

## NorthAnnaRAIsPEm Resource

---

**From:** Klos, John  
**Sent:** Tuesday, July 29, 2014 9:58 AM  
**To:** na3raidommailbox@dom.com  
**Cc:** Weisman, Robert; NorthAnnaRAIsPEm Resource; Stieve, Alice; Klos, John  
**Subject:** Draft RAIS FSAR Section 2.5 North Anna COL (52-017) eRAI 7642  
**Attachments:** North Anna draft RAI Sec. 2.5 eRAI 7642 .docx

Hi,

Please see attached Draft RAI 7642 for FSAR Section 2.5 of North Anna's combined license application. Please let me know if you need any clarifications before COB Aug 1, 2014. Otherwise, it will be issued as final after Aug 4, 2014.

Sincerely,

**John Klos, Project Manager**  
**U.S. NRC, Office of New Reactors**  
**NRC/NRO/DNRL/LB3, TWFN 6J10**  
**Washington, DC 20555-0001**  
**301.415.5136, 301.415.6323 (fax)**  
**MS T6D38**  
[John.Klos@NRC.gov](mailto:John.Klos@NRC.gov)

**Hearing Identifier:** NorthAnna3\_eRAI  
**Email Number:** 44

**Mail Envelope Properties** (94A2A4408AC65F42AC084527534CF4160132F1493D68)

**Subject:** Draft RAIS FSAR Section 2.5 North Anna COL (52-017) eRAI 7642  
**Sent Date:** 7/29/2014 9:57:53 AM  
**Received Date:** 7/29/2014 9:57:54 AM  
**From:** Klos, John

**Created By:** John.Klos@nrc.gov

**Recipients:**

"Weisman, Robert" <Robert.Weisman@nrc.gov>

Tracking Status: None

"NorthAnnaRAIsPEm Resource" <NorthAnnaRAIsPEm.Resource@nrc.gov>

Tracking Status: None

"Stieve, Alice" <Alice.Stieve@nrc.gov>

Tracking Status: None

"Klos, John" <John.Klos@nrc.gov>

Tracking Status: None

"na3raidommailbox@dom.com" <na3raidommailbox@dom.com>

Tracking Status: None

**Post Office:** HQCLSTR01.nrc.gov

| <b>Files</b>                                  | <b>Size</b> | <b>Date &amp; Time</b> |
|---|-------------|------------------------|
| MESSAGE                                       | 518         | 7/29/2014 9:57:54 AM   |
| North Anna draft RAI Sec. 2.5 eRAI 7642 .docx |             | 24419                  |

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

In your response to RAI 7477 Question 2.5.1-4 and 2.5.1-5, you conclude that erosion susceptibility contrasts between different lithologies and large increases in stream power (or drainage area) are responsible for topographic lineaments and stream profile nick points or gradient changes in the epicentral area. These processes and characteristics that shape the landscape are presented as an alternative to a neotectonic cause. Staff notes that your data (Figures) does not support your conclusion well. Please provide clarification.

- a. In response to Question 2.5.1-4b you state that lithologic erosional contrasts between the Chopawamsic Formation and the Ellisville pluton, (Figure 5A) are expressed as a topographic lineament (Figure 5B) and as differences in relief (Figure 6). This NW facing escarpment is also coincident with the newly defined Harris Creek fault (Burton et al, 2014). You conclude that the topographic escarpment disappears to the northeast of Beaver Creek because the Harris Creek fault no longer juxtaposes two different lithologic units, but places Chopawamsic against Chopawamsic rock. The implication being that the escarpment is not fault related but lithologically controlled.

Staff notes that in Figure 5B the NW facing escarpment/lineament clearly extends NE of Beaver Creek, more or less coincident with the fault and not with the lithologic contact between the Chopawamsic Formation and the Ellisville pluton. This figure does not support your conclusion about erosional contrasts between lithologies.

In figure 6 (Q4 part b) you point out high relief between the Ellisville pluton and the Chopawamsic terrane in the neck area that results in a SE-facing scarp and NW-facing scarp and conclude that these observations support a lithologic as opposed to tectonic explanation for the geomorphic feature in the data.

Staff notes in Figure 6 that high relief values are concentrated in the epicentral area and the Quail fault projection zone and don't extend along the SE contact of the pluton with the Chopawamsic Formation to the NE, outside the epicentral area. In addition, staff also notes that in areas immediately to the NE of the epicentral box, high relief values disappear even though there is no change in lithology. One possible interpretation is that this is neotectonic uplift in the epicentral area. In support of 10 CFR 100.23, please provide clarification regarding these differences.

- b. The response to Question 2.5.1-5c examines the longitudinal stream profiles and maps (geologic, elevation and Hillshade) in the epicentral area to determine if subtle anomalies in the profiles align with known geologic features or with topographic lineaments illustrated on geologic or LiDAR based maps. Staff notes that the geologic map used in Q5 (assemblage of earlier work) is not the same as the geologic map used in Q4 (Burton et al, 2014) and features previously discussed in Q4 such as the Harris Creek fault, lithologic contacts and the topographic scarps are not indicated in Figure 8 nor are they indicated on the various stream profiles. Also the location of the Chopawamsic fault appears to be misplaced too far to the SE. Staff notes that the geologic map from Burton is the most recent, most detailed (1:24,000), and focused on the epicentral area. Staff cannot verify the discussion provided in text with the

various map products or stream profiles. In support of 10 CFR 100.23, please provide clarification and coordination between the discussion in text and the various illustrations provided in Questions 2.5.1-4b and 2.5.1-5c.

- c. The stream profiles provided in response to Question 2.5.1-5c are generally well graded and at 25 times vertical exaggeration, knick points, gradient changes, convexity changes are subtle and difficult to distinguish from data artifacts that are exaggerated and not explicitly identified. In addition, throughout your responses you maintain that large changes in drainage area might be the cause of the knick points found on profiles. However, it is not possible for staff to verify that statement based on the figures provided. Did you consider other derivative information from Liar data that might provide a different or more discriminating perspective of the profile data such as slope vs distance, cumulative drainage area vs distance? In support of 10 CFR 100.23, please provide further clarification for the analysis of stream profiles.