Separate spectral shapes ~~were~~are developed for high frequency (HF) and low frequency (LF). In order to reflect accurately the UHRS values calculated by the PSHA as shown in Table 2.5.2-~~14~~32, the HF spectral shape ~~was~~is anchored to the UHRS values from Table 2.5.2~~-14 at 100 Hz, 25 Hz, 10 Hz, 5 Hz, and 2.5 Hz. In~~-32. For the 10^{-4} AFE hazard level, the HF spectral shape, derived from NUREG/CR-6728, is scaled to the UHRS amplitudes at 5, 10, 25, and 100 Hz (PGA). The NUREG/CR-6728 spectral shape defines the HF spectrum between ~~these frequencies, the spectrum was interpolated using shapes~~ 0.5 and 5 Hz anchored ~~to the next higher and lower frequency and using weights on the two shapes equal to the inverse logarithmic difference between the intermediate frequency and the next higher or lower frequency. Below 2.5 Hz, the HF shape was extrapolated from 2.5 Hz. (The HF spectrum was anchored to the UHRS amplitude at 2.5 Hz, in addition to 5 Hz, because anchoring~~(scaled) to the UHRS amplitude at 5 Hz. For the 10^{-5} and ~~extrapolating~~10^{-6} HF response spectrum, the HF spectral shape scaled to ~~lower frequencies gave a 2.5 Hz amplitude that exceeded the UHRS.) For the LF spectral shape, a similar procedure was used except that the LF spectral shape was anchored~~ 5 Hz exceeds the 2.5 Hz UHRS value, therefore, the HF spectral shape, derived from NUREG/CR-6728, is scaled to the UHRS ~~values at 2.5 Hz, 1 Hz, and 0.5 Hz. Above 2.5 Hz, the LF shape was extrapolated from 2.5 Hz~~amplitudes at 2.5, 5, 10, 25, and 100 Hz (PGA). The NUREG/CR-6728 spectral shape defines the HF spectrum between 0.5 and 2.5 Hz anchored (scaled) to the UHRS amplitude at 2.5 Hz.

For each AFE hazard level, the LF spectral shape, derived from the NUREG/CR-6728, is scaled to the UHRS amplitudes at 0.5, 1, and 2.5 Hz. The NUREG/CR-6728 spectral shape defines the LF spectrum above 2.5 Hz when anchored (scaled) to the UHRS amplitude at 2.5 Hz. To create these spectral shapes, the single-corner and double-corner models recommended in NUREG/CR-6728 ~~were~~are weighted equally for each AFE hazard level, and for both HF and LF. For frequencies below 0.5 Hz, the spectral shape ~~was~~is extrapolated from the value at 0.5 Hz assuming a constant spectral velocity (i.e., spectral accelerations ~~were~~are assumed to scale linearly with frequency) down to 0.167 Hz (6 sec period). From 0.167 Hz to 0.1 Hz, spectral accelerations ~~were~~are assumed to scale as ~~(~~the square of the frequency~~)~~^{2}. This follows the recommendation of FEMA 450 (Reference 2.5.2-21) for long periods. Some smoothing of the 10^{-4} and 10^{-5} ~~M~~AFE LF spectrum is applied between 0.6 Hz and 2 Hz to avoid bumps in this frequency range that are apparent if no smoothing is applied.

Figures 2.5.2-31 through 2.5.2-33 ~~show~~present the horizontal HF and LF spectra calculated in this way for 10^{-4}, 10^{-5}, and 10^{-6} annual frequencies of exceedance, respectively. As mentioned previously, these spectra accurately reflect the rock UHRS amplitudes in Table 2.5.2-~~14~~32 that ~~were~~are calculated for the seven spectral frequencies~~ at which PSHA calculations were done~~. For each AFE hazard level, the envelope spectrum (smooth mean rock UHRS) is also calculated. Figure 2.5.2-76 shows the smooth mean rock 10^{-4}, 10^{-5}, and 10^{-6} AFE UHRS for the PSEG Site.

2.5.2.5 Seismic Wave Transmission Characteristics of the Site

The subsurface conditions necessary to predict and model the seismic wave transmission characteristics for the PSEG Site ~~were ~~are determined from both site-specific and regional data. This data included both stratigraphic and representative shear-wave measurements, degradation properties of the soils, and the uncertainties associated with these parameters. A detailed presentation of these parameters, as well as a discussion of the data and methodology for developing them, are provided in Subsections 2.5.4.2 through 2.5.4.7.

The profile is divided into the shallow profile (surface to about 400 ~~feet [~~ft~~.])~~.) and the deep profile (about 400 ft. to “basement”). The shallow profile represents depth to which extensive characterization has been performed. The lateral and vertical control on the subsurface strata (layering) ~~was~~ is defined primarily on lithology and material properties. The GMRS is developed for the top of the Competent Layer (Layer 1) (Figure 2.5.4.7-8a), following the guidance of RG 1.208, which has a mean elevation of -67 feet. Soils above this elevation are considered only for the purposes of calculating confining stresses.

2.5.2.5.1 Aleatory and Epistemic Uncertainty

The uncertainties in most of the site-characterization parameters are developed in Subsection 2.5.4.7 and are summarized here. Other necessary parameters not described in Subsection 2.5.4.7 are developed in this subsection.

Uncertainty in shear-wave velocities ~~was~~is specified by means of its Coefficient of Variation (COV). This COV takes a value of 0.25 for the top 160 ft. of the shallow profile, 0.30 for the deeper portion of the shallow profile, and 0.35 for the deep profile.

Uncertainty in the stratigraphy ~~was~~is also ~~specified~~described in Subsections 2.5.4.1, 2.5.4.7.2, and 2.5.4.7.4, including uncertainty in the depth to basement rock. These uncertainties ~~were~~ are specified as standard deviations or ranges for the elevation of the top of each layer.

Uncertainties in the degradation properties for soils in the shallow profile ~~were specified~~are discussed in Subsection 2.5.4.7.5. These values are roughly comparable to those recommended by Costantino (Reference 2.5.2-28) and by EPRI (Reference 2.5.2-38). For the deep profile and bedrock, which have strain-independent properties, the uncertainty in damping ~~was~~is characterized by a COV of 0.35 based on the recommendations in EPRI (Reference 2.5.2-38).

2.5.2.5.2 Description of Site Response Analysis

The site response analysis ~~was~~is conducted in three steps that are common to analyses of this type. First, the site geology and geotechnical properties in Subsections 2.5.4.1, 2.5.4.2, and 2.5.4.7, and the assessments of uncertainty described in Subsection 2.5.2.5.1 ~~were~~ are reviewed and used to generate multiple synthetic profiles of site characteristics. Second, sets of rock spectra ~~were~~are selected to represent rock ground motions corresponding to mean annual exceedance frequencies of 10^{-4}, 10^{-5}, and 10^{-6}. Finally, site response ~~was~~is calculated using an equivalent-linear technique, using the multiple synthetic profile and the sets of rock spectra representing input motions. These three steps are described in detail in the following subsections.

2.5.2.5.2.1 Generation of Synthetic Profiles

To account for the epistemic and aleatory uncertainties in the site's dynamic properties, 60 synthetic profiles ~~were~~ are generated using the stochastic model developed by Toro (Reference 2.5.2-84), with some modifications to account for the conditions at the PSEG Site. These synthetic profiles represent the site column from the top of the bedrock to the top of the Competent Layer, where the GMRS is defined. Bedrock is defined as having a shear-wave velocity of 9,200 ft/sec, in order to achieve consistency with the ~~new~~ EPRI attenuation equations used for the rock hazard calculations (Reference 2.5.2-39). This stochastic model uses as inputs the following quantities, ~~all of them coming~~provided from Subsections 2.5.2.5.1 or 2.5.4.2, 2.5.4.4, and 2.5.4.7: (1) the median shear-wave velocity profile, ~~which is given~~provided in Table 2.5.2-17; (2) the standard deviation of ln(Vs) (the natural logarithm of the shear-wave velocity) as a function of depth below the top of the ~~competent layer, which is also given~~Competent Layer, provided in Table 2.5.2-17 and is taken as identical to the COV values given in Subsection 2.5.2.5.1; (3) the correlation coefficient between ln(Vs) in adjacent layers, ~~which is taken~~ from generic results in Toro (Reference 2.5.2-84); and (4) the uncertainties in the depths to the top of the various layers, ~~which are given~~provided in Table 2.5.2-18 (note that the standard deviations for the shallow profile take into account that the elevation of the top of Competent Layer is itself uncertain).

The correlation coefficient between ln(Vs) in adjacent layers is estimated using the inter-layer correlation model from Toro (Reference 2.5.2-84) for USGS category A+B, which corresponds to Vs30 values of 360 m/s (~1,180 ft./s) or greater. This correlation model predicts fairly high correlation coefficients, except for the very top of the profile. For instance, the correlation coefficient is approximately 75~~%~~ percent at a depth of 50 ft. and higher values at greater depths.

Figures 2.5.2-34 and 2.5.2-35 ~~display~~present the Vs values of the 60 synthetic profiles~~,~~ for the entire profile and shallow ~~portion~~profile, respectively. Figures 2.5.2-36 and 2.5.2-37 compare the ~~median~~ logarithmic means of these 60 Vs profiles to the Vs ± Variability values ~~given~~provided in Table 2.5.2-17, indicating excellent agreement. The difference near the bottom of the profile occurs because the values in Table 2.5.2-17 do not take into account the depth to bedrock and its uncertainty.

For the randomization of the degradation properties, the standard deviations given in Subsection 2.5.4.7.5 are read at a strain of 3.16E-2, converted to logarithmic standard deviations and used as input to the randomization calculations. To account for a possible range in the Overconsolidation Ratio (OCR) of Layers 1 through 9B in Table 2.5.2-17 (varying from 2 to 6), idealized G/Gmax and damping curves are developed whose median and standard deviations bound the respective curves for the range of OCRs as shown in Figures 2.5.2-77 through 2.5.2-80. The randomization software extends these uncertainty values to other strains, tapering them near the ends to achieve physically reasonable curves for the synthetic G/Gmax and damping curves. The correlation coefficient between ln(G/Gmax) and ln(damping) in the fill is specified as -0.75. This implies that in synthetic profiles where the fill has higher than average G/Gmax, the fill tends to have lower than average damping. The degradation and damping properties are treated as fully correlated among layers with the same soil type, but independent between different soil types. In this analysis, damping values are truncated at 15 percent as is standard practice.

~~Figure~~Figures 2.5.2-~~38 shows~~77 through 2.5.2-80 illustrate the modulus-degradation and damping curves for layers 1, 2-5, 6-8, and 9A/9B, respectively used in the 60 synthetic profiles. ~~Similarly, Figure 2.5.2-39 shows the curves for layers 6-8~~.

Each set of 60 synthetic profiles, consisting of Vs and unit weight vs. depth, depth to bedrock, stiffness, and damping curves, is used to calculate and quantify site response and its uncertainty, as described below.

2.5.2.5.2.2 Selection of Rock Input Motions

Rock input motions ~~were~~ are selected for input to the site response calculations using the seismic hazard and deaggregation results. Six separate input motions are considered, corresponding to HF and LF motions at 10^{-4}, 10^{-5}, and 10^{-6}. The development of spectra for these motions is presented in Subsection 2.5.2.4.4 and ~~shown~~illustrated in Figures 2.5.2-~~31~~59 through 2.5.2-~~33~~61.

2.5.2.5.2.2.1 Site Response Calculations

The site response calculations for the PSEG ~~were~~ Site are performed using the Random Vibration Theory (RVT) approach. In many respects, the inputs and assumptions are the same for an RVT analysis and for a time-history based analysis (e.g., an analysis with the program SHAKE (Reference 2.5.2-47)~~.~~). Both the RVT and ~~time-history (~~SHAKE~~)~~ procedures use a horizontally layered half-space representation of the site and use an equivalent-linear representation of dynamic response to vertically propagating shear waves. Starting from the same inputs (in the form of response spectra), both procedures ~~will lead to~~ result in similar estimates of site response (Reference 2.5.2-73). The main advantage of the RVT approach is that it does not require the spectral matching of multiple time histories to a given rock response spectrum. Instead, the RVT approach uses a probabilistic representation of the ensemble of all input motions corresponding to that given response spectrum and then calculates the response spectrum of the ensemble of dynamic responses.

Site-response calculations ~~were~~ are performed for the six bedrock motions as described in the previous subsection.

In addition to the rock response spectra, the RVT site-response calculations require the following inputs: (1) the strong-motion duration (T) associated with each rock spectrum; and (2) the equivalent-strain ratio to use in the equivalent-linear calculations (this input is required for both the time-history and RVT approaches~~)~~ and depends on magnitude). The duration is calculated from the de-aggregation results in Subsection 2.5.2.4.4 (Table 2.5.2-~~16~~34), using standard seismological relations between magnitude, seismic moment, corner frequency (fc), and duration (Reference 2.5.2-73), and ~~using~~ stress-drop and crustal Vs values typical of the eastern United States. The effective strain ratio is calculated using the expression $(\mathbf{M}_{\cancel{w}}-1)/10$ (Reference 2.5.2-47), where **M** is moment magnitude. Values smaller than 0.5 or greater than 0.65 ~~were~~ are brought into the 0.5-0.65 range, which is the range recommended by Kramer (Reference 2.5.2-54). The calculated values of duration and effective strain ratio are given in Table 2.5.2-19.

