

December 30, 2012

Surveyor's Report 12-840

Upon a Survey to Locate the Common Line of Lot 3-B and Lot 5 of BROOKS HOLLOW RESUBDIVISION in Travis County, Texas

General :

At the request of Frank Oliver, Attorney, I have made a survey for the purpose of determining the common boundary of Lot 3-B and Lot 5 of BROOKS HOLLOW RESUBDIVISION in Travis County, Texas shown upon the plat recorded in Book 6 at Page 157 of the Travis County Plat Records. I understood that a dispute has existed between the owners of Lot 3-B, Clift and Laura Richardson and the owner of the Southeast part of Lot 5 adjoining Lot 3-B, Karen White, as to the location of the common boundary of their properties.

This dispute appeared to originate in large part from resurveys made during the last decade by land surveyors who had either (a) failed to find all the relevant evidence, (b) mistakenly interpreted a meander line shown on the plat of BROOKS HOLLOW RESUBDIVISION as the true boundary of the land subdivided, or both. Many of these same resurveys also reflect some confusion about the determination of elevations with respect to what is known as Mean Sea Level Datum, or the National Geodetic Vertical Datum of 1929, established from US Geological Survey benchmarks.

The location of the common line of Lots 3-B and Lot 5 depends upon how the subdivision plat is to be understood and upon certain fact questions that have been evidently the subject of needless confusion.

Prior to conducting this survey, I made a careful and detailed examination of the Travis County Real Property Records to assemble the relevant history of title to both Lot 3-B and Lot 5 as well as to certain lands lying below the 670 ft. elevation contour adjacent to those lots.

Brief Historical Summary :

I believe the following history is well known to the attorneys representing the Richardsons and Ms. White in this dispute, but I will briefly restate the essential elements of it. In December of 1953, when they executed the plat of BROOKS HOLLOW RESUBDIVISION recorded in Book 6 at Page 157, Travis County Plat Records (TCPR), the subdividers, James P. Yeates and his wife, Thelma Bolm Yeates, were the record owners of a certain 15.15 acre tract of land conveyed to James P. Yeates by Alden Davis

et ux in April of 1945 (ref: Vol. 765 Pg. 8 Travis County Deed Records). That 15.15 acres had originally been severed from a larger tract of about 180 acres when Nick Hornsby et ux conveyed it to Alden Davis the month before, in March of 1945.

In the deed by which Hornsby conveyed the 15.15 acre tract, the land was described by metes and bounds that specifically called for one of its boundaries to follow "a contour which is 670 feet above Mean Sea Level as established from U.S. Geological Survey Bench Marks" [my emphasis], and recited courses and distances along that contour to describe its approximate meanders. The clear intention of the deed was to convey land bounded by the irregularly curving 670 ft. elevation contour. The purpose of the courses and distances recited was to enable an approximate area calculation that was probably adequate for the purposes of the day. The conveyance by Davis to Yeates a month later used essentially the identical description.

Upon the purchase from Alden Davis in 1945, Yeates and his wife had assembled a tract of land consisting of the following parts as shown by the deeds of record indicated in the table below totaling 23.44 acres :

John McDonald Sur.	Jasper Gilbert Sur.	Grantor	Vol/Pg TCDR
	2.77 ac.	A.K. Stewart	741/387
	0.50 ac.	Mrs. Susan Clifton	742/448
0.59 ac.	4.43 ac.	Mrs. Annie Stewart	755/547
	15.15 ac.	Alden Davis	765/8
0.59 ac.	22.85 ac.		

According to the various deeds to Yeates, he and his wife owned a total of 22.85 acres in the Jasper Gilbert Survey of which the 15.15 acre tract was a part.

BROOKS HOLLOW Subdivision in 1950 :

In August of 1950, James P. Yeates and Thelma B. Yeates executed the plat of BROOKS HOLLOW recorded in Book 5 at Page 123 TCPR. While this plat bears the statement of Doak Rainey, PE that the subdivision was surveyed by him, it appears to me to have been entirely the product of office work consisting of plotting up the metes and bounds descriptions of the the four Yeates tracts, attempting to fit the four parts together to form a picture of the whole they comprised, and then drawing lines upon the picture to depict lots with apparently no work on the ground. Mr. Rainey's office plat contained some obvious mistakes. For example, the East line of Lots 1, 2, and 3 was annotated with a bearing of N28°39'E, which is a transposition error made in copying the bearing of N29°38'E appearing in the metes and bounds of the 15.15 acres in the Yeates deed and in the earlier conveyance in his chain of title.

