Shine & Associates
REGISTERED SURVEYORS TEXAS AND LOUISIANA
D. D. SHINE, RPS, LSLS, RLS
T. M. JUMPER, RPS

File No. Sketch File 103
Harris County
M.H.H.W. of Clear Lake tributary, mouth of which lies 7800ft. east of mouth of Taylor Lake.
Filed June 11 19 92
GARRY MAURO, Com'r
By Douglas Howard

April 29, 1992

Mr. Paul Kwan
Landtech Consultants
2627 North Loop West, Suite 224
Houston, Texas 77008

Re: Establishment of Mean Higher High Water in Lake Cove Subdivision

Dear Paul:

At your request, in my capacity as a Licensed State Land Surveyor in Texas, I have determined the line of mean higher high water in reference to the National Geodetic Vertical Datum of 1929 adjusted to the latest geodetic adjustment of 1987, for the Lake Cove Subdivision located in the Ritson Morris League, Abstract 52, Harris County, Texas.

Ritson Morris received title to said league bordering on Galveston Bay, Clear Creek, and Clear Lake from the Mexican state on November 14, 1832.

The court held in Humble Oil & Refining Co. v. Sun Oil Co., 90 F 2d 191,

> In construing grants issued by King of Spain and Mexican state before adoption of common law in Texas, boundary between sea and upland must be determined in accordance with principles announced in Las Siete Partidas, the basic law of Spain and Mexico, which defines "shore" as all ground covered with water at high tide during the whole year, whether in winter or in summer.

In a later decision the Texas Supreme Court in Luttes v. State, 324 SW 2d 167, 159 Tex. 500, on remand 328 SW 2d 920, found that the shoreline boundary of common law grants was different from the shoreline boundary in civil law grants. These boundary lines under Luttes are: Civil

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law (grants made by Spain or Mexico) - the line of mean higher high tide (water) MHHW as distinguished from the line of mean high tide (water) MHW of common law grants. (Grants made by the Republic or State of Texas.) These datums (MHHW/MHW) are determined by tide gauge readings adjusted to nineteen year values (Luttes supra). Luttes acknowledges that the method promulgated in that case is not infallible when the court said:

> If it be shown in a given case that the upper level of the shore, as actually covered and uncovered by the sea, is higher (or lower) than the level of mean higher high tide as determined by tide gauges, and if it also appears that an upper median line of the shore, as actually so regularly covered and uncovered, can be determined with reasonable accuracy otherwise than by exclusive resort to tide gauges, we do not by our opinion intend to foreclose such a case.

While there is some controversy over the application of the shoreline boundaries promulgated by Luttes on some of the Texas shores, I am of the opinion that a shoreline survey in accordance with the principles announced in Las Siete Partidas or those in Luttes along the shoreline of Lake Cove would generally be synonymous. Therefore, I have chosen to use the tide gauge method from Luttes because this data is readily obtainable in a shorter period of time.

The tide is the alternating rise and fall in sea level produced by the gravitational force of the moon and the sun. Other non-astronomical factors, such as meteorological forces, ocean floor topography and coast line configuration, also play an important role in shaping the tide (National Ocean Survey 1976). A tidal datum, such as MHHW, is usually considered to be the average of all occurrences of a certain tidal extreme for a period of nineteen years. Such a period is called a tidal epoch. (Water Boundaries, George Cole.)

Tidal datums are a local phenomenon because of the various local conditions shaping the tides. There can be considerable differences in the elevation of a tidal datum from point to point in even the same general vicinity. Because of the local variation in the elevation of tidal datums, it is obvious that datums would have to be determined in the immediate vicinity of the subject shoreline boundary. It is equally obvious that it would be impractical to do so if nineteen years of observations are necessary at each desired datum point. Fortunately, methods have been developed for correcting short term observations to the equivalent of a nineteen year mean. The most satisfactory method to achieve this is by simultaneous observations at the desired

point and at a control station for which nineteen year mean values are known. The length of time necessary for tidal observations in the local area would depend upon the proximity of a nineteen year control station. This time frame could range from a few hours to a year or more.

We were fortunate that Lake Cove was in the general proximity of the National Ocean Service tide gauge "Pier 21" in Galveston. This tide gauge has been in operation since the early 1900's. We were also fortunate that the Blucher Institute of Surveying and Science of Corpus Christi State University installed their "Clear Lake" tide gauge in Clear Lake at the Harris County Park site in the latter part of 1990.

A staff gauge was installed in the estuary of Clear Lake in the Lake Cove Subdivision. The staff gauge was observed on six minute intervals through three high tide cycles. These staff observations were compared simultaneously with the Clear Lake gauge.

