



Tennessee Valley Authority, 1101 Market Street, LP 5A, Chattanooga, Tennessee 37402-2801

November 14, 2008

10 CFR 52.79

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

In the Matter of)
Tennessee Valley Authority)

Docket No. 52-014 and 52-015

**BELLEFONTE COMBINED LICENSE APPLICATION – RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION – BASIC GEOLOGIC AND SEISMIC INFORMATION
SUPPLEMENTAL RESPONSE**

- Reference: 1) Letter from Joseph Sebrosky (NRC) to Andrea L. Sterdis (TVA), Request for Additional Information Letter No. 123 Related to SRP Section 02.05.01 for the Bellefonte Units 3 and 4 Combined License Application, dated September 4, 2008
- 2) Letter from Andrea L. Sterdis (TVA) to Document Control Desk (NRC), Bellefonte Combined License Application – Response to Request for Additional Information – Basic Geologic And Seismic Information, dated October 4, 2008

This letter provides the Tennessee Valley Authority's (TVA) supplemental response to the Nuclear Regulatory Commission's (NRC) request for additional information (RAI) number 02.05.01-02 included in Reference 1.

The original response to NRC RAI number 02.05.01-02 is contained in Reference 2 and is not changed by this supplement. This supplement does not identify any additional associated changes that will be made in a future revision of the BLN application.

If you should have any questions, please contact Phillip Ray at 1101 Market Street, LP5A, Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7030, or via email at pmray@tva.gov.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on this 14th day of Nov, 2008.

Andrea L. Sterdis
Manager, New Nuclear Licensing and Industry Affairs
Nuclear Generation Development & Construction

Enclosure
cc: See Page 2

D085
NRO

Document Control Desk
Page 2
November 14, 2008

cc: (w/ Enclosures)

J. P. Berger, EDF
J. M. Sebrosky, NRC/HQ
E. Cummins, Westinghouse
S. P. Frantz, Morgan Lewis
M. W. Gettler, FP&L
R. Grumbir, NuStart
P. S. Hastings, NuStart
P. Hinnenkamp, Entergy
M. C. Kray, NuStart
D. Lindgren, Westinghouse
G. D. Miller, PG&N
M. C. Nolan, Duke Energy
N. T. Simms, Duke Energy
K. N. Slays, NuStart
G. A. Zinke, NuStart

cc: (w/o Enclosure)

B. C. Anderson, NRC/HQ
M. M. Comar, NRC/HQ
B. Hughes/NRC/HQ
R. G. Joshi, NRC/HQ
R. H. Kitchen, PGN
M. C. Kray, NuStart
A. M. Monroe, SCE&G
C. R. Pierce, SNC
R. Reister, DOE/PM
L. Reyes, NRC/RII
T. Simms, NRC/H

Enclosure

TVA Letter Dated November 14, 2008

RAI Response

Supplemental response to NRC Request for Additional Information number 02.05.01-02 letter

No. 123 dated September 4, 2008

(2 pages, including this list)

Subject: Basic geologic and seismic information in the Final Safety Analysis Report

<u>RAI Number</u>	<u>Date of TVA Response</u>
02.05.01-01	Letter dated October 4, 2008
02.05.01-02	This letter and letter dated October 4, 2008
02.05.01-03	Letter dated October 4, 2008
02.05.01-04	Letter dated October 4, 2008

Associated Additional Attachments / Enclosures

Pages Included

Attachment 02.05.01-02A

21

Enclosure

TVA Letter Dated November 14, 2008

RAI Response

NRC Letter Dated: September 4, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.05.01-02

During the Bellefonte site visit during week of 10/27/08, NRC requested a copy of the Coulson 1977 geology report, Reference 400 in the BLN 3 & 4 application and also referenced in the BLN 1 & 2 FSAR. TVA corrected the reference number this report in the original response to this RAI.

BLN RAI ID: 2400

BLN RESPONSE:

During the TVA review to respond to the original NRC RAI, an incorrect reference number was identified in the text of the application. This text was corrected in the original response with the proper number for the reference. During the geology site visit at Bellefonte, the NRC reviewers requested that TVA submit the reference document as a supplement to the original response. The requested reference is enclosed as Attachment 02.05.01-02A

This response is PLANT-SPECIFIC.

ASSOCIATED BLN COL APPLICATION REVISIONS:

No additional changes have been identified.