The lakeward boundary of BROOKS HOLLOW as shown upon the plat is labeled "670' Contour" and was obviously an attempt to map the 670 ft. contour by simply using the

courses and distances of its approximate meanders recited in the original deed from Nick Hornsby to Alden Davis and repeated in the deed from Davis to Yeates.

The plat of BROOKS HOLLOW reflects the Yeates's intention to include all of their 22.85 acres situated in the Jasper Gilbert Survey within the subdivision, stating that it is their subdivision of four tracts including the 15.15 acres and giving the total acreage of the subdivision as 23.44 acres which was the sum of the record acreages of all their land in the Gilbert and McDonald surveys.

BROOKS HOLLOW RESUBDIVISION IN 1953 :

The Real Property Records indicate that the Yeateses didn't sell any lots by reference to their 1950 plat. In August of 1950 when BROOKS HOLLOW was platted, the records of the LCRA indicate that the level of Lake Travis was no higher than 641 ft., so the 670 ft. contour was high and dry. In fact, after August of 1950, the level of Lake Travis generally continued to drop during a period of extreme drought, reaching a minimum level below 615 ft. in June and July of 1952. Lake lots in some remote subdivision on Lake Travis, as BROOKS HOLLOW was, probably seemed a dubious investment as the lake shrank from the shore.

However, LCRA records indicate that in September, 1952, the lake rose to nearly full and remained around that level for the next ten months or so. This may have renewed interest in lake lots and caused James P. Yeates and his wife to have BROOKS HOLLOW subdivision reconfigured as shown on the plat of BROOKS HOLLOW RESUBDIVISION. That plat was executed by them and recorded in December, 1953 in Book 6 at Page 157 TCPR. It also bears the seal and signature of Doak Rainey, PE on a statement to the effect that the resubdivision had been surveyed by him.

The lakeward boundary of Lots 1, 2-A, 2-B, 3-A, and 3-B shown upon the 1953 plat again followed the approximate meanders of the 670 ft. contour recited in the 1945 conveyance of the 15.15 acres to Yeates. It isn't explicitly labeled "670' Contour", but it is plain that the Yeateses intended to subdivide all of their four tracts, including all of the 15.15 acre tract that extended to the sinuous boundary formed by the 670 ft. elevation contour. The summary of the acreages of lands covered by the plat remains a total of 23.44 acres, of which 22.85 acres remain situated in the Jasper Gilbert Survey and would have necessarily included all of the 15.15 acres conveyed by Alden Davis to Yeates.

The 1953 plat includes some further scrivener's errors. For example, the error in the bearing of the East line of Lots 1 through 3-B that had been noted as N28°39'E on the 1950 plat was compounded by another error that rendered it as N22°39'E on the 1953 plat. I know of absolutely no reason to think that the line on the ground had significantly changed. The change to the bearing appears to be purely a careless drafting error.

Unlike the 1950 plat, the 1953 resubdivision plat does appear to be the product of at least a partial survey on the ground. This is shown in particular by the meander line at the

lakeward sides of Lots 5, 7, 8, 10, 11, 13, 14 16, 17, and 19, which differs markedly from the meanders of the 670 ft. elevation contour recited in the deed to the 15.15 acres from which the 670 ft. contour was evidently plotted on the 1950 plat. The plat does not specifically state that markers were set at the lot corners. However, the open circle symbol that appears on the plat was nearly universally used by surveyors in practice in Travis County in 1953 to indicate that a marker was set and on the ground I have found iron rods in place at various of these corners of an appearance consistent with what I would expect an iron rod set sixty years ago in that locality to have.

In my opinion, it is clear that the Yeateses intended to subdivide all of their 15.15 acre tract of land in the Gilbert Survey. This means that the true boundary of lots 3-B and 5, as well as the other lakefront lots, is the boundary of the 15.15 acres, the sinuous contour at elevation 670 ft. elevation above Mean Sea Level as established from US Geological Survey benchmarks, an irregular, curving boundary that is only crudely approximated by the courses and distances of its approximate meanders recited in the conveyance of the 15.15 acres to Yeates. According to my understanding, this interpretation of the plat of BROOKS HOLLOW RESUBDIVISION is not contested by the parties.