For each rock-motion input, separate site response calculations ~~were~~are performed for the corresponding 60 synthetic profiles, and these results ~~were~~are used to calculate the logarithmic mean and standard deviation of the amplification factor. Figures 2.5.2-40 and 2.5.2-41 ~~show~~ present the amplification factors computed for the 60 synthetic profiles, for the $10^{-\cancel{5}4}$ HF and LF motions, and the resulting logarithmic mean and standard deviation. Figures 2.5.2-42 and 2.5.2-43 ~~show~~present the logarithmic mean and standard deviation of the amplification factor for ~~the~~all three exceedance frequencies considered. Tables 2.5.2-20 and 2.5.2-21 present these results in Tabular form.

Figures 2.5.2-44 and 2.5.2-45 ~~show~~provide the peak strains as a function of depth for the 60 synthetic profiles, for the 10^{-}~~5~~^{4} HF and LF rock motions. Results are shown only for the shallow portion of the profile because the properties of the deep profile are independent of strain.

2.5.2.6 Ground Motion and Site Response Analysis

2.5.2.6.1 Ground Motion Response Spectrum (GMRS)

With the site-specific amplification described in Subsection 2.5.2.5, the seismic hazard model described in Subsection 2.5.2.4 ~~was~~ is ~~rerun~~analyzed incorporating the site amplifications into the hazard calculations. For ground motions below the 10^{-4} amplitudes, site amplification ~~was~~ is assumed to be the same as for the 10^{-4} amplitudes (Tables 2.5.2-20 and 2.5.2-21). For ground motions greater than the 10^{-6} amplitudes, site amplification ~~was~~ is assumed to be the same as for the 10^{-6} amplitudes (Tables 2.5.2-20 and 2.5.2-21). The logarithmic standard deviations in Tables 2.5.2-20 and 2.5.2-21 ~~were~~ are used to represent uncertainties in site response. ~~The~~A minimum moment magnitude (**M**) of 5.0 is used in the calculations (no CAV filter was applied ~~to these calculations~~), using ~~Vs30~~Vs30m for surface conditions for the PSEG Site - 730 m/s (2395 ft/sec) and using amplitudes at the surface after site effects have been taken into account.

The amplification factors for the HF input spectra ~~were~~are used for hazard calculations at 5, 10, 25 and 100 Hz (peak ground acceleration; PGA), and the amplification factors for the LF input spectra ~~were~~ are used for hazard ~~calculation~~calculations at 0.5, 1, and 2.5 Hz. ~~The reason is~~ Figures 2.5.2-59 through 2.5.2-61 illustrate that the HF rock spectra dominate the high frequencies and the LF rock spectra dominate the low frequencies. ~~This is apparent from Figures 2.5.2-31 through 2.5.2-33.~~

Figures 2.5.2-46 through 2.5.2-52 ~~show~~present seismic hazard curves for the ~~7~~seven spectral frequencies at which ground motion equations are available for the GMRS elevation ~~and~~. These figures cover a frequency range from ~~the~~ PGA (100 hz) in Figure 2.5.2-46 to 0.5 hz (Figure 2.5.2-52). ~~The mean hazard curves roll over to an annual frequency of exceedance that is less than 10^{-4}, because the CAV calculation indicates that many small-magnitude earthquakes will not be damaging.~~ Seismic hazard ~~curves~~ data for the GMRS elevation are ~~documented~~provided in Table 2.5.2-22. Table 2.5.2-23 ~~shows~~provides mean and median amplitudes for annual frequencies of 10^{-4}, 10^{-5}, and 10^{-6}. The mean and median soil UHRS for 10^{-4}, 10^{-5}, and 10^{-6} are ~~plotted~~presented in Figure 2.5.2-53.

2.5.2.6.1.1 Horizontal GMRS Spectrum

The horizontal Ground Motion Response Spectra (GMRS) ~~was~~ is developed from the horizontal soil UHRS using the approach described in ASCE/SEI Standard 43-05 (Reference 2.5.2-4) and RG 1.208**.**

The ASCE/SEI Standard 43-05 (Reference 2.5.2-4) approach defines the GMRS using the site-specific UHRS, which is defined for Seismic Design Category SDC-5 at a mean 10^{-4} annual frequency of exceedance. The procedure for computing the GMRS is as follows~~.~~:

For each spectral frequency at which the UHRS is defined, a slope factor A_R is determined from:

$$A_R=SA(10^{-5})/SA(10^{-4}) \qquad \text{(Equation 2.5.2-2)}$$

where $SA(10^{-4})$ is the spectral acceleration SA at a mean UHRS exceedance frequency of 10^{-4}/yr (and similarly for $SA(10^{-5})$). A Design Factor “DF” is defined based on A_R, which reflects the slope of the mean hazard curve between 10^{-4} and 10^{-5} mean annual frequencies of exceedance. The DF at each spectral frequency is given by:

$$DF= 0.6(A_R)^{0.80} \qquad \text{(Equation 2.5.2-3)}$$

and

$$GMRS = \max[SA(10^{-4}) \times \max(1, DF), 0.45 \times SA(10^{-5})] \qquad \text{(Equation 2.5.2-4)}$$

The derivation of DF is described in detail in ~~the Commentary to ASCE/SEI Standard 43-05~~ Reference 2.5.2-4 and in RG 1.208. ~~For the PSEG Site, the 10^{-4} soil UHRS is not defined, as described in Subsection 2.5.2.6.1. Therefore, factors A_R and DF in Equations (2.5.2-2) and (2.5.2-3) are not defined. For this case, Equation (2.5.2-3) indicates that the GMRS is calculated as 0.45 times the 10^{-5} UHRS.~~ Table 2.5.2-24 ~~shows the calculation of~~tabulates the horizontal GMRS ~~from the 10^{-5} UHRS~~. The horizontal GMRS is plotted in Figure 2.5.2-54.

2.5.2.6.1.2 Vertical GMRS Spectrum

The vertical GMRS ~~was~~ is developed using vertical-to-horizontal (V/H) ratios. NRC RG 1.60 and NUREG/CR-6728 ~~indicate~~provide proposed V/H ratios for design spectra for nuclear facilities, and these V/H ratios are plotted in Figure 2.5.2-55. The V/H ratios in the portion of Figure 2.5.2-55 ~~from~~ labeled “NUREG/CR-6728 CEUS rock” are ~~labeled “CEUS rock (<0.2g)” and~~ from Table 4-5 in NUREG/CR-6728. The values are those recommended for rock sites in the CEUS when the horizontal PGA ~~<~~ranges from 0.2g to 0.~~2g~~5g, which is the case for the horizontal GMRS at the PSEG Site. These V/H ratios are shown for background information only. For soil conditions, two ground motion prediction equations ~~were~~ are used based on empirical data from ~~California, Abrahamson~~ the Western United States (WUS), Campbell and Bozorgnia (Reference 2.5.2-112) and ~~Silva (Reference 2.5.2-1)~~Gülerce and ~~Campbell (Reference 2.5.2-23),~~Abrahamson (Reference 2.5.2-113) because these studies ~~predict spectral amplitudes for both horizontal and vertical motion~~enable prediction of V/H ratios as a function of $\mathbf{M}_w$ and R. ~~To obtain V/H ratios, ground motions were predicted for both horizontal and vertical spectra, and the ratio plotted.~~ Two earthquakes ~~were~~ are used for this calculation, corresponding to the $\mathbf{M}_w$ and R values ~~shown~~presented in Table 2.5.2-~~16~~34 for HF 10^{-4} and 10^{-5} spectra: $\mathbf{M}_w$=5.~~6~~9 and R=~~9.6 and 22~~27 km (~~13~~16.7 mi.), and **M**=6.0 and R=12 km (7.5 mi.). The GMRS is ~~less than~~ between the 10^{-4} and 10^{-5} UHRS~~, and the soil 10^{-4} UHRS is not defined,~~ as shown in Figure 2.5.2-81 but these $\mathbf{M}_w$ and R values are indicative of the magnitudes and distances that ~~would be expected to~~ cause the GMRS ground motion.

Two sets of V/H ratios are ~~shown~~ presented on Figure 2.5.2-55 for each ~~distance (R=9.6 and 22 km; 6 and 13.7 mi., respectively) in Figure 2.5.2-55. The~~ of the two WUS ground motion prediction equations. The first ~~(~~set is labeled “~~WUS soil”) shows V/H~~ unshifted” and is taken directly ~~as the average V/H from~~ from each respective ground motion prediction equation for the ~~two ground motion prediction equations. The~~ corresponding HF controlling earthquake. The second set of V/H ratios ~~(~~, labeled “~~WUS soil (~~shifted~~)”)~~” recognizes that CEUS earthquake ground motions tend to have more high-frequency content than their ~~western~~ WUS counterparts. To approximate what might be a V/H ratio for soil conditions in the CEUS, the WUS soil V/H ratios are shifted by scaling the frequency by a factor of 3, which shifts the peak V/H ratio to higher frequencies. The locations of the peak for the “~~WUS soil (~~shifted~~)~~” V/H ratios are consistent with the peak in the “NUREG/CR-6728 CEUS rock~~ (<0.2g)~~” V/H ratio.

Based on these comparisons, ~~it is recommended that ~~the ~~applicable ~~recommended V/H ratios for the PSEG Site ~~should be~~are 1.~~0~~15 at spectral frequencies between ~~100 ~~40 Hz and ~~1040~~100 Hz, 0.75 for frequencies from ~~5 ~~0.1 Hz to ~~0.1~~5 Hz. Between the frequencies of 5 and 40 Hz the V/H ratio is assumed to vary linearly from 0.75 at 5 Hz up to 1.15 at 40 Hz.~~, and V/H should be interpolated (on a log-linear scale) between 1.015 at 1040 Hz and 0.75 at 5 Hz. This recommendation is shown~~The recommended V/H ratios are depicted on Figure 2.5.2-55 as a ~~dashed red~~solid black line. ~~This recommendation bounds~~These recommended V/H ratios bound ~~all of ~~the V/H ratios described above, ~~plotted ~~except the RG 1.60 ratio, which is considered obsolete because it is based on a small number of ground motions recorded prior to 1973.

Vertical spectra ~~were~~are scaled from the horizontal spectra using the ~~recommended ~~V/H ratios. The vertical GMRS ~~was~~is calculated by multiplying the horizontal GMRS at each frequency by the V/H ratio ~~shown~~depicted by the solid black line in Figure 2.5.2-55. Figure 2.5.2-54 ~~shows~~illustrates the horizontal GMRS and the vertical GMRS calculated using this ~~way~~method. The V/H ratios and vertical GMRS ~~are documented~~values are provided in Table 2.5.2-24.

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~~Table 2.5.2-1~~

~~Earthquakes from 1985 through 3/31/2009 in Study Region with Emb>3.0~~

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Tables 2.5.2-1 through 2.5.2-16 Not Used

Table 2.5.2-17
Base-Case Soil Profile
Mean Shear Wave Velocity

mation	**Soil Curve Number**	**Soil Curve Description**	**Thickness (ft.)**	**Vs (ft/sec)**	**Unit Weight (pcf)(a)**	**Sigma (ln Vs)**	**Dept Top laye ~~bes estin~~ – be estin (ft.)(**
er 1 (Tvt, Tht and Knv) - ompetent Layer for GMRS(b)	1	Layer 1	84.5	2250	121	0.25	0
er 2 (Kml)	2	Layers 2-5	18.5	3920	131	0.25	84
er 3 (Kml)	2	Layers 2-5	21.5	2490	131	0.25	10
er 4 (Kml)	2	Layers 2-5	34.5	3020	131	0.25	124
er 5 (Kml, Kwn, Kmt)	2	Layers 2-5	62.0	2490	128	0.25	15
er 6 (Ket, Kwb)	3	Layers 6-8	84.0	1710	125	0.30	22
er 7 (Kmv)	3	Layers 6-8	26.0	2290	130	0.30	30
er 8 (Kmg)	3	Layers 6-8	25.0	1780	130	0.30	33
er 9A (Kmg)	4	Layers 9a-9b	31.0	2490	130	0.30	35
er 9B (Kp)	4	Layers 9a-9b	51.0	2490	130	0.30	38
er Potomac	5	Deep Profile	365.0	2200	135	0.35	43
dle Potomac	5	Deep Profile	430.0	2630	135	0.35	80
er Potomac	5	Deep Profile	450.0	3060	135	0.35	123

a) pcf = pounds per cubic foot
b) Layer definitions are shown on Figure 2.5.4.7-8a
~~c) Depths are referenced to top of Competent Layer~~