ASSOCIATED ATTACHMENTS/ENCLOSURES:

Attachment 02.05.01-02A

Attachment
TVA Letter Dated November 14, 2008
RAI Response

Attachment 02.05.01-02A

(22 pages including cover)

“Investigation to Determine the Significance
of a Sheared Joint in the Foundation of the Unit 1 QA Record Storage Vault,”
Detailed supplementary information,
Bellefonte Nuclear Plant,
TVA Division of Water Management,
Geologic Services Branch

1977

J.H. Coulson

TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER MANAGEMENT
GEOLOGIC SERVICES BRANCH

BELLEFONTE NUCLEAR PLANT

DETAILED
SUPPLEMENTARY
INFORMATION

Distribution List:

1 - R. W. Allen
1 - B. W. Brown
1 - M. B. Brazel
1 - J. H. Coulson
3 - R. G. Domer
1 - GSB Files
6 - L. M. Mills
1 - A. D. Soderberg

Knoxville, Tennessee

March 1977

Bellefonte Nuclear Plant

Investigation to Determine the Significance
of a Sheared Joint in the Foundation of the
Unit 1 QA Record Storage Vault

Tennessee Valley Authority
Division of Engineering Design
Civil Engineering and Design Branch

J. H. Coulson
January 1977

Introduction

During final cleanup of the Unit 1 QA Record Storage Vault foundation, a feature with 3 inches of vertical offset was discovered. Concern was expressed that the feature might be a significant fault, and the following detailed investigation was made by TVA.

Results of Investigation

Figure 1, geologic drawing 88GE4-822K2321, shows a plan view of the vault foundation. Figure 2 shows a cross section of the feature constructed with data from three vertical and two inclined core holes identified in figure 1 with small hexagons. Core logs for these holes are included at the end of this report.

The feature is calcite filled and ranges in thickness from 1/16 to 1/2 inch. At the section where the core holes were drilled it exhibits a sinuous, rather than planar, character and has an average dip of 64° S. The dip steepens slightly to the west. Approximately 10 feet west of the G line, just outside the limits of the building, the feature is truncated by a vertical joint trending N57°E. At this joint there is no evidence of offset, and the feature cannot be traced farther to the west.

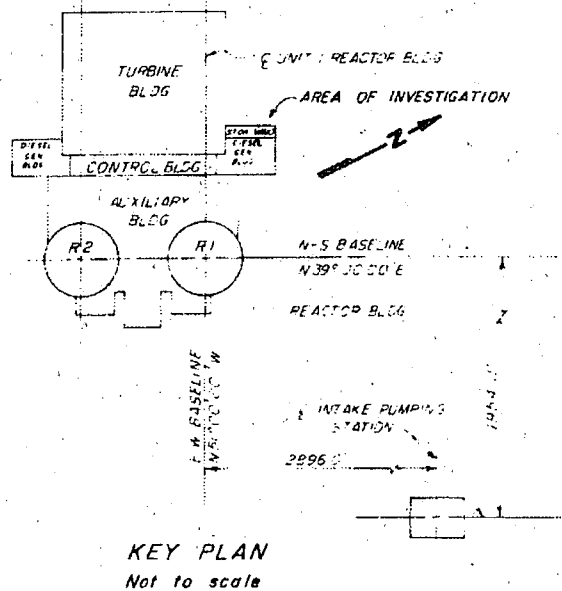
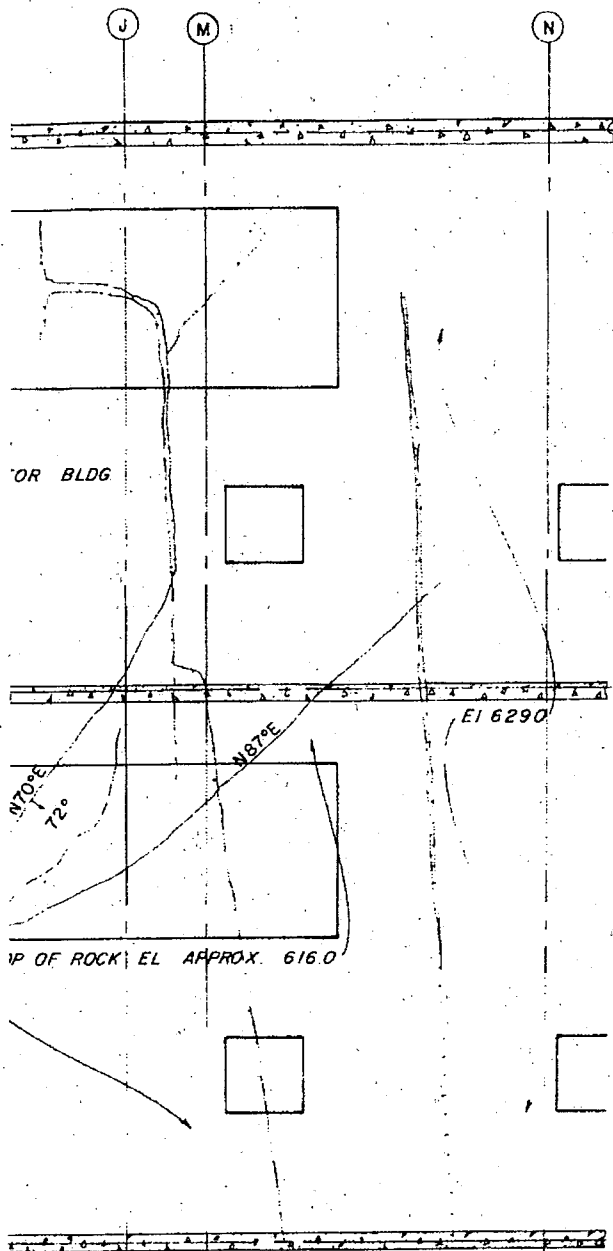
Four other joints striking from N70°E to N87°E with dips similar to that of the feature in question were found within the area of the QA record storage vault foundation. All of these joints are calcite filled, but none exhibits offset. If offset were present it would be readily apparent in the riser of each step where the 17° bedding outcrops at the top of rock.

