



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

October 11, 2010  
U7-C-STP-NRC-100218

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

South Texas Project  
Units 3 and 4  
Docket Nos. 52-012 and 52-013  
Response to Request for Additional Information

Attached are STP Nuclear Operating Company (STPNOC) supplemental responses to RAI question 02.04.12-47, related to Combined License Application (COLA) Part 2, Tier 2, Section 2.4S.12, "Groundwater," and RAI question 02.05.02-28, related to COLA Part 2, Tier 2, Section 2.5S.2, "Vibratory Ground Motion." Attachments 1 and 2 provide the responses to the RAI questions listed below:

02.04.12-47, Supplement 1

02.05.02-28, Supplement 2, Revision 1

When a change to the COLA is required, it will be incorporated into the next routine revision of the COLA following NRC acceptance of the RAI response.

There are no commitments in this letter.

If you have any questions, please contact Scott Head at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

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

Executed on 10/11/10

Scott Head  
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South Texas Project Units 3 & 4

rhb

Attachments: RAI 02.04.12-47, Supplement 1  
RAI 02.05.02-28, Supplement 2, Revision 1

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cc: w/o attachments and enclosure except\*  
(paper copy)

(electronic copy)

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**02.04.12-47, Supplement 1**

**SUPPLEMENTAL QUESTION:**

The response to RAI 02.04.12-47 was submitted to the NRC in Letter U7-C-STP-NRC-100195 on August 30, 2010. However, the response submitted inadvertently omitted, Table 4, "Comparison of water budgets among GHB sensitivity runs."

**RESPONSE:**

This supplemental response to RAI 02.04.12-47 provides Table 4, "Comparison of water budgets among GHB sensitivity runs," which is discussed in the original response but was inadvertently omitted when the response was submitted to the NRC in STPNOC Letter U7-C-STP-NRC-100195 on August 30, 2010.

Table 4. Comparison of water budgets among GHB sensitivity runs

Description	Runs																Summary			
	201NewTopo		201NewTopoGHB00		201NewTopoGHB01		201NewTopoGHB02		201NewTopoGHB03		201NewTopoGHB04		201NewTopoGHB05		201NewTopoGHBBest		Inflows (gpm)		Outflows (gpm)	
	Inflows (gpm)	Outflows (gpm)	Inflows (gpm)	Outflows (gpm)	Inflows (gpm)	Outflows (gpm)	Inflows (gpm)	Outflows (gpm)	Inflows (gpm)	Outflows (gpm)	Inflows (gpm)	Outflows (gpm)	Inflows (gpm)	Outflows (gpm)	Inflows (gpm)	Outflows (gpm)	Max	Min	Max	Min
MCR Discharge Total	3557.5	0.0	3560.8	0.0	3585.2	0.0	3587.7	0.0	3588.6	0.0	3581.9	0.0	3585.1	0.0	3576.8	0.0	3587.7	3587.5	0.0	0.0
Through Sand Pits	2816.7	0.0	2819.0	0.0	2822.0	0.0	2836.4	0.0	2823.1	0.0	2820.3	0.0	2835.1	0.0	2829.0	0.0	2836.4	2816.7	0.0	0.0
Through Remaining Portion of MCR	740.7	0.0	741.8	0.0	743.2	0.0	751.3	0.0	743.6	0.0	741.6	0.0	750.0	0.0	747.6	0.0	751.3	740.7	0.0	0.0
Precipitation/Recharge	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
ECP	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.8	0.0	0.0
Stratum C GHB	319.3	51.9	287.4	51.2	258.7	49.5	219.2	217.1	261.6	68.5	277.3	68.9	218.5	232.4	215.2	235.7	319.3	215.2	235.7	49.5
Stratum E GHB	208.7	104.4	203.4	100.8	168.6	91.6	135.9	129.2	182.7	114.6	279.5	120.5	238.0	159.0	217.1	98.9	279.5	135.9	159.0	91.6
Stratum H GHB	195.8	89.9	177.9	92.5	172.3	86.9	182.4	141.6	177.5	95.4	318.9	128.5	319.8	192.8	182.4	91.1	319.8	172.3	192.8	86.9
Levee-Bound Irrigation Canals	144.3	3.1	145.0	3.1	145.6	3.1	153.4	3.1	145.7	3.1	137.5	3.1	147.6	3.1	150.9	3.1	153.4	137.5	3.1	3.1
Livestock Well	0.0	0.4	0.0	0.4	0.0	0.4	0.0	0.4	0.0	0.4	0.0	0.4	0.0	0.4	0.0	0.4	0.0	0.4	0.4	0.4
Colorado River	0.1	688.0	0.3	673.2	0.6	663.0	2.0	595.9	1.2	654.7	0.4	812.3	1.6	721.7	0.5	663.1	0.0	0.0	811.9	594.0
Canals and Ditches in Stratum A/B	0.0	690.2	0.0	676.1	0.0	659.6	0.0	581.8	0.0	650.9	0.0	657.2	0.0	577.6	0.0	599.4	0.0	0.0	690.2	577.6
Little Robbins Slough and Plant Area Drainage Ditches in Stratum C	0.0	768.0	0.0	754.6	0.0	741.6	0.0	637.9	0.0	738.2	0.0	767.1	0.0	649.9	0.0	661.7	0.0	0.0	768.0	637.9
Kelly Lake	0.0	297.2	0.0	297.1	0.0	297.0	0.0	295.9	0.0	296.9	0.0	298.7	0.0	297.1	0.0	296.6	0.0	0.0	298.7	295.9
MCR Relief Wells and Sand Drains from MCR	0.0	1719.9	0.0	1713.0	0.0	1704.7	0.0	1668.8	0.0	1698.4	0.0	1705.3	0.0	1668.1	0.0	1684.5	0.0	0.0	1719.9	1668.1
MCR Relief Wells and Sand Drains from other Sources	0.0	15.5	0.0	16.0	0.0	16.6	0.0	11.7	0.0	17.0	0.0	16.6	0.0	11.9	0.0	11.3	0.0	0.0	17.0	11.3
<b>TOTALS</b>	<b>4428.5</b>	<b>4428.6</b>	<b>4377.7</b>	<b>4378.0</b>	<b>4313.9</b>	<b>4313.9</b>	<b>4283.5</b>	<b>4283.5</b>	<b>4338.1</b>	<b>4338.1</b>	<b>4578.4</b>	<b>4578.6</b>	<b>4513.7</b>	<b>4514</b>	<b>4345.5</b>	<b>4345.9</b>	<b>4574.4</b>	<b>4277.9</b>	<b>4575.1</b>	<b>4278.4</b>
<b>PERCENT DISCREPANCY</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.01</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>										

