31 May 2019

USACE Galveston District
Attn: BBTRS
P.O. Box 1229
Galveston, TX 77553-1229
BBTRS@usace.army.mil

RE: USACE Buffalo Bayou and Tributaries Resiliency Study

Dear BBTRS Coordinator:

Bayou City Waterkeeper,[1] a nonprofit advocacy organization working to protect and restore the Lower Galveston Bay Watershed, appreciates the opportunity to comment on Buffalo Bayou and Tributaries Resilience Study. We are encouraged to see that the U.S. Army Corps of Engineers is undertaking a study of Buffalo Bayou and tributaries with the intention of increasing resilience. Houston will greatly benefit from a flood mitigation plan that is objective, regional, science-based, and forward-thinking – rooted in conservation and nature-based flood mitigation solutions.

As noted by Edmond Russo, Jr., Deputy District Engineer for Programs and Project Management, U. S. Army Corps of Engineers, Galveston District, on March 24, 2019:

> *[Engineers] would try to control nature, but we know we can't. . . . In the case we only had engineered solutions, the system is more brittle and prone to failure. There's always a bigger disaster than what you design for.*[2]

-01 Nature-based solutions are the cornerstone of resilience in a region such as a Houston. The incorporation of nature-based infrastructure and blue-green measures into planning processes is vital to creating an effective and durable system for the protection and resilience of the Greater Houston Region, while also maintaining the quality of life and desirability of our area.

Multiple Approaches for Resiliency

-02 While the USACE acknowledges an "opportunity" to "engineer with nature and implement nature-based features," the absence of these strategies from potential measures, alternatives development, and maps of strategies is notable. Given the lack of discussion, we are concerned that nature-based solutions will not be considered in the USACE review of alternatives. While this may be early in the planning process, it's critical that the USACE seriously consider nature-based solutions at the forefront. As NEPA requires, an EIS must provide a "full and fair discussion of significant environmental impacts and . . . inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."

[1] Bayou City Waterkeeper, 2010 N. Loop West, Ste 103, Houston, TX 77005, whose mission is to protect and restore the bayous, rivers and streams that flow throughout the Galveston Bay Watershed. www.bayoucitywaterkeeper.org

[2] Medill News Service, Northwestern University. "Nature-based infrastructure could be an effective way to manage flooding." 24 March 2019. https://www.planetforward.org/idea/nature-based-infrastructure-could-be-an-effective-way-to-manage-flooding

Additionally, America's Water Infrastructure Act of 2018 requires precisely such an analysis:

> "(c) NATURAL INFRASTRUCTURE.—In carrying out a feasibility report developed under section 905 of the Water Resources Development Act of 1986 (33 U.S.C. 2282) for a project for flood risk management or hurricane and storm damage risk reduction, the Secretary shall consider the use of both traditional and natural infrastructure alternatives, alone or in conjunction with each other, if those alternatives are practicable."

The Greater-Houston region must invest in long-term, resilient systems to offset the impacts of subsidence and the threats of major storm events. A nature-based system could provide a mechanism for planning and adaptation that minimizes risk to communities, its economies, and the environment by managing how they are exposed to these risks. A multi-tiered strategy that incorporates nature-based solutions provides the foundational support that unifies the vision of a healthy and protected ecosystem, while also providing critical protection to people, place and property.

-03 The USACE has many examples across the United States of taking a thoughtful, and multi-pronged approach to studying resiliency and protection. For example, the USACE Southern California project, the Prado Dam, strategies included the widespread and intensive establishment of wetlands to provide flood control services. In conjunction with these efforts, the State of California established the Santa Ana River Conservancy to coordinate projects across many stakeholders to enhance the watershed, provide numerous co-benefits, and ensure resiliency.

The National Wildlife Federation noted in its *Natural Defenses in Action* Report (2016),[3] every $1 spent in preventive measures saves $4 in disaster recovery costs. That same report notes that protecting open space and existing natural habitats are among the most cost-effective ways of reducing risks to communities, by noting the following:

> *Deploying natural defenses is good not only for the environment but also for the economy. Natural or nature-based approaches can be as, or more, cost effective as traditional man-made structures and by avoiding or reducing community risks, can decrease taxpayer liabilities for disaster response and recovery and result in lower insurance costs to property owners.*

The Gulf Coast has great potential to employ creative approaches to watershed management. Notably, the Buffalo Bayou watershed has two key advantages over those areas: 1) significant portions of the watershed remain available for long-term preservation; and, 2) long-established conservation partners are stakeholder ready.