Considering that the old iron rod that marks the common corner of Lots 3-B and 5 on Hurst Hollow is actually approximately at elevation 691.8 ft. Mean Sea Level as established from US Geological Survey benchmarks, and more than 124 feet from the 670 ft. elevation contour at the nearest point on that contour, the question at issue is how the boundary between Lot 3-B and Lot 5 is to run from the old iron rod to reach the 670 ft. elevation contour.

Easement for Access to Water across Lot 5 :

One significant feature of the 1953 resubdivision plat is that it indicates that Lot 5 was subject to an "Easement for access to Water" shown on the plat. I find nothing on the plat to suggest that any part of Lot 3-B was intended to be subject to this easement.

Mean Sea Level Datum as established from US Geological Survey Benchmarks :

Some surveyors who have attempted to determine the elevations of various points adjacent to Lake Travis have considered the pool level or water surface of Lake Travis to have the elevation indicated by the gauges operated by the Lower Colorado River Authority at Mansfield Dam as published by the LCRA. These elevations of Lake Travis given by the gauge readings, however, do not refer to Mean Sea Level as established from US Geological Survey Benchmarks (a leveling datum also known as the "National Geodetic Vertical Datum of 1929"), but refer to a special system of elevations that LCRA staff call "Hydromet Datum" which differs systematically from Mean Sea Level Datum as established from nearby US Geological Survey Benchmarks.

The net effect of this in the vicinity of BROOKS HOLLOW RESUBDIVISION is that under conditions of negligible release at Mansfield Dam (and absent some high, steady

wind conditions that might slope the water surface of Lake Travis), when according to the LCRA gauges the elevation of the pool level of Lake Travis is 670.00 ft. Hydromet Datum, the elevation of the pool level is actually 670.40 ft. Mean Sea Level Datum.

To properly determine the elevation of 670.00 ft. Mean Sea Level Datum from US Geological Survey benchmarks as described in the original 1945 conveyance of the 15.15 acre tract from Nick Hornsby to Alden Davis mentioned above, I used the actual Mean Sea Level Datum elevation of a US Geological Survey benchmark at Mansfield Dam and derived the Mean Sea Level Datum elevations of various points on and around Lot 3-B and Lot 5 from it.

Method of Determination of Common Line of Lot 3-B and Lot 5 :

The plat of BROOKS HOLLOW RESUBDIVISION does not explicitly provide for a method by which the lots were to be extended to actually reach the 670 ft. elevation contour. From a surveying standpoint, the desirable solution is one that is:

- (a) definite and ascertainable by a surveyor,
- (b) impersonal, meaning three surveyors should get essentially the same solution from the same data
- (c) does not produce a result that is plainly contradictory to the intent of the subdivider as deduced from the plat.

From the study of historical aerial photos and examination of the properties on the ground, in my view, the easement for access to water shown on the plat of BROOKS HOLLOW RESUBDIVISION plainly contemplated using a natural feature that the present boat ramp pavement extends along as the route for that access to water. The ramp follows a more or less direct route toward deep water that is useful for launching boats in a way that a long, shallow route over varying terrain is not. I understand the plat to indicate that this water access was to be located upon Lot 5 only and in the vicinity of one side of the lot. In my view, the subdivider by implication elected for the common line of Lots 3-B and 5 to also run along a direct route toward deep water as the lake access easement as developed and used does.

The portion of Lot 5 upon which the boat ramp is situated and a certain distance to either side of it cannot be used for boat dockage since to do otherwise would obstruct the easement for access to the variable waters of the lake, and to locate the common line of Lots 3-B and 5 in such a way as to cramp or cover the boat ramp maintained by virtue of the platted easement would only create the conditions for further disputes since the public records indicate that Lot 5 is the only lot of the two subject to the easement.