**02.05.02-28, Supplement 2, Revision 1****SUPPLEMENTAL QUESTION:**

During a public teleconference with the NRC on September 22, 2010, STPNOC agreed to further clarify the supplemental response to RAI 02.05.02-28 which addresses a minor discrepancy identified in the  $M_{max}$  distribution used for the Bechtel Earth Science Team (EST) Gulf Coast Source Zone (GCSZ) BZ1 in the STP 3 & 4 COLA.

**RESPONSE:**

As part of the review of the maximum magnitude ( $M_{max}$ ) distribution used to revise the EPRI-SOG Gulf Coastal Source Zones (GCSZs) for the STP 3 & 4 COLA, a minor discrepancy was identified in the  $M_{max}$  distribution used for the Bechtel Earth Science Team (EST) Gulf Coast Source Zone (GCSZ) BZ1. The distribution reported in the STP 3 & 4 COLA for BZ1 based on an initial interpretation was 6.1, 6.4, and 6.6 with weights of 0.1, 0.4, and 0.5, respectively. The correct updated distribution that should have been presented is 6.1, 6.4 and 6.6, and 6.7 with weights of 0.1, 0.4, 0.1, and 0.4, respectively. A sensitivity study has been performed showing that the effect of adopting the correct BZ1  $M_{max}$  distribution would result in increases of 0.1% or less in ground motion design response spectrum values over those based on the initial updated  $M_{max}$  distribution. Based on these results, it is concluded that this increase is insignificant, and that the design ground motions derived from the spectra in FSAR Tables 2.5S.2-18 and 2.5S.2-19 remain appropriate for the STP site.

The following COLA markup to FSAR Subsection 2.5S.2.4.3.1 and Table 2.5S.2-13 is being provided as a supplemental response to RAI 02.05.02-28 (STP Letter U7-C-STP-NRC-100057 (ML100770389) dated March 15, 2010), to reflect the correct updated distribution for Zone BZ1 and a description of the sensitivity analysis performed.

The second and third paragraphs of FSAR Subsection 2.5S.2.4.3.1 and the first row of Table 2.5S.2-13 are being revised as shown below:

~~The updated  $M_{max}$  values of 6.1, 6.4, and 6.6 with weightings of 0.1, 0.4, and 0.5 used here (Table 2.5S.2-13) follow from~~ The following summarizes the Bechtel Group's methodology for defining  $M_{max}$  distributions, as described within their EST volume follows (Reference 2.5S.2-13), and its application to update Zone BZ1:

- The lower-bound magnitude of the distribution is defined as the greater of either the largest observed earthquake magnitude within the zone, or  $m_b$  5.4 with a weight of 0.1. For Zone BZ1 this lower-bound  $M_{max}$  value is  $m_b$  6.1 with a weight of 0.1.
- The next higher magnitude is 0.3 magnitude units greater than the minimum lower-bound  $M_{max}$  value and is given a weight of 0.4. For Zone BZ1 this results in an  $M_{max}$  value of  $m_b$  6.4 with a weight of 0.4.

