ITB=	5
I=	59	X=	2.385	QIL=	89.	YIL=	1481.42	DEP=	.70	ITB=	5
I=	58	X=	2.357	QIL=	89.	YIL=	1481.54	DEP=	.69	ITB=	5
I=	57	X=	2.329	QIL=	89.	YIL=	1481.66	DEP=	.68	ITB=	5
I=	56	X=	2.300	QIL=	89.	YIL=	1481.78	DEP=	.67	ITB=	5
I=	55	X=	2.272	QIL=	89.	YIL=	1481.89	DEP=	.66	ITB=	5
I=	54	X=	2.244	QIL=	89.	YIL=	1482.01	DEP=	.65	ITB=	5
I=	53	X=	2.216	QIL=	89.	YIL=	1482.13	DEP=	.64	ITB=	5
I=	52	X=	2.188	QIL=	89.	YIL=	1482.25	DEP=	.64	ITB=	5
I=	51	X=	2.159	QIL=	89.	YIL=	1482.37	DEP=	.63	ITB=	5
I=	50	X=	2.131	QIL=	89.	YIL=	1482.49	DEP=	.62	ITB=	5
I=	49	X=	2.103	QIL=	89.	YIL=	1482.61	DEP=	.61	ITB=	5
I=	48	X=	2.053	QIL=	89.	YIL=	1482.83	DEP=	.62	ITB=	5
I=	47	X=	2.003	QIL=	89.	YIL=	1483.06	DEP=	.63	ITB=	5

I= 46	X= 1.953	QIL= 89.	YIL= 1483.28	DEP= .64	ITB= 5
I= 45	X= 1.903	QIL= 89.	YIL= 1483.51	DEP= .65	ITB= 5
I= 44	X= 1.853	QIL= 89.	YIL= 1483.73	DEP= .66	ITB= 5
I= 43	X= 1.803	QIL= 89.	YIL= 1483.96	DEP= .68	ITB= 5
I= 42	X= 1.753	QIL= 89.	YIL= 1484.19	DEP= .69	ITB= 5
I= 41	X= 1.702	QIL= 89.	YIL= 1484.42	DEP= .70	ITB= 5
I= 40	X= 1.652	QIL= 89.	YIL= 1484.65	DEP= .72	ITB= 5
I= 39	X= 1.602	QIL= 89.	YIL= 1484.88	DEP= .74	ITB= 5
I= 38	X= 1.552	QIL= 89.	YIL= 1485.11	DEP= .75	ITB= 5
I= 37	X= 1.502	QIL= 89.	YIL= 1485.34	DEP= .77	ITB= 5
I= 36	X= 1.452	QIL= 89.	YIL= 1485.58	DEP= .79	ITB= 5
I= 35	X= 1.402	QIL= 89.	YIL= 1485.81	DEP= .81	ITB= 5
I= 34	X= 1.352	QIL= 89.	YIL= 1486.05	DEP= .83	ITB= 5
I= 33	X= 1.302	QIL= 89.	YIL= 1486.29	DEP= .86	ITB= 4
I= 32	X= 1.252	QIL= 89.	YIL= 1486.53	DEP= .88	ITB= 4
I= 31	X= 1.202	QIL= 89.	YIL= 1486.77	DEP= .91	ITB= 4
I= 30	X= 1.152	QIL= 89.	YIL= 1487.01	DEP= .94	ITB= 4
I= 29	X= 1.102	QIL= 89.	YIL= 1487.26	DEP= .97	ITB= 5
I= 28	X= 1.051	QIL= 89.	YIL= 1487.50	DEP= 1.00	ITB= 4
I= 27	X= 1.001	QIL= 89.	YIL= 1487.75	DEP= 1.04	ITB= 4
I= 26	X= .951	QIL= 89.	YIL= 1488.00	DEP= 1.07	ITB= 4
I= 25	X= .901	QIL= 89.	YIL= 1488.25	DEP= 1.11	ITB= 4
I= 24	X= .851	QIL= 89.	YIL= 1488.50	DEP= 1.15	ITB= 4
I= 23	X= .801	QIL= 89.	YIL= 1488.76	DEP= 1.19	ITB= 4
I= 22	X= .751	QIL= 89.	YIL= 1489.02	DEP= 1.24	ITB= 4
I= 21	X= .701	QIL= 89.	YIL= 1489.29	DEP= 1.29	ITB= 4
I= 20	X= .666	QIL= 89.	YIL= 1489.47	DEP= 1.37	ITB= 4
I= 19	X= .631	QIL= 89.	YIL= 1489.63	DEP= 1.43	ITB= 4
I= 18	X= .596	QIL= 89.	YIL= 1489.79	DEP= 1.49	ITB= 4
I= 17	X= .561	QIL= 89.	YIL= 1489.95	DEP= 1.55	ITB= 4
I= 16	X= .526	QIL= 89.	YIL= 1490.11	DEP= 1.61	ITB= 4
I= 15	X= .491	QIL= 89.	YIL= 1490.27	DEP= 1.67	ITB= 4
I= 14	X= .456	QIL= 89.	YIL= 1490.43	DEP= 1.73	ITB= 4
I= 13	X= .421	QIL= 89.	YIL= 1490.59	DEP= 1.79	ITB= 4
I= 12	X= .386	QIL= 89.	YIL= 1490.76	DEP= 1.86	ITB= 4
I= 11	X= .351	QIL= 89.	YIL= 1490.94	DEP= 1.94	ITB= 4
I= 10	X= .315	QIL= 89.	YIL= 1491.12	DEP= 2.02	ITB= 4
I= 9	X= .280	QIL= 89.	YIL= 1491.31	DEP= 2.11	ITB= 4
I= 8	X= .245	QIL= 89.	YIL= 1491.51	DEP= 2.21	ITB= 4
I= 7	X= .210	QIL= 89.	YIL= 1491.73	DEP= 2.33	ITB= 4
I= 6	X= .175	QIL= 89.	YIL= 1491.96	DEP= 2.46	ITB= 4
I= 5	X= .140	QIL= 89.	YIL= 1492.20	DEP= 2.60	ITB= 4
I= 4	X= .105	QIL= 89.	YIL= 1492.46	DEP= 2.76	ITB= 4
I= 3	X= .070	QIL= 89.	YIL= 1492.74	DEP= 2.94	ITB= 4
I= 2	X= .035	QIL= 89.	YIL= 1493.03	DEP= 3.13	ITB= 4
I= 1	X= .000	QIL= 89.	YIL= 1493.34	DEP= 3.34	ITB= 4