~~Table 2.5.2-17~~
~~Base-Case Soil Profile~~
~~Mean Shear Wave Velocity~~

~~eFormation~~	**~~Latitude (lat)Soil Curve Number~~**	**~~Longitude (long)Soil Curve Description~~**	**~~EmbThickness (ft.)~~**	**~~SMBVs (ft/sec)~~**	**~~RMBUnit Weight (pcf)(a)~~**	**~~Magnitude TypeSigma (ln Vs)~~**	**~~Sour Dep toT of la (ft~~**
~~5/10/15Layer 1 (Tvt, Tht and Knv)~~ ~~ompetent Layer for GMRS(b)~~	~~42.5301~~	~~71.470Layer 1~~	~~3.1084.5~~	~~0.12250~~	~~3.11121~~	~~MN0.25~~	~~NES~~
~~5/10/19Layer 2 (Kml)~~	~~40.9802~~	~~73.830Layers 2-5~~	~~4.0718.5~~	~~0.13920~~	~~4.08131~~	~~mbLg0.25~~	~~SYK0 .5~~
~~5/10/21Layer 3 (Kml)~~	~~40.9902~~	~~73.830Layers 2-5~~	~~3.2021.5~~	~~0.12490~~	~~3.21131~~	~~mbLg0.25~~	~~SYK0 3~~
~~0/01/23Layer 4 (Kml)~~	~~42.5502~~	~~71.480Layers 2-5~~	~~3.604.5~~	~~0.13020~~	~~3.61131~~	~~Mn0.25~~	~~NESI 4.~~
~~0/05/05Layer 5 (Kml, Kwn, Kmt)~~	~~36.0302~~	~~71.670Layers 2-5~~	~~3.7062.0~~	~~0.12490~~	~~3.71128~~	~~Mb0.25~~	~~NEIC~~

~~1/03/15Layer 6 (Ket, Kwb)~~	~~37.746~~	~~77.909Layers 6-8~~	~~3.8084.0~~	~~0.11710~~	~~3.81125~~	~~mbLg0.30~~	~~SEUS 22~~
~~1/04/12Layer 7 (Kmv)~~	~~41.1503~~	~~73.650Layers 6-8~~	~~3.2026.0~~	~~0.12290~~	~~3.21130~~	~~Mn0.30~~	~~NESI 5~~
~~1/06/03Layer 8 (Kmg)~~	~~41.0503~~	~~71.440Layers 6-8~~	~~3.3025.0~~	~~0.11780~~	~~3.31130~~	~~Mn0.30~~	~~NESI 1~~
~~1/06/17Layer 9A (Kmg)~~	~~42.593~~	~~74.637Layers 9a-9b~~	~~4.0031.0~~	~~0.32490~~	~~4.10130~~	~~MC0.30~~	~~LCSI 6~~
~~1/08/15Layer 9B (Kp)~~	~~40.783~~	~~77.667Layers 9a-9b~~	~~3.0051.0~~	~~0.32490~~	~~3.10130~~	~~MC0.30~~	~~LCSI 7~~
~~1/09/02Upper Potomac~~	~~42.4915~~	~~74.209Deep Profile~~	~~3.1065.0~~	~~0.32200~~	~~3.20135~~	~~MC0.35~~	~~LCSI 8~~
~~1/09/03Middle Potomac~~	~~42.9405~~	~~71.510Deep Profile~~	~~3.30430.0~~	~~0.12630~~	~~3.31135.0~~	~~Mn0.35~~	~~NESI 3~~
~~1/10/28Lower Potomac~~	~~41.0605~~	~~73.630Deep Profile~~	~~3.10450.0~~	~~0.13060~~	~~3.11135.0~~	~~Mn0.35~~	~~NESI 33~~

~~1992/01/09~~	~~40.360~~	~~74.340~~	~~3.00~~	~~0.1~~	~~3.01~~	~~mbLg~~	~~SYK08~~
~~1992/03/10~~	~~41.040~~	~~72.130~~	~~4.10~~	~~0.1~~	~~4.11~~	~~Mn~~	~~NESN~~
~~1994/01/16~~	~~40.369~~	~~76.092~~	~~4.60~~	~~0.3~~	~~4.70~~	~~MC~~	~~LCSN~~
~~1994/03/12~~	~~42.789~~	~~77.688~~	~~3.50~~	~~0.3~~	~~3.60~~	~~MC~~	~~LCSN~~
~~1994/10/02~~	~~42.360~~	~~72.250~~	~~3.40~~	~~0.1~~	~~3.41~~	~~Mn~~	~~NESN~~
~~1996/03/22~~	~~41.690~~	~~71.240~~	~~3.10~~	~~0.3~~	~~3.20~~	~~Mc~~	~~NESN~~
~~1997/11/14~~	~~40.164~~	~~76.276~~	~~3.00~~	~~0.3~~	~~3.10~~	~~MC~~	~~LCSN~~
~~1998/10/21~~	~~37.422~~	~~78.439~~	~~3.80~~	~~0.1~~	~~3.81~~	~~mbLg~~	~~SEUSSN~~
~~2000/01/27~~	~~43.000~~	~~71.180~~	~~3.00~~	~~0.1~~	~~3.01~~	~~Mn~~	~~NESN~~
~~2000/06/16~~	~~42.100~~	~~72.820~~	~~3.00~~	~~0.1~~	~~3.01~~	~~Mn~~	~~NESN~~
~~2001/02/03~~	~~42.340~~	~~77.390~~	~~3.20~~	~~0.3~~	~~3.30~~	~~MC~~	~~LCSN~~
~~2001/09/22~~	~~38.026~~	~~78.396~~	~~3.20~~	~~0.1~~	~~3.21~~	~~mbLg~~	~~SEUSSN~~
~~2002/07/11~~	~~40.390~~	~~71.330~~	~~3.00~~	~~0.3~~	~~3.10~~	~~MC~~	~~LCSN~~
~~2003/05/05~~	~~37.655~~	~~78.055~~	~~3.90~~	~~0.1~~	~~3.91~~	~~mbLg~~	~~SEUSSN~~
~~2003/08/26~~	~~40.570~~	~~75.110~~	~~3.48~~	~~0.1~~	~~3.49~~	~~mbLg~~	~~SYK08~~
~~2003/12/09~~	~~37.774~~	~~78.100~~	~~4.50~~	~~0.1~~	~~4.51~~	~~mbLg~~	~~SEUSSN~~
~~2007/07/24~~	~~42.604~~	~~74.119~~	~~3.10~~	~~0.3~~	~~3.20~~	~~MC~~	~~LCSN~~
~~2008/12/27~~	~~40.114~~	~~76.403~~	~~3.40~~	~~0.3~~	~~3.50~~	~~MC~~	~~LCSN~~
~~2009/02/03~~	~~40.870~~	~~74.522~~	~~3.00~~	~~0.3~~	~~3.10~~	~~MC~~	~~LCSN~~

a)~~LCSN – Lamont-Doherty Cooperative Seismographic Network~~
~~NESN – New England Seismic Network~~
~~SEUSSN – Southeastern U. S. Seismic Network~~
~~SYK08 – Sykes, et al., 2008~~
~~NEIC – National Earthquake Information Center~~

Table 2.5.2-18
Parameters for Layer-Depth Randomization

Formation (top of)	Distribution Type	Depth 1 (ft.)[(a)]	Depth 2 (ft.) [(a)]
Layer 2 (Kml)	Normal	84.5	4.27
Layer 3 (Kml)	Normal	103	4.27
Layer 4 (Kml)	Normal	124.5	4.27
Layer 5 (Kml, Kwn, Kmt)	Normal	159	4.27
Layer 6 (Ket, Kwb)	Normal	221	4.27
Layer 7 (Kmv)	Normal	305	6.40
Layer 8 (Kmg)	Normal	331	6.40
Layer 9A (Kmg)	Normal	356	6.40
Layer 9B (Kp)	Normal	387	20.40
Upper Potomac	Uniform	433	443
Middle Potomac	Uniform	603	1003
Lower Potomac	Uniform	1033	1433
Bedrock	Uniform	1483	1883

a) For normal distributions, Depth1 is the mean depth below competent layer and Depth2 is the standard deviation of depth; for uniform distributions, Depth1 is the minimum depth to the top of the layer below top of competent layer and Depth2 is the maximum depth to the top of the layer below top of competent layer.

a)~~For normal distributions, Depth1 is the mean depth and Depth2 is the standard deviation of depth; for uniform distributions, Depth1 is the minimum depth and Depth2 is the maximum. Depths are to tops of layers as measured from the top of the competent layer.~~

Table 2.5.2-19

Calculation of Durations and Effective Strain Ratios for Input Rock Motions

Event	M	Distance ~~(R)~~ (R) km (mi)	Mo (dyn-cm)[a]	fc (Hz)	T (seconds)	Effective Strain Ratio
1E-4 HF	5.9	27 (16.7)	7.94E+24	0.42	3.71	0.5
1E-4 LF	7.3	540 (335.5)	1.00E+27	0.08	38.82	0.63
1E-5 HF	6.0	12 (7.5)	1.21E+25	0.38	3.25	0.5
1E-5 LF	7.6	570 (354)	2.82E+27	0.06	45.20	0.65
1E-6 HF	6.3	9 (5.6)	3.16E+25	0.27	4.19	0.53
1E-6 LF	7.7	420 (261)	3.98E+27	0.05	39.74	0.65

a) Mo = seismic moment; dyn-cm = Dyne-centimeters

Table 2.5.2-20

Amplification Factors for High- Frequency (HF) Motions

Frequency (Hz)	Logarithmic Mean Amplification Factors			Logarithmic Standard Deviations		
	1.00E-04	1.00E-05	1.00E-06	1.00E-04	1.00E-05	1.00E-06
100	1.07	0.77	0.48	0.21	0.23	0.30
90	0.97	0.70	0.43	0.21	0.23	0.30
80	0.85	0.60	0.37	0.22	0.24	0.30
70	0.72	0.51	0.30	0.23	0.24	0.31
60	0.62	0.42	0.25	0.25	0.26	0.31
50	0.57	0.38	0.21	0.28	0.28	0.32
45	0.57	0.37	0.20	0.29	0.30	0.33
40	0.59	0.37	0.19	0.30	0.32	0.34
35	0.63	0.38	0.19	0.31	0.34	0.36
30	0.67	0.41	0.19	0.31	0.36	0.39
25	0.76	0.46	0.21	0.30	0.36	0.43
20	0.89	0.57	0.25	0.30	0.36	0.46
15	1.06	0.73	0.33	0.27	0.33	0.48
12.5	1.14	0.84	0.42	0.23	0.29	0.47
10	1.27	0.97	0.52	0.22	0.27	0.43
9	1.38	1.07	0.59	0.22	0.27	0.43
8	1.51	1.19	0.69	0.21	0.26	0.43
7	1.63	1.31	0.80	0.22	0.26	0.40
6	1.74	1.43	0.92	0.19	0.22	0.37
5	1.80	1.53	1.03	0.28	0.25	0.32
4	1.64	1.50	1.10	0.32	0.31	0.33
3	1.42	1.37	1.17	0.22	0.25	0.34
2.5	1.47	1.39	1.22	0.26	0.27	0.35
2	1.69	1.57	1.35	0.23	0.26	0.33
1.5	1.93	1.83	1.57	0.23	0.25	0.31
1.25	2.05	1.96	1.70	0.24	0.25	0.34
1	2.18	2.17	1.98	0.26	0.23	0.24
0.9	2.06	2.10	2.03	0.26	0.25	0.23
0.8	1.97	2.02	2.02	0.23	0.23	0.23
0.7	2.00	2.05	2.08	0.24	0.23	0.21
0.6	2.16	2.22	2.29	0.23	0.23	0.21
0.5	2.44	2.49	2.57	0.23	0.23	0.22
0.4	2.75	2.82	2.89	0.30	0.30	0.30
0.3	2.34	2.41	2.48	0.38	0.39	0.39
0.2	1.60	1.64	1.69	0.32	0.33	0.35
0.15	1.36	1.39	1.41	0.18	0.19	0.21
0.125	1.31	1.33	1.34	0.14	0.15	0.16
0.1	1.29	1.31	1.30	0.11	0.12	0.13