Improving Natural Infrastructure

-04 While the Buffalo Bayou watershed continues densify within the urban environment, opportunities exist to protect those portions of the watershed which have not already been converted to residential and commercial development. Through conserving existing coastal prairie to provide flood mitigation, ensure healthy communities, and deliver multiple ecological co-benefits, these local assets can be leveraged to improve Houston's resiliency.

-05 We are concerned that alternatives suggested by USACE would remove natural flood mitigation solutions from the alternatives available to improve resiliency. Currently, the study recommends a study of the potential construction of a third reservoir northwest of Addicks Reservoir, which provides a false sense of engineered security and encourages new development in inherently floodprone areas. It is imperative that any new projects should provide cumulative benefits -06 rather than replace benefits already in place, such as the prairie lands conserved within the Katy Prairie. Expanded protection for these coastal prairie wetlands, including restoration to improve the infiltration and natural detention of -07 such lands, provides long-term and adaptive protection that a new reservoir cannot provide. Both the Addicks and Barker watersheds would benefit from more aggressive and focused conservation and restoration of lands upstream.

We recognize that the capacity of Addicks and Barker Reservoirs has diminished over the last several decades. Years of sedimentation and growth of invasive species have decreased the holding capacity of these reservoirs. We appreciate the

[3] Small-Lorenz, Stacy, et. al. National Wildlife Federation. "Natural Defenses in Action". 2016. p 1. https://www.nwf.org/~/media/PDFs/Global-Warming/Reports/NWF_Natural-Defenses-in-Action_Report.pdf

USACE's efforts to improve Addicks and Barker Reservoirs to recover this eroded capacity. The removal of such materials, combined with a return of the landscape to a wet prairie or tall grass prairie, will increase the volume of water that can be held during a heavy rainfall event. We recommend that the USACE study and consider the further excavation of the reservoirs to increase storage capacity. -08

Upstream Land Use

As USACE outlines in its "Overview – Flood Risk Management" storyboard, the "[h]istoric urban expansion has modified the way water moves throughout the watersheds. Less surface runoff can be absorbed than historic conditions resulting in more water entering the bayous and reservoirs."[4] The protection of existing conservation lands must constitute a key alternative in the USACE analysis, in addition to the acquisition of open lands for conservation is critical. The USACE's *Engineering With Nature: An Atlas*[5] provides several strategies for thoughtfully addressing riparian systems and flooding. Many components of different projects, specifically natural processes, nature-based projects, and the tenant of broadening benefits, are entirely applicable and should be examined within the Buffalo Bayou Study. -09 -10

We request a thorough and thoughtful incorporation of nature-based solutions to the study framework, including an entire project alternative built around and including the following:

- Protection of existing (as well as potential) conservation lands;
- Use of the natural capacity of wetlands and coastal prairies, such as the Katy Prairie, to hold water;
- Restoration of prairies to increase storage capacity;
- Acquisition, protection, and restoration of additional prairies, forests, wetlands, and floodplain/floodway lands for conservation purposes;
- Preservation of lands along the various tributaries to Addicks and Barker Reservoirs; -11
- Acquisition of properties where appropriate to increase the width of the protective riparian corridor which would keep people from harm's way, decrease flood losses, and increase access to open space and recreational facilities;
- Protection and enhancement of wetlands;
- Landscape-scale restoration of wet prairie;
- Landscape-scale restoration of tallgrass prairie;
- Promotion of land uses, such as rice fields, to improve storage during flood events;
- Contracting with local farmers for maintenance of nature-based infrastructure; and,
- Establishment of riparian woodlands to slow flood flows.

Protecting People and Place

We urge the USACE to take additional action to protect the region's floodways and floodplains throughout the watershed. No structures should be allowed within floodways or deep within the floodplain; existing structures should be studied to determine their removal, and no new structures should be constructed within these zones. The USACE should also consider requiring existing properties within the floodplain to be flood-proofed, with the clear objective that such flood-proofing will occur comprehensively so as to reduce negative impacts on neighboring properties. -12 -13 -14

Levees that constrict floodways must be prohibited, as this results in more water and increased flooding downstream. In channel detention projects, weirs and mini-reservoirs should be considered to slow and hold back water in a more natural manner. Without preemptive action and regulatory guidance, development along these corridors will exacerbate and compound problems downstream. Priority should be given to preserving, protecting and restoring existing wetlands, as well as creating or enhancing historic wetlands - both of which provide wildlife habitat, improve water quality by filtering pollutants, desynchronize floodwaters, and facilitate groundwater recharge. -15 -16 -17

