## CARL E. NORMAN, PH.D. P.G. 1772; CPG 6831

12625 MEMORIAL DRIVE #77 HOUSTON, TEXAS 77024 dod895@aol.com 713-461-7420 Office 713-401-6980 Mobile SPECIALIZING IN ACTIVE GEOLOGIC FAULTS ON THE GULF COASTAL PLAIN

## CONSULTING GEOLOGIST

April 23, 2016

SAN JACINTO RIVER AUTHORITY, GRP OFFICE 6627 Longmire Road Building 1 Conroe, Texas 77304

Attention: Mark Smith, GRP Division Director Copy to: Lance McLeod, PE, PMP

SUBJECT: REPORT ON THE SECOND RE-MEASURE OF WATERLINE W1A AND W2A BENCHMARK ELEVATIONS IN THE WOODLANDS, TEXAS IN MARCH 2016.

The benchmark monitoring program consists of 47 benchmarks, 28 in 2 lines across the Egypt Fault near the intersection of Research Forest Drive and FM 2978, 4 across the Big Barn Fault in the vicinity of Research Forest Drive and Greenbridge Drive, and 19 in a line across Cat's Cradle Drive along the north side of Research Forest Drive. The latter group crosses an area between two known faults where surface evidence of ground movement related to fault activity is lacking.

The second re-measure shows no clear evidence of fault movement at any of the 4 lines of benchmarks since their installation in March 2015. During that 1-year period, 45 of the 47 show an elevation change of 0.00 to 0.01 feet (0.12 inches). One of the remaining 2 changed -0.02 feet and the other -0.04 feet. The 0.04 foot (0.48 inch) change occurred at the middle of a line of 20 benchmarks that crosses the Egypt Fault along the east side FM 2978. The remaining 19 benchmarks (10 on the high side of the fault, 9 on the low side) showed elevation changes of 0.00 to -0.01 feet over the past year. Such small changes are in the range of measurement error.

It is not unusual for Gulf Coast active faults to become inactive for periods exceeding a year or more. A movement event will be demonstrated when most, or all, benchmarks on one side of the fault show a consistent up or down sense of movement compared to those on the opposite side.

The third re-measure of the benchmarks is scheduled for September of this year.

Respectfully submitted,

Carl E. Norman, Ph.D. Consulting Geologist P.G. 1772; CPG 6831