INITIAL CONDITIONS

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   (QDI(I),I=1,N)
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
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89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.      89.      89.      89.      89.      89.      89.      89.
89.
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(YI(I),I=1,N)

3.34	1493.03	1492.74	1492.46	1492.20	1491.96	1491.73	1491.51
1.31	1491.12	1490.94	1490.76	1490.59	1490.43	1490.27	1490.11
1489.95	1489.79	1489.63	1489.47	1489.29	1489.02	1488.76	1488.50
488.25	1488.00	1487.75	1487.50	1487.26	1487.01	1486.77	1486.53
486.29	1486.05	1485.81	1485.58	1485.34	1485.11	1484.88	1484.65
484.42	1484.19	1483.96	1483.73	1483.51	1483.28	1483.06	1482.83
182.61	1482.49	1482.37	1482.25	1482.13	1482.01	1481.89	1481.78
1481.66	1481.54	1481.42	1481.30	1481.18	1481.07	1480.95	1480.83
1480.72	1480.60	1480.49	1480.38	1480.26	1480.15	1480.04	1479.93
1479.82	1479.70	1479.60	1479.49	1479.38	1479.27	1479.16	1479.05
1478.95	1478.84	1478.73	1478.63	1478.53	1478.43	1478.33	1478.23
1478.13	1478.03	1477.94	1477.84	1477.74	1477.65	1477.54	1477.44
1477.25	1477.06	1476.87	1476.68	1476.49	1476.30	1476.11	1475.93
1475.74	1475.55	1475.36	1475.17	1474.98	1474.79	1474.61	1474.42
1474.23	1474.04	1473.85	1473.66	1473.48	1473.29	1473.10	1472.91
1472.72	1472.54	1472.35	1472.16	1471.97	1471.78	1471.59	1471.41
1471.22	1471.03	1470.84	1470.66	1470.47	1470.28	1470.09	1469.90
1469.72	1469.53	1469.34	1469.15	1468.96	1468.78	1468.59	1468.40
1468.21	1468.03	1467.84	1467.66	1467.47	1467.29	1467.10	1466.92
1466.73	1466.54	1466.36	1466.17	1465.98	1465.80	1465.61	1465.43
1465.24	1465.05	1464.87	1464.68	1464.50	1464.31	1464.12	1463.94
1463.75	1463.57	1463.38	1463.19	1463.01	1462.82	1462.64	1462.45
1462.26	1462.08	1461.89	1461.71	1461.52	1461.33	1461.15	1460.96
1460.78	1460.59	1460.40	1460.22	1460.03	1459.84	1459.66	1459.47
1459.28							

ROUTING COMPLETED.