[4] Buffalo Bayou and Tributaries Resiliency Study Public Scoping Meeting Storyboards - storyboards presented at the public scoping meetings April 30, May 2, May 7, May 8, and May 9, 2019

[5] Bridges, T. S., E. M. Bourne, J. K. King, H. K. Kuzmitski, E. B. Moynihan, and B. C. Suedel Engineering With Nature: An Atlas. 2018. ERDC/EL SR-18-8. Vicksburg, MS: U.S. Army Engineer Research and Development Center. http://dx.doi.org/10.21079/11681/27929

Integrating Nature-Based Solutions

-18 Every project alternative should include nature-based tactics. No potential alternative should be composed of traditional engineering solutions alone, but should also incorporate the enhancement and creation of wetland, woodland, and floodplain areas to maximize benefit and resiliency. For example, in developing detention, it is preferable to use natural wetlands instead of engineered wetlands; in enhancing bayous, the use of native plant material should be followed as a "best practice," etc.. In all cases, projects must be analyzed not only for the cost-effectiveness of the initial capital costs,

-19 but also for the long-term operating, maintenance, and replacement costs, as well as the human costs. Nature-based solutions can result in longer project life, including projects that self-adapt to new stressors, with a lower risk of failure during severe weather events (i.e. flood or drought). In addition, nature-based projects provide social, economic, and environmental benefits to the community, including improved water quality, carbon capture, and availability of areas for recreation, wildlife, local agriculture, and improved quality of life.

-20 In its current iteration, the USACE Buffalo Bayou Study does not adequately incorporate and analyze nature-based solutions, despite noting that "nonstructural elements" should be considered. The USACE defines "nonstructural" to include strategies such as, "modifications in public policy, management practices, regulatory policy, and pricing policy." We request the non-structural analysis encompass the full range of nonstructural approaches and integrate these mechanisms into project alternatives.

In Conclusion

James Dalton, Director of Civil Works, USACE, notes: *When we leverage natural systems and processes through integrated water resources management, we can develop more sustainable solutions and systems. By broadening our view of potential outcomes, we can find ways to deliver a broader array of services, benefits, and value from investment made in infrastructure systems.*[6]

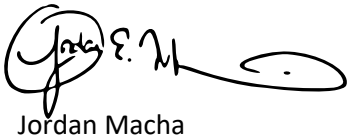
We must aim for a resilient, effective approach to watershed management. A resilient, nature-based approach provides a mechanism for planning and adaptation that minimizes risk to communities, its economies, and the environment by managing how they are exposed to related risks. The ability to co-evolve and accommodate trends over the long-term allows communities to limit their impacts and adjust as needed – all while maintaining their integrity.

-21 The nature-based approach is self-adaptive, and produces significant co-benefits. By moving away from the mono-functionality of hard, "grey" infrastructure and combining structural and non-structural–including blue-green measures–design, allows cities like Houston to increase their capacity address needs before, during, and after major weather events. Not only does it increase natural protections and provide flexibility to address both flooding and heat-related vulnerabilities, blue-green measures can increase quality of life by reconnecting and providing new outlets to nature.

Without the ability and willingness to adapt and implement change, solutions to address flooding, drought, and significant weather will go unanswered. Our vision for a more resilient region must be centered on working and living-with nature. By committing to an adaptable and sustainable framework, we can enhance our quality of life all while protecting the environment.

Thank you for the opportunity. We appreciate your consideration.

Sincerely,



Jordan Macha
Executive Director

[6] Bridges. Engineering With Nature: An Atlas. p *v*.

From: Gianni Matteucci
To: CESWT-BBTRS
Subject: [Non-DoD Source] Comments about the Buffalo Bayou and Tributaries Resiliency Study
Date: Friday, May 31, 2019 8:19:21 PM

Hello,
My wife, my family, and I are residents in a subdivision affected by the Harvey flooding in 2017. We have lived there for over 25 years. We attended one of your public presentation, met some of your staff, and investigated your website.
While we appreciate the efforts at communicating the goals of the study, process, timing, costs, and the alternatives proposed, the level was quite generic. We wish your could have been more specific about the most practical and feasible solutions.