Table 2.5.2-21

Amplification Factors for Low- Frequency (LF) Motions

Frequency (Hz)	Logarithmic Mean Amplification Factors			Logarithmic Standard Deviations		
	1~~.00~~E-~~0~~4	1E-5~~5~~	1~~.00~~E-~~0~~6	1~~.00~~E-~~0~~4	1~~.00~~E-~~0~~5	1~~.00~~E-~~0~~6
100	1.13	0.93	0.63	0.18	0.21	0.28
90	1.05	0.86	0.58	0.18	0.21	0.28
80	0.93	0.76	0.51	0.19	0.21	0.28
70	0.80	0.64	0.43	0.20	0.21	0.28
60	0.69	0.54	0.36	0.21	0.22	0.28
50	0.64	0.48	0.31	0.23	0.23	0.29
45	0.63	0.47	0.30	0.25	0.25	0.29
40	0.64	0.46	0.29	0.26	0.26	0.30
35	0.67	0.47	0.29	0.27	0.27	0.30
30	0.71	0.49	0.29	0.28	0.29	0.32
25	0.77	0.53	0.30	0.28	0.31	0.34
20	0.89	0.60	0.33	0.28	0.33	0.37
15	1.04	0.72	0.37	0.27	0.33	0.42
12.5	1.12	0.82	0.43	0.24	0.32	0.44
10	1.26	0.94	0.51	0.23	0.30	0.45
9	1.36	1.03	0.56	0.22	0.30	0.46
8	1.47	1.14	0.63	0.22	0.29	0.47
7	1.59	1.25	0.73	0.22	0.28	0.45
6	1.69	1.36	0.83	0.20	0.25	0.43
5	1.74	1.43	0.91	0.28	0.27	0.39
4	1.62	1.43	0.99	0.32	0.31	0.38
3	1.42	1.34	1.07	0.21	0.26	0.36
2.5	1.47	1.38	1.16	0.25	0.28	0.38
2	1.66	1.51	1.26	0.22	0.26	0.37
1.5	1.93	1.79	1.48	0.22	0.26	0.35
1.25	2.03	1.91	1.60	0.23	0.25	0.39
1	2.10	2.02	1.77	0.23	0.18	0.26
0.9	2.06	2.08	1.94	0.24	0.22	0.25
0.8	2.00	2.04	2.00	0.22	0.21	0.26
0.7	2.03	2.07	2.07	0.23	0.21	0.24
0.6	2.20	2.26	2.28	0.24	0.23	0.23
0.5	2.51	2.54	2.63	0.27	0.26	0.24
0.4	2.73	2.77	2.85	0.30	0.30	0.29
0.3	2.30	2.33	2.42	0.37	0.38	0.37
0.2	1.55	1.57	1.62	0.31	0.31	0.34
0.15	1.30	1.31	1.34	0.17	0.18	0.19
0.125	1.23	1.23	1.25	0.13	0.13	0.14
0.1	1.17	1.18	1.19	0.09	0.09	0.10

Table 2.5.2-22 (Sheet 1 of 7)

Mean and Fractile Soil Seismic Hazard Curves at GMRS Elevation

100 Hz (PGA) Hazard Curves						
Amplitude (a)	**MEAN**	**0.05(b)**	**0.16**	**0.5(c)**	**0.84**	**0.95**
0.0005	6.08E-02	2.10E-02	2.83E-02	4.76E-02	1.04E-01	1.41E-01
0.0007	4.73E-02	1.70E-02	2.14E-02	3.41E-02	8.22E-02	1.16E-01
0.001	3.56E-02	1.29E-02	1.62E-02	2.44E-02	6.12E-02	8.97E-02
0.0015	2.54E-02	9.12E-03	1.13E-02	1.71E-02	4.45E-02	6.52E-02
0.002	1.98E-02	6.92E-03	8.56E-03	1.28E-02	3.43E-02	5.09E-02
0.003	1.36E-02	4.90E-03	6.04E-03	8.85E-03	2.29E-02	3.59E-02
0.005	8.29E-03	2.82E-03	3.72E-03	5.33E-03	1.37E-02	2.16E-02
0.007	5.86E-03	1.86E-03	2.63E-03	4.00E-03	8.85E-03	1.49E-02
0.01	3.98E-03	1.23E-03	1.74E-03	2.82E-03	5.97E-03	1.00E-02
0.015	2.50E-03	7.08E-04	1.07E-03	1.86E-03	3.80E-03	5.78E-03
0.02	1.76E-03	4.68E-04	7.08E-04	1.32E-03	2.65E-03	4.04E-03
0.03	1.04E-03	2.69E-04	4.07E-04	7.59E-04	1.52E-03	2.33E-03
0.05	5.06E-04	1.35E-04	1.91E-04	3.80E-04	7.59E-04	1.23E-03
0.07	3.09E-04	7.76E-05	1.10E-04	2.34E-04	4.68E-04	7.59E-04
0.1	1.82E-04	4.17E-05	6.31E-05	1.35E-04	2.88E-04	4.68E-04
0.15	9.89E-05	2.16E-05	3.16E-05	7.76E-05	1.66E-04	2.51E-04
0.2	6.35E-05	1.29E-05	1.95E-05	5.13E-05	1.02E-04	1.55E-04
0.3	3.33E-05	6.46E-06	1.08E-05	2.75E-05	5.89E-05	8.32E-05
0.5	1.38E-05	2.14E-06	3.98E-06	1.05E-05	2.57E-05	3.89E-05
0.7	7.23E-06	9.33E-07	1.86E-06	5.25E-06	1.38E-05	2.24E-05
1	3.41E-06	3.20E-07	7.08E-07	2.29E-06	6.46E-06	1.05E-05
1.5	1.29E-06	7.24E-08	2.04E-07	7.08E-07	2.29E-06	4.27E-06
2	5.93E-07	2.09E-08	6.53E-08	3.09E-07	1.00E-06	2.29E-06
3	1.71E-07	2.37E-09	1.05E-08	7.24E-08	2.88E-07	7.33E-07
5	2.69E-08	3.59E-15	4.68E-10	8.51E-09	4.79E-08	1.30E-07
7	6.55E-09	5.19E-29	4.73E-15	1.68E-09	1.12E-08	3.27E-08
10	1.24E-09	4.20E-29	6.31E-17	2.34E-10	2.00E-09	6.03E-09

~~Spectral acceleration in g~~

~~(b)Percentile~~

~~**a)**~~

~~0.5 fractile = median~~

a) Spectral acceleration in g
b) Percentile
c) 0.5 fractile = median

Table 2.5.2-22 (Sheet 2 of 7)

Mean and Fractile ~~Rock~~Soil Seismic Hazard Curves at GMRS Elevation

25 Hz Hazard Curves~~25 Hz Hazard Curves~~						
Amplitude [a]~~Amplitude [a]~~	**MEAN~~MEAN~~**	**0.05[b]~~0.05 [b]~~**	**0.16~~0.16~~**	**0.5 [c]~~0.5 [c]~~**	**0.84~~0.84~~**	**0.95~~0.95~~**
0.0005~~0.0010005~~	7.69E-02~~2.26E7.69E-02~~	~~7.41E-03~~1.82E-02	3.02E-02~~1.29E3.02E-02~~	7.55E-02~~2.24E7.55E-02~~	~~3.16E-02~~1.11E-01	~~3.89E-02~~1.71E-01
0.0007~~0.00150007~~	6.18E-02~~1.92E6.18E-02~~	~~5.62E-03~~1.48E-02	2.44E-02~~1.05E2.44E-02~~	5.75E-02~~1.88E5.75E-02~~	9.10E-02~~2.75E9.10E-02~~	~~3.27E-02~~1.32E-01
0.001~~0.002001~~	4.84E-02~~1.69E4.84E-02~~	1.29E-02~~4.57E-031.29E-02~~	1.84E-02~~8.51E-031.84E-02~~	4.38E-02~~1.59E4.38E-02~~	7.00E-02~~2.40E7.00E-02~~	~~3.06E-02~~1.02E-01
0.0015~~0.0030015~~	3.62E-02~~1.38E3.62E-02~~	1.05E-02~~3.13E-031.05E-02~~	1.49E-02~~6.03E-031.49E-02~~	2.91E-02~~1.29E2.91E-02~~	5.38E-02~~2.09E5.38E-02~~	7.49E-02~~2.66E7.49E-02~~
0.002~~0.005002~~	2.92E-02~~1.04E2.92E-02~~	9.12E-03~~1.80E9.12E-03~~	1.20E-02~~3.98E-031.20E-02~~	2.21E-02~~9.12E-032.21E-02~~	4.19E-02~~1.59E4.19E-02~~	5.86E-02~~2.09E5.86E-02~~
0.003~~0.007003~~	2.14E-02~~8.36E-032.14E-02~~	7.41E-03~~1.19E7.41E-03~~	9.13E-03~~3.02E9.13E-03~~	1.45E-02~~6.92E-031.45E-02~~	3.01E-02~~1.29E3.01E-02~~	4.57E-02~~1.82E4.57E-02~~

0.005~~0.01005~~	1.43E-02~~6.52E-031.43E-02~~	4.90E-03~~7.33E-044.90E-03~~	6.46E-03~~2.14E6.46E-03~~	9.39E-03~~5.25E9.39E-03~~	1.98E-02~~1.05E98E-02~~	3.01E-02~~1.48E3.01E-02~~
0.007~~0.015007~~	1.08E-02~~4.78E-031.08E-02~~	3.98E-03~~4.52E-043.98E-03~~	4.90E-03~~1.41E4.90E-03~~	7.05E-03~~3.72E7.05E-03~~	1.46E-02~~7.41E-031.46E-02~~	2.29E-02~~1.12E2.29E-02~~
0.01~~0.0201~~	7.99E-03~~3.74E7.99E-03~~	2.82E-03~~3.31E-042.82E-03~~	3.47E-03~~9.33E-043.47E-03~~	5.30E-03~~2.92E5.30E-03~~	1.06E-02~~5.62E-031.06E-02~~	1.72E-02~~8.81E-031.72E-02~~
0.015~~0.03015~~	5.62E-03~~2.56E5.62E-03~~	1.86E-03~~1.97E-041.86E-03~~	2.46E-03~~5.37E-042.46E-03~~	3.73E-03~~2.00E3.73E-03~~	7.24E-03~~3.98E7.24E-03~~	1.16E-02~~6.24E-031.16E-02~~
0.02~~0.0502~~	4.34E-03~~1.48E4.34E-03~~	1.32E-03~~81.32E-0503~~	1.86E-03~~2.51E-041.86E-03~~	3.02E-03~~1.07E3.02E-03~~	5.76E-03~~2.29E5.76E-03~~	8.97E-03~~3.85E8.97E-03~~
0.03~~0.0703~~	2.96E-03~~9.88E-042.96E-03~~	8.13E-04~~4.62E-058.13E-04~~	~~1.45E-04~~1.23E-03	2.14E-03~~7.08E-042.14E-03~~	4.02E-03~~1.62E4.02E-03~~	6.00E-03~~2.63E6.00E-03~~
0.05~~0.105~~	1.74E-03~~6.23E-041.74E-03~~	4.22E-04~~2.09E-054.22E-04~~	~~7.76E-05~~6.61E-04	1.23E-03~~4.37E-041.23E-03~~	2.46E-03~~1.00E2.46E-03~~	3.55E-03~~1.68E3.55E-03~~
0.07~~0.1507~~	1.18E-03~~3.55E-041.18E-03~~	2.69E-04~~7.67E-062.69E-04~~	~~4.17E-05~~4.37E-04	8.13E-04~~2.43E8.13E-04~~	1.68E-03~~5.37E-041.68E-03~~	2.48E-03~~9.33E-042.48E-03~~
0.1~~0.21~~	7.54E-04~~2.33E7.54E-04~~	~~3.35E-06~~1.66E-04	~~2.57E-05~~2.51E-04	5.37E-04~~1.66E5.37E-04~~	1.07E-03~~3.80E-041.07E-03~~	1.74E-03~~5.96E-041.74E-03~~
0.15~~0.315~~	4.39E-04~~1.26E4.39E-04~~	~~9.33E-07~~8.91E-05	~~1.29E-05~~1.40E-04	3.09E-04~~8.61E-053.09E-04~~	6.17E-04~~2.04E6.17E-04~~	1.07E-03~~3.20E-041.07E-03~~
0.2~~0.52~~	2.93E-04~~5.56E-052.93E-04~~	~~1.45E-07~~5.89E-05	~~5.25E-06~~8.91E-05	2.04E-04~~3.51E-052.04E-04~~	4.07E-04~~1.02E4.07E-04~~	7.08E-04~~1.55E7.08E-04~~
0.3~~0.73~~	1.62E-04~~3.17E-051.62E-04~~	~~3.76E-08~~3.16E-05	~~2.29E-06~~4.79E-05	1.18E-04~~1.82E-051.18E-04~~	2.34E-04~~5.89E-052.34E-04~~	4.07E-04~~1.02E4.07E-04~~
0.5~~10.5~~	7.40E-05~~1.70E7.40E-05~~	~~7.67E-09~~1.29E-05	~~8.71E-07~~2.24E-05	5.50E-05~~8.22E-065.50E-~~	1.18E-04~~3.39E-051.18E-~~	1.97E-04~~6.10E-051.97E-~~

