

City of West Lake Hills

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MEMORANDUM

To: Travis County Water District 10 Board of Directors:

Mr. Clif Drummond, *President* Mr. Charles Barker, *Vice President*
Mr. Hollis Boehme Mr. Harvey Ford
Mr. John Staha Mr. Paul Wakefield, *General Manager*

Cc: Travis County Emergency Services District #9 Board of Commissioners:

Dr. John Hogg, *President* Ms. Krista Malloy, *Vice President*
Dr. Tad Davis Mr. Steve Scheffe
Mr. Kirt Kiester

The West Lake Hills City Council:

Mr. Stan Graham, *Mayor Pro Tem* Mr. David Moore
Mr. Taylor Holcomb Mr. Spencer Stevens
Mr. Jean Goehring Mr. Robert Wood, *City Administrator*

Mr. Gerald Daugherty, *Travis County Commissioners Court*

From: Dave Claunch, *Mayor of the City of West Lake Hills*

Date: April 17, 2013

Re: Fire Hydrant Pressures and Flow Rates in the City of West Lake Hills

I am writing on behalf of the West Lake Hills City Council and the residents of the City in response to your email to us dated April 10, 2013, included at the bottom of this memo for reference. The City Council has asked me to convey the following comments, which I hope you will consider in the spirit of mutual respect and cooperation as they are intended.

We fully understand that the District's *design criteria* has been 1,500 GPM for all new construction since 1996 and that the water system was built within the much lower standards of the 1950's. But times have changed, area homes are much larger, we're in the middle of an historic drought, and our fire department has evolved beyond a single truck manned by volunteers. Our water system appears not to have kept up with those changes.

We have repeatedly asked that the District's Board of Directors adopt a fire flow standard for its existing infrastructure. The City and ESD9 have both set the standard of 2,000 GPM. At various points over the past year and a half, you have indicated the Board's intention to set

such a standard. Can you please clarify whether or not you intend to do so? If so, when? If not, why not?

We fully understand and appreciate the fact that upgrading the existing infrastructure to achieve even a minimum of 1,500 GPM will be expensive, but that does not lessen the need for the improvements to be made or the District's responsibility to do so. In your message, you state that the "number of homes directly benefiting [those upgrades] is approximately 125, out of the District's total number of 2,840 connections." The implication of this statement is that the high cost of the upgrades is not warranted, given the low number of homes receiving a "direct benefit." Lower in your message, you state that the City/ESD9 goal of 2,000 GPM will not be sufficient to fight a fire on the scale of the 2011 Bastrop fire.

These statements reflect a critical and fundamental misunderstanding of the City's position which must be corrected. At no time has the City suggested that any amount of fire flow would suffice to extinguish a raging wildfire. Rather, we have consistently communicated **the critical importance of having sufficient fire flows from your hydrants in order to stop a large house fire from becoming a wildfire.**

According to ESD9 District Chief Michael Lacey, there have been several recent house fires in our area that could have very easily ignited the surrounding vegetation – possibly leading to a catastrophic wildfire that could consume much of our area – if the fire department had not had sufficient water on hand to contain the house fire.

The fire that occurred last year in the garage of a home on the western end of Yaupon Valley Road could easily have ignited Wild Basin Nature Reserve had the fire department not been able to contain it. I remind you that the hydrants along that section of Yaupon Valley Road tested well below the majority of hydrants in the City. Frankly, we were all very lucky that day.

The truth is that the entire community will benefit from infrastructure upgrades that improve the fire department's ability to contain any house fire that might otherwise spread to the surrounding area. Implying otherwise is deceptive and counterproductive.

As I state above, we understand that these critical infrastructure upgrades will be expensive. In your message, you offer various calculations regarding the impact of these costs on the District's tax rate. You paint quite an alarming picture, but you neglect to mention that there are other ways to pay those costs, including the use of existing reserves, the issuance of long-term bond debt, raising service and demand rates, securing grants and other funding. I urge you and the Board to engage the services of a Financial Analyst to advise you on the many alternatives available to help pay these costs. I think you will find that those options are not as alarming as you think.