In terms of the alternatives considered, to us is seems they should meet the following criteria

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- increase storage upstream of the Barker and Cypress Reservoirs
- increase linear storage along the bayou
- improve the bayou channel by removing debris, REGULARLY, grading and widening where possible
- ensure that the extra storage gained is significantly more (say 50 to 100% more) of what was available in the reservoirs at the time of Harvey's occurrence

-02

- but truly there should be some serious consideration at the city, county, and regional level of minimizing the increase of paved/impermeable surfaces. No new subdivision should be allowed to be built unless they meet the criteria of being above the 500 yr flood level, they should have enough local storage to minimize runoff downstream, and alternative creative solutions should be encouraged to maximize water retention. This could be a recommended guideline of your study.

- Please use our tax dollars wisely!

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Best regards,
Gianni Matteucci
14722 Broadgreen Drive, Houston, Texas, 77079-6427, USA
Mobile: +1-832-614-3818 Reply to gwrmatteucci@gmail.com

From: Save Buffalo Bayou
To: CESWT-BBTRS
Subject: [Non-DoD Source] Comment on Buffalo Bayou and Tributaries Resiliency Study
Date: Friday, May 31, 2019 9:05:57 PM

May 31, 2019

Buffalo Bayou and Tributaries Resiliency Study
Galveston District, US Army Corps of Engineers

Comments of Susan Chadwick, President and Executive Director, Save Buffalo Bayou, a nonprofit organization in Houston, Texas.

-01 Save Buffalo Bayou urges the Corps of Engineers to focus on green, nature-based approaches to flood risk in the Buffalo Bayou watershed and elsewhere. Modern flood management emphasizes stopping stormwater before it floods our streams. That means slowing down, spreading out, and soaking in rain runoff. It also means moving and keeping people out of harm's way. It means preserving greenspace, stands of trees, native vegetation, prairies and wetlands, and the natural landscape, including meandering streams. It means accepting some woody debris in the stream for slowing the flow, protecting and rebuilding the banks, as nature does.

-02 Practices that focus on collecting more and more stormwater runoff faster only leads to more flooding. Costly, high-maintenance dams, levees, and flood tunnels with a limited life-span and tendency to fail only lead to a false sense of security and increased development in areas that will eventually become flood-prone again, placing people in harm's way. (See federal dams on Buffalo Bayou.[i] See also this cautionary tale of the flood tunnel in Chicago.[ii])

-03 The Corps should use, recommend, and require the most effective and practical, the least expensive and least environmentally damaging solutions for reducing flood risk.

The best use of public funds would be land acquisition in the form of buyouts of structures in flood-prone areas, purchase and preservation of undeveloped land for greenspace and widening the floodplain along Buffalo Bayou and its tributaries.

-04 "Channel improvements" mean deepening, widening, and straightening, which have been [iii] [iv]

proven to be ineffective, damaging, and costly. The river seeks its own equilibrium.
-04 Deepening and widening, breaking up the banks, only leads to bank collapse, increased sedimentation, and constant maintenance.

-05 We are opposed to costly bypasses of the meanders on Buffalo Bayou. Among other significant problems, this would only shorten the channel, reducing its capacity, and speed up the flow, causing more erosion and flooding downstream.[v]

-06 There are numerous areas within the landscaped parks inside the federal reservoirs where detention basins could be added, increasing the storage capacity of the reservoirs.

Most definitely the Corps, in tandem with surrounding counties and municipalities, should develop better warning systems and emergency action plans.

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[i] "The Problem with Dams," Save Buffalo Bayou, Nov. 9, 2017. Blockedhttp://www.savebuffalobayou.org/?page_id=4347

[ii] Blockedhttps://slate.com/business/2019/01/chicagos-deep-tunnel-is-it-the-solution-to-urban-flooding-or-a-cautionary-tale.html?fbclid=IwAR0p0QffnDiMybK-Vz5K4wmiW_yVC8asiFNR5JPoXwdaYLqCfLnQ1dFTVLo

[iii] Blockedhttps://charlesrangeleywilson.com/2015/12/19/why-dredging-makes-flooding-worse/

[iv] Blockedhttps://www.scientificamerican.com/article/taming-the-mighty-mississippi-may-have-caused-bigger-floods/?redirect=1

[v] "Did Straightening Upper Buffalo Bayou Make Future Residents More Vulnerable to Flooding?" by Susan Chadwick, Save Buffalo Bayou, Oct. 29, 2018. Blockedhttp://www.savebuffalobayou.org/?page_id=6105

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Blockedwww.SaveBuffaloBayou.org

Save Buffalo Bayou on Facebook

Comment #: ES256

From: Eric Munscher
To: CESWT-BBTRS
Subject: [Non-DoD Source] Public Comment - Buffalo Bayou and Tributaries Resiliency Study
Date: Friday, May 31, 2019 9:16:43 PM
Attachments: image001.png
Public Comment - Buffalo Bayou and Tributaries Resiliency Study.pdf

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Mr., Andrew Weber:

Please find attached the Turtle Survival Alliance's comments regarding the Buffalo Bayou and Tributaries Resiliency Study. Please let me know if you have any questions.