- The third magnitude is 0.6 magnitude units above the minimum lower-bound  $M_{\max}$  value and is given a weight of 0.4. For Zone BZ1 this results in an  $M_{\max}$  value of  $m_b$  6.7 with a weight of 0.4.
- The fourth magnitude, and upper bound of the distribution, is  $m_b$  6.6 interpreted by the Bechtel EST as the largest intraplate earthquake in the CEUS with specific exceptions, and is given a weight of 0.1.
- The weightings on the four  $M_{\max}$  values are 0.1, 0.4, 0.4, and 0.1, assigned consecutively from the minimum  $M_{\max}$  value.

If these guidelines result in an upper bound magnitude or magnitudes greater than  $m_b$  6.6, then the upper  $M_{\max}$  distribution is truncated at  $m_b$  6.6, and all weightings for magnitudes greater than or equal to 6.6 summed and collapsed onto the magnitude 6.6 upper bound. Applying this methodology to account for the Emb 6.1 earthquake results in updated  $M_{\max}$  values, listed in increasing magnitude order, of 6.1, 6.4, 6.6, and 6.7 with weights of 0.1, 0.4, 0.1, and 0.4, respectively, for Zone BZ1 (Table 2.5S.2-13).

It is noted, however, that a different initial interpretation of the Bechtel methodology was used in the development of the rock UHRS shown in Tables 2.5S.2-18 and 2.5S.2-19. The resultant  $M_{\max}$  distribution and weights for BZ1 based on the initial interpretation was 6.1, 6.4, and 6.6 with weights of 0.1, 0.4 and 0.5, respectively. A sensitivity study has been performed showing that the effect of adopting the updated BZ1  $M_{\max}$  distribution shown in Table 2.5S.2-13 would result in increases of 0.1% or less in ground motion design response spectrum values over those based on the initial updated  $M_{\max}$  distribution. Based on these results, it is concluded that this increase is insignificant, and that the design ground motions derived from the spectra in Tables 2.5S.2-18 and 2.5S.2-19 remain appropriate for the STP site.

Table 2.5S.2-13 Comparison of EPRI EST Characterizations of Gulf of Mexico Coastal Source Zones and Modifications for STP 3 & 4

EPRI EST	Source	Description	EPRI Model		Updated Model for STP 3 & 4	
			$M_{max}$ ( $m_b$ ) and Wts. [1]	Contributes to 99% of Hazard [2]	$M_{max}$ ( $m_b$ ) and Wts [3]	Smoothing Options and Wts. [4]
Bechtel Group	BZ1	Gulf Coast	5.4 [0.1] 5.7 [0.4] 6.0 [0.4] 6.6 [0.1]	Yes	6.1 [0.10] 6.4 [0.40] 6.6 [0.50] 6.7 [0.40]	No Update
Dames & Moore	20	South Coastal Margin	5.3 [0.8] 7.2 [0.2]	Yes	5.5 [0.80] 7.2 [0.20]	I (0.2) II (0.4) III (0.4)
Law Engineering	126	South Coastal Block	4.6 [0.9] 4.9 [0.1]	Yes	5.5 [0.90] 5.7 [0.10]	No Update
Rondout Associates	51	Gulf Coast to Bahamas Fracture Zone	4.8 [0.2] 5.5 [0.6] 5.8 [0.2]	Yes	6.1 [0.30] 6.3 [0.55] 6.5 [0.15]	No Update
Weston Geophysical Corporation	107	Gulf Coast	5.4 [0.71] 6.0 [0.29]	Yes	6.6 [0.89] 7.2 [0.11]	No Update
Woodward-Clyde Consultants	B43	Central US Backgrounds	4.9 [0.17] 5.4 [0.28] 5.8 [0.27] 6.5 [0.28]	Yes	No Update	No Update

[1]  $M_{max}$  distribution and weights from EPRI 1986 model (EPRI, Reference 2.5S.2-16)

[2] Whether or not the source contributes to 99% of the hazard at STP 3 & 4

[3] Updated  $M_{max}$  distributions and weights as described in Subsection 2.5S.2.6.2

[4] Updated smoothing options and weights as described in Subsection 2.5S.2.6.2.7.1

I: Constant a, constant b, strong prior on b of 1.04

II: Medium smoothing on a, medium smoothing on b, strong prior on b of 1.04

III: high smoothing on a, high smoothing on b, strong prior on b of 1.04