



Tennessee Valley Authority, 1101 Market Street, Chattanooga, TN 37402

CNL-17-049

April 3, 2017

10 CFR 52, Subpart A

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Clinch River Nuclear Site
NRC Docket No. 52-047

Subject: Submittal of Supplemental Information Related to Site Safety Analysis Report
Figures in Support of Early Site Permit Application for Clinch River Nuclear Site

Reference: Letter from TVA to NRC, CNL-16-081, "Application for Early Site Permit for Clinch
River Nuclear Site," dated May 12, 2016

By letter dated May 12, 2016 (Reference), Tennessee Valley Authority (TVA) submitted an application for an early site permit for the Clinch River Nuclear Site in Oak Ridge, TN. During a public meeting phone call held on February 21, 2017, the NRC requested that TVA provide supplemental information regarding two Figures in Part 2, Site Safety Analysis Report (SSAR), of the Early Site Permit Application submitted by the reference letter.

The enclosure to this letter provides supplemental information related to the SSAR Figures to support the NRC staff review.

There are no new regulatory commitments associated with this submittal. If any additional information is needed, please contact Dan Stout at (423) 751-7642.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 3rd day of April 2017.

Respectfully,

A handwritten signature in blue ink, appearing to read "JWS", is written over the word "Respectfully,".

J. W. Shea
Vice President, Nuclear Licensing

Enclosure

cc: See Page 2

Enclosure:

Supplemental Information Regarding Site Safety Analysis Report Figures for the Clinch
River Nuclear Site

cc (enclosure):

A. Fetter, Project Manager, Division of New Reactor Licensing, USNRC (2 copies)

cc (without enclosure):

V. McCree, Executive Director of Operations, USNRC
C. Haney, Regional Administrator, Region II, USNRC
M. Johnson, Deputy Executive Director for Reactor and Preparedness Programs,
USNRC
V. Ordaz, Acting Director, Office of New Reactors, USNRC
F. Akstulewicz, Director, Division of New Reactor Licensing, USNRC
J. Donoghue, Acting Branch Chief, Division of New Reactor Licensing, USNRC
M. Sutton, Project Manager, Division of New Reactor Licensing, USNRC
P. Vokoun, Project Manager, Division of New Reactor Licensing, USNRC
T. Dozier, Project Manager, Division of New Reactor Licensing, USNRC
T. Beville, SMR Licensing Technical Support Program, DOE
M. Shields, SMR Licensing Technical Support Program, DOE
M. M. McIntosh, Regulatory Specialist, Eastern Regulatory Field Office, Nashville
District, USACE

ENCLOSURE

SUPPLEMENTAL INFORMATION REGARDING SITE SAFETY ANALYSIS REPORT FOR THE CLINCH RIVER NUCLEAR SITE

By letter dated May 12, 2016 (Reference 1), Tennessee Valley Authority (TVA) submitted an application for an early site permit for the Clinch River Nuclear (CRN) Site in Oak Ridge, TN. During a public meeting phone call held on February 21, 2017, the NRC requested that TVA consider providing supplemental information to provide a Site Safety Analysis Report (SSAR) figure similar to Figure 2.5.2-26, with expanded focus on the CRN Site relative to the East Tennessee Seismic Zone (ETSZ) and Douglas Reservoir.

In addition, the numbers in parentheses shown on SSAR Figure 2.5.1-65, Sheet 1 of 2 (provided by Reference 2), were discussed during the public meeting phone call. The number in parentheses represent the apparent thickness of the shear-fracture zone encountered in boreholes. NRC staff requested clarification of the parenthetical values in SSAR Figure 2.5.1-65, Sheet 1 of 2, compared with the apparent thickness values in SSAR Table 2.5.1-17.

This enclosure provides supplemental information related to these discussions to the SSAR Figures to support the NRC staff review. These changes will be incorporated in a future revision of the Early Site Permit Application.