Sea level is monitored by the National Ocean Service, and in recent years, this monitoring has indicated a world-wide trend of continual rise in sea level. To correct for this rise, a new epoch has historically been adopted every two or three decades when significant change has occured. At such times, adjustments are made to all datum elevations. In effect, a quantum jump occurs in the elevations of all tidal datum planes for stations published by the National Ocean Service at those times. An example of this occured in 1981 when a change in epoch was adopted. Previously, the epoch of 1941-1957 was used. The current National Tidal Epoch adopted in 1981 is 1960-1978. In recent years, sea level has been rising at an average rate of 0.0066 feet per year in the United States (Hicks 1988). Some sections of the coast have a much higher rate. The data collected from the Pier 21 gauge at Galveston (primary gauge for this project) has revealed that sea level has risen an average of more than 0.01 feet per year since the 1960-78 tidal epoch. Therefore, we considered it necessary to recompute data on a more current epoch rather than use published data computed on the National Tidal Datum Epoch. The data for Pier 21, Clear Lake, and the staff in the Clear Lake estuary were computed on the epoch of 1969-87 to reflect the more current mean tidal datum elevations and at the same time, compare to the most recent NGVD adjustments of 1987.

The datum for Clear Lake published by NOS was based on three months observation at Clear Lake (Jan.-Mar. 1991) and the 1960-78 epoch at Pier 21. The datums reflected in the letter from James R. Hubbard, Chief, Datums Section, NOS, to William Massey

were based on three months observations and the 1960-78 epoch.

We secured from the Blucher Institute the six minute readings from the Clear Lake Gauge for the entire calendar year of 1991. Tidal datum relationships were then computed for the Clear Lake gauge using a year's observation related to the Pier 21 1969-87 tidal epoch datum.

Tide staff observations were made at the Lake Cove Subdivision site simultaneous to the Clear Lake gauge through three different high tide cycles. Using the amplitude ratio method between the Clear Lake gauge and the Lake Cove staff, mean higher high water was calculated for the Lake Cove staff. Mean higher high water when related to NGVD (1987 adjustment) is computed at 1.09 feet.

Mean higher high water is computed at 0.89 feet above NGVD (1987 adjustment) at the Clear Lake gauge using the current datum mentioned above.

Points were set on the mean higher high water line on both banks of the Clear Lake estuary extending through the Lake Cove Subdivision. These points were incorporated into surveyed meanders delineating the dividing line between the state's ownership of the estuary and the littoral owners.

This survey is reflected on Landtech Consultant's subdivision plat of the Lake Cove Subdivision dated May 12, 1992.

Respectfully submitted,

D. D. Shine
Licensed State Land Surveyor

DDS:nf

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ACRN = AW1574 ********** BENCH MARK DESCRIPTION *********
DESIGNATION -- J 1201 STATE--TX COUNTY--HARRIS
QUAD--0290951 QSN-- LATITUDE = N293434. LONGITUDE = W0950142.
MONUMENT BY--NGS YR--1973 MARK TYPE--BENCH MARK DISK
LAST RECOVERY BY--NGS YR--1987 CONDITION--GOOD
STAMPING--J 1201 1973
***** SPECIFIC SETTING--COPPER-CLAD STEEL ROD
***** MARK ORIGIN --- NGS
ABOUT 0.8 MILE NORTH ALONG STATE HWY. 146 FROM THE INTERSECTION OF NASA RD. 1 AT SEABROOK, ABOUT 56 FEET WEST OF THE CENTER LINE OF THE MEDIAN OF THE HIGHWAY, 32 FEET NORTH OF THE CENTER LINE OF REPSDORPH RD., 8.4 FEET EAST OF SEADRIFT PIPE LINE MARKER, 3.4 FEET SOUTHEAST OF TELEPHONE POLE 57 BRACED BY A GUY WIRE, 2.6 FEET SOUTHEAST OF A GAS LINE BREATHER, ABOUT 0.7 FOOT NORTHWEST OF A METAL WITNESS POST, ABOUT 1 FOOT BELOW THE LEVEL OF THE HIGHWAY, AND IS A DISK SET ON TOP OF A 5/8-INCH COPPER COATED STEEL ROD PROJECTING 1 INCH ABOVE THE LEVEL OF THE GROUND AND PROTECTED BY A 6-INCH IRON PIPE WHICH PROJECTS 2 INCHES. THE ROD WAS DRIVEN TO A DEPTH OF 53 1/2 FEET.
***** REPORT BY--TCBINC DATE--1974 CONDITION-- GOOD
***** REPORT BY--NGS DATE--1978 CONDITION-- GOOD
ABOUT 1.0 MILE NORTH ALONG HIGHWAY 146 FROM THE UNITED METHODIST CHURCH AT SEABROOK IN THE NORTHEAST CORNER OF INTERSECTION OF REPSDORPH ROAD BETWEEN HIGHWAY 146 AND TEXAS AND NEW ORLEANS RAILROAD, 67 FEET WEST OF CENTERLINE OF HIGHWAY, 51 FEET EAST OF EAST RAIL, 30 FEET NORTH OF CENTERLINE OF REPSDORPH ROAD, AND 6 FEET EAST-NORTHEAST OF POWER POLE.
***** REPORT BY--NGS DATE--1983 CONDITION-- GOOD
***** REPORT BY--NGS DATE--1987 CONDITION-- GOOD
RECOVERED IN GOOD CONDITION, THE DESCRIPTION IS ADEQUATE EXCEPT TO CHANGE THE 40 CODE TO READ RECESSED 30 CM AND ADD 43 CODE.