KTIME= 699 ALLOWABLE KTIME= 699 TT= 14.0

PROFILE OF CRESTS AND TIMES FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

DISTANCE FROM DAM MILE	MAX ELEV FEET	MAX FLOW CFS	TIME MAX ELEV-HRS	MAX VEL FPS	FLOOD ELEV FEET	TIME FLOOD ELEV-HRS
.000	1512.59	22704	.440	3.83	.00	.00
.035	1512.25	22217	.460	3.86	.00	.00
.070	1511.95	21707	.460	3.89	.00	.00
.105	1511.62	21267	.460	3.92	.00	.00
.140	1511.27	20820	.460	3.94	.00	.00
.175	1510.89	20379	.460	3.98	.00	.00
.210	1510.56	19974	.480	4.00	.00	.00
.245	1510.20	19539	.480	4.04	.00	.00
.280	1509.82	19082	.480	4.06	.00	.00
.315	1509.43	18717	.500	4.09	.00	.00
.351	1509.06	18319	.500	4.12	.00	.00
.386	1508.67	17893	.500	4.15	.00	.00
.421	1508.24	17509	.500	4.18	.00	.00
.456	1507.84	17168	.520	4.20	.00	.00
.491	1507.42	16796	.520	4.23	.00	.00
.526	1506.96	16407	.520	4.25	.00	.00
.561	1506.52	16128	.540	4.29	.00	.00
.596	1506.05	15816	.540	4.33	.00	.00
.631	1505.55	15477	.560	4.38	.00	.00
.666	1505.06	15227	.560	4.46	.00	.00
.701	1504.52	14966	.560	4.55	.00	.00
.751	1503.79	14552	.580	4.51	.00	.00
.801	1503.07	14215	.600	4.46	.00	.00
.851	1502.36	13814	.600	4.41	.00	.00
.901	1501.68	13475	.620	4.36	.00	.00
.951	1501.01	13105	.640	4.29	.00	.00
1.001	1500.35	12758	.660	4.23	.00	.00
1.051	1499.71	12422	.680	4.17	.00	.00
1.102	1499.09	12073	.700	4.11	.00	.00
1.152	1498.49	11748	.700	4.03	.00	.00
1.202	1497.90	11438	.720	3.97	.00	.00
1.252	1497.33	11125	.740	3.90	.00	.00
1.302	1496.77	10814	.760	3.83	.00	.00
1.352	1496.22	10509	.780	3.75	.00	.00
1.402	1495.68	10210	.800	3.69	.00	.00
1.452	1495.16	9930	.820	3.63	.00	.00
1.502	1494.65	9655	.860	3.55	.00	.00
1.552	1494.16	9386	.880	3.47	.00	.00
1.602	1493.67	9125	.900	3.39	.00	.00
1.652	1493.19	8870	.920	3.31	.00	.00
1.702	1492.73	8621	.940	3.23	.00	.00
1.753	1492.28	8381	.980	3.15	.00	.00
1.803	1491.85	8154	1.020	3.08	.00	.00
1.853	1491.44	7934	1.040	3.01	.00	.00
1.903	1491.06	7707	1.080	2.94	.00	.00
1.953	1490.72	7470	1.140	2.87	.00	.00
2.003	1490.41	7222	1.180	2.80	.00	.00
2.053	1490.13	6964	1.220	2.72	.00	.00

PROFILE OF CRESTS AND TIMES FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