Reference:

1. Letter from TVA to NRC, CNL-16-081, "Application for Early Site Permit for Clinch River Nuclear Site," dated May 12, 2016
2. Letter from TVA to NRC, CNL-16-162, "Submittal of Supplemental Information Related to Geologic Characterization Information, Surface Deformation, and Stability of Subsurface Materials and Foundation in Support of Early Site Permit Application for Clinch River Nuclear Site," dated October 21, 2016

Supplemental Information

To address the clarification requested by the NRC, SSAR Figure 2.5.2-26 (Sheet 1 of 2) is being revised and Figure 2.5.2-26 (Sheet 2 of 2) is being added to the ESPA. Reference to SSAR Figure 2.5.2-26 is being inserted in SSAR Subsection 2.5.3.2.6. Markups reflecting the proposed changes to the SSAR subsection and the SSAR figures are included in this enclosure.

To clarify the parenthetical values, the shear-fracture zone thickness values initially presented in SSAR Figure 2.5.1-65 (Sheet 1 of 2) will be removed, and that figure will be revised to refer to Reference 2.5.1-100 and the more detailed thickness values listed in SSAR Table 2.5.1-17. SSAR Figures 2.5.1-66 and 2.5.1-67 (provided by Reference 2) are derived from the shear-fracture zone thicknesses listed in SSAR Table 2.5.1-17, making the listing of thickness values on Figure 2.5.1-65 (Sheet 1 of 2) unnecessary. A copy of the modified SSAR figure is included in this enclosure.

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SSAR Subsection 2.5.3.2.6 is being revised as indicated. Underlines indicate text to be added.

2.5.3.2.6 Proposed Quaternary Deformation Features Along Douglas Reservoir, TN

The CEUS SSC (Reference 2.5.3-1) includes a paleoliquefaction database developed from earlier compilations of paleoliquefaction data of the New Madrid seismic zone and surrounding area. The ETSZ was discussed in general terms by the CEUS SSC modelers as a zone of elevated seismicity and noted:

“At locations east to northeast of Knoxville, Tennessee, with late Quaternary terrace deposits, Vaughn et al. [Reference 2.5.3-11] report the occurrence of outcrop-scale strike-slip, reverse, and normal faults and prevalent fractures; minor paleoliquefaction features; and anomalous fractured and disrupted features attributed to liquefaction and forceful expulsion of groundwater during one or more major late Quaternary earthquakes. These preliminary observations suggest that the ETSZ has produced surface faulting and generated one or more strong earthquakes during late Quaternary time. However, these preliminary results could not qualify that RLMEs had occurred in the ETSZ, and were therefore insufficient to determine whether the ETSZ could be considered an RLME zone and treated accordingly in the CEUS SSC Project.” (Reference 2.5.3-1, Section 7.3.4.4).

The elevated seismicity rate that defines the ETSZ was included in the CEUS SSC model as part of the Paleozoic Extended Crust (PEZ) areal source zone. Spatial smoothing was used to retain the elevated rate of seismicity in the ETSZ region.

Since publication of the CEUS SSC report, more recent published research formally presents the earlier findings from Vaughn et al. (Reference 2.5.3-11) as well as additional evidence for possible paleoseismic features within the ETSZ (References 2.5.3-12, 2.5.3-13, and 2.5.3-57). This more recent research documents field work conducted along the shoreline of Douglas Reservoir, which is located approximately 50 mi east-northeast of the CRN Site (see Figure 2.5.2-26). Guidance from the CEUS SSC (Reference 2.5.3-1, Appendix E) is used to evaluate the recently reported paleoseismic evidence in these new publications on the ETSZ (References 2.5.3-11, 2.5.3-12, 2.5.3-13, and 2.5.3-57).