Harris Co. Sk. File 103

LANDTECH CONSULTANTS
Civil Engineering • Land Surveying

June 5, 1992

Mr. C.B. Thomson, RPLS, LSLS
General Land Office
1700 North Congress Avenue
Austin, Texas 78752

RE: Lake Cove Subdivision, Ritson Morris Survey, A-52
Harris County, Texas

Dear Mr. Thomson:

We are in the process of platting a residential subdivision in Seabrook, Texas. An estuary of Clear Creek is within the subject property. Our client plans to develop some water fronted lots with bulkhead structures along the estuary. A survey together with a report locating the Mean Higher High Water Line was prepared under the direction of Mr. D.D. Shine, LSLS, RPLS. It is respectfully requested that the General Land Office issues a letter approving the location of the boundary line of the state property as shown in the attached map. Thank you for your consideration.

Sincerely,

Paul Kwan

Paul Kwan, RPLS

File No. Sketch File 103
Harris County
M.H.H.W. of Clear Lake Tributary, mouth of which lies 7900' east of mouth of Taylor Lake.
Filed June 11 19 92
GARRY MAURO, Com'r
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2627 North Loop West, Suite 224 • Houston, Texas 77008 • Tel: (713) 861-7068 • Fax: (713) 861-4131

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LANDTECH CONSULTANTS
Civil Engineering • Land Surveying