DISTANCE FROM DAM MILE	MAX ELEV FEET	MAX FLOW CFS	TIME MAX ELEV-HRS	MAX VEL FPS	FLOOD ELEV FEET	TIME FLOOD ELEV-HRS
2.103	1489.88	6700	1.260	2.60	.00	.00
2.131	1489.75	6557	1.280	2.60	.00	.00
2.159	1489.62	6418	1.300	2.59	.00	.00
2.188	1489.50	6281	1.320	2.56	.00	.00
2.216	1489.37	6146	1.340	2.55	.00	.00
2.244	1489.25	6017	1.380	2.54	.00	.00
2.272	1489.13	5893	1.400	2.52	.00	.00
2.300	1489.02	5771	1.420	2.51	.00	.00
2.329	1488.90	5653	1.440	2.50	.00	.00
2.357	1488.79	5537	1.480	2.48	.00	.00
2.385	1488.68	5424	1.500	2.47	.00	.00
2.413	1488.58	5314	1.520	2.46	.00	.00
2.441	1488.47	5209	1.560	2.45	.00	.00
2.469	1488.37	5106	1.580	2.44	.00	.00
2.498	1488.28	5005	1.600	2.43	.00	.00
2.526	1488.18	4906	1.640	2.42	.00	.00
2.554	1488.09	4809	1.660	2.40	.00	.00
2.582	1487.99	4714	1.680	2.40	.00	.00
2.610	1487.90	4623	1.700	2.39	.00	.00
2.639	1487.81	4534	1.720	2.37	.00	.00
2.667	1487.72	4446	1.740	2.37	.00	.00
2.695	1487.64	4360	1.760	2.36	.00	.00
2.723	1487.55	4276	1.780	2.35	.00	.00
2.751	1487.46	4193	1.800	2.34	.00	.00
2.780	1487.37	4112	1.820	2.33	.00	.00
2.808	1487.28	4033	1.840	2.32	.00	.00
2.836	1487.19	3956	1.860	2.31	.00	.00
2.864	1487.10	3881	1.880	2.31	.00	.00
2.892	1487.01	3807	1.900	2.30	.00	.00
2.921	1486.92	3735	1.900	2.29	.00	.00
2.949	1486.82	3665	1.920	2.28	.00	.00
2.977	1486.73	3598	1.940	2.28	.00	.00
3.005	1486.63	3534	1.960	2.27	.00	.00
3.033	1486.53	3475	1.980	2.26	.00	.00
3.062	1486.43	3421	2.000	2.25	.00	.00
3.090	1486.32	3372	2.020	2.24	.00	.00
3.118	1486.21	3326	2.040	2.24	.00	.00
3.146	1486.10	3284	2.060	2.23	.00	.00
3.174	1485.99	3244	2.080	2.22	.00	.00
3.202	1485.87	3206	2.100	2.21	.00	.00
3.231	1485.75	3170	2.120	2.19	.00	.00
3.259	1485.62	3136	2.140	2.18	.00	.00
3.287	1485.49	3102	2.160	2.17	.00	.00
3.315	1485.36	3069	2.180	2.16	.00	.00
3.343	1485.22	3037	2.220	2.15	.00	.00
3.372	1485.09	3005	2.240	2.14	.00	.00
3.400	1484.95	2974	2.260	2.13	.00	.00
3.428	1484.82	2944	2.300	2.10	.00	.00

PROFILE OF CRESTS AND TIMES FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

DISTANCE FROM DAM MILE	MAX ELEV FEET	MAX FLOW CFS	TIME MAX ELEV-HRS	MAX VEL FPS	FLOOD ELEV FEET	TIME FLOOD ELEV-HRS
3.477	1484.59	2893	2.340	2.08	.00	.00
3.526	1484.36	2844	2.380	2.06	.00	.00
3.575	1484.13	2797	2.420	2.04	.00	.00
3.624	1483.90	2752	2.460	2.02	.00	.00
3.674	1483.67	2708	2.520	2.01	.00	.00
3.723	1483.45	2667	2.560	1.99	.00	.00
3.772	1483.22	2627	2.600	1.97	.00	.00
3.821	1483.00	2588	2.640	1.96	.00	.00
3.870	1482.77	2551	2.700	1.94	.00	.00
3.919	1482.54	2516	2.740	1.93	.00	.00
3.968	1482.32	2481	2.780	1.91	.00	.00
4.017	1482.10	2448	2.840	1.90	.00	.00
4.066	1481.87	2416	2.880	1.88	.00	.00
4.116	1481.65	2385	2.920	1.87	.00	.00
4.165	1481.42	2356	2.980	1.86	.00	.00
4.214	1481.20	2327	3.020	1.84	.00	.00
4.263	1480.97	2299	3.080	1.83	.00	.00
4.312	1480.75	2272	3.120	1.82	.00	.00
4.361	1480.52	2246	3.160	1.81	.00	.00
4.410	1480.30	2221	3.220	1.80	.00	.00
4.459	1480.07	2197	3.260	1.78	.00	.00
4.508	1479.85	2174	3.300	1.77	.00	.00
4.558	1479.62	2151	3.360	1.76	.00	.00
4.607	1479.40	2130	3.400	1.75	.00	.00
4.656	1479.18	2109	3.440	1.74	.00	.00
4.705	1478.95	2088	3.500	1.73	.00	.00
4.754	1478.73	2069	3.540	1.72	.00	.00
4.803	1478.51	2050	3.600	1.71	.00	.00
4.852	1478.28	2031	3.640	1.70	.00	.00
4.901	1478.06	2014	3.680	1.69	.00	.00
4.950	1477.84	1996	3.740	1.68	.00	.00
5.000	1477.62	1980	3.780	1.68	.00	.00
5.049	1477.40	1963	3.840	1.67	.00	.00
5.098	1477.18	1947	3.880	1.66	.00	.00
5.147	1476.96	1932	3.920	1.65	.00	.00
5.196	1476.74	1917	3.980	1.64	.00	.00
5.245	1476.52	1902	4.020	1.63	.00	.00
5.294	1476.30	1888	4.060	1.63	.00	.00
5.343	1476.09	1874	4.120	1.62	.00	.00
5.392	1475.87	1861	4.160	1.61	.00	.00
5.442	1475.65	1847	4.220	1.60	.00	.00
5.491	1475.44	1834	4.280	1.60	.00	.00
5.540	1475.22	1821	4.320	1.59	.00	.00
5.589	1475.01	1809	4.360	1.58	.00	.00
5.638	1474.80	1796	4.420	1.58	.00	.00
5.687	1474.58	1784	4.460	1.57	.00	.00
5.736	1474.37	1772	4.520	1.56	.00	.00
5.785	1474.16	1761	4.560	1.56	.00	.00