				~~05~~	~~04~~	~~04~~
0.7~~1.50.7~~	4.31E-05~~8.03E-064.31E-05~~	~~1.19E-09~~6.92E-06	~~2.88E-07~~1.29E-05	3.16E-05~~3.47E-063.16E-05~~	7.24E-05~~1.59E7.24E-05~~	1.22E-04~~3.39E-051.22E-04~~
1~~21~~	2.37E-05~~4.54E-062.37E-05~~	~~2.99E-10~~3.47E-06	~~1.18E-07~~6.03E-06	~~1.62E-06~~1.70E-05	4.47E-05~~8.51E-064.47E-05~~	6.31E-05~~2.02E6.31E-05~~
1.5~~31.5~~	1.15E-05~~1.89E-061.15E-05~~	~~2.95E-11~~1.41E-06	~~2.40E-08~~2.82E-06	~~4.84E-07~~8.22E-06	2.24E-05~~3.47E-062.24E-05~~	3.39E-05~~9.12E-063.39E-05~~
~~5~~2	6.61E-06~~5.43E-076.61E-06~~	~~1.23E-12~~6.38E-07	~~2.29E-09~~1.41E-06	~~8.04E-08~~4.42E-06	1.20E-05~~8.71E-071.20E-05~~	2.09E-05~~2.72E-062.09E-05~~
~~7~~3	2.85E-06~~2.13E-072.85E-06~~	~~1.26E-13~~1.91E-07	~~3.80E-10~~4.37E-07	~~2.09E-08~~1.62E-06	~~2.88E-07~~4.90E-06	9.77E-06~~1.04E9.77E-06~~
~~10~~5	~~7.04E-08~~8.61E-07	~~8.81E-15~~3.06E-08	~~4.79E-11~~8.32E-08	~~5.07E-09~~3.80E-07	~~7.24E-08~~1.41E-06	3.02E-06~~3.31E-073.02E-06~~
7	3.53E-07	6.24E-09	2.24E-08	1.26E-07	5.75E-07	1.32E-06
10	1.23E-07	5.56E-10	4.57E-09	3.63E-08	1.91E-07	5.01E-07

a) Spectral acceleration in g
b) Percentile
c) 0.5 fractile = median
~~Spectral acceleration in g~~
~~(b)Percentile~~

~~0.5 fractile = median~~

Table 2.5.2-22 (Sheet 3 of 7)

Mean and Fractile Soil Seismic Hazard Curves at GMRS Elevation

10 Hz Hazard Curves~~10 Hz Hazard Curves~~						
(a)Amplitude~~Amplitude (a)~~	**MEAN~~MEAN~~**	**0.05(b)~~0.05(b)~~**	**0.16~~0.16~~**	**0.5(c)~~0.5(c)~~**	**0.84~~0.84~~**	**0.95~~0.95~~**
0.0005~~0.0010005~~	9.89E-02~~2.49E9.89E-02~~	~~9.44E-03~~3.91E-02	5.62E-02~~1.48E5.62E-02~~	9.32E-02~~2.40E9.32E-02~~	~~3.39E-02~~1.45E-01	~~4.17E-02~~1.84E-01
0.0007~~0.0015007~~	7.94E-02~~2.12E7.94E-02~~	~~7.16E-03~~3.18E-02	4.27E-02~~1.20E4.27E-02~~	7.12E-02~~2.09E7.12E-02~~	~~2.95E-02~~1.19E-01	~~3.63E-02~~1.52E-01
0.001~~0.002001~~	6.15E-02~~1.85E6.15E-02~~	~~5.82E-03~~2.41E-02	3.24E-02~~9.77E-033.24E-02~~	5.08E-02~~1.82E5.08E-02~~	9.14E-02~~2.57E9.14E-02~~	~~3.16E-02~~1.17E-01
0.0015~~0.0030015~~	4.50E-02~~1.49E4.50E-02~~	~~4.12E-03~~1.82E-02	2.29E-02~~6.92E-032.29E-02~~	3.63E-02~~1.48E3.63E-02~~	6.58E-02~~2.24E6.58E-02~~	9.03E-02~~2.75E9.03E-02~~
0.002~~0.005002~~	3.56E-02~~1.08E3.56E-02~~	~~2.37E-03~~1.48E-02	1.85E-02~~4.57E-031.85E-02~~	2.76E-02~~9.77E-032.76E-02~~	5.09E-02~~1.70E5.09E-02~~	7.07E-02~~2.09E7.07E-02~~
0.003~~0.007003~~	2.52E-02~~8.35E-032.52E-02~~	~~1.51E9.78E-03~~9.78E-03	1.30E-02~~3.24E-031.30E-02~~	1.82E-02~~7.41E-031.82E-02~~	3.70E-02~~1.29E3.70E-02~~	5.21E-02~~1.76E5.21E-02~~
0.005~~0.01005~~	1.60E-02~~6.17E-031.60E-02~~	~~8.41E-04~~6.46E-03	7.98E-03~~2.29E7.98E-03~~	1.10E-02~~5.43E-031.10E-02~~	2.34E-02~~9.77E-032.34E-02~~	3.45E-02~~1.33E3.45E-02~~
0.007~~0.015007~~	1.17E-02~~4.19E-031.17E-02~~	~~4.68E-04~~4.57E-03	5.63E-03~~1.32E5.63E-03~~	8.21E-03~~3.59E8.21E-03~~	1.65E-02~~6.92E-031.65E-02~~	2.54E-02~~9.44E-032.54E-02~~
0.01~~0.0201~~	8.20E-03~~3.09E8.20E-03~~	~~3.09E-04~~3.02E-03	~~8.71E-04~~3.98E-03	5.73E-03~~2.63E5.73E-03~~	1.14E-02~~4.90E-031.14E-02~~	1.76E-02~~7.16E-031.76E-02~~
0.015~~0.03015~~	5.39E-03~~1.93E~~	~~1.78E-04~~2.00E-	~~4.68E-04~~2.63E-	4.01E-03~~1.74E~~	7.20E-03~~3.24E~~	1.16E-02~~4.57E~~

	~~5.39E-03~~	03	03	~~4.01E-03~~	~~7.20E-03~~	~~-031.16E-02~~
0.02~~0.0502~~	3.95E-03~~9.97E-043.95E-03~~	~~7.24E-05~~1.41E-03	~~2.04E-04~~2.00E-03	3.03E-03~~8.13E-043.03E-03~~	5.25E-03~~1.62E5.25E-03~~	7.90E-03~~2.46E7.90E-03~~
0.03~~0.0703~~	2.48E-03~~6.24E-042.48E-03~~	~~3.51E-05~~8.13E-04	~~1.10E-04~~1.23E-03	2.00E-03~~5.37E-042.00E-03~~	3.33E-03~~1.00E3.33E-03~~	4.86E-03~~1.57E4.86E-03~~
0.05~~0.105~~	1.31E-03~~3.71E-041.31E-03~~	~~1.53E-05~~4.07E-04	~~5.89E-05~~6.17E-04	1.07E-03~~3.20E-041.07E-03~~	1.75E-03~~6.17E-041.75E-03~~	2.59E-03~~9.02E-042.59E-03~~
0.07~~0.1507~~	8.27E-04~~2.01E8.27E-04~~	~~5.25E-06~~2.51E-04	~~2.95E-05~~3.80E-04	6.61E-04~~1.72E6.61E-04~~	1.08E-03~~3.31E-041.08E-03~~	1.66E-03~~5.01E-041.66E-03~~
0.1~~0.21~~	4.94E-04~~1.28E4.94E-04~~	~~2.07E-06~~1.45E-04	~~1.70E-05~~2.19E-04	4.07E-04~~1.10E4.07E-04~~	7.08E-04~~2.19E7.08E-04~~	1.01E-03~~3.20E-041.01E-03~~
0.15~~0.315~~	2.69E-04~~6.64E-052.69E-04~~	~~5.56E-07~~7.76E-05	~~7.94E-06~~1.10E-04	2.19E-04~~5.50E-052.19E-04~~	4.07E-04~~1.26E4.07E-04~~	5.77E-04~~1.66E5.77E-04~~
0.2~~0.52~~	1.74E-04~~2.75E-051.74E-04~~	~~7.76E-08~~4.79E-05	~~2.63E-06~~6.76E-05	1.45E-04~~2.16E-051.45E-04~~	2.88E-04~~5.13E-052.88E-04~~	3.81E-04~~7.50E-053.81E-04~~
0.3~~0.73~~	9.23E-05~~1.46E9.23E-05~~	~~1.88E-08~~2.32E-05	~~1.23E-06~~3.39E-05	7.76E-05~~1.05E7.76E-05~~	1.55E-04~~2.75E-051.55E-04~~	2.04E-04~~4.32E-052.04E-04~~
0.5~~10.5~~	~~7.01E-06~~4.02E-05	~~4.12E-09~~8.51E-06	~~4.68E-07~~1.38E-05	~~4.42E-06~~3.39E-05	7.24E-05~~1.29E7.24E-05~~	9.55E-05~~2.24E9.55E-05~~
0.7~~1.50.7~~	~~2.76E-06~~2.24E-05	~~5.37E-10~~4.57E-06	~~1.35E-07~~7.41E-06	~~1.46E-06~~1.82E-05	~~5.25E-06~~3.89E-05	~~9.77E-06~~5.50E-05
1~~21~~	~~1.32E-06~~1.15E-	~~1.26E-10~~2.21E-	~~5.13E-08~~3.47E-	~~6.17E-07~~9.12E-	~~2.63E-06~~2.09E-	~~4.90E-06~~3.16E-

	05	06	06	06	05	05
~~3~~1.5	~~4.17E-07~~5.02E-06	~~1.16E-11~~8.71E-07	~~9.12E-09~~1.32E-06	~~1.60E-07~~3.47E-06	~~8.13E-07~~9.12E-06	~~1.68E-06~~1.38E-05
~~5~~2	~~7.81E-08~~2.62E-06	~~3.94E-13~~3.80E-07	~~7.08E-10~~6.38E-07	~~2.40E-08~~1.86E-06	~~1.35E-07~~4.90E-06	~~3.31E-07~~7.41E-06
~~7~~3	~~2.23E-08~~9.49E-07	~~3.63E-14~~1.02E-07	~~1.10E-10~~2.04E-07	~~4.90E-09~~6.17E-07	~~3.63E-08~~1.74E-06	~~9.55E-08~~2.82E-06
~~10~~5	~~5.16E-09~~2.18E-07	~~1.46E-15~~1.20E-08	~~1.29E-11~~3.16E-08	~~7.85E-10~~1.35E-07	~~7.94E-09~~3.80E-07	~~2.24E-08~~6.61E-07

~~a)Percentile~~

~~Table 2.5.2-13 (Sheet 4 of 7)~~

~~Mean and Fractile Rock Seismic Hazard Curves~~

~~**5 Hz Hazard Curves**~~						
~~**Amplitude**~~7	7.28E-08	1.57E-09	6.92E-09	3.89E-08	1.26E-07	2.34E-07
10	~~**MEAN**~~2.02E-08	~~**0.05**~~7.50E-11	~~**0.16**~~9.33E-10	~~**0.5**~~9.12E-09	~~**0.84**~~3.89E-08	~~**0.95**~~7.24E-08
~~0.001~~	~~2.50E-02~~	~~9.44E-03~~	~~1.48E-02~~	~~2.40E-02~~	~~3.39E-02~~	~~4.17E-02~~

a) Spectral acceleration in g
b) Percentile
c) 0.5 fractile = median

~~0.0015Spectral acceleration in g~~
~~Percentile~~
~~0.5 fractile = median~~

Table 2.5.2-22 (Sheet 4 of 7)

Mean and Fractile Soil Seismic Hazard Curves at GMRS Elevation

5 Hz Hazard Curves						
Amplitude (a)	~~2.07E-02~~**MEAN**	~~6.92E-03~~**0.05**(b)	~~1.12E-02~~**0.16**	~~1.95E-02~~**0.5**(c)	~~2.95E-02~~**0.84**	~~3.76E-02~~**0.95**
0.0005~~0.0020005~~	~~1.77E-02~~1.12E-01	~~5.62E-03~~5.91E-02	~~8.51E-03~~7.38E-02	~~1.70E9.97E-02~~9.97E-02	~~2.57E-02~~1.66E-01	~~3.39E-02~~2.04E-01
0.0007~~0.0030007~~	~~1.38E8.95E-02~~8.95E-02	~~3.85E-03~~4.19E-02	~~6.46E-03~~5.62E-02	~~1.29E7.63E-02~~7.63E-02	~~2.09E-02~~1.36E-01	~~21.75E-0201~~1.75E-01
0.001~~0.005001~~	~~9.36E-03~~6.88E-02	~~2.07E-03~~2.96E-02	~~3.98E-03~~4.27E-02	~~8.51E-03~~5.50E-02	~~1.48E-02~~1.05E-01	~~2.02E-02~~1.44E-01
0.0015~~0.0070015~~	~~6.91E-03~~4.96E-	~~1.23E-03~~2.09E-	~~2.63E-03~~2.82E-	~~6.03E-03~~3.94E-	~~1.12E7.62E-~~	~~1.53E-02~~1.11E-