In the adjacent turbine building excavation to the southwest and in the cooling tower excavations farther to the southwest, at least 20 more joints in the same set were identified. Some are calcite filled, but none exhibits offset. All appear to be 50 feet or less in length.

Conclusions

It is TVA's opinion that the feature in question is a member of a joint set which exists throughout the general plant area. It is truncated and terminates at another joint, and no offset was observed at the point of truncation. The maximum observed offset is only 3 inches, and none of the other joints in the set exhibit offset. For these reasons, it can be concluded that the feature is not a significant fault, but is a joint that received minor shear displacement during the process that developed the entire joint set.

On September 22, 1976, a meeting was held at the site with Richard McMullen, a geologist from NRC. At that time he concurred with the conclusions reached by TVA. Shortly after this meeting the nonconformance status of the feature was lifted and construction was resumed.



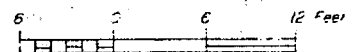
LEGEND

- = Joint with apparent vertical displacement
- = Blast cracks or tight joints
- = Joint, hachured to indicate change in elevation
- = Core drill hole showing hole number. — arrow indicates direction of angled hole
- = Strike and dip of beds

NOTE:

All rock encountered is in the Chickamauga Formation

SCALE:



FOUNDATION INVESTIGATIONS
Q A RECORD STORAGE VAULT

GEOLOGIC MAP PLAN VIEW

BELLEFONTE NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY

SUBMITTED: RECOMMENDED: APPROVED:

KNOXVILLE 10-26-76 88 GE 4 822 K2321

Elev.