PROFILE OF CRESTS AND TIMES FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

DISTANCE FROM DAM MILE	MAX ELEV FEET	MAX FLOW CFS	TIME MAX ELEV-HRS	MAX VEL FPS	FLOOD ELEV FEET	TIME FLOOD ELEV-HRS
5.834	1473.95	1749	4.620	1.55	.00	.00
5.884	1473.74	1738	4.660	1.54	.00	.00
5.933	1473.54	1726	4.720	1.53	.00	.00
5.982	1473.33	1715	4.780	1.53	.00	.00
6.031	1473.13	1705	4.820	1.52	.00	.00
6.080	1472.92	1694	4.860	1.51	.00	.00
6.130	1472.72	1683	4.920	1.50	.00	.00
6.180	1472.51	1673	4.960	1.50	.00	.00
6.231	1472.30	1662	5.020	1.49	.00	.00
6.281	1472.10	1652	5.080	1.48	.00	.00
6.331	1471.89	1642	5.120	1.48	.00	.00
6.381	1471.69	1633	5.180	1.47	.00	.00
6.431	1471.48	1623	5.220	1.47	.00	.00
6.482	1471.28	1614	5.280	1.46	.00	.00
6.532	1471.07	1604	5.320	1.46	.00	.00
6.582	1470.87	1595	5.380	1.45	.00	.00
6.632	1470.66	1586	5.420	1.45	.00	.00
6.683	1470.46	1578	5.480	1.44	.00	.00
6.733	1470.26	1569	5.540	1.44	.00	.00
6.783	1470.05	1560	5.580	1.43	.00	.00
6.833	1469.85	1552	5.620	1.43	.00	.00
6.883	1469.65	1544	5.680	1.43	.00	.00
6.934	1469.44	1536	5.740	1.42	.00	.00
6.984	1469.24	1528	5.780	1.42	.00	.00
7.034	1469.04	1520	5.840	1.41	.00	.00
7.084	1468.84	1512	5.900	1.41	.00	.00
7.134	1468.64	1505	5.940	1.40	.00	.00
7.185	1468.43	1497	5.980	1.40	.00	.00
7.235	1468.23	1490	6.040	1.40	.00	.00
7.285	1468.03	1482	6.100	1.39	.00	.00
7.335	1467.83	1475	6.160	1.39	.00	.00
7.385	1467.63	1468	6.200	1.38	.00	.00
7.436	1467.43	1461	6.260	1.38	.00	.00
7.486	1467.23	1454	6.320	1.38	.00	.00
7.536	1467.03	1447	6.360	1.37	.00	.00
7.586	1466.82	1441	6.420	1.37	.00	.00
7.636	1466.62	1434	6.480	1.37	.00	.00
7.687	1466.42	1428	6.520	1.36	.00	.00
7.737	1466.22	1421	6.580	1.36	.00	.00
7.787	1466.03	1415	6.620	1.36	.00	.00
7.837	1465.83	1408	6.680	1.35	.00	.00
7.888	1465.63	1402	6.740	1.35	.00	.00
7.938	1465.43	1396	6.780	1.34	.00	.00
7.988	1465.23	1390	6.840	1.34	.00	.00
8.038	1465.03	1384	6.900	1.34	.00	.00
8.088	1464.83	1378	6.940	1.34	.00	.00
8.139	1464.64	1372	7.000	1.33	.00	.00
8.189	1464.44	1366	7.060	1.33	.00	.00

