

Subject: FW: Exponent Liquefaction Slides and Write-up

From: Jon Wren [mailto:wren@exponent.com]
Sent: Monday, October 10, 2011 2:32 PM
To: [Redacted] Bob Lipscomb; Daubin, Brian M (GT&D)
Cc: [Redacted]
Subject: RE: Exponent Liquefaction Slides and Write-up

Bob,

Here is the info requested on Friday.

Based on the analysis performed to date, Exponent can provide an estimate of the most likely size of an earthquake that will produce ground accelerations sufficient to cause liquefaction induced total settlements greater than 2 inches near the [Redacted]k site. As described in its methodology memo dated October 1, 2011, Exponent performed a site specific analysis of the probability of liquefaction at the [Redacted]k crossing of Line 132 based on the data in one soil boring near the site. This analysis considered all potential earthquake sources that may produce ground accelerations sufficient to cause liquefaction at the site. The San Andreas and Hayward fault data were included in the USGS data utilized. Exponent has not performed a scenario-based analysis of liquefaction triggering or settlement produced by earthquakes on a particular fault. According to the USGS data used in Exponent's analysis, a magnitude 7.9 earthquake on the north portion of the San Andreas fault is the most likely earthquake magnitude and fault sufficient to cause liquefaction displacements greater than approximately 2.0 inches at the site. The closest distance from the [Redacted] Creek crossing of Line 132 to the San Andreas fault is approximately 2 miles.

Therefore, to answer the query of what is the most likely size of an earthquake that will produce ground accelerations sufficient to cause liquefaction induced total settlements greater than 2 inches near the [Redacted]k site, the response is:

Based on review of the USGS data used in PG&E's expert analysis, a magnitude 7.9 earthquake on the north portion of the San Andreas fault is the most likely earthquake magnitude and source sufficient to cause liquefaction displacements greater than approximately 2.0 inches near the Line 132 crossing of [Redacted].

Below is a definition of liquefaction from the USGS
(<http://earthquake.usgs.gov/hazards/qfaults/glossary.php#L>):

The transformation of loose sediment or soil into a fluid state as a result of increasing the pressure of the fluid in between the grains due to strong ground shaking. Liquefaction typically occurs in poorly consolidated, water-saturated sediment. Liquefaction can cause significant earthquake-related damage because structures located on ground that liquefies can collapse or sink into the ground.

Please let me know if you have further questions.

Redacted

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