	02	02	02	02	~~02~~7.62E-02	01
0.002~~0.01002~~	~~4.80E-03~~3.87E-02	~~6.84E-04~~1.48E-02	~~1.62E-03~~2.00E-02	~~4.12E-03~~3.03E-02	~~7.94E-03~~6.25E-02	~~1.08E8.58E-02~~8.58E-02
0.003~~0.015003~~	~~3.01E-03~~2.67E-02	~~3.55E-04~~9.78E-03	~~8.71E-04~~1.31E-02	~~2.63E-03~~2.02E-02	~~4.90E-03~~4.22E-02	~~7.16E-03~~6.24E-02
0.005~~0.02005~~	~~2.10E-03~~1.61E-02	~~2.19E-04~~5.62E-03	~~5.01E-04~~7.48E-03	~~1.74E-03~~1.23E-02	~~3.47E-03~~2.55E-02	~~5.25E-03~~3.84E-02
0.007~~0.03007~~	~~1.21E-03~~1.13E-02	~~1.10E-04~~3.72E-03	~~2.34E-04~~4.92E-03	~~1.00E8.01E-03~~8.01E-03	~~2.00E-03~~1.80E-02	~~3.02E-03~~2.77E-02
0.01~~0.0501~~	~~5.73E-04~~7.55E-03	~~3.89E-05~~2.46E-03	~~1.10E-04~~3.24E-03	~~4.68E-04~~5.50E-03	~~1.00E-03~~1.20E-02	~~1.51E-03~~1.87E-02
0.015~~0.07015~~	~~3.41E-04~~4.64E-03	~~1.82E-05~~1.46E-03	~~5.50E-05~~2.00E-03	~~2.69E-04~~3.32E-03	~~5.75E-04~~7.06E-03	~~8.71E-04~~1.12E-02
0.02~~0.102~~	~~1.93E-04~~3.21E-03	~~7.16E-06~~1.00E-03	~~2.57E-05~~1.41E-03	~~1.55E-04~~2.32E-03	~~3.31E-04~~4.79E-03	~~5.19E-04~~7.60E-03
0.03~~0.1503~~	~~9.86E-05~~1.85E-03	~~2.07E-06~~5.37E-04	~~1.20E-05~~8.13E-04	~~8.04E-05~~1.42E-03	~~1.78E-04~~2.62E-03	~~2.60E-04~~4.28E-03
0.05~~0.205~~	~~6.01E-05~~8.87E-04	~~7.85E-07~~2.51E-04	~~6.46E-06~~3.80E-04	~~5.13E-05~~6.84E-04	~~1.10E-04~~1.21E-03	~~1.60E-04~~1.91E-03
0.07~~0.307~~	~~2.88E-05~~5.31E-04	~~1.78E-07~~1.55E-04	~~2.82E-06~~2.19E-04	~~2.24E-05~~4.07E-04	~~5.13E-05~~7.14E-04	~~8.04E-05~~1.13E-03
0.1~~0.51~~	~~1.04E-05~~3.01E-04	~~2.48E-08~~8.32E-05	~~8.71E-07~~1.26E-04	~~7.16E-06~~2.34E-04	~~1.95E-05~~4.37E-04	~~3.16E-05~~6.29E-04
0.15~~0.715~~	~~4.98E-06~~1.56E-04	~~6.03E-09~~4.17E-05	~~36.31E-0705~~6.31E-05	~~2.82E-06~~1.18E-04	~~9.12E-06~~2.51E-04	~~1.64E-05~~3.56E-04
0.2~~10.2~~	~~2.12E-06~~9.65E-05	~~1.15E-09~~2.40E-05	~~1.02E-07~~3.63E-05	~~1.04E-06~~7.24E-05	~~3.98E-06~~1.55E-04	~~7.67E-06~~2.19E-04
0.3~~1.50.3~~	~~7.20E-07~~4.83E-05	~~1.40E-10~~1.12E-05	~~2.24E-08~~1.70E-05	~~2.88E-07~~3.63E-05	~~1.32E-06~~7.76E-05	~~2.72E-06~~1.10E-04
0.5~~20.5~~	~~3.11E-07~~1.92E-05	~~2.66E-11~~3.98E-06	~~6.46E-09~~6.03E-06	~~1.14E-07~~1.48E-05	~~6.17E-07~~3.16E-05	~~1.23E-06~~4.79E-05
0.7~~30.7~~	~~8.50E-08~~1.00E-	~~2.14E-12~~1.86E-	~~1.00E-09~~2.82E-	~~2.40E-08~~7.94E-	~~1.66E-07~~1.70E-	~~3.43E-07~~2.57E-

	05	06	06	06	05	05
1~~51~~	~~1.34E-08~~4.74E-06	~~5.69E-14~~7.59E-07	~~6.31E-11~~1.23E-06	~~2.54E-09~~3.72E-06	~~2.57E-08~~8.51E-06	~~5.69E-08~~1.29E-05
1.5~~71.5~~	~~3.43E-09~~1.86E-06	~~3.59E-15~~2.51E-07	~~6.92E-12~~4.37E-07	~~5.19E-10~~1.41E-06	~~5.62E-09~~3.47E-06	~~1.38E-08~~5.25E-06
~~10~~2	~~7.09E-10~~9.05E-07	~~9.55E-17~~1.02E-07	~~5.75E-13~~1.78E-07	~~6.76E-11~~6.61E-07	~~9.33E-10~~1.74E-06	~~2.63E-0906~~2.63E-06

~~a.Percentile~~

~~Table 2.5.2-13 (Sheet 5 of 7)~~

~~Mean and Fractile Rock Seismic Hazard Curves~~

~~**2.5 Hz Hazard Curves**~~						
~~**Amplitude**~~3	2.95E-07	1.82E-08	4.17E-08	2.04E-07	5.75E-07	9.33E-07
5	~~**MEAN**~~5.97E-08	~~**0.05**~~5.07E-12	~~**0.16**~~4.27E-09	~~**0.50**~~3.16E-08	~~**0.84**~~1.18E-07	~~**0.95**~~2.19E-07
~~0.001~~7	~~2.07E-02~~1.84E-08	~~6.92E-03~~7.50E-14	~~1.05E-02~~4.52E-10	~~1.95E-02~~7.67E-09	~~2.95E-02~~3.63E-08	~~3.89E-02~~7.24E-08
~~0.0015~~10	~~1.61E-02~~4.70E-09	~~4.73E-03~~9.66E-19	~~7.94E-03~~2.75E-14	~~1.53E-02~~1.51E-09	~~2.40E-02~~9.12E-09	~~3.06E-02~~2.09E-08
~~0.002~~	~~1.32E-02~~	~~3.59E-03~~	~~6.46E-03~~	~~1.20E-02~~	~~1.95E-02~~	~~2.75E-02~~

a) Spectral acceleration in g
b) Percentile
c) 0.5 fractile = median
~~0.003Spectral acceleration in g~~
~~Percentile~~
~~0.5 fractile = median~~

Table 2.5.2-22 (Sheet 5 of 7)

Mean and Fractile Soil Seismic Hazard Curves at GMRS Elevation

2.5 Hz Hazard Curves						
Amplitude [(a)]	~~9.47E-03~~**MEAN**	~~2.37E-03~~**0.05**[(b)]	~~4.27E-03~~**0.16**	~~8.22E-03~~**0.5**[(c)]	~~1.48E-02~~**0.84**	~~2.09E-02~~**0.95**
0.0005~~0.0005~~	~~5.77E-03~~1.03E-01	~~1.19E-03~~1.59E-02	~~2.29E-03~~6.44E-02	~~4.90E-03~~4.19E-02	~~9.77E-03~~1.56E-01	~~1.38E-02~~1.98E-01
0.0007~~0.0007~~	~~3.96E-03~~8.06E-02	~~6.61E-04~~1.13E-02	~~1.41E-03~~4.58E-02	~~3.24E-03~~3.07E-02	~~6.46E-03~~1.28E-01	~~9.77E-03~~1.70E-01
0.001~~0.001~~	~~2.53E-03~~6.06E-02	~~3.67E-04~~7.17E-03	~~7.59E-04~~3.24E-02	~~2.00E-03~~2.10E-02	~~4.27E-03~~9.86E-02	~~6.68E-03~~1.36E-01
0.0015~~0.0015~~	~~1.45E-03~~4.26E-02	~~1.66E-04~~4.27E-03	~~3.55E-04~~2.01E-02	~~1.07E-03~~1.38E-02	~~2.63E-03~~7.20E-02	~~3.98E-03~~9.89E-02
0.002~~0.002~~	~~9.44E-04~~3.26E-02	~~9.23E-05~~2.92E-03	~~2.04E-04~~1.42E-02	~~7.08E-04~~9.78E-03	~~1.62E-03~~5.60E-02	~~2.63E-03~~8.01E-02
0.003~~0.003~~	~~4.98E-04~~2.18E-02	~~3.63E-05~~1.62E-03	~~8.91E-05~~8.68E-03	~~3.55E-04~~6.46E-03	~~8.13E-04~~3.81E-02	~~1.41E-03~~5.50E-02
0.005~~0.005~~	~~2.11E-04~~1.25E-02	~~1.08E-05~~7.85E-04	~~2.95E-05~~4.61E-03	~~1.45E-04~~3.47E-03	~~3.55E-04~~2.18E-02	~~5.96E-04~~3.30E-02
0.007~~0.007~~	~~1.16E-04~~8.34E-03	~~4.27E-06~~4.68E-04	~~1.29E-05~~3.03E-03	~~8.32E-05~~2.14E-03	~~2.04E-04~~1.40E-02	~~3.43E-04~~2.28E-02
0.01~~0.01~~	~~6.00E-05~~5.25E-03	~~1.46E-06~~2.51E-04	~~5.62E-06~~1.87E-03	~~4.47E-05~~1.32E-03	~~1.02E-04~~8.61E-03	~~1.78E-04~~1.49E-02

0.015~~0.015~~	~~2.74E-05~~2.97E-03	~~3.94E-07~~1.18E-04	~~2.14E-06~~1.07E-03	~~1.82E-05~~7.59E-04	~~5.13E-05~~4.76E-03	~~8.61E-05~~8.52E-03
0.02~~0.02~~	~~1.52E-05~~1.93E-03	~~1.30E-07~~7.24E-05	~~1.00E-06~~6.61E-04	~~15.01E-0504~~5.01E-04	~~2.95E-05~~2.82E-03	~~4.96E-05~~5.72E-03
0.03~~0.03~~	~~6.36E-06~~1.02E-03	~~2.75E-08~~3.16E-05	~~3.55E-0704~~3.55E-04	~~3.72E-06~~2.69E-04	~~1.29E-05~~1.39E-03	~~2.24E-05~~2.76E-03
0.05~~0.05~~	~~1.92E-06~~4.35E-04	~~3.02E-09~~1.05E-05	~~6.31E-08~~1.45E-04	~~8.71E-07~~1.10E-04	~~3.47E-06~~5.59E-04	~~7.41E-06~~1.05E-03
0.07~~0.07~~	~~8.14E-07~~2.42E-04	~~6.17E-10~~4.57E-06	~~1.59E-08~~7.76E-05	~~3.09E-07~~5.89E-05	~~1.62E-06~~3.36E-04	~~3.24E-06~~5.59E-04
0.1~~0.1.0~~	~~3.04E-07~~1.27E-04	~~8.91E-11~~1.86E-06	~~2.82E-09~~4.17E-05	~~8.04E-08~~2.75E-05	~~6.17E-07~~1.79E-04	~~1.23E-06~~2.90E-04
0.15~~1.50.15~~	~~8.92E-08~~5.98E-05	~~8.51E-12~~5.75E-07	~~3.55E-10~~1.95E-05	~~2.02E-08~~1.29E-05	~~1.78E-07~~9.56E-05	~~3.67E-07~~1.38E-04
0.2~~0.2.0~~	~~3.45E-0805~~3.45E-05	~~1.32E-12~~2.19E-07	~~5.89E-11~~1.12E-05	~~6.46E-09~~6.92E-06	~~6.31E-08~~5.89E-05	~~1.35E-07~~8.10E-05
0.3~~0.3.0~~	~~7.92E-09~~1.56E-05	~~6.31E-14~~4.79E-08	~~4.90E-1206~~4.90E-06	~~9.66E-10~~2.82E-06	~~1.12E-08~~2.75E-05	~~3.06E-08~~3.64E-05
0.5~~0.5.0~~	~~9.75E-10~~5.47E-06	~~7.85E-16~~2.27E-10	~~1.35E-13~~1.41E-06	~~5.69E-11~~8.71E-07	~~1.23E-09~~9.77E-06	~~3.59E-09~~1.38E-05
0.7~~0.7.0~~	~~2.09E-10~~2.61E-06	~~2.09E-26~~1.80E-12	~~9.12E-15~~5.75E-07	~~7.16E-12~~3.31E-07	~~2.51E-10~~4.90E-06	~~7.59E-10~~6.92E-06
~~1~~1~~0.0~~	~~3.53E-11~~1.13E-06	~~8.61E-29~~7.00E-14	~~8.91E-17~~2.04E-07	~~7.59E-13~~8.91E-08	~~3.16E-11~~2.14E-06	~~1.26E-10~~3.24E-06

a)~~Percentile~~

~~Table 2.5.2-13 (Sheet 6 of 7)~~
~~Mean and Fractile Rock Seismic Hazard Curves~~