PROFILE OF CRESTS AND TIMES FOR Clinch River
BELOW AEP Clinch Riv 1A/1B

DISTANCE FROM DAM MILE	MAX ELEV FEET	MAX FLOW CFS	TIME MAX ELEV-HRS	MAX VEL FPS	FLOOD ELEV FEET	TIME FLOOD ELEV-HRS
8.239	1464.24	1361	7.100	1.32	.00	.00

DISCHARGE HYDROGRAPH FOR Clinch River ... STATION NUMBER 21
BELOW AEP Clinch Riv 1A/1B AT MILE .70

GAGE ZERO = 1488.00 FEET MAX ELEVATION REACHED BY FLOOD WAVE = 1504.52 FEET
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 16.52 FEET AT TIME = .560 HOURS
MAX FLOW = 14967 CFS AT TIME = .520 HOURS

TIME HR	STAGE FEET	FLOW CFS	0 5000 10000 15000 20000 25000
.0	1.3	89	* . . . . .
.1	1.3	89	* . . . . .
.2	1.3	89	* . . . . .
.3	3.4	1160	. * . . . . .
.4	11.7	9596	. . . *. . . .
.5	15.8	14731	. . . . *. . .
.6	16.4	13031	. . . . * . . .
.7	15.3	9690	. . . *. . . .
.8	14.0	7213	. . * . . . .
.9	12.7	5536	. .* . . . .
1.0	11.5	4345	. *. . . . .
1.1	10.4	3438	. * . . . . .
1.2	9.5	2759	. * . . . . .
1.3	8.6	2234	. * . . . . .
1.4	7.8	1821	. * . . . . .
1.5	7.1	1499	. * . . . . .
1.6	6.5	1242	. * . . . . .
1.7	5.9	1036	. * . . . . .
1.8	5.4	871	. * . . . . .
1.9	5.0	737	.* . . . . .
2.0	4.6	628	.* . . . . .
2.1	4.2	538	.* . . . . .
2.2	3.9	463	.* . . . . .
2.3	3.6	401	.* . . . . .
2.4	3.3	349	.* . . . . .
2.5	3.0	305	.* . . . . .
2.6	2.8	269	.* . . . . .
2.7	2.6	239	* . . . . .
2.8	2.4	213	* . . . . .
2.9	2.3	192	* . . . . .
3.0	2.1	175	* . . . . .
3.1	2.0	160	* . . . . .
3.2	1.9	148	* . . . . .
3.3	1.8	137	* . . . . .
3.4	1.7	129	* . . . . .
3.5	1.7	122	* . . . . .
3.6	1.6	116	* . . . . .
3.7	1.5	111	* . . . . .
3.8	1.5	107	* . . . . .
3.9	1.5	103	* . . . . .
4.0	1.4	100	* . . . . .
4.1	1.4	98	* . . . . .
4.2	1.4	96	* . . . . .
4.3	1.4	95	* . . . . .
4.4	1.3	94	* . . . . .
4.5	1.3	93	* . . . . .
4.6	1.3	92	* . . . . .
4.7	1.3	91	* . . . . .
4.8	1.3	91	* . . . . .
4.9	1.3	90	* . . . . .
5.0	1.3	90	* . . . . .

DISCHARGE HYDROGRAPH FOR Clinch River ... STATION NUMBER 49
BELOW AEP Clinch Riv 1A/1B AT MILE 2.10

GAGE ZERO = 1482.00 FEET MAX ELEVATION REACHED BY FLOOD WAVE = 1489.88 FEET
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 7.88 FEET AT TIME = 1.260 HOURS
MAX FLOW = 6700 CFS AT TIME = 1.020 HOURS