Survey Work on the Ground :

The basic tasks of my survey were the following:

- identify the position of the common corner of Lots 3-B and 5 at the intersection of the North and West lines of the road known as Hurst Hollow bounding the lots,
- determine the location of the contour which is 670 feet above Mean Sea Level as established from US Geological Survey benchmarks,
- determine the bearing of the shortest straight line from the common corner of Lots 3-B and 5 on Hurst Hollow to the 670 ft. elevation contour,
- mark where that shortest straight line intersects the 670 ft. elevation contour and place such other survey markers as will make the location of the line readily ascertainable at some time in the future when the 670 ft. contour is inundated again by the waters of Lake Travis, and
- prepare a written description of this line to the 670 ft. elevation contour.

Common corner of Lots 3-B and 5 at Hurst Hollow :

In the written description dated December 30, 2012 submitted herewith describing the common boundary of Lots 3-B and 5 running from Hurst Hollow to the 670 ft. elevation contour, I have taken care to give ties to all of the important evidence I found that confirms the location of the common lot corner at Hurst Hollow. In particular, by careful investigation, I was able to recover the old 1/2 in. iron rod that has apparently been recognized since at least 2002 as marking that corner by five surveyors whose maps showing the boundaries of Lot 3-B and Lot 5 I have examined. The ties I recite show that the rod presently is in essentially the same position it has been since at least 2002 when the record of modern surveys begins.

The one exception is that of a survey made by Name Redacted, RPLS in 2011 which evidently failed to discover either this old rod or the other old rod that I found marking the Southeast common corner of Lots 3-A and 3-B on Hurst Creek Road. Mr. Redacted's map of Lot 3-B shows the common corner of Lots 3-B and 5 as being in a position nearly a foot (0.95 ft.) to the Northeast of where the corner remains marked by the old 1/2 in. Iron Rod that has otherwise been evidently universally recognized as marking the common corner. My understanding from notes on his map is that Mr. Redacted based his location of Lot 3-B upon surveys of the lot made in 2004 and 2006 by James Grant, RPLS, but apparently without realizing that Mr. Grant's map also contained significant errors that were then perpetuated in Mr. Redacted's work.

Determination of 670 ft. Elevation Contour :

I located the 670 ft. elevation contour by first determining the elevation of a temporary benchmark that I established near where it crosses the concrete boat ramp pavement on Lot 5. I determined the elevation of this benchmark by two independent methods which gave essentially the exact same result. The first method consisted of transferring the elevation of the pool of Lake Travis on two different days when releases from Mansfield Dam were negligible and the slope of the lake surface from the gauges at the dam to the vicinity of Lot 3-B was therefore effectively zero. I used a careful technique to level to the water surface and found that the elevations of the benchmark I determined from the lake surface were essentially identical (a difference of 0.004 ft) from day to day.

The pool levels of Lake Travis are published on a special datum known as "Hydromet Datum" that LCRA has adopted and used for years. To convert elevations in relation to Hydromet Datum, one adds 0.40 ft. to obtain an elevation in relation to Mean Sea Level as established by the US Geological Survey, also known as the National Geodetic Vertical Datum of 1929 or NGVD29. This equation between the Hydromet Datum gauge readings and US Geological Survey Mean Sea Level Datum is one that the surveying staff of LCRA have informed me they determined by leveling from US Geological Survey benchmarks to the gauges on Mansfield Dam.

To verify the correctness of the difference between LCRA Hydromet Datum and Mean Sea Level (NGVD29) as established from US Geological Survey benchmarks, using static GPS methods I transferred the elevation established by the US Geological Survey for a permanent benchmark at Mansfield Dam about 3.5 miles distant. This transfer was made by two different GPS vector solutions on two different days and the surveyed ellipsoid height differences from the GPS vectors were reduced to NAVD88 orthometric height differences using the most current geoid model published by the National Geodetic Survey (GEOID12a). The NAVD88 orthometric height differences were in turn converted to Mean Sea Level elevation differences using small corrections generated by the National Geodetic Survey's VERTCON software. The resulting Mean Sea Level Datum (NGVD29) elevation of the same temporary benchmark at the boat ramp was essentially identical (671.496 ft. vs. 671.500 ft.) to that determined from the Hydromet Datum elevations corrected as described above.