~~1 Hz Hazard Curves~~

~~**Amplitude**~~1.5	3.99E-07	1.15E-15	4.79E-08	1.59E-08	8.13E-07	1.15E-06
2	~~**MEAN**~~1.78E-07	~~**0.05**~~1.46E-18	~~**0.16**~~1.25E-08	~~**0.5**~~7.24E-11	~~**0.84**~~3.80E-07	~~**0.95**~~5.37E-07
~~0.0005~~3	~~1.68E-02~~5.15E-08	~~5.07E-03~~4.04E-29	~~7.41E-03~~8.91E-11	~~1.48E-02~~1.88E-14	~~2.75E-02~~1.10E-07	~~3.51E-02~~1.66E-07
~~0.0007~~5	~~1.32E-02~~8.85E-09	~~3.72E-03~~4.20E-29	~~5.62E-03~~2.07E-15	~~1.20E-02~~5.07E-29	~~2.09E-02~~1.82E-08	~~2.75E-02~~3.16E-08
~~0.001~~7	~~9.93E-03~~2.44E-09	~~2.54E-03~~4.20E-29	~~3.98E-03~~4.32E-17	~~8.51E-03~~4.28E-29	~~1.48E-02~~4.90E-09	~~2.24E-02~~9.77E-09
~~0.0015~~10	~~6.96E-03~~5.53E-10	~~1.46E-03~~4.20E-29	~~2.63E-03~~3.55E-19	~~6.03E-03~~4.20E-29	~~1.05E-02~~1.07E-09	~~1.59E-02~~2.46E-09
~~0.002~~	~~5.28E-03~~	~~1.04E-03~~	~~2.00E-03~~	~~4.42E-03~~	~~8.51E-03~~	~~1.29E-02~~

a) ~~0.003~~Spectral acceleration in g
b) Percentile
c) 0.5 fractile = median

Table 2.5.2-22 (Sheet 6 of 7)

Mean and Fractile Soil Seismic Hazard Curves at GMRS Elevation

1 Hz Hazard Curves						
Amplitude (a)	~~3.44E-03~~**MEAN**	~~5.56E-04~~**0.05(b)**	~~1.15E-03~~**0.16**	~~2.82E-03~~**0.5(c)**	~~5.62E-03~~**0.84**	~~8.51E-03~~**0.95**
0.0005~~0.0005~~	~~1.88E-03~~5.94E-02	~~2.34E-04~~1.59E-02	~~5.01E-04~~3.04E-02	~~1.41E-03~~4.27E-02	~~3.24E-03~~1.05E-01	~~5.07E-03~~1.29E-01
0.0007~~0.0007~~	~~1.20E-03~~4.44E-02	~~1.18E-04~~1.13E-02	~~2.69E-04~~2.01E-02	~~8.13E-04~~3.12E-02	~~2.14E-03~~8.21E-02	~~3.47E-03~~1.07E-01
0.001~~0.001~~	~~7.10E-04~~3.19E-02	~~5.69E-05~~7.17E-03	~~1.35E-04~~1.32E-02	~~4.37E-04~~2.16E-02	~~1.32E-03~~5.70E-02	~~2.29E-03~~7.91E-02
0.0015~~0.0015~~	~~3.70E-04~~2.14E-02	~~2.02E-05~~4.27E-03	~~5.89E-05~~8.10E-03	~~2.04E-04~~1.41E-02	~~6.61E-04~~3.94E-02	~~1.27E-03~~5.71E-02
0.002~~0.002~~	~~2.24E-04~~1.59E-02	~~9.12E-06~~2.92E-03	~~2.95E-05~~5.32E-03	~~1.18E-04~~1.03E-02	~~4.07E-04~~2.93E-02	~~7.85E-04~~4.43E-02
0.003~~0.003~~	~~1.04E-04~~1.02E-02	~~2.63E-06~~1.62E-03	~~9.77E-06~~2.84E-03	~~4.32E-05~~6.22E-03	~~1.91E-04~~1.87E-02	~~3.80E-04~~2.93E-02
0.005~~0.005~~	~~3.66E-05~~5.47E-03	~~5.01E-07~~7.85E-04	~~2.14E-06~~1.32E-03	~~1.38E-05~~3.09E-03	~~5.89E-05~~1.02E-02	~~1.30E-04~~1.78E-02
0.007~~0.007~~	~~1.75E-05~~3.49E-03	~~1.45E-07~~4.68E-04	~~7.59E-07~~7.09E-04	~~6.03E-06~~1.80E-03	~~2.95E-05~~6.12E-03	~~6.53E-05~~1.19E-02
0.01~~0.01~~	~~7.68E-06~~2.08E-03	~~3.63E-08~~2.51E-04	~~2.34E-07~~4.08E-04	~~2.63E-06~~9.62E-04	~~1.48E-05~~3.57E-03	~~3.16E-05~~7.64E-03
0.015~~0.015~~	~~2.91E-~~	~~5.82E-~~	~~5.50E-~~	~~7.59E-~~	~~6.03E-~~	~~1.29E-~~

	~~06~~1.10E-03	~~09~~1.18E-04	~~08~~2.04E-04	~~07~~4.76E-04	~~06~~1.66E-03	~~05~~4.33E-03
0.02~~0.02~~	~~1.43E-06~~6.84E-04	~~1.46E-09~~7.24E-05	~~1.95E-08~~1.18E-04	~~3.31E-07~~2.82E-04	~~2.82E-06~~9.18E-04	~~6.46E-06~~2.69E-03
0.03~~0.03~~	~~5.09E-07~~3.35E-04	~~1.40E-10~~3.16E-05	~~3.24E-09~~5.31E-05	~~9.55E-08~~1.37E-04	~~9.33E-07~~3.79E-04	~~2.07E-06~~1.22E-03
0.05~~0.05~~	1.27E-~~1.27E-07~~04	~~5.62E-12~~1.05E-05	~~2.51E-10~~1.82E-05	~~1.59E-08~~5.14E-05	~~1.91E-07~~1.44E-04	~~5.37E-07~~3.88E-04
0.07~~0.07~~	~~4.75E-08~~6.41E-05	~~5.75E-13~~4.57E-06	~~3.63E-11~~9.12E-06	~~3.98E-09~~2.76E-05	~~6.31E-08~~7.94E-05	~~1.97E-07~~1.70E-04
0.1~~0.1~~	~~1.54E-08~~2.96E-05	~~4.03E-14~~1.86E-06	~~3.98E-12~~4.27E-06	~~7.59E-10~~1.38E-05	~~2.24E-08~~4.20E-05	~~67.31E-0805~~7.31E-05
0.15~~1.50.15~~	~~3.80E-09~~1.18E-05	~~1.37E-15~~5.75E-07	~~21.51E-1306~~1.51E-06	~~1.02E-10~~6.03E-06	~~3.98E-09~~1.95E-05	~~1.64E-08~~2.93E-05
0.2~~0.2~~	~~1.29E-09~~6.09E-06	~~7.76E-23~~2.19E-07	~~2.75E-14~~6.61E-07	~~2.09E-11~~3.24E-06	~~1.07E-09~~1.12E-05	~~5.07E-09~~1.63E-05
0.3~~0.3~~	~~2.47E-10~~2.40E-06	~~8.91E-29~~4.79E-08	~~3.80E-16~~1.91E-07	~~2.00E-12~~1.32E-06	~~2.04E-10~~4.90E-06	~~8.41E-10~~7.45E-06
0.5~~0.5~~	~~2.44E-11~~7.30E-07	~~7.76E-29~~2.27E-10	~~8.91E-29~~2.02E-08	~~7.76E-14~~3.55E-07	~~1.38E-11~~1.62E-06	~~9.55E-11~~2.46E-06

a)~~Percentile~~

~~Table 2.5.2-13 (Sheet 7 of 7)~~

~~Mean and Fractile Rock Seismic Hazard Curves~~

~~0.5 Hz Hazard Curves~~						
~~Amplitude~~0.7	3.21E-07	1.80E-12	1.78E-10	1.26E-07	7.59E-07	1.15E-06
1	~~MEAN~~1.27E-07	~~0.05~~7.00E-14	~~0.16~~1.48E-11	~~0.5~~3.89E-08	~~0.84~~2.88E-07	~~0.95~~5.01E-07
~~0.0005~~1.5	~~8.70E-03~~4.01E-08	~~2.21E-03~~1.15E-15	~~3.47E-03~~1.97E-13	~~7.41E-03~~1.05E-08	~~1.38E-02~~8.61E-08	~~1.95E-02~~1.78E-07
~~0.0007~~2	~~6.55E-03~~1.65E-08	~~1.51E-03~~1.46E-18	~~2.63E-03~~9.44E-15	~~5.25E-03~~3.24E-09	~~1.05E-02~~3.39E-08	~~1.48E-02~~7.76E-08
~~0.001~~3	~~4.76E-03~~4.26E-09	~~1.00E-03~~4.04E-29	~~1.86E-03~~1.45E-16	~~3.72E-03~~4.07E-10	~~7.41E-03~~8.51E-09	~~1.12E-02~~2.16E-08
~~0.0015~~5	~~3.23E-03~~6.28E-10	~~5.56E-04~~4.20E-29	~~1.07E-03~~2.88E-19	~~2.46E-03~~2.85E-11	~~5.25E-03~~1.15E-09	~~7.94E-03~~3.47E-09
~~0.002~~7	~~2.40E-03~~1.55E-10	~~3.43E-04~~4.20E-29	~~7.08E-04~~5.28E-29	~~1.74E-03~~4.27E-12	~~3.98E-03~~2.51E-10	~~6.24E-03~~8.71E-10
~~0.003~~10	~~1.52E-03~~3.12E-11	~~1.60E-04~~4.20E-29	~~3.31E-04~~5.28E-29	~~1.00E-03~~5.75E-13	~~2.82E-03~~4.47E-11	~~4.42E-03~~1.66E-10
~~0.005~~	~~8.01E-04~~	~~5.31E-05~~	~~1.10E-04~~	~~4.07E-04~~	~~1.62E-03~~	~~2.72E-03~~

a) ~~0.007~~Spectral acceleration in g
b) Percentile
c) 0.5 fractile = median

Table 2.5.2-22 (Sheet 7 of 7)

Mean and Fractile Soil Seismic Hazard Curves at GMRS Elevation

0.5 Hz Hazard Curves						
Amplitude [a]	~~5.00E-04~~**MEAN**	~~2.16E-~~ **0.~~05~~05**[b]	~~5.13E-05~~**0.16**	~~2.04E-04~~**0.5** [c]	~~9.33E-04~~**0.84**	~~1.74E-03~~**0.95**
~~0.~~0.~~01~~0005	~~2.90E-04~~3.34E-02	~~7.16E-06~~6.96E-03	~~2.09E-05~~1.28E-02	~~9.55E-05~~2.31E-02	~~5.01E-04~~6.08E-02	~~1.04E-03~~8.54E-02
0.~~0.015~~0007	~~1.48E-04~~2.43E-02	~~2.00E-06~~4.59E-03	~~5.62E-06~~7.86E-03	~~3.39E-05~~1.72E-02	~~2.04E-04~~4.53E-02	~~5.37E-04~~6.67E-02
0.~~0.02~~001	~~8.81E-05~~1.71E-02	~~7.08E-07~~2.82E-03	~~2.29E-06~~4.79E-03	~~1.70E-05~~1.23E-02	~~1.10E-04~~3.16E-02	~~2.99E-04~~4.92E-02
0.~~0.03~~0015	~~4.02E-05~~1.12E-02	~~1.50E-07~~1.57E-03	~~6.61E-07~~2.54E-03	~~6.03E-06~~7.75E-03	~~4.79E-05~~2.11E-02	~~1.22E-04~~3.41E-02
0.~~0.05~~002	~~1.34E-05~~8.24E-03	~~1.53E-08~~1.00E-03	~~1.02E-07~~1.55E-03	~~1.62E-06~~5.26E-03	~~1.59E-05~~1.57E-02	~~3.63E-05~~2.59E-02
0.~~0.07~~003	~~5.99E-06~~5.17E-03	~~2.46E-09~~4.68E-04	~~2.75E-08~~7.68E-04	~~5.75E-07~~2.71E-03	~~6.03E-06~~9.97E-03	~~1.64E-05~~1.76E-02
0.~~0.1~~005	~~2.37E-06~~2.73E-03	~~3.31E-10~~1.66E-04	~~6.03E-09~~2.89E-04	~~1.84E-07~~1.12E-03	~~2.46E-06~~5.27E-03	~~7.41E-06~~1.04E-02
0.~~0.15~~007	~~7.57E-07~~1.74E-03	~~3.06E-11~~8.32E-05	~~8.71E-10~~1.55E-04	~~4.32E-08~~5.86E-04	~~8.13E-07~~3.17E-03	~~2.63E-06~~6.89E-03
0.~~0.2~~01	~~3.21E-07~~1.04E-03	~~4.90E-12~~3.89E-05	~~1.91E-10~~7.25E-05	~~1.38E-08~~2.87E-04	~~3.55E-07~~1.71E-03	~~1.27E-06~~4.39E-03
0.~~0.3~~015	~~9.15E-08~~5.56E-04	~~2.69E-13~~1.59E-05	~~1~~2. 95E-~~95E-11~~05	~~3.02E-09~~1.33E-04	~~1.02E-07~~7.20E-04	~~3.80E-07~~2.44E-03
0.~~0.5~~02	~~1.79E-~~	~~3.72E-~~	~~6.61E-~~	~~3.31E-~~	~~1.70E-~~	~~7.76E-~~