TIME HR	STAGE FEET	FLOW CFS	0 2000 4000 6000 8000 10000
.0	.6	89	* . . . . .
.2	.6	89	* . . . . .
.4	.6	89	* . . . . .
.6	.6	89	* . . . . .
.8	.6	89	* . . . . .
1.0	7.1	6698	. . . . .
1.2	7.9	5917	. . . . .
1.4	7.8	4739	. . . . .
1.6	7.5	3751	. . . . .
1.8	7.1	2994	. . . . .
2.0	6.6	2437	. . . . .
2.2	6.2	2026	. . . . .
2.4	5.8	1714	. . . . .
2.6	5.4	1471	. . . . .
2.8	5.1	1277	. . . . .
3.0	4.7	1118	. . . . .
3.2	4.4	985	. . . . .
3.4	4.1	873	. . . . .
3.6	3.8	776	. . . . .
3.8	3.5	692	. . . . .
4.0	3.2	619	. . . . .
4.2	3.0	554	. . . . .
4.4	2.8	496	. . . . .
4.6	2.5	444	. . . . .
4.8	2.3	397	. . . . .
5.0	2.1	356	. . . . .
5.2	2.0	319	. . . . .
5.4	1.8	285	. . . . .
5.6	1.6	255	. . . . .
5.8	1.5	229	. . . . .
6.0	1.4	206	. . . . .
6.2	1.3	186	. . . . .
6.4	1.2	170	. . . . .
6.6	1.1	157	. . . . .
6.8	1.0	146	. . . . .
7.0	1.0	138	. . . . .
7.2	.9	130	. . . . .
7.4	.9	123	. . . . .
7.6	.8	117	. . . . .
7.8	.8	112	. . . . .
8.0	.8	108	. . . . .
8.2	.7	104	. . . . .
8.4	.7	101	. . . . .
8.6	.7	98	* . . . . .
8.8	.7	96	* . . . . .
9.0	.7	95	* . . . . .
9.2	.6	93	* . . . . .
9.4	.6	92	* . . . . .
9.6	.6	92	* . . . . .
9.8	.6	91	* . . . . .
10.0	.6	91	* . . . . .

DISCHARGE HYDROGRAPH FOR Clinch River ... STATION NUMBER 96
BELOW AEP Clinch Riv 1A/1B AT MILE 3.43

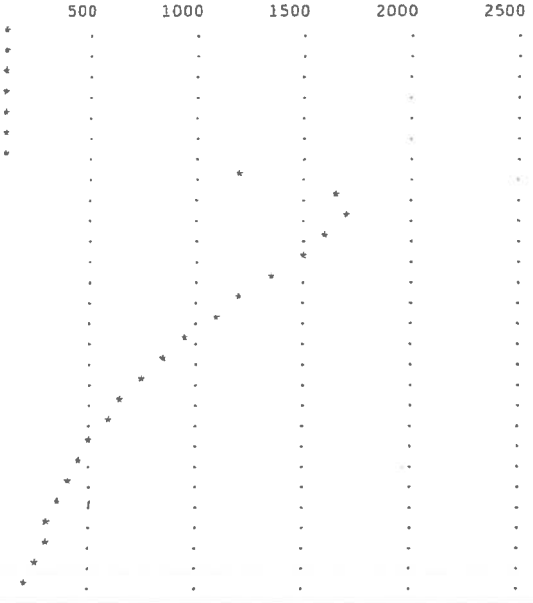
GAGE ZERO = 1476.00 FEET MAX ELEVATION REACHED BY FLOOD WAVE = 1484.82 FEET
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 8.82 FEET AT TIME = 2.300 HOURS
MAX FLOW = 2945 CFS AT TIME = 1.920 HOURS

TIME HR	STAGE FEET	FLOW CFS	0 1000 2000 3000 4000 5000
.0	1.4	89	.* . . . . .
.5	1.4	89	.* . . . . .
1.0	1.4	89	.* . . . . .
1.5	4.3	1371	. . * . . . .
2.0	8.6	2924	. . . *. . .
2.5	8.8	2492	. . . * . . .
3.0	8.3	2032	. . * . . .
3.5	7.7	1663	. . * . . . .
4.0	7.1	1372	. . * . . . .
4.5	6.5	1140	. .* . . . .
5.0	6.0	951	. * . . . .
5.5	5.4	796	. * . . . .
6.0	5.0	666	. * . . . .
6.5	4.5	559	. * . . . .
7.0	4.1	469	. * . . . .
7.5	3.7	395	. * . . . .
8.0	3.4	333	. * . . . .
8.5	3.1	282	. * . . . .
9.0	2.8	239	. * . . . .
9.5	2.5	204	. * . . . .
10.0	2.3	176	. * . . . .
10.5	2.1	154	. * . . . .
11.0	2.0	136	.* . . . .
11.5	1.8	123	.* . . . .
12.0	1.7	113	.* . . . .
12.5	1.6	106	.* . . . .
13.0	1.6	100	.* . . . .
13.5	1.5	97	.* . . . .