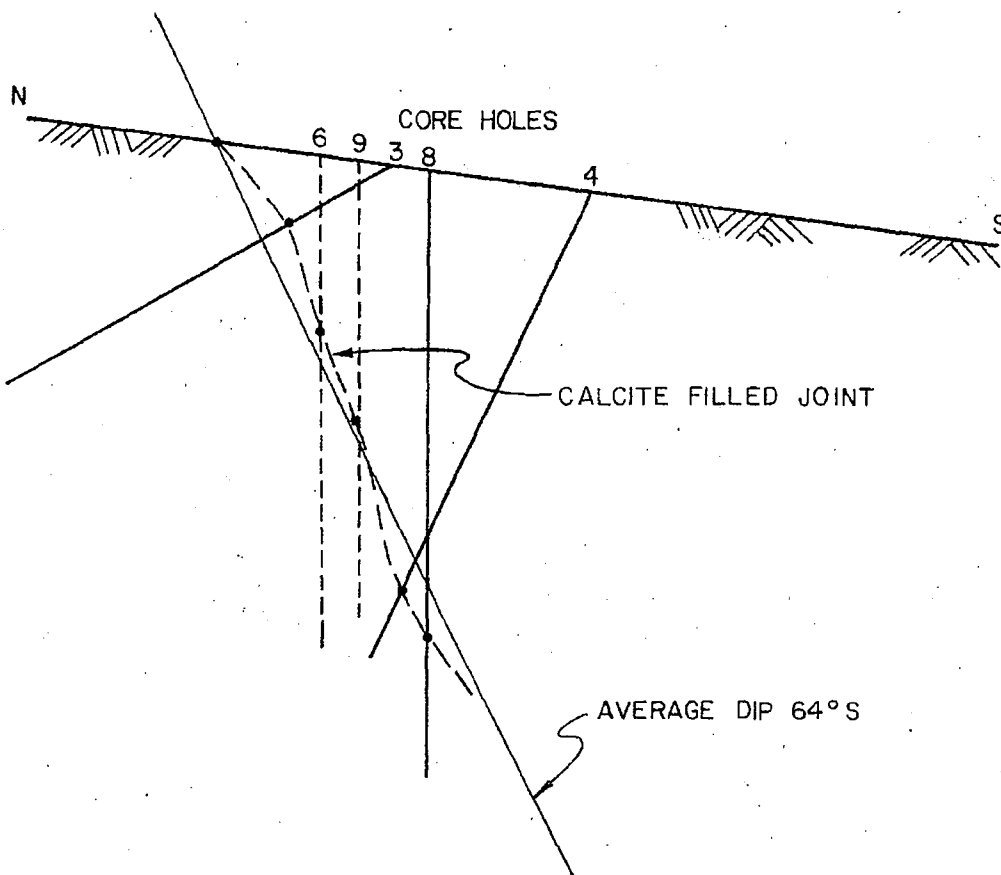
615

610

605

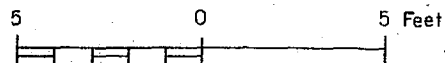
600

595



CROSS SECTION PERPENDICULAR TO CALCITE FILLED JOINT
IN Q.A. RECORD STORAGE VAULT.

SCALE:



FOUNDATION INVESTIGATIONS		
CROSS SECTION THROUGH JOINT		
BELLEFONTE NUCLEAR PLANT TENNESSEE VALLEY AUTHORITY DIVISION OF WATER MANAGEMENT		
SUBMITTED	RECOMMENDED	APPROVED
	<i>A. Sordani</i>	<i>[Signature]</i>
KNOXVILLE	1-24-77 88 GE 4	822A2332 RI

GEOLOGIC RECORD OF DRILL HOLE

PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number 9.25' SOUTH OF D-1 #3 3 9' WEST OF H		Location Q. A. RECORDS STORAGE VAULT		Geologic Formation CHICKAMAUGA	
Elevation of Surface 611.3				Elevation of Water Loss NONE	
Elevation Top of Bedrock 611.3		Thickness of Overburden NONE		Elevation of Water Gained NONE	
Elevation Bottom of Hole 605.3		Size of Core NX-WIRELINE		Driller HASKEW	
Recommended Foundation Grade		Bottom of Weathering Encountered		Date Started 9/17/76	Date Completed 9/20/76
		*28° from Horizontal			

Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	Description
LIMESTONE	611.3	0.0	0.5	17°	Fine to coarse grained, medium to dark gray, argillaceous, fossiliferous, interbedded with argillaceous dark gray shale. Weathered parting 611.1.
CAVITY	610.8	1.0	0.2		Driller reported soft shale and mud.
LIMESTONE	610.6	1.5	0.15		Medium to coarse grained, medium to dark gray, argillaceous.
CAVITY	610.45	1.8	0.05		Driller reported mud.
LIMESTONE	610.4	2.0	5.1		Fine to coarse grained, medium to dark gray, banded argillaceous to silty fossiliferous, interbedded with argillaceous to silty dark gray shale, weathered parting 610.4, side of cavity 610.1-610.0; possible clay seam 610.0; weathered parting 609.8. Loss of core calcite filled joint 609.6-609.4; calcite filled near vertical joint 609.2-609.1; weathered parting 609.0; possible clay seam 608.3 - 608.2; weathered parting 607.7, 607.6, 607.4.
BOTTOM OF HOLE	605.3	12.8			

REMARKS:

Water Level
Elevation

Barometer

Air

Logged By M. B. BRAZEL

GEOLOGIC RECORD OF DRILL HOLE

PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number 14.0' SOUTH OF D-1 #4 4 6.7' WEST OF H		Location Q.A. RECORDS STORAGE VAULT		Geologic Formation CHICKAMAUGA	
Elevation of Surface 610.6				Elevation of Water Loss NONE	
Elevation Top of Bedrock 610.6		Thickness of Overburden NONE		Elevation of Water Gained NONE	
Elevation Bottom of Hole 598.2		Size of Core NX-WIRELINE		Driller 9-325, 9-700	
Recommended Foundation Grade		Bottom of Weathering Encountered		Date Started 9/21/76	Date Completed 9/21/76
65° From Horizontal					
Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	Description
LIMESTONE	610.6	0.0	12.4	17°	Fine to coarse grained, medium to dark gray, banded, fossiliferous, argillaceous to silty, interbedded argillaceous to silty dark gray shale. Weathered parting 610.4, 608.3; calcite filled near vertical joint 607.3 - 607.2; weathered shale parting 605.0, 604.0 calcite filled near vertical joint 603.3 - 603.2, 603.3-603.1, 602.6 - 602.3, 600.4 - 600.2; calcite 600.2 - 600.0; possible calcite filled fault 599.7 - 599.2.
BOTTOM OF HOLE	598.2	13.7			

REMARKS:

Water test:

Elevation:

G.P.M.

