

## PMBelCOL PEmails

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**From:** Spink, Thomas E [tespink@tva.gov]  
**Sent:** Thursday, July 31, 2008 9:41 AM  
**To:** Mallecia Hood  
**Cc:** Sterdis, Andrea Lynn  
**Subject:** Courtesy email copy of TVA's Response to Environmental Report RAI Letter 32 - CRITERIA AND BASIS FOR COMPARATIVE RATINGS AMONG ALTERNATIVE SITES  
**Attachments:** ER Ltr 32 - Alternatives RAI #01\_Cover Letter Final amp\_07\_29\_08 doc Enclosure.pdf

Mallecia:

I have enclosed a pdf copy of our response to Environmental Report RAIs 9.3.1(Historic and Cultural Resources), 9.3.3, 9.3.4, and 9.3.6 with this email as a courtesy. As always, the official submittal has been submitted to the Document Control Desk via paper copy using Federal Express services. The paper copy should arrive today. Due to the size of the file, the letter attachment will be sent in a separate email.

If you have any questions, please do not hesitate to call me.

*Thomas E. Spink*

Licensing Project Manager  
Nuclear Generation Development  
1101 Market Street, LP 5A  
Chattanooga, TN 37402  
423-751-7062 Fax: (423)-751-6509

**Hearing Identifier:** Bellefonte\_COL\_Public\_EX  
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**Subject:** Courtesy email copy of TVA's Response to Environmental Report RAI Letter 32 -  
CRITERIA AND BASIS FOR COMPARATIVE RATINGS AMONG ALTERNATIVE SITES  
**Sent Date:** 7/31/2008 9:40:59 AM  
**Received Date:** 7/31/2008 9:42:33 AM  
**From:** Spink, Thomas E

**Created By:** tespink@tva.gov

**Recipients:**  
"Sterdis, Andrea Lynn" <alsterdis@tva.gov>  
Tracking Status: None  
"Mallecia Hood" <Mallecia.Hood@nrc.gov>  
Tracking Status: None

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

July 30, 2008

10 CFR 52.80

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

In the Matter of )  
Tennessee Valley Authority )

Docket Numbers 52-014 and 52-015

BELLEFONTE COMBINED LICENSE APPLICATION – RESPONSE TO  
ENVIRONMENTAL REPORT REQUEST FOR ADDITIONAL INFORMATION – CRITERIA  
AND BASIS FOR COMPARATIVE RATINGS AMONG ALTERNATIVE SITES

Reference: Letter from Mallecia Hood (NRC) to Ashok S. Bhatnaker (TVA), Request for  
Additional Information Regarding the Environmental Review of the Combined  
License Application for Bellefonte Nuclear Plant, Units 3 and 4, dated July 11, 2008,  
[ML081840493].

This letter provides the Tennessee Valley Authority's (TVA) response to four of the Nuclear  
Regulatory Commission's (NRC) request for additional information (RAI) items included in the  
reference letter.

The enclosure to this letter also provides a response to three requests related to Alternative  
Sites/Alternative Plant Systems and one request related to Historic and Cultural Resources, as  
well as identifying several associated changes that will be made in a future revision of the BLN  
application. The status of the NRC requests related to Alternative Sites/Alternative Plant Systems  
is provided in the enclosure.

In a discussion with the NRC's Environmental Project Manager for the BLN Combined License  
Application (COLA) review, it was noted that some of the details addressed in the TVA report  
attached to this letter have not yet been identified as changes to the COLA in the RAI responses  
provided in the enclosure to this letter. TVA understands that the NRC staff expects that the  
remaining COLA (i.e., Environmental Report) changes to be provided to the staff shortly after the  
scheduled completion of the environmental RAI response period. TVA will submit those changes  
to the NRC within two weeks following the 30-day due date for the environmental RAI responses  
(i.e., August 25, 2008). Based on discussions with the staff, TVA understands that transmittal of  
these ER changes by August 25, 2008, will not result in a schedule delay.

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If you should have any questions, please contact Thomas Spink at 1101 Market Street, LP5A, Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7062, or via email at [tespink@tva.gov](mailto:tespink@tva.gov).

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 30<sup>th</sup> day of July, 2008.