DISCHARGE HYDROGRAPH FOR Clinch River ... STATION NUMBER 150
BELOW AEP Clinch Riv 1A/1B AT MILE 6.08

GAGE ZERO = 1466.00 FEET MAX ELEVATION REACHED BY FLOOD WAVE = 1472.92 FEET
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 6.92 FEET AT TIME = 4.860 HOURS
MAX FLOW = 1694 CFS AT TIME = 4.380 HOURS

TIME HR	STAGE FEET	FLOW CFS
.0	1.3	89
.5	1.3	89
1.0	1.3	89
1.5	1.3	89
2.0	1.3	89
2.5	1.3	89
3.0	1.3	102
3.5	4.8	1216
4.0	6.4	1637
4.5	6.8	1690
5.0	6.9	1613
5.5	6.8	1488
6.0	6.5	1350
6.5	6.2	1212
7.0	5.9	1081
7.5	5.5	961
8.0	5.2	851
8.5	4.8	752
9.0	4.5	664
9.5	4.2	586
10.0	3.9	516
10.5	3.6	455
11.0	3.4	402
11.5	3.1	355
12.0	2.9	314
12.5	2.7	279
13.0	2.5	248
13.5	2.3	222



DISCHARGE HYDROGRAPH FOR Clinch River ... STATION NUMBER 193
BELOW AEP Clinch Riv 1A/1B AT MILE 8.24

GAGE ZERO = 1458.00 FEET MAX ELEVATION REACHED BY FLOOD WAVE = 1464.24 FEET
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 6.24 FEET AT TIME = 7.100 HOURS
MAX FLOW = 1361 CFS AT TIME = 6.600 HOURS

TIME HR	STAGE FEET	FLOW CFS	0 500 1000 1500 2000 2500
1.71	1.3	89	
1.96	1.3	89	
2.21	1.3	89	
2.46	1.3	89	
2.71	1.3	89	
2.96	1.3	89	
3.21	1.3	89	
3.46	1.3	89	
3.71	1.3	89	
3.96	1.3	89	
4.21	1.3	89	
4.46	1.3	89	
4.71	1.4	115	
4.96	2.5	423	
5.21	3.8	796	
5.46	4.7	1041	
5.71	5.3	1193	
5.96	5.7	1285	
6.21	5.9	1336	
6.46	6.1	1358	
6.71	6.2	1360	
6.96	6.2	1346	
7.21	6.2	1323	
7.46	6.2	1291	
7.71	6.2	1255	
7.96	6.1	1215	
8.21	6.0	1172	
8.46	5.9	1128	
[illegible]71	5.8	1084	
[illegible]96	5.7	1039	
[illegible]21	5.6	995	
9.46	5.4	952	
9.71	5.3	909	
9.96	5.2	868	
10.21	5.0	827	
10.46	4.9	788	
10.71	4.8	750	
10.96	4.6	714	
11.21	4.5	680	
11.46	4.4	646	
11.71	4.3	615	
11.96	4.1	584	
12.21	4.0	555	
12.46	3.9	528	
12.71	3.8	502	
12.96	3.7	477	
13.21	3.6	453	
13.46	3.5	431	
13.71	3.4	409	
13.96	3.3	389	

ORIGINAL

PART I - CERTIFICATIONS

This plan was prepared by Geo/Environmental Associates, Inc., for American Electric Power Service Corporation (AEPSC).

Geo/Environmental Associates, Inc.
3502 Overlook Circle
Knoxville, TN 37909
(865) 584-0344

Name	Title	Date
Scott M Arwood	Engineer	10-31-09

Signature

Scott M Arwood
Printed Name

This plan has been approved by the Clinch River Plant Manager:

Rick Chafin, Plant Manager — 11-16-09 (Date)

Signature and Distribution List

Signature:

The undersigned states he/she will distribute a copy of the Emergency Action Plan to the persons named in the Distribution List below:

Name	Title	Date
Monty D. Guy	Plant Environmental Coordinator	11-16-09

Signature

Monty Guy
Printed Name

Distribution:

The following is a list of the persons and agencies that will receive a copy of this Emergency Action Plan:

Name	Address	Copy Nos.
Pedro Amaya, P.E.	AEPSC Geotechnical Engineering Section	1