I found that certain prior surveys performed in the area of Lots 3-B and 5 had reported significantly erroneous elevations. Michael Samford, RPLS reported (ref: Doc. No. 2002244443 TCOPR) that an iron rod he found in place in 2002 had an elevation of 679.46 ft. and another an elevation of 678.55 ft. I found what I take to almost certainly be the same two rods to actually have Mean Sea Level elevations of 679.78 ft. and 678.87 ft., respectively. This means that both elevations of the rods reported by Mr. Samford were 0.32 ft. lower than their actual Mean Sea Level elevations.

I found that survey markers evidently placed by Terra Firma Surveying Company to mark the 670 ft. elevation contour in the vicinity of Lot 3-B had actual elevations of 670.31 ft. and 670.71 ft., elevation errors that would likewise result in erroneous locations of the 670 ft. elevation contour.

This should not be understood, however, to mean that the problem of determining the elevation of 670 ft. above Mean Sea Level Datum is somehow impossibly difficult or burdensome. I checked several rod and cap markers placed on the 670 ft. elevation contour under the direction of John Barnard, RPLS, of Loomis Austin to mark the true lakeward boundary of Lot 1 of BROOKS HOLLOW RESUBDIVISION. His markers were within 0.01 ft. of elevation 670.00 ft. Mean Sea Level Datum. The basic problem appears to me to be not extreme technical difficulty, but merely some flawed procedures or assumptions that the above mentioned erroneous results were based upon.

Marking of 670 ft. Elevation Contour :

Using a laser level, I located points at close intervals along the contour at an elevation of 670 ft. above Mean Sea Level (NGVD29) and set 3/8 in. steel spikes to mark those points on the contour as located by me. This was so that there would not be any question at all about where I found the 670 ft. contour actually located upon the ground in the vicinity of the area of interest.

I found that the general form of the 670 ft. contour was a curve that bowed toward the common corner of Lot 3-B and Lot 5 on Hurst Hollow. To find the exact shortest line to reach the 670 ft. contour, I determined the horizontal positions of the spikes and made the calculation described below.

One of the first things I noted was that the contour at 670 ft. elevation above Mean Sea Level is actually as much as four feet distant from where it is shown on Name Redacted's map of Lot 3-B. This is most likely attributable to the fact that the Survey Control Point, a steel cotton picker spindle driven into rock, shown on his map as having an elevation of 674.71 ft. NGVD29 actually has an elevation of 675.10 ft. NGVD29. In other words, the delineation of the 670 ft. contour on Mr. Redacted's map is systematically in error as a result of an error in the determination of that fundamental elevation.

Method of Locating Shortest Line :

I used what I consider to be an impersonal method to calculate the shortest straight line to the 670 ft. elevation contour from the old iron rod marking the common corner of Lot 3-B and Lot 5 on Hurst Hollow. This consisted of calculating the distances from the lot corner to the various spikes I had driven along the 670 ft. contour to identify which was the closest. This identified three spikes at intervals of 1.59 ft. and 1.38 ft. (about 19 inches and 16-1/2 inches apart) that lay upon an arc of the curving contour. To define the

curve of that short arc and to exactly place the nearest point upon it, I calculated the position of the center of the one circle that all of the three nearest points would lie upon. A line connecting the center of the circle upon which the arc lies with the position of the old 1/2 in. iron rod at the lot corner on Hurst Hollow is the shortest line from that rod to the segment of the circular arc along the contour. I marked the point at which this exact line intersects the 670 ft. contour with a rod and cap monument for the common corner of Lot 3-B and Lot 5.

As a check, I also computed the center of the circle that best fits a whole series of the spikes along the contour for about five feet to either side of the closest point upon it and found that to give essentially the same result for the location of the shortest line. I consider this method to give an impersonal result that is definite and subject to much less uncertainty than is found in several recent surveys I examined that were conducted in the vicinity of Lots 3-B and 5 by others.

Written Description :

The accompanying written description I have prepared sets forth in detail the location of the common line of Lots 3-B and 5 as determined by me, giving sufficient information and survey ties from which the lines may be plotted on the map of Lot 3-B prepared by Name Redacted, RPLS.

Respectfully submitted,



Kent Neal McMillan

Kent Neal McMillan
Registered Professional Land Surveyor
No. 4341
418 Ridgewood Road, Austin TX 78746
Telephone (512) 445-5441