Andrea L. Sterdis

Manager, New Nuclear Licensing and Industry Affairs  
Nuclear Generation Development & Construction

Enclosure and Attachment:  
See Page3

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July 30, 2008

Enclosure:

Response to Environmental Report Request for Additional Information – Alternative Sites  
and Alternative Plant Systems

Attachment:

Tennessee Valley Authority, Alternative Sites Report #2, “Criteria and Basis for Comparative  
Ratings Among Alternative Brownfield and Greenfield Sites,” July 2008

cc (Enclosure and Attachment):

M. A. Hood, NRC/HQ

cc (w/o Enclosure and Attachment):

S. P. Frantz, Morgan Lewis

R. C. Grumbir, NuStart

P. S. Hastings, NuStart

R. H. Kitchen, PGN

M. C. Kray, NuStart

A. M. Monroe, SCE&G

C. R. Pierce, SNC

L. Reyes, NRC/RII

R. F. Smith-Kevern, DOE/HQ

G. A. Zinke, NuStart

ENCLOSURE  
RESPONSE TO ENVIRONMENTAL REPORT REQUEST FOR ADDITIONAL INFORMATION  
ALTERNATIVE SITES AND ALTERNATIVE PLANT SYSTEMS

**RESPONSE TO ENVIRONMENTAL REPORT  
REQUEST FOR ADDITIONAL  
INFORMATION**

**ALTERNATIVE SITES AND ALTERNATIVE  
PLANT SYSTEMS**

TVA Letter Dated: July 30, 2008

Responses to Environmental Report Information Needs – Alternative Sites and Alternative Plant Systems

This enclosure provides the status of the nine requests for additional information (RAI) related to Alternative Sites and Alternative Plant Systems and provides the BLN responses to three of these requests. This enclosure also provides the BLN response to one request related to Historic and Cultural Resources, RAI 9.3-1 (see Note (a) in the following status table).

Status of Requests for Additional Information Related to Alternative Sites and Alternative Plant Systems

<b>RAI Number</b>	<b>Date of TVA Response</b>
• 9.2-1	Future – expected submittal by August 6, 2008
• 9.3-1 <sup>(a)</sup>	Future – expected submittal by August 6, 2008
• 9.3-2	Future – expected submittal by August 6, 2008
• 9.3-3	This letter – see following pages.
• 9.3-4	This letter – see following pages.
• 9.3-5	Future – expected submittal by August 4, 2008
• 9.3-6	This letter – see following pages.
• 9.3-7	Future – expected submittal by August 4, 2008
• 9.3-8	Future – expected submittal by August 4, 2008

- (a) NRC issued two requests with the same RAI Number 9.3-1, one related to Alternative Sites and Alternative Plant Systems and one related to Historic and Cultural Resources. RAI Number 9.3-1 referred to in this table is related to Alternative Sites and Alternative Plant Systems, and will be addressed in a TVA submittal expected by August 6, 2008. RAI Number 9.3-1 related to Historic and Cultural Resources is addressed in this letter.



**NRC Review of the BLN Environmental Report**

**NRC Environmental Category: HISTORIC AND CULTURAL RESOURCES**

**NRC RAI NUMBER: 9.3-1**

Describe process for weighing cultural resources in the alternative site analysis.

**BLN RESPONSE:**

The attached TVA alternative sites report, *Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites*, was prepared by TVA in response to comments related to the criteria and basis for the comparative ratings among BLN and the alternative brownfield and greenfield sites. This report includes a description of the cultural resources identified at the alternative sites and the process that was applied to rate this criterion based upon the number of identified cultural resource sites as an indicator of the potential for encountering new unknown cultural sites during the assessment of the alternative sites. Sites with increased potential for impacts to these resources would be rated lower than those with no impacts. These numbers are identified in the individual site description in the attached document and in ER Section 2.5. The BLN and Murphy Hill (MH) sites were ranked slightly higher due to the small number of sites identified and the protective/ avoidance measures already in place. The other sites rated slightly lower due to the extensive number of sites already identified, indicating the potential for new discoveries if systematic surveys are performed. As noted in the report, TVA did not apply weighting to the comparative rating values used in the alternative sites evaluation.

This response is PLANT-SPECIFIC.

**ASSOCIATED BLN COL APPLICATION TEXT CHANGES:**

None.

**ATTACHMENTS:**

The following document is provided as an attachment to this enclosure:

Tennessee Valley Authority, *Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites*, Revision 0, July 2008.

**NRC Review of the BLN Environmental Report**

**NRC Environmental Category: ALTERNATIVE SITES / ALTERNATIVE PLANT SYSTEMS**

**NRC RAI NUMBER: 9.3-3**

Describe the rating and weighting system that the applicant used to further screen sites and resulted in Table 9.3-1 in the ER.