Thank you,
Eric M.

Eric C. Munscher, M.S., ESIX (Regional Scientist)
Herpetologist / Ecologist
Certified Gopher Tortoise Agent
Director of TSA-NAFTRG
Section Editor – Herpetology Notes

SWCA Environmental Consultants
10245 West Little York Rd
Houston, TX 77040
O 281-617-3217
C 717-676-8497

turtle survival alliance

Transforming passion for turtles into conservation action

Andrew Weber, P.E, Study Manager
USACE Galveston District
P.O. Box 1229
Galveston, TX 77553-1229
ATTN: BBTRS

Dear Mr. Weber,

Thank you for providing the opportunity to comment on the Buffalo Bayou and Tributaries Resiliency Study (BBTRS). As Director of the Turtle Survival Alliance's North American Freshwater Turtle Research Group (TSA-NAFTRG), and Regional Scientist with SWCA Environmental Consultants, I have a strong interest in preserving the natural Buffalo Bayou channel, while achieving site stability, water quality improvements, and stabilizing or increasing refugia for its fauna.

TSA-NAFTRG is the North American field research component of the Turtle Survival Alliance, a global 501(c)3 conservation nonprofit headquartered in Charleston, South Carolina. TSA-NAFTRG was formed in 1999 as a long-term monitoring effort for important protected habitats and the freshwater turtle species that inhabit them. Our field program has 14 research sites across 5 states, including 3 in Texas. One of these long-term population monitoring sites is Buffalo Bayou, Harris County, Texas. Our primary research here focuses on the State Threatened western alligator snapping turtle (*Macrochelys temminckii*). This research is permitted through the Texas Parks and Wildlife Department (TPWD) and funded in part by the TPWD Conservation License Plate program.

Western alligator snapping turtles are obligate freshwater turtles that routinely occur in major river drainages but have been observed in a wide variety of permanent aquatic habitats including lakes, reservoirs, swamps, flood plain marshes, and bayous. Little is known of the geographic range, habits, life history, habitat utilization, or population of *M. temminckii* in Texas. A 2002 report of a state-wide species assessment in their known historic range only demonstrated the capture of 48 specimens across 17 sites and 23 sampling locations. However, these specimen occurrences have not elucidated functioning populations in the localities of their reporting.

-01

Over the past several years, several documentations of *M. temminckii* have occurred in Harris County, Texas, the southwestern most known county of their distribution in the state. Of these reports, Buffalo Bayou, a naturally occurring, yet highly impacted waterway, has demonstrated a relatively significant amount of observations. In October 2016, TSA-NAFTRG and SWCA Environmental Consultants sampled Buffalo Bayou to assess turtle diversity and abundance as part of a herpetological species diversity assessment funded by the Memorial Park Conservancy (MPC). During this initial two-day survey, six *M. temminckii* specimens, representing various sex, size, and age-classes were captured, demonstrating a hypothetically functioning population in the segment of Buffalo Bayou running through Memorial Park. Beginning in January 2017, TSA-NAFTRG initiated a long-term population assessment and monitoring study to: 1) quantify the extent of *M. temminckii* distribution in Buffalo Bayou; 2) determine its reproductive functionality; 3) reveal hotspots of habitat preference; and 4) quantify specimen movement and bayou utilization.

The area of study encompasses ca. 14.4 km of riverine habitat from I-610 and Woodway Drive to Sabine Street and Allen Parkway. This segment of Buffalo Bayou features an assortment of adjacent habitat types including urban parkland featuring forested riparian buffers; private golf courses; open, managed parkland with little to no riparian buffer; bicycle and walking paths; and private and commercial real estate. Sections of this segment of the bayou are characterized by moderate water flow, high turbidity, and with an abundance of snags, sandy beaches, and in-water column deadfall. Other sections are characterized by anthropomorphic alterations and low frequency of natural bends, snags, and deadfall. Water levels in these areas fluctuate with any significant amount of rainfall or releases from the upstream dam(s).

-02

Our