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**SPECIALIZING IN ACTIVE FAULTS
ON THE TEXAS-LOUISIANA
GULF COASTAL PLAIN**

May 6, 2020

**SAN JACINTO RIVER AUTHORITY, GRP OFFICE
11998 Pine Valley Drive
Conroe, Texas 77304**

Attention: Mark Smith, GRP Division Director

**SUBJECT: REPORT ON THE TENTH AND FINAL RE-MEASURE OF
WATERLINE W1A AND W2A BENCHMARK ELEVATIONS IN THE
WOODLANDS, TEXAS IN MARCH 2020.**

All past remeasurements of the 47 W1A and W2A benchmarks show very little change in their elevations over the previous 6 months. The largest amount from September 2019 to March 2020 was only plus or minus 0.01 feet (0.12 inches) at 18 of the 47 benchmarks. The remainder showed no elevation change. The small changes are likely to be due to variations in soil moisture content at each of the 4 lines of benchmarks.

Looking at the 5-year total change in elevation of the 20 BMs crossing the Egypt Fault along FM 2978, there has been a drop of 0.10 feet (1.2 inches) of a single BM (No. 11) located near the upper edge of the downthrown fault block at the midpoint of the BM line. It is likely located in the narrow zone of highly disturbed soil between the upthrown and downthrown fault blocks. Over the same time period, 3 BMs (No. 13, 15, 19) on the downthrown block dropped -0.01 feet, and 6 others (No. 12, 14, 16 17 18 20) dropped -0.02 feet. Looking at the pattern of changes along the entire 20-BM line, no BM on either fault block has risen, while 10 have descended 0.01 feet, 8 descended 0.02 feet and only 1 shows no net movement. The only reasonable interpretation of that movement pattern is that this known active fault has, at this specific location, been inactive for the past 5 years.

This conclusion also applies to a line of 4 BMs across the same fault at a location where the fault and the BM line cross Research Forest Drive a few hundred feet east of FM 2978. Over the past 5 years, two of the 4 BMs descended 0.02 feet,

and the other two only 0.01 feet. These changes over a 5-year period are much too small to attribute to a currently active fault.

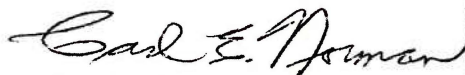
A line of 4 benchmarks along Research Forest Drive crosses the well-known Big Barn Fault just east of Green Bridge Drive. Over the past 5 years, 3 of them descended 0.01feet while the other showed no net movement. The magnitude of net differential movement of the 4 benchmarks over a 5 year period is much too small to attribute to an active fault at this location.

Farther to the east, an east-west line of 19 benchmarks along the north side of Research Forest Drive, at and near Cat's Cradle Drive, crosses an area where a northeast-southwest gap exists between 2 known active faults, both of which trend in a northeasterly direction.. Although there is no field or subsurface evidence for the existence of an active fault in the gap, the 19 benchmarks were installed near its center to identify ground movements that might be expected to occur across a known active fault.

Over the past 5 years the entire range of their vertical movements was 0.00 to - 0.04 feet (-0.48 inches). Of nine benchmarks on the expected upthrown side of the possible fault, four showed no movement, two descended 0.01 feet, one descended 0.02 feet, and two descended 0.03 feet. Of the ten benchmarks on the expected downthrown side of the possible fault, one descended 0.01 feet, seven descended 0.02 feet, one descended 0.03 feet and one descended 0.4 feet.

These 19 benchmarks showed essentially the same pattern of movement every year over the past 5 years, i.e. nearly uniform distribution of elevation changes on both sides of the projected location of the possible fault. The benchmark data strongly suggest that no fault exists within the gap between the two known active faults.

Respectfully submitted,



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