	~~08~~3.47E-04	~~15~~8.51E-06	~~13~~1.59E-05	~~10~~7.44E-05	~~08~~3.64E-04	~~08~~1.51E-03
0.~~0.7~~03	~~5.86E-09~~1.74E-04	~~8.51E-18~~3.02E-06	~~5.89E-14~~6.03E-06	~~5.50E-11~~3.41E-05	~~4.90E-09~~1.48E-04	~~2.32E-08~~6.21E-04
~~1~~0.05	~~1.70E-09~~7.08E-05	~~9.55E-29~~7.08E-07	~~3.02E-15~~1.74E-06	~~6.92E-12~~1.20E-05	~~1.41E-09~~5.47E-05	~~6.24E-09~~1.68E-04
~~1.5~~0.07	~~3.81E-10~~3.70E-05	~~8.04E-29~~2.19E-07	~~2.29E-24~~6.61E-07	~~5.75E-13~~5.62E-06	~~2.51E-10~~2.82E-05	~~1.51E-09~~7.02E-05
~~2~~0.1	~~1.23E-10~~1.70E-05	~~7.76E-29~~5.69E-08	~~8.91E-29~~2.19E-07	~~8.91E-14~~2.46E-06	~~5.13E-11~~1.39E-05	~~4.84E-10~~2.86E-05
~~3~~0.15	~~2.22E-11~~6.24E-06	~~4.62E-29~~5.43E-09	~~8.32E-29~~4.79E-08	~~4.57E-15~~7.59E-07	~~4.90E-12~~6.03E-06	~~7.24E-11~~1.05E-05
~~5~~0.2	~~2.09E-12~~2.86E-06	~~4.47E-29~~9.55E-11	~~7.76E-29~~1.05E-08	~~1.82E-26~~3.55E-07	~~1.78E-13~~3.47E-06	~~4.73E-12~~5.77E-06
0.3	9.03E-07	1.27E-12	1.10E-10	1.18E-07	1.32E-06	2.83E-06
0.5	2.11E-07	8.22E-15	3.98E-12	1.95E-08	4.07E-07	9.34E-07
0.7	8.32E-08	5.56E-16	1.84E-13	3.47E-09	1.91E-07	4.22E-07
1	3.09E-08	4.04E-29	4.42E-15	3.67E-10	7.76E-08	1.78E-07
1.5	9.53E-09	4.04E-29	8.61E-17	4.17E-11	2.40E-08	5.50E-08
2	3.88E-09	4.04E-29	4.73E-18	8.51E-12	9.77E-09	2.40E-08
3	9.81E-10	4.20E-29	5.28E-29	1.00E-12	2.29E-09	6.03E-09
5	1.41E-10	4.20E-29	5.28E-29	4.17E-14	2.51E-10	9.33E-10
7	3.43E-11	4.20E-29	4.47E-29	4.12E-15	4.79E-11	2.19E-10
10	6.76E-12	4.20E-29	4.47E-29	2.19E-16	7.41E-12	4.17E-11

d) Spectral acceleration in g
e) Percentile
f) 0.5 fractile = median
~~Spectral acceleration in g~~
~~(b)Percentile~~

~~0.5 fractile = median~~

Table 2.5.2-23

~~**Mean and Median UHRS Values for** Rock**Soil Seismic Hazard** at Hope Creek **(SA in g)**~~

~~**Frequency, Hz**~~	~~**Mean** 10^{-4}~~	~~**Mean** 10^{-5}~~	~~**Mean** 10^{-6}~~
~~100 (PGA)~~	~~0.1239158~~	~~0.4869465~~	~~1.3450.958~~
~~25~~	~~0.3461313~~	~~1.3320.836~~	~~3.8951.59~~
~~10~~	~~0.2328360~~	~~0.84121.07~~	~~2.20717~~
~~5.0~~	~~0.1487366~~	~~0.50991.12~~	~~1.3252.48~~
~~2.5~~	~~0.07582174~~	~~0.2432543~~	~~0.64571.42~~
~~1.0~~	~~0.03063122~~	~~0.08916341~~	~~0.2301853~~
~~0.5~~	~~0.01864110~~	~~0.05649341~~	~~0.1359823~~
~~**Frequency, Hz**~~	~~**Median** 10^{-4}~~	~~**Median** 10^{-5}~~	~~**Median** 10^{-6}~~
~~100 (PGA)~~	~~0.1059133~~	~~0.3592415~~	~~0.8710837~~
~~25~~	~~0.2735254~~	~~0.9159756~~	~~2.3521.42~~
~~10~~	~~0.2111317~~	~~0.7134991~~	~~1.70296~~
~~5.0~~	~~0.1310316~~	~~0.43051.02~~	~~1.0112.29~~
~~2.5~~	~~0.06257146~~	~~0.2009479~~	~~0.47631.21~~
~~1.0~~	~~0.021350767~~	~~0.05699251~~	~~0.1371665~~
~~0.5~~	~~0.0097860465~~	~~0.02461144~~	~~0.05850378~~

Mean and Median UHRS Values for Soil Seismic Hazard (SA in g)

Frequency, Hz	Mean 10^{-4}	Mean 10^{-5}	Mean 10^{-6}
100 (PGA)	0.158	0.465	0.958
25	0.313	0.836	1.59
10	0.360	1.07	2.17
5.0	0.366	1.12	2.48
2.5	0.174	0.543	1.42
1.0	0.122	0.341	0.853
0.5	0.110	0.341	0.823
Frequency, Hz	**Median 10^{-4}**	**Median 10^{-5}**	**Median 10^{-6}**
100 (PGA)	0.133	0.415	0.837
25	0.254	0.756	1.42
10	0.317	0.991	1.96
5.0	0.316	1.02	2.29
2.5	0.146	0.479	1.21
1.0	0.0767	0.251	0.665
0.5	0.0465	0.144	0.378

Table 2.5.2-24

Calculation of Horizontal and Vertical GMRS

Frequency (Hz)	Horizontal GMRS (g)	V/H Ratio	Vertical GMRS (g)
0.1	9.14E-03	0.75	6.86E-03
0.125	1.49E-02	0.75	1.12E-02
0.15	2.28E-02	0.75	1.71E-02
0.2	4.04E-02	0.75	3.03E-02
0.3	8.98E-02	0.75	6.74E-02
0.4	1.42E-01	0.75	1.07E-01
0.5	1.60E-01	0.75	1.20E-01
0.6	1.54E-01	0.75	1.16E-01
0.7	1.50E-01	0.75	1.12E-01
0.8	1.53E-01	0.75	1.15E-01
0.9	1.60E-01	0.75	1.20E-01
1	1.72E-01	0.75	1.29E-01
1.25	1.97E-01	0.75	1.48E-01
1.5	2.20E-01	0.75	1.65E-01
2	2.45E-01	0.75	1.84E-01
2.5	2.59E-01	0.75	1.94E-01
3	2.84E-01	0.75	2.13E-01
4	4.17E-01	0.75	3.13E-01
5	5.26E-01	0.75	3.95E-01
6	5.67E-01	0.79	4.45E-01
7	5.72E-01	0.81	4.66E-01
8	5.59E-01	0.84	4.70E-01
9	5.39E-01	0.86	4.65E-01
10	5.23E-01	0.88	4.62E-01
12.5	5.17E-01	0.93	4.79E-01
15	5.11E-01	0.96	4.91E-01
20	4.63E-01	1.02	4.71E-01
25	4.13E-01	1.06	4.37E-01
30	3.66E-01	1.09	4.01E-01
35	3.32E-01	1.12	3.73E-01
40	3.02E-01	1.15	3.47E-01
45	2.81E-01	1.15	3.23E-01
50	2.67E-01	1.15	3.07E-01
60	2.45E-01	1.15	2.81E-01
70	2.33E-01	1.15	2.68E-01
80	2.28E-01	1.15	2.62E-01
90	2.26E-01	1.15	2.60E-01
100	2.25E-01	1.15	2.59E-01

~~Table 2.5.2-24~~
~~Calculation of Horizontal and Vertical GMRS~~

~~Frequency~~	~~1E-5 UHRS, g~~	~~GMRS, g~~	~~V/H ratio~~	~~Vertical GMRS, g~~
~~100~~	~~4.00E-01~~	~~1.80E-01~~	~~1~~	~~1.80E-01~~
~~90~~	~~4.03E-01~~	~~1.81E-01~~	~~1~~	~~1.81E-01~~
~~80~~	~~4.07E-01~~	~~1.83E-01~~	~~1~~	~~1.83E-01~~
~~70~~	~~4.16E-01~~	~~1.87E-01~~	~~1~~	~~1.87E-01~~
~~60~~	~~4.34E-01~~	~~1.96E-01~~	~~1~~	~~1.96E-01~~
~~50~~	~~4.72E-01~~	~~2.13E-01~~	~~1~~	~~2.13E-01~~
~~45~~	~~4.99E-01~~	~~2.25E-01~~	~~1~~	~~2.25E-01~~
~~40~~	~~5.40E-01~~	~~2.42E-01~~	~~1~~	~~2.42E-01~~
~~35~~	~~5.99E-01~~	~~2.69E-01~~	~~1~~	~~2.69E-01~~
~~30~~	~~6.71E-01~~	~~3.03E-01~~	~~1~~	~~3.03E-01~~
~~25~~	~~7.75E-01~~	~~3.48E-01~~	~~1~~	~~3.48E-01~~
~~20~~	~~8.79E-01~~	~~3.89E-01~~	~~1~~	~~3.89E-01~~
~~15~~	~~9.42E-01~~	~~4.20E-01~~	~~1~~	~~4.20E-01~~
~~12.5~~	~~9.36E-01~~	~~4.20E-01~~	~~1~~	~~4.20E-01~~
~~10~~	~~8.99E-01~~	~~4.10E-01~~	~~1~~	~~4.10E-01~~
~~9~~	~~9.22E-01~~	~~4.13E-01~~	~~0.96~~	~~3.97E-01~~
~~8~~	~~9.29E-01~~	~~4.17E-01~~	~~0.92~~	~~3.84E-01~~
~~7~~	~~9.23E-01~~	~~4.14E-01~~	~~0.87~~	~~3.61E-01~~
~~6~~	~~8.77E-01~~	~~3.96E-01~~	~~0.82~~	~~3.23E-01~~
~~5~~	~~8.17E-01~~	~~3.60E-01~~	~~0.75~~	~~2.70E-01~~
~~4~~	~~6.29E-01~~	~~2.84E-01~~	~~0.75~~	~~2.13E-01~~
~~3~~	~~3.96E-01~~	~~1.78E-01~~	~~0.75~~	~~1.33E-01~~
~~2.5~~	~~3.20E-01~~	~~1.45E-01~~	~~0.75~~	~~1.09E-01~~
~~2~~	~~2.91E-01~~	~~1.31E-01~~	~~0.75~~	~~9.79E-02~~
~~1.5~~	~~2.46E-01~~	~~1.09E-01~~	~~0.75~~	~~8.19E-02~~
~~1.25~~	~~2.07E-01~~	~~9.27E-02~~	~~0.75~~	~~6.95E-02~~
~~1~~	~~1.59E-01~~	~~7.34E-02~~	~~0.75~~	~~5.51E-02~~
~~0.9~~	~~1.44E-01~~	~~6.47E-02~~	~~0.75~~	~~4.85E-02~~
~~0.8~~	~~1.24E-01~~	~~5.63E-02~~	~~0.75~~	~~4.23E-02~~
~~0.7~~	~~1.09E-01~~	~~4.92E-02~~	~~0.75~~	~~3.69E-02~~
~~0.6~~	~~9.88E-02~~	~~4.44E-02~~	~~0.75~~	~~3.33E-02~~
~~0.5~~	~~9.05E-02~~	~~4.07E-02~~	~~0.75~~	~~3.05E-02~~
~~0.4~~	~~7.97E-02~~	~~3.58E-02~~	~~0.75~~	~~2.69E-02~~
~~0.3~~	~~5.15E-02~~	~~2.31E-02~~	~~0.75~~	~~1.73E-02~~
~~0.2~~	~~2.26E-02~~	~~1.05E-02~~	~~0.75~~	~~7.85E-03~~
~~0.15~~	~~1.24E-02~~	~~5.60E-03~~	~~0.75~~	~~4.20E-03~~
~~0.125~~	~~8.04E-03~~	~~3.63E-03~~	~~0.75~~	~~2.72E-03~~
~~0.1~~	~~4.90E-03~~	~~2.21E-03~~	~~0.75~~	~~1.65E-03~~

Note: Light-gray cells indicate high frequency controlling earthquakes and dark-gray cells indicate low frequency controlling earthquakes.