In your message, you also state that the District has passed 4 bond issues totaling just over \$7 million for capital improvements to the system – and that the cost to upgrade your infrastructure to a 2,000 GPM minimum will be "10 times" that amount. If that is true, then perhaps it is a reflection on how little the District has spent over the past five and a half decades to keep its system up to par. Your statement that "the expected fire flow values in these four areas is the same now as when the District originally constructed them" appears to

prove the point: it is simply unacceptable to have a water system in 2013 that functions no better than it did in the 1950's.

We have seen a similar dynamic with the former Ridgewood Village Water System, which now requires significant upgrades due to long-term neglect. (By the way, I have been contacted by a number of residents in the Ridgewood area who are concerned that the scope of the improvement project in their area may have been altered without their knowledge. I continue to urge you to communicate with those residents to keep them apprised of the scope, cost and timeline for that project.)

Regardless, I fundamentally believe that the overwhelming majority of your customers (and our citizens) will support reasonable, strategic investments in the District's infrastructure in order to protect our community – even if it means increased water rates or taxes.

You take issue with the City's and ESD9's determination that 2,000 GPM is an appropriate minimum standard and you make various references to the National Fire Protection Association and other industry sources. As I have explained previously, the 2,000 GPM number was arrived at after significant consultation with the experts at ESD9. We asked them how much water would be needed from a hydrant in order to fight a house fire at a typical West Lake Hills home. The methodology they use to arrive at their answer is quite simple:

A single, hand-held fire hose requires 250 GPM. The "Master Stream" from the top of a pumper truck requires 1,000 GPM. Since the pumper truck carries only 750 gallons of water (enough for 3 minutes of water from a hand-held line or only 45 seconds from the master stream), a well-producing fire hydrant is critical to their ability to fight a fire.

To fight a fully-engaged fire at a typical West Lake Hills home (located on a slope among relatively dense vegetation), the fire department would want to launch two attacks consisting of two 250 GPM hand-held lines each (for a total of 1,000 GPM) to enter the home and rescue any occupants. They'd also want to have the 1,000 GPM Master Stream to suppress the fire. That's a total of 2,000 GPM of total fire fighting capability.

I urge you to use that methodology when evaluating and establishing an appropriate minimum standard for the District's infrastructure. Think of the problem in terms of, "How many fire hoses will be available to fight a fire near this hydrant?" Think of it as, "If this hydrant were located in front of my house and it caught on fire, how many hoses would I want the fire department to be able to use to fight that fire?"

The 2,000 GPM standard was chosen as a good target that represents a reasonable improvement over existing conditions, not as the "best fire flow" as you referred to it in your letter. Furthermore, the International Fire Code calls for 2,500 GPM for the size home that you referenced in your email, not 1,000 GPM as you stated.

In your message and on several occasions in recent months, you have made the claim that the State's minimum standard for fire hydrants is 250 GPM. **That statement is very misleading.** The state does not say that 250 GPM is sufficient to protect a home. The state does have a requirement that any hydrant that produces less than 250 GPM should be painted black so as to designate it is a flush valve instead of as a fire hydrant, but that regulation falls far short of establishing a reasonable standard for fire flows.

To claim that the District exceeds the state's minimum requirement for hydrant flows of 250 GPM is inaccurate and misleading. It is true that the state does not currently provide much guidance on hydrant fire flows. But that does not mean that the District has fulfilled its obligations to its customers and our citizens by merely exceeding 250 GPM at all of its hydrants. **The District can and should aim higher** than that ridiculously low and ultimately irrelevant 250 GPM number. The District *should* be taking steps to meet the real standard for fire flow, which is the International Fire Code. That Code calls for 2,500 GPM for the typical size home in the City.