P.S.I.

LOGGED BY M. B. BRAZEL

GEOLOGIC RECORD OF DRILL HOLE

PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number 10.2' SOUTH OF D-1		Location		Geologic Formation	
#8 8.6' WEST OF H		Q. A. RECORDS STORAGE VAULT		CHICKAMAUGA	
Elevation of Surface				Elevation of Water Loss	
614.4				NONE	
Elevation Top of Bedrock		Thickness of Overburden		Elevation of Water Gained	
611.3		3.1		NONE	
Elevation Bottom of Hole		Size of Core		Driller	
594.4		NX-WIRELINE		E. ARNOLD	
Recommended Foundation Grade		Bottom of Weathering Encountered		Date Started	Date Completed
				9/27/76	9/27/76
Vertical					
Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	Description
CONCRETE	614.4	0.0	3.1	17°	
LIMESTONE	611.3	3.1	16.9		Fine to coarse grained, medium to dark gray, argillaceous to silty, banded, fossiliferous, interbedded dark gray argillaceous to silty shale. Driller reported clay seam 610.9, 610.6, 610.4; weathered shale parting 609.6, 609.1; possible clay seam 606.6; calcite filled near vertical joint 606.4 - 606.2; vug 602.3; shale parting 602.1; calcite filled near vertical joint 601.2 - 600.8; possible calcite filled fault 599.0 - 598.7; calcite filled near vertical joint 598.7 - 597.9, 598.0 - 597.6, 596.4 - 596.3 cherty 594.5.
BOTTOM OF HOLE	594.4	20.0			

REMARKS:

Water test.
Elevation

G.P.V.

F.S.

Logged By M. B. BRAZEL

GEOLOGIC RECORD OF DRILL HOLE

Page 1 of 1PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number <u>7.7' SOUTH OF D-1</u> <u>#9 8.7' WEST OF H</u>	Location <u>Q.A. RECORDS STORAGE VAULT</u>	Geologic Formation <u>CHICKAMAUGA</u>	
Elevation of Surface <u>614.4</u>		Elevation of Water Loss <u>NONE</u>	
Elevation Top of Bedrock <u>611.2</u>	Thickness of Overburden Concrete <u>3.2</u>	Elevation of Water Gained <u>NONE</u>	
Elevation Bottom of Hole <u>599.2</u>	Size of Core <u>NX-WIRELINE</u>	Driller <u>E. ARNOLD</u>	
Recommended Foundation Grade	Bottom of Weathering Encountered	Date Started <u>9/27/76</u>	Date Completed <u>9/27/76</u>
<u>Vertical</u>			

Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	Description
CONCRETE	614.4	0.0	3.2	17°	
LIMESTONE	611.2	3.2	12.0		Fine to coarse grained, medium to dark gray argillaceous to silty, fossiliferous, banded; interbedded argillaceous to silty dark gray shale. Possible clay seams 610.5, 610.4; weathered parting 610.2; weathered shale parting 609.55, 609.0; tight near vertical joint 607.2 - 607.1; possible calcite filled fault 604.9; weathered parti
					603.1; calcite filled near vertical joint 602.0 - 601.8, 602.0 - 601.4, 599.85 - 599.2.
BOTTOM OF HOLE	599.2	15.2			

REMARKS:

Water test:
Elevation G.P.M. P.S.I.

Logged By M. B. BRAZEL

Page ~~1 of 1~~

PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number 7.7' SOUTH OF D-1	Location	Geologic Formation	
#9 8.7' WEST OF H	Q.A. RECORDS STORAGE VAULT	CHICKAMAUGA	
Elevation of Surface 614.4		Elevation of Water Loss NONE	
Elevation Top of Bedrock 611.2	Thickness of Overburden Concrete 3.2	Elevation of Water Gained NONE	
Elevation Bottom of Hole 599.2	Size of Core NX-WIRELINE	Driller E. ARNOLD	
Recommended Foundation Grade	Bottom of Weathering Encountered	Date Started 9/27/76	Date Completed 9/27/76
	Vertical		

[illegible]

REMARKS:

Water test:

Elevation	G.P.M.	P.S.I.
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Logged By M. B. BRAZEL

PROJECT RECORD OF DRILL HOLE
PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number <u>10.2' SOUTH OF D-1</u> <u>#8 8.6' WEST OF H</u>	Location <u>Q. A. RECORDS STORAGE VAULT</u>	Geologic Formation <u>CHICKAMAUGA</u>	
Elevation of Surface <u>614.4</u>	Thickness of Overburden <u>XXXXXXX Concrete</u> <u>3.1</u>	Elevation of Water Loss <u>NONE</u>	
Elevation Top of Bedrock <u>611.3</u>	Size of Core <u>NX-WIRELINE</u>	Elevation of Water Gained <u>NONE</u>	
Elevation Bottom of Hole <u>594.4</u>	Bottom of Weathering Encountered	Driller <u>E. ARNOLD</u>	
Recommended Foundation Grade		Date Started <u>9/27/76</u>	Date Completed <u>9/27/76</u>
Vertical			

Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	Description
CONCRETE	614.4	0.0	3.1	17°	<u>920814S0468</u> <u>(C)</u>
LIMESTONE	611.3	3.1	16.9		Fine to coarse grained, medium to dark gray, argillaceous to silty, banded, fossiliferous, interbedded dark gray argillaceous to silty shale. Driller reported clay seam 610.9, 610.6, 610.4; weathered shale parting 609.6, 609.1; possible clay seam 606.6; calcite filled near vertical joint 606.4 - 606.2; vug 602.3; shale parting 602.1; calcite filled near vertical joint 601.2 - 600.8; possible calcite filled fault 599.0 - 598.7; calcite filled near vertical joint 598.7 - 597.9, 598.0 - 597.6, 596.4 - 596 cherty 594.5.
BOTTOM OF HOLE	594.4	20.0			

REMARKS:

Water test:
Elevation G.P.M. P.S.I.

Logged By M. B. BRAZEL

PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number 7.3 SOUTH OF D-1 #6 9.7 WEST OF H	Location Q.A. RECORDS STORAGE VAULT	Geologic Formation CHICKAMAUGA	
Elevation of Surface 611.5		Elevation of Water Loss NONE	
Elevation Top of Bedrock 611.5	Thickness of Overburden NONE	Elevation of Water Gained NONE	
Elevation Bottom of Hole 598.6	Size of Core NX-WIRELINE	Driller HASKEW	
Recommended Foundation Grade	Bottom of Weathering Encountered	Date Started 9/21/76	Date Completed 9/21/76
	Vertical		

[illegible]

Water test:
Elevation G.P.M. P.S.I.

Logged By M. B. BRAZEL

Page 1 OF 1

PROJECT BELLEFONTE NUCLEAR PLANT

Vertical

920814S0466
• Description

N/A DID NOT HIT FAULT AREA.

Elevation

G.P.M.

P.S.I.

Logged By M. B. BRAZEL

GEOLOGIC RECORD OF DRILL HOLE

Page 1 of 1

PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number 14.0' SOUTH OF D-1 #4 6.7' WEST OF H	Location Q.A. RECORDS STORAGE VAULT	Geologic Formation CHICKAMAUGA
Elevation of Surface 610.6		Elevation of Water Loss NONE
Elevation Top of Bedrock 610.6	Thickness of Overburden NONE	Elevation of Water Gained NONE
Elevation Bottom of Hole 598.2	Size of Core NX-WIRELINE	Driller 9-325, 9-700
Recommended Foundation Grade	Bottom of Weathering Encountered 65° From Horizontal	Date Started 9/21/76
		Date Completed 9/21/76

Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	Description
LIMESTONE	610.6	0.0	12.4	17°	Fine to coarse grained, medium dark gray, banded, fossiliferous argillaceous to silty, interbed argillaceous to silty dark gray shale. Weathered parting 610.4 608.3; calcite filled near vertical joint 607.3 - 607.2; weathered shale parting 605.0, 604.0 calc. filled near vertical joint 603.2, 603.3-603.1, 602.6 - 602.600.4 - 600.2; calcite 600.2 - 600.0; possible calcite filled fault 599.7 - 599.2.
BOTTOM OF HOLE	598.2	13.7			

REMARKS:

Water test:
Elevation G.P.M. P.S.I.

Logged By M. B. BRAZEL

GEOLOGIC RECORD OF DRILL HOLE

Page 1 of 1

PROJECT BELLEFONTE NUCLEAR PLANT.

Hole Number 9.25' SOUTH OF D-1 #3 9' WEST OF H	Location Q. A. RECORDS STORAGE VAULT	Geologic Formation CHICKAMAUGA
Elevation of Surface 611.3		Elevation of Water Loss NONE
Elevation Top of Bedrock 611.3	Thickness of Overburden NONE	Elevation of Water Gained NONE
Elevation Bottom of Hole 605.3	Size of Core NX-WIRELINE	Driller HASKEW
Recommended Foundation Grade	Bottom of Weathering Encountered	Date Started 9/17/76
	28° from Horizontal	Date Completed 9/20/76

Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	920814S0464 Description
LIMESTONE	611.3	0.0	0.5	17°	Fine to coarse grained, medium dark gray, argillaceous, fossiliferous, interbedded with argillaceous dark gray shale. Weathered parting 611.1.
CAVITY	610.8	1.0	0.2		Driller reported soft shale and mud.
LIMESTONE	610.6	1.5	0.15		Medium to coarse grained, medium to dark gray, argillaceous.
CAVITY	610.45	1.8	0.05		Driller reported mud.
LIMESTONE	610.4	2.0	5.1		Fine to coarse grained, medium to dark gray, banded argillaceous to silty fossiliferous, interbedded with argillaceous to silty dark gray shale, weathered parting 610.1, side of cavity 610.1-610.4; possible clay seam 610.0; weathered parting 609.8. Loss of core 609.6-609.4; calcite filled joint 609.2-609.1; weathered parting 609.0; possible clay seam 608.3 - 608.2; weathered parting 607.7, 607.6, 607.4.
BOTTOM OF HOLE	605.3	12.8			

REMARKS:

Water test:
Elevation

G.P.M.

P.S.I.

Logged By M. B. BRAZEL

GEOLOGIC RECORD OF DRILL HOLE

Page 1 OF 1

PROJECT BELLEFONTE NUCLEAR PLANT

Hole Number <u>14.1' SOUTH OF D-1</u> <u>#2</u> <u>6.7' WEST OF H</u>	Location <u>Q. A. RECORDS STORAGE VAULT</u>	Geologic Formation <u>CHICKAMAUGA</u>	
Elevation of Surface <u>610.6</u>		Elevation of Water Loss <u>NONE</u>	
Elevation Top of Bedrock <u>610.6</u>	Thickness of Overburden <u>NONE</u>	Elevation of Water Gained <u>NONE</u>	
Elevation Bottom of Hole <u>603.1</u>	Size of Core <u>NX-WIRELINE</u>	Driller <u>HASKEW</u>	
Recommended Foundation Grade	Bottom of Weathering Encountered <u>28°</u>	Date Started <u>9/16/76</u>	Date Completed <u>9/17/76</u>

Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	Description
LIMESTONE	610.6	0.0	1.6		Fine to coarse grained, medium to dark gray, argillaceous to silty limestone, fossiliferous, banded interbedded dark gray argillaceous to silty shale. Weathered partings 610.3, 609.8, 609.2; shale seam 609.1-609.0.
FILLED CAVITY	609.0	3.4	0.3		Driller reported soft shale and mud fill.
LIMESTONE	608.7	3.97	5.6		Same as above. Clay filled near vertical joint 608.5-608.4; weathered parting 608.2; shale partings 607.9, 606.6. Possible calcite filled fault, 605.6-605.4
BOTTOM OF HOLE	603.1	15.9			

REMARKS:

POSSIBLE THAT CORE WASN'T PLACED IN THE BOX RIGHT.

Water test: N/A
Elevation G.P.M. P.S.I.

Logged By M. B. BRAZEL

PROJECT BELLEFONTE NUCLEAR PLANT

 58°

920814S0462	Description

Hole drilled not parallel to strike of fault.

Water test: N/A

Logged By M. B. Brazel

GEOLOGIC RECORD OF DRILL HOLE

PROJECT BELLEFONTE

Hole Number	Rock Test	Location	Geologic Formation
Core drill hole #1		800'N 39°E of	Chickamauga
Elevation of Surface		Center line of Reactor #1	Elevation of Water Loss
618.0			---
Elevation Top of Bedrock		Thickness of Overburden	Elevation of Water Gained
616.5		1.5	---
Elevation Bottom of Hole		Size of Core	Driller
567.6		Nx-wireline	Dave Farr
Recommended Foundation Grade		Bottom of Weathering Encountered	Date Started
---		600.3	7/73
			Date Completed
			7/73

Material	Elevation of Stratum	Depth From Surface	Thickness of Stratum	Dip	Description
			CONCRETE		
	618.0	0.0	1.5		920814S0348 (D)
			ROCK DRILLING		
Unit 2					
Limestone&Shale	616.5	1.5	18.5	17°±	Medium-coarse grain, medium dark gray fossiliferous limestone with lenses of dark gray shale. Weathered
					partings 616.3, 616.0. Pape
					thin gypsum 608.0. Clay sea
					600.3.
Limestone&Shale	598.0	20.0	10.0		Fine grain, medium to light gray limestone mottled and banded with dark gray shale
					M-3 marker 592.6.
Limestone&Shale	588.0	30.0	20.4		Fine-medium grain, medium-dark gray, fossiliferous limestone, mottled and band
					with dark gray shale ;
					shear in shale along
					bedding 579.1, calcite heal
					shear on bedding 571.8.
BOTTOM OF HOLE	567.6	50.4			