FACSIMILE TRANSMISSION

DATE: 6/10/92 LANDTECH PROJECT NO.: _____

PROJECT: Lake Cove MHHW

TO: Elisandro Leos

COMPANY: General Land Office

FAX NUMBER: 512-463-5098

FROM: Paul Cruth

NUMBER OF PAGES INCLUDING COVER SHEET: 2

MESSAGE: BM used NGS monument J1201
1987 Adjustment -

IF ANY PROBLEMS WITH FAX TRANSMISSION, PLEASE CALL (713) 861-7068

Harris Co. Sk. File 103

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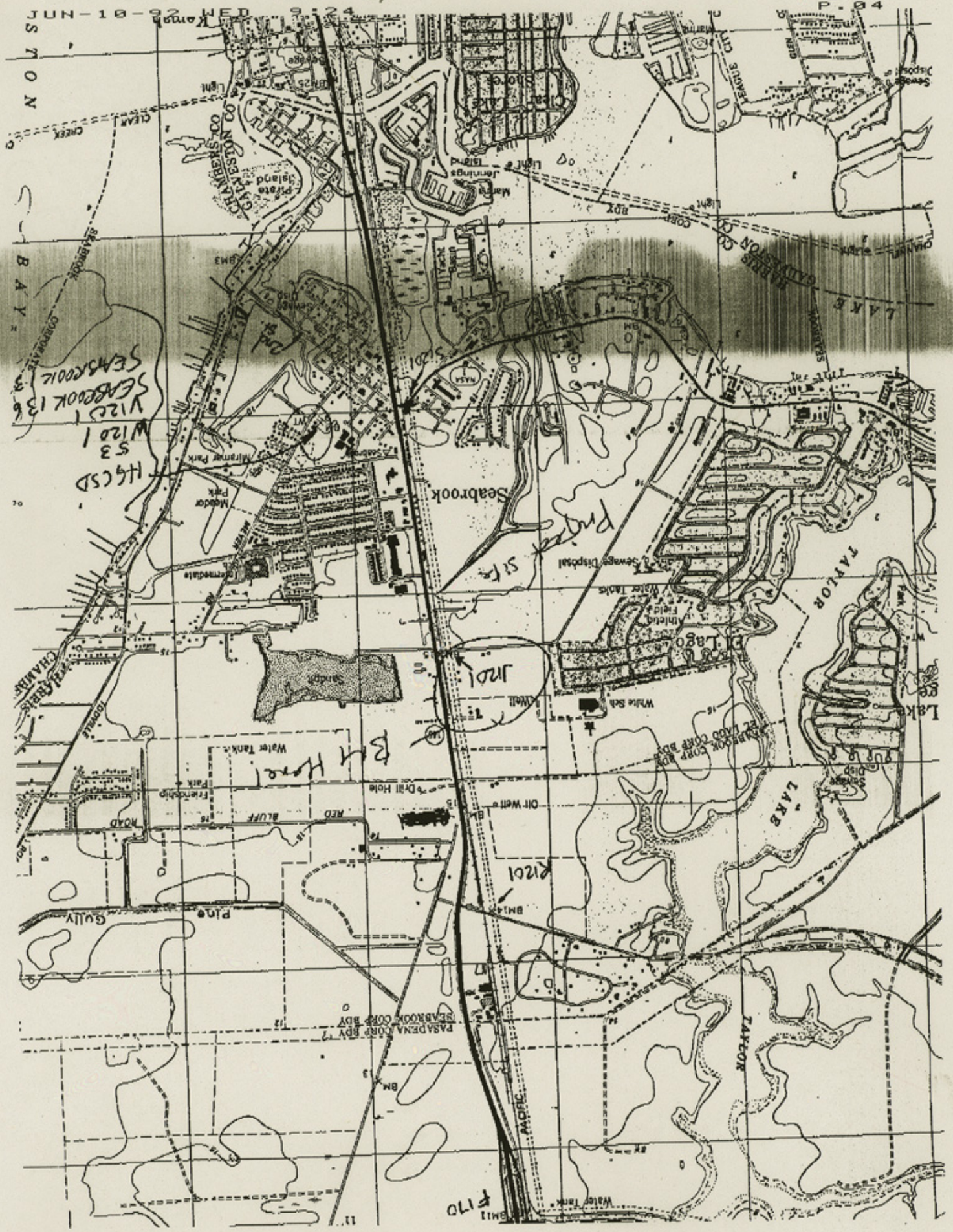
HARRIS-GALVESTON COASTAL SUBSIDENCE AREA, TX; DECEMBER, 1987

L25005/4
O/C = 1/2

ACRN	BENCH MARK DESIGNATION	NGVD 29 ADJUSTED ORTHOMETRIC HEIGHT U.S. SURVEY METERS	FEET	APPROX POSITION LATITUDE	LONGITUDE
AW1562	SYLVAN RM 2	3.605	11.83	293838 N	0950050 W
AW1563	SYLVAN RM 1	3.525	11.57	293838 N	0950050 W
AW1565	K 1201	2.786	9.14	293758 N	0950109 W
AW1566	L 1201	2.453	8.05	293712 N	0950106 W
AW1567	WELL 1089 USGS	1.902	6.24	293711 N	0950056 W
AW1568	F 1205	1.031	3.38	293705 N	0950004 W
AW5663	HGCSD 50	2.684	8.80	293706 N	0950005 W
AW1569	T 1201	1.767	5.80	293704 N	0950201 W
AW1570	U 1201	2.754	9.04	293615 N	0950154 W
AW1571	V 1204	3.005	9.86	293612 N	0950118 W
AW1572	F 170	3.608	11.84	293547 N	0950125 W
AW1573	R 1201	3.718	12.20	293519 N	0950152 W
AW1574	J 1201	4.071	13.36	293434 N	0950142 W
AW1575	S 1201	2.795	9.17	293350 N	0950134 W
AW5664	HGCSD 53	2.585	8.48	293353 N	0950116 W
AW1576	W 1201	2.669	8.76	293353 N	0950116 W
AW1578	V 1201	2.387-	7.83	293352 N	0950115 W
AW5665	SEABROOK 1360 USGS 1986	3.509	11.51	293350 N	0950116 W
AW1577	SEABROOK 1360 USGS	3.534	11.60	293350 N	0950116 W
AW1579	C 170	0.266	0.87	293327 N	0950100 W
AW1580	T 1204	0.444	1.46	293323 N	0950101 W
AW1583	U 1186	3.815	12.52	293219 N	0950109 W
AW1586	27 TXRD	4.652	15.26	293136 N	0950043 W
AW1587	J 1241	4.694	15.40	293105 N	0950022 W
AW1588	X 1201	5.005	16.42	293042 N	0950018 W
AW1589	Y 169 RESET 1973	3.779	12.40	293011 N	0945951 W
AW1590	C 1204	3.795	12.45	292950 N	0945942 W
AW1591	G 1138	4.224	13.86	293021 N	0945902 W
AW1592	CLIFTON RM 4	3.769	12.36	293033 N	0945813 W
AW3028	CLIFTON 1933 1960	3.924	12.87	293033 N	0945813 W

* = UNCHANGED HEIGHT



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