You also suggest that the “perhaps it is time for the City to revisit whether to require by ordinance that homes over 3,600 sft. be sprinkled to conform to the 2012 IFC.” I believe the City Council would welcome the opportunity to enact such an ordinance. But alas, the City's ability to do so was taken away by the State Legislature in 2009 with the passage of SB 1410, which retroactively prohibited municipalities from enacting such requirements.

As it stands today, neither the City nor ESD9 can do much to prevent a large home from being constructed in an area where the District's infrastructure is not able to provide adequate fire flows. The ESD9 Fire Marshal issues a Letter of Non-Compliance, which theoretically impacts the cost of the homeowner's insurance for that property, but otherwise we have no way of preventing the construction or requiring sprinklers, except in cases where we can condition approval of a replat or subdivision on such compliance – as we did recently with the Overlook at Butler Cove subdivision.

You state that the District's modeling indicates that the hydrant near Valley View and Forest Trail elementary schools should be able to produce 3,500 GPM at 20psi. The 2011 test results show that the two hydrants in that area, H244 and H247, produced 1,275 and 1,175 GPM respectively. At my request, ESD9 conducted another flow test at these hydrants on Friday, April 12 and the results measured 822 GPM. This gravely concerns me for three reasons.

First, the measured flow is alarmingly low given the fact that these hydrants serve two elementary schools with hundreds of students, teachers and staff. Since that structure does not have a sprinkler system, the Fire Code calls for 5,500 GPM from the nearest fire hydrant. According to this most recent test, your hydrants are only able to provide 15% of that amount.

Second, the vast disparity between the measured flows and the District's modeling calls into serious question the validity of your modeling. If the modeling in this area is so wildly inaccurate, then how can we possibly trust the modeling elsewhere in the system? I encourage you and the District's engineering firm to investigate this disparity further.

Third, we recently learned that the contractor engaged by the District to conduct the 2011 flow tests has been using a flawed method that potentially overinflates the actual test results. Chief Lacey observed the contractor using a “Flow Monster” device to diffuse the water flowing from the hydrant during the testing of a hydrant on Yaupon Valley Drive earlier this week. That device appears to be creating an artificial “backflow pressure” that results in the test results being inflated by approximately 300 GPM. If this device was used when testing the other hydrants in West Lake Hills, then **it is quite likely that all of the District's 2011 test results are wrong.**

Given the low performance of the hydrants that serve Valley View Elementary, I ask that you expand your feasibility study to explore the options and costs for upgrading the infrastructure in that area. I'm sure we agree that this area should be prioritized above all others and slated for upgrade **as soon as possible**.

I also ask the District to investigate the methodology used by its contractor to determine if the results of the hydrant tests fully paid for by the City of West Lake Hills are indeed accurate. If there is any question about the validity of those tests, I ask that the District redo all of those tests at no expense to the City and provide us with the accurate test results as soon as possible.

I wholeheartedly agree that "the way forward is neither simple nor inexpensive." But that observation does not lessen the need or the urgency for this work to be done. Hopefully the facts above will help illuminate the course forward and underscore the importance of doing so diligently and with haste. The high risk of wildfire in our community will not diminish anytime soon.

I hope you and your fellow Board members will solicit input from our community, consider the options available to you for solving this public safety problem, and focus the District's time and resources on finding solutions instead of trying to convince yourselves and others that there is no problem.

Thank you for your service to our community. I look forward to your prompt attention to this urgent matter.