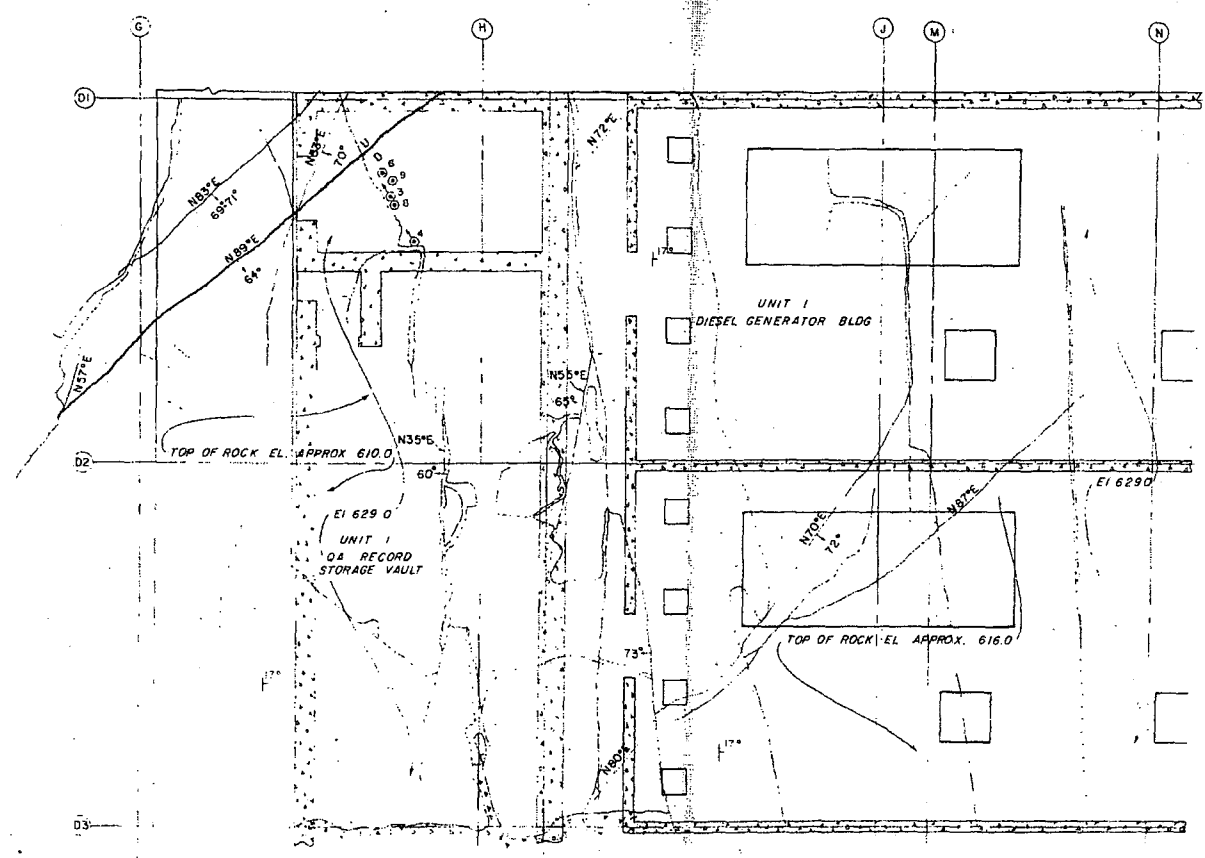
REMARKS:

Water test:
Elevation

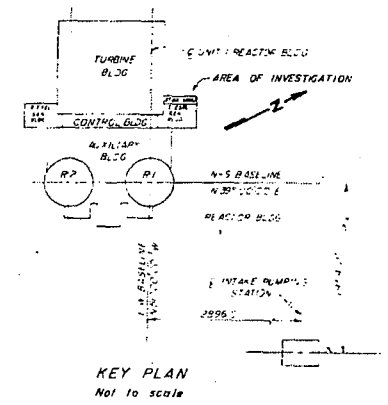
G.P.M.

P.S.I.

Logged By C. E. Drinnon



FLOOR PLAN - EL. 629.0
PLAN - TOP OF ROCK



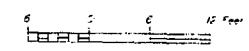
LEGEND

- Joint with apparent vertical displacement
- Blast cracks or tight joints
- Joint, hachured to indicate change in elevation
- Core drill hole showing hole number — arrow indicates direction of angled hole
- Strike and dip of beds

NOTE

All rock encountered is in the Chickamauga Formation.

SCALE



FOUNDATION INVESTIGATIONS		
QA RECORD STORAGE VAULT		
GEOLOGIC MAP		
PLAN VIEW		
BELLEFONTE NUCLEAR PLANT		
TENNESSEE VALLEY AUTHORITY		
SUBMITTED	RECOMMENDED	APPROVED
ANDOVERVILLE 10-26-76 88/GE 41822 K2321		