**BLN RESPONSE:**

The attached TVA alternative sites report, *Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites*, was prepared by TVA in response to comments related to the criteria and basis for the comparative ratings among BLN and the alternative brownfield and greenfield sites. This report provides detail regarding the criteria for comparing alternative candidate sites to the BLN site. The Electric Power Research Institute (EPRI) Siting Guide (ER Section 9.3.1, Reference 1) was used as a general guideline for the alternative site comparison. The criteria are generally grouped into four areas; i.e., those related to Safety and Health, Environmental, Socio-economic, and Engineering and Cost-Related Factors. The report includes a discussion of the basis for ranking the sites on each criterion, and includes a table that shows the individual ratings for selection criteria and total rating value of the sites in this comparison. As noted in the criteria and basis for comparative ratings report, TVA did not apply weighting to the comparative rating values used in the alternative sites evaluation. The selection criteria and comparison reflect the need for balancing engineering, environmental and economic factors in selecting a site that meets the current need.

This response is PLANT-SPECIFIC.

**ASSOCIATED BLN COL APPLICATION TEXT CHANGES:**

None.

**ATTACHMENTS:**

The following document is provided as an attachment to this enclosure:

Tennessee Valley Authority, *Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites*, Revision 0, July 2008.

**NRC Review of the BLN Environmental Report****NRC Environmental Category: ALTERNATIVE SITES / ALTERNATIVE PLANT SYSTEMS****NRC RAI NUMBER: 9.3-4**

Provide a description of the activities that went into assessing the 4 alternative sites (i.e., “re-evaluat[ion] of continued viability for the purpose of operating nuclear power generation facilities.” Page 9.3-3 of ER).

**Supporting Information:** *The ER states that, “. . . over time, as TVA has had to make decisions in response to the growing need for power generation, the suitability of the most attractive sites has been re-evaluated (including addition to, restart, or completion of existing or partially-completed nuclear assets) as to their continued viability for the purpose of operating nuclear power generation facilities.” Clarify at what time and in what manner these “re-evaluations” have taken place. Provide descriptions of these updated studies and evaluations to ensure that data is current and valid. Specifically, please provide descriptions of activities and/or references of the following:*

*Section 9.3.3.1 – “Cooling System Suitability” – Reference to average flow numbers (dates should be included).*

*Section 9.3.3.1 – “Plant Safety Evaluation – Flooding Potential” – Reference to flood rating numbers. Include minimum flow levels.*

*Section 9.3.3.2 – “Construction-Related Effects on Terrestrial Ecology” – Description and dates of survey activities and/or references on which terrestrial characteristics are based.*

*Section 9.3.3.2 – “Construction-Related Effects on Wetlands” – Dates of “current aerial photogrammetry at each site.”*

*Section 9.3.3.2 – “Entrainment and Impingement Effects” – Dates when sites “were evaluated with respect to their relative potential for entrainment and impingement effects from closed-cycle cooling water systems.”*

*Section 9.3.3.2 -- References and dates for cultural resource surveys conducted.*

*Section 9.3.3.3 – “Socioeconomics Criteria” – Descriptions of the “previous studies” and “recent updates” used to predict that brownfield sites were capable of adequately handling an increase in population due to the construction worker influx. Description should include the data (demographic, housing, etc) on which conclusions are based.*

**BLN RESPONSE:**

The attached TVA alternative sites report, *Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites*, was prepared by TVA in response to comments related to the criteria and basis for the comparative ratings among BLN and the alternative brownfield and greenfield sites. This report provides the requested additional detail regarding the reevaluation of the alternative sites to confirm their continued viability for the purpose of operating nuclear power generation facilities.

Included in the TVA report, “Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites,” are data and evaluations pertaining to cooling system suitability, flooding potential, construction-related effects on terrestrial ecology and wetlands, entrainment and impingement effects, and socioeconomics. Changes to the TVA Alternative Site Evaluation Summary of Results are presented in Table 1 in the TVA report, and presented below as changes to ER Table 9.3-1. It includes the addition of information for a comparison of low-flow characteristics of the alternative sites, the result of which affect

TVA Letter Dated: July 30, 2008

Responses to Environmental Report Information Needs- Alternative Sites and Alternative Plant Systems

other criteria as discussed in the document. The TVA report also provides references and dates for cultural resource surveys conducted.

Additionally, as discussed in the overview section of the TVA report, the information upon which the Applicant's Environmental Report was written was reviewed by TVA staff and contractors to confirm it remains valid and adequately represents current conditions for the comparative screening level process, and has been updated as necessary to reflect more current information or data required to accurately depict current conditions for the alternative sites and environs. The "previous studies" referred to in Subsection 9.3.3.3 are those addressed in the Environmental Statements associated with the original licensing of these alternative sites, and the Overview section in the attached TVA report discusses the updates that were performed in support of this licensing activity. The updates are further discussed in the body of the attached TVA report, and summarized in Table 2. Table 2 indicates which information from the original environmental statements was reviewed and deemed adequate (R) and which was updated (U). Where other or updated sources of information were utilized, they are cited at the end of each discussion for an individual criterion.

This response is PLANT-SPECIFIC.

#### **ASSOCIATED BLN COL APPLICATION TEXT CHANGES:**

1. Change COLA Part 3, ER Chapter 9, Subsection 9.3.3.3, fourth paragraph under the Construction-Related Effects heading, as follows:

Previous studies and recent updates predicted that the four brownfield sites are capable of adequately handling an increase in population due to construction worker influx, and the corresponding demand on housing and related services. The ~~MH~~ YCN site is located in a more rural area where housing, infrastructure, transportation routes, and public services are less well developed. Based on this, ~~MH~~ YCN is rated lower while the other brownfield sites and MH are rated equally for purposes of construction-related socioeconomic effects and are included in **Table 9.3-1**.

2. Change COLA Part 3, ER Chapter 9, Table 9.3-1, TVA ASE Summary of Results, as shown on the following page.

**TABLE 9.3-1  
TVA ASE SUMMARY OF RESULTS**

	BLN	HVN	PBN	YCN	MH
<b>Safety &amp; Health Criteria –</b>					
Geologic Evaluation	<del>5</del> <u>4</u>	5	<del>5</del> <u>3</u>	<del>5</del> <u>4</u>	<del>5</del> <u>4</u>
Cooling System Suitability	5	5	<del>5</del> <u>4</u>	5	5
<b>Plant Safety Evaluation –</b>					
Flooding Potential Evaluation	5	5	5	5	5
<b>Accident Effects Evaluation –</b>					
Population	4	4	4	<del>4</del> <u>5</u>	<del>5</del> <u>4</u>
Emergency Planning	5	<del>5</del> <u>2</u>	5	5	4
Atmospheric Dispersion	4	5	<del>5</del> <u>4</u>	5	4
Operational Effects Evaluation	5	5	5	5	5
<b>Transportation Safety Evaluation –</b>					
Cooling Tower Drift	4	5	5	5	4
<b>Environmental Criteria –</b>					
Proximity to Natural Areas	4	3	5	2	5
Construction-Related Effects on Aquatic Ecology	5	5	5	5	5
Construction-Related Effects on Terrestrial Ecology	5	5	5	5	5
Construction-Related Effects on Wetlands	5	5	5	5	5
Operations-Related Effects on Aquatic Ecology					
Thermal Discharge	4	4	<del>2</del> <u>3</u>	5	4
Entrainment And Impingement Effects	5	5	<del>5</del> <u>4</u>	4	5
Operations-Related Effects on Terrestrial Ecology					
Cooling Tower Drift	4	5	5	5	4
<b>Socioeconomic Criteria –</b>					
Construction-Related Effects	5	5	5	<del>5</del> <u>4</u>	<del>4</del> <u>5</u>
Highway Access During Construction	5	5	5	5	4
Operations-Related Effects	5	5	5	5	5
Environmental Justice Evaluation	5	5	5	5	5
Land Use	5	4	3	4	<del>2</del> <u>3</u>
Cultural Resources	5	4	4	4	5
<b>Engineering and Cost Related Criteria –</b>					
Water Supply Cost	5	5	<del>5</del> <u>4</u>	5	5
<b>Transportation –</b>					
Highway Access Cost*	5	5	5	5	3
Rail Access Cost*	5	3	5	<del>3</del> <u>5</u>	2
Barge Access Cost*	5	<del>3</del> <u>4</u>	<del>3</del> <u>1</u>	<del>3</del> <u>5</u>	2
Transmission Access Cost*	5	<del>2</del> <u>3</u>	<del>3</del> <u>5</u>	2	<del>2</del> <u>3</u>
<b>Site Preparation –</b>					
Land Use And Ownership Assessment	5	3	3	2	2
Topographic Modifications	5	5	5	4	3
Flood Protection Cost*	<del>3</del> <u>4</u>	4	<del>2</del> <u>3</u>	5	<del>2</del> <u>3</u>
Cooling Water Cost*	5	5	5	5	5
<b>Total</b>	142	<del>134</del> <u>133</u>	<del>134</del> <u>130</u>	<del>132</del> <u>135</u>	<del>121</del> <u>123</u>

1 = Least Suitable; 5 = Most Suitable

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Responses to Environmental Report Information Needs- Alternative Sites and Alternative Plant Systems

\* = These criteria were based upon an examination of the relative potential for financial impacts from major factors contributing to “cost” associated with that criterion, rather than cost estimates.

**ATTACHMENTS:**

The following document is provided as an attachment to this enclosure:

Tennessee Valley Authority, *Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites*, Revision 0, July 2008.

**NRC Review of the BLN Environmental Report****NRC Environmental Category: ALTERNATIVE SITES / ALTERNATIVE PLANT SYSTEMS****NRC RAI NUMBER: 9.3-6**

Verify the transmission distance requirements for Hartsville, Phipps Bend, and the Yellow Creek alternative sites.

**BLN RESPONSE:**

The evaluation of transmission line needs for BLN and the alternative sites, as addressed in Subsection 9.3.3.4 of the BLN environmental report, concluded:

- The Bellefonte site requires no additional transmission line or right-of-way (ROW).
- The Hartsville (HVN) site would require approximately 397 miles (mi.) of 500-kV and 8 mi. of 161-kV transmission line to be constructed on 9720 acres (ac.) of transmission ROW.
- The Phipps Bend (PBN) site would require approximately 139 mi. of both 500-kV and 161-kV transmission line to be constructed on 1464 ac. of transmission ROW.
- The Yellow Creek (YCN) site would require approximately 328 mi. of 500-kV and 14 mi. of 161-kV transmission line to be constructed on 6890 ac. of transmission ROW.
- The Murphy Hill (MH) site would require approximately 50 mi. of 500-kV and 5 mi. of 161-kV transmission line to be constructed on 1215 ac. of transmission ROW.

The evaluation of transmission line needs was subsequently reviewed in the evaluation of engineering and cost-related factors in the attached TVA alternative sites report, *Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites*. This review identified the following revised transmission ROW needs:

- The HVN site would require approximately 40 mi. of 500-kV transmission line to be constructed along two corridors and encumbering about 1000 ac. of transmission ROW, uprates to approximately 120 mi. of existing 500-kV transmission line, and a new 500-kV substation, occupying approximately 70 ac.
- The PBN site would require rebuilding a 33-mi. 161-kV transmission line, which would disturb approximately 17 ac. of existing ROW.
- The YCN site would require two 500-kV corridors of approximately 120 mi. traversing approximately 3,397 ac. of land. Acquisition of approximately 2,266 ac. would be required for the new ROW. Approximately 5 mi. of 161-kV line would be required, of which about 1.1 mi. (10 ac.) would require new ROW."

These changes are reflected in the associated COLA text changes identified below.

This response is PLANT-SPECIFIC.

**ASSOCIATED BLN COL APPLICATION TEXT CHANGES:**

Change COLA Part 3, ER Chapter 9, Subsection 9.3.3.4, second paragraph under the Transmission Access heading, as follows:

To accommodate the anticipated generation, the BLN site requires no additional transmission line or ROW. The HVN site would require approximately 40 mi. ~~397-mi.~~ of 500-kV ~~and 8-mi. of 161-kV~~ transmission line to be constructed on 1000 ac. along two transmission corridors, uprates to approximately 120 mi. of existing 500-kV transmission line, and a new 500-kV substation, occupying approximately 70 ac. ~~9720 ac. of transmission ROW.~~ The PBN site would require ~~139-mi. of both 500-kV and~~ rebuilding approximately 33 mi. of 161-kV transmission line ~~to be constructed on 1464~~ on 17 ac. of transmission ROW. Because of the proximity of the MH and BLN sites and the likely tie-in to some of the same existing 500-kV infrastructure, lines and substations, the transmission lines for MH would be roughly equivalent to that constructed earlier and already existing for BLN. Additionally, the presence of existing 500-kV and 161-kV lines crossing the MH site reduce the mileage of ROW needing to be constructed. Supporting operation of two nuclear units at the MH site would still, however, require off-site construction of approximately 50 miles of new 500-kV transmission lines and approximately 5 miles of 161-kV line on a combined total of 1215 ac. ~~acres.~~ The YCN site would require two 500-kV corridors of approximately 120 mi. traversing approximately 3397 ac. of land. Acquisition of approximately 2266 ac. would be required for the new ROW. ~~328-mi. of 500-kV and 14-mi.~~ Approximately 5 mi. of 161-kV ~~transmission-line would be required, of which about 1.1 mi. (10 ac.) would require new~~ ~~to be construction on 6890 ac. of transmission~~ ROW. The HVN, PBN, MH, and YCN would all require additional assessment for threatened and endangered species, cultural resources, land use, and potential impacts to water resources.

**ATTACHMENTS:**

The following document is provided as an attachment to this enclosure:

Tennessee Valley Authority, "Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites," Revision 0, July 2008.