From: Clif Drummond <clif.drummond@gmail.com>

Date: Wed, 10 Apr 2013 13:03:29 -0500

To: Dave Claunch <mayor@westlakehills.org>, David Moore <wlhcc5@westlakehills.org>, Jean Goehring <wlhcc4@westlakehills.org>, Spencer Stevens <wlhcc1@westlakehills.org>, Stan Graham <wlhcc3@westlakehills.org>, Taylor Holcomb <wlhcc2@westlakehills.org>, Robert Wood <cityadmin@westlakehills.org>

Cc: Michael Lacey <mlacey@westlakefd.org>, Clif Drummond <clif.drummond@gmail.com>, Paul Wakefield <wakie@austin.rr.com>, Tom Arndt <Tom.Arndt@dannenbaum.com>

Subject: WLH Feasibility Study

Dear Mayor and Members of the Council,

We have completed the engineering feasibility study of the four areas within the City of West Lake Hills that were identified in the fire flow tests partially paid for by the City as having fire flows below 1000 gpm (specifically, between 684 gpm and 982 gpm spread over 11 hydrants). Those four areas are generally Nob Hill Cir./Skyline Dr.; Windsong Tr.; West Ledgeway/Cedar Oak Dr., and, the western portion of Yaupon Valley Rd. plus upper Flintridge Rd.

With respect to fire flow design criteria, it applies to *new* construction demand nodes. We have never said we were considering applying a design criteria to *existing* construction, since *design criteria* obviously is only applicable for *new* construction. (Please see below the District cost estimations for what the level of capital improvements that would be required to, *a priori*, rebuild the District's pumping, storage, and transmission systems to produce an expected fire flow rate of 2000 gpm within the City, which is a level apparently arbitrarily arrived at by the Council. As we have previously reported on several occasions, the existing fire flow design requirement for new construction in the Water District is 1500 gpm, and has been since 1996. The original fire flow design criteria at the District's founding in 1958 was 500 gpm – when the only fire protection in the City was provided by the Volunteer Fire

Department and one small fire truck.

In general, the expected fire flow values in these four areas is the same now as when the District originally constructed them, (in some instances, the values are better since the District has increased the number, size, and reliability of the pumps in the pump stations). The homes constructed over time in the same areas have all been reviewed and permitted by the City, not by the Water District. That ordinance-making authority is reserved for General Law and Home Rule cities. And, as you and your staff have pointed out, the average size of all homes constructed within the City prior to 2010 was approximately 3,200 s.f.; and in the two year period of 2010-2012, the average size has now more than doubled to an average of 7,344 s.f., with the largest being approximately 14,000 s.f.

The just completed and detailed engineering feasibility study of only the four areas described above shows that the cost to increase existing pipe sizes (generally from 6-inches to 8- or 12-inches) and to construct the required two new pumps stations and reservoirs necessary to provide the greatly increased water volume and flow rates is estimated to be \$18.54 million. The two new pump stations and water reservoirs would be located at the intersections of Skyline Drive and Red Bud Tr., and at Flintridge Rd. and Red Bud Tr.

The number of homes directly benefiting is approximately 125, out of the District's total number of 2,840 connections. If these costs were spread over the entire District, it would require the current tax rate to more than triple.

Further, in response to the resolution passed last September by the City's council, that asked the Water District to change its guaranteed water delivery rate capability, solely within the City of West Lake Hills, to 2000 gpm from the existing 1500 design criteria for new construction, we have developed an order of magnitude estimated costs of approximately \$66 million, which dose not include the \$18.54 million for the four identified areas above. This level of public expenditure would conservatively increase our debt by at least \$77 million (after accounting for use of approximately \$7 million of reserves on hand now). This additional debt would, if applied across the entire District, increase the tax on each home and business owner by an additional 25 to 30 cents on top of the existing 2.89 cents Maintenance Tax. Such an increase would mean taxpayers' taxes would be 10 times higher. And that would only be for capital expenditures inside the City of West Lake Hills. The entire District is twice as large as the City.

In the 55 years since the beginning of the District, our taxpayers have passed 4 bond issues whose total costs are just more than \$7 million for capital improvements to improve and upgrade our infrastructure. All four bond issues have been paid in full as of about two years ago.

The City of West Lake Hills is asking the taxpayers of the Water District to spend 10 times as much on capital improvements as has been spent in total over the past 55 years, and which has provided safe, reliable, and entirely sufficient water for all 4 levels of demand conditions over our large service area. If the Council's notion that the arbitrarily arrived at fire flow level of 2000 gpm will be sufficient to fight a fire of the Bastrop-2011 class, it will be disappointed.