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As a result of the clarification, the following SSAR Figures are being revised and replaced:

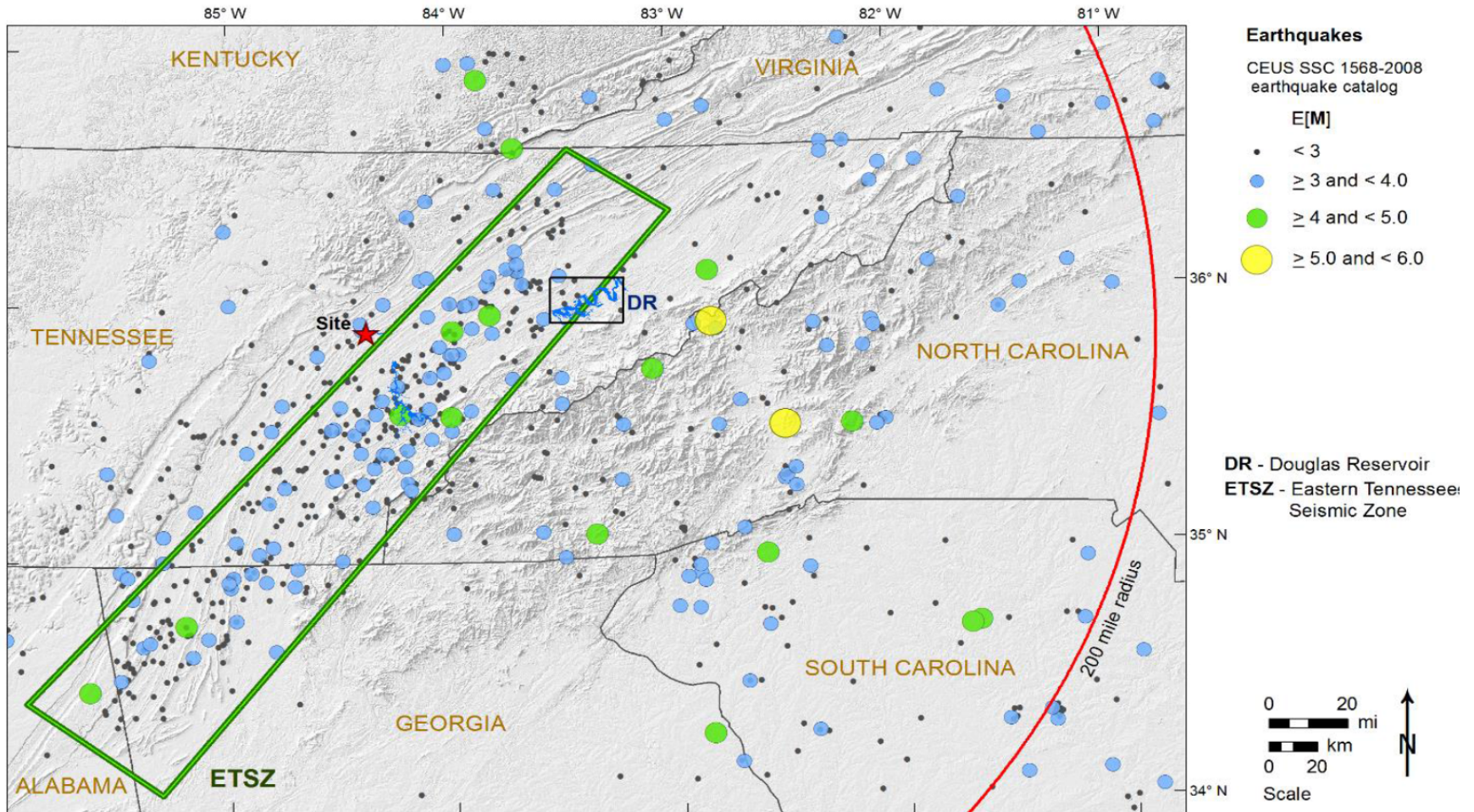
1. SSAR Figure 2.5.2-26 (Sheet 1 of 2)
2. SSAR Figure 2.5.1-65 (Sheet 1 of 2)

As a result of the clarification, the following SSAR Figure is being added:

1. SSAR Figure 2.5.2-26 (Sheet 2 of 2)

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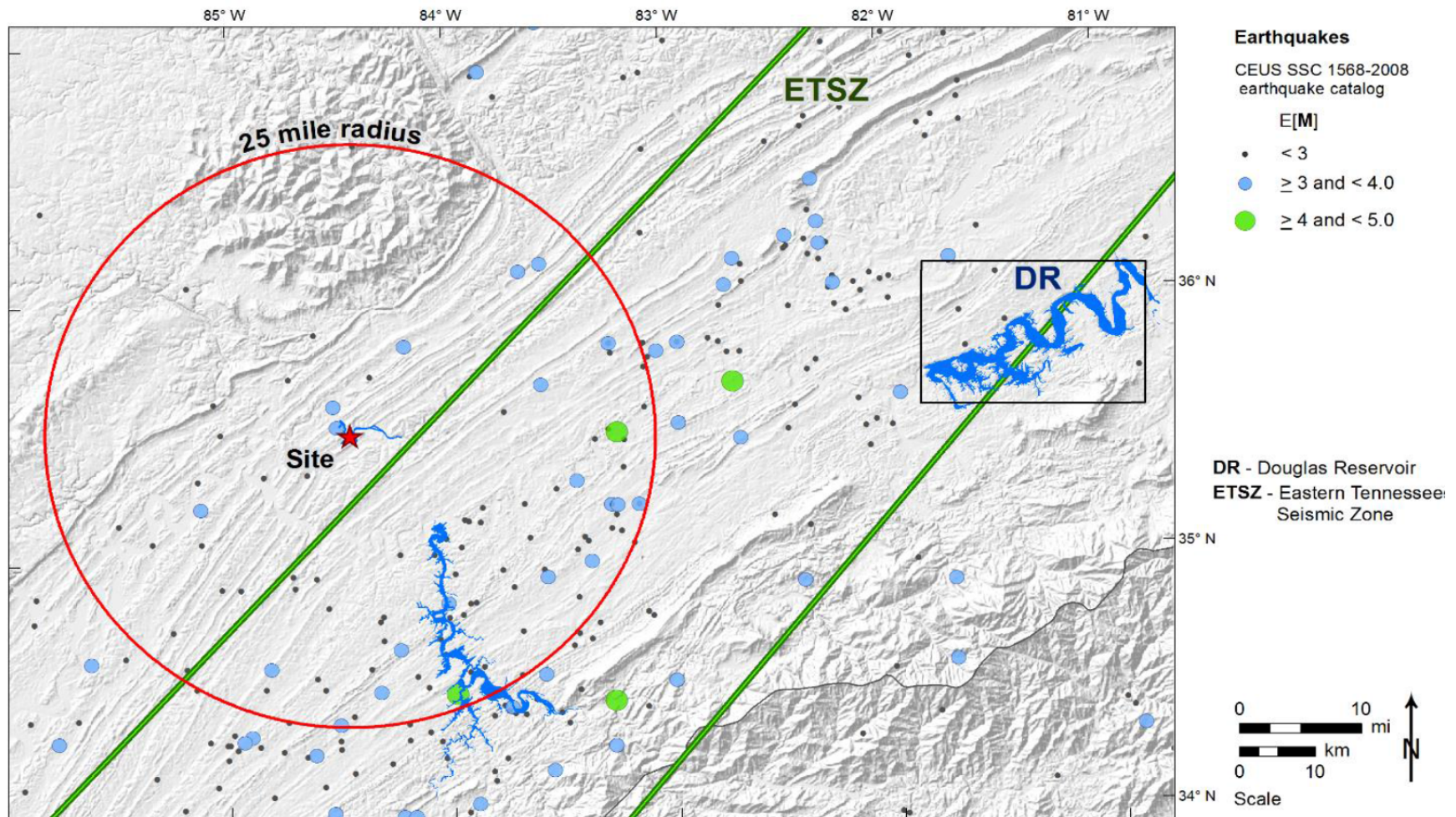


Note:
ETSZ geometry from Reference 2.5.2-10

Figure 2.5.2-26. (Sheet 1 of 2) Map Showing the Eastern Tennessee Seismic Zone Geometry Defined by the U.S. Geological Survey

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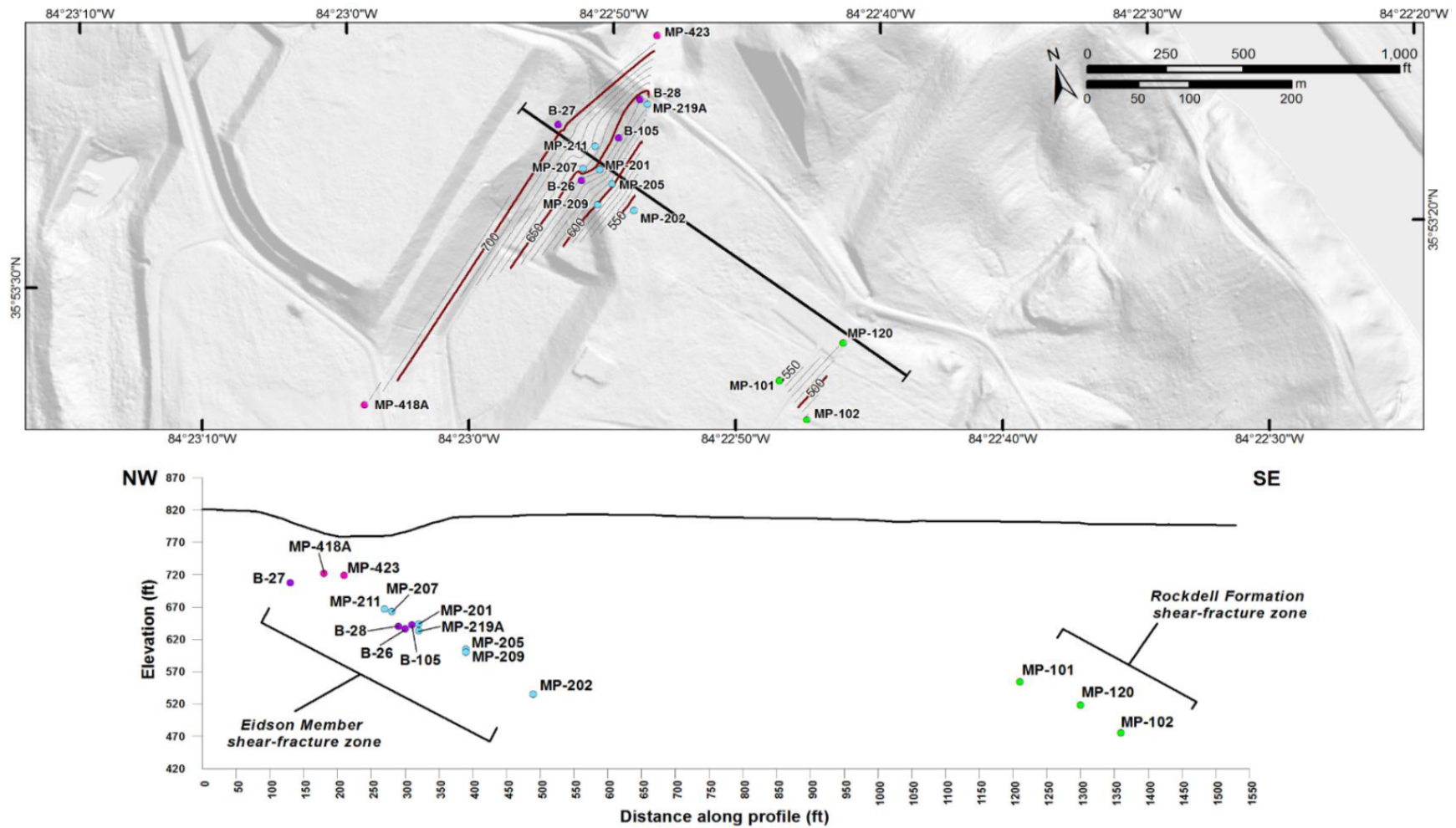


Note:
ETSZ geometry from Reference 2.5.2-10

Figure 2.5.2-26. (Sheet 2 of 2) Map Showing the Location of the Douglas Reservoir Relative to the CRN Site and Site Vicinity

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Notes:

See Table 2.5.1-17 for MP-Series boring data. B-series boring data from Reference 2.5.1-100.
Geometry of shear-fracture zones are shown on Figures 2.5.1-66 and 2.5.1-67.

Figure 2.5.1-65. (Sheet 1 of 2) Structure Contour Map of Shear Fracture Zones and Associated Profile