Attachment A. Excerpt from Energy Northwest response letter (dated 17 September 2010) to the Nuclear Regulatory Commission letter (dated 13 July 2010) requesting additional information on seismic hazards for the review of the Columbia Generating Station license renewal application. Red numbers along the left-hand margin of the pages correspond to numbered items/sections in the evaluation.
Attachment A (Continued). Excerpt from Energy Northwest response letter (dated 17 September 2010) to the Nuclear Regulatory Commission letter (dated 13 July 2010) requesting additional information on seismic hazards for the review of the Columbia Generating Station license renewal application. Red numbers along the left-hand margin of the pages correspond to numbered items/sections in the evaluation.

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information that indicated a greater shear wave velocity contrast between the basalts and interbeds and new data from the sediments that reflected greater damping.

Of importance to the CGS site is their conclusion regarding the 1996 ground motion models which was based on the seismic hazard model adopted from CGS. They concluded in PNNL-16653 (Updated Site Response Analysis for the Waste Treatment Plant, DOE Hanford Site, Washington, 2007, page 37), that the hazard results obtained using the new ground motion models at the WTP site are similar to those obtained using the 1996 set of ground motion models. The relative amplification function (ratio of Hanford / California response) for the WTP site based on the updated site response model is generally below 1.0 (i.e., WTP site response is less than predicted using California recordings) with the exception of minor isolated peaks at 2, 4 and 20 Hz (see PNNL-16653, Figure 33). This is a large reduction over the intern relative amplification factors developed for the WTP in 2005 (PNNL-15089, Figure 3.3.9) where the Hanford response is predicted to be greater than the California data for most frequencies greater than about 1 Hz.

The United States Geological Survey (USGS) recently updated (2008) its assessment of seismic hazard for the United States. The results of this national program provide an opportunity for an updated independent validation of the results determined by Geomatrix for the CGS site. The USGS website offers its results either in the form of a contour map or more directly by the gridded data set that was used to construct the maps. The grid file (0.05 degree increment) was used to avoid interpolation of the small scale map contours. The USGS hazards results from two of the grid files (for 115.35°W, 46.50°N) are compared with the mean results from the Geomatrix 1994 report for the CGS site in Table 3.3.1 below. The Geomatrix (CGS) values are similar but slightly larger than those calculated by the USGS.

<table>
<thead>
<tr>
<th>Study</th>
<th>PGA for T = 500 years (10% in 50 years)</th>
<th>PGA for T = 2500 years (2% in 50 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USGS 2008</td>
<td>0.072 g</td>
<td>0.169 g</td>
</tr>
<tr>
<td>Geomatrix 1994</td>
<td>0.081 g</td>
<td>0.176 g</td>
</tr>
</tbody>
</table>

Although differences exist in the methods used to develop the individual site response models for different Hanford facilities, Energy Northwest concludes that the recent site-specific work performed by USDOE for the WTP validates earlier conclusions regarding the applicability of the California strong motion database to the estimation of ground motions at Hanford. Further, it should be noted that the other aspects of the hazard analysis such as fault locations, earthquake magnitudes and frequencies and attenuation relationships were not reexamined.