Using the equations and algorithms contained in the NFPA Standard for Water Supplies for Suburban and Rural Fire Fighting (National Fire Protection Association-Bulliten #1142) that are used to determine the Total Water Supply Required (ie. the *amount* of water required to fight a fire in structures of the type found on the West Bank) and the Rate at Which Water is Available, and for an example of a 7,500 s.f. home (that is not sprinkled, as is the case under current West Lake Hills ordinances), the amount of water required is 22,500 gallons (which the District can supply in 33 minutes at the fire hydrant of lowest expected flow), and the recommended **rate** at which the water to be delivered is 1000 gpm. The Council's recommendation of 2000 gpm is based on something other than the NFPA.

However, the Council has stated that it's recommendation is based on the recommendation of the experts (no disagreement that means ESD#9) that "2000 gpm would provide the best fire flow." However, if 1900 gpm is available, then 95% of that level does not mean their water cannon and hoses will not work; it means they will flow 95% of 2000 gpm which is a great deal larger than the 1000 gpm.

The important thing all governments and all citizens concerned about fire safety on the West Bank (that would be all of us) ought to remember is that the International Fire Codes and the NFPA Standards do not have a mathematical term in their equations for “cedar trees,” “mulberry bushes,” “steep and ubiquitous canyons,” “exceptional drought conditions,” or “high winds coinciding in a perfect storm with all the above,” not to mention smokers carelessly discarding cigarettes from their vehicles along any of the major thoroughfares throughout the West Bank such as alongside Wild Basin Wilderness Preserve, Loop 360, Bee Cave Road, Westlake Drive, Red Bud Trail, etc.

The District is currently conducting fire flow tests on the fire hydrants in the remainder of the District *outside* the city since the city constitutes only about half of the District’s responsibilities. There are more than twice as many hydrants outside the City as within the City. That testing should be completed by early summer.

The State of Texas actually does not require Water Districts to include fire hydrants in their systems. (One other water district on the West Bank has no fire hydrants!) Water District #10 decided to include hydrants from its beginning. For water districts with fire hydrants, the State of Texas requires the fire flow to be at least 250 gpm for 2 hours at a pressure of 20 pounds per square inch or better. That requirement’s origin is contained in the National Fire Protection Association Standard #1142.

The District’s Board of Directors is well aware of the significant efforts undertaken and paid for out of your tax revenues with respect to the removal of approximately 2,000,000 pounds of dangerous ground fuel in the form of dead trees, limbs, and other fallen flora that had accumulated over a significant period. This was a major step in the right direction, though not sufficient by itself to fight major wildfires, especially of the Bastrop-2011 class. Perhaps it is a good time for the City to revisit whether to require by ordinance that homes over 3600 s.f. be sprinkled to conform to the 2012 (and previous) IFCs, and, as is currently required by ESD#9’s enforcement of the 2012 IFC sprinkler requirements in the non-WLH portion of the ESD9’s fire protection area which is almost 12,000 acres. Both the Water District and the City are considerably smaller than ESD#9’s service area.

With respect to “when will the District move forward on the projects identified in the feasibility study,” it is obvious that due and careful consideration is required before this government will decide what is the best way to finance these tremendous costs.

With respect to the hydrant near Valley View and Forest Trail elementary schools, the perviously modeled value of 1175 gpm failed to take into account that that line was also interconnected to our new 12” along Loop 360. The corrected modeled fire flow for that hydrant is 3500 gpm at 20 psi.

Thank you for your thoughtful questions. Hopefully, the facts identified above will help illuminate just how complex, how costly, and how important the answers are. The way forward is neither simple nor inexpensive. The taxpayers of the Water District will have to judge the merits and the costs.

with best regards,



**CLIF W DRUMMOND
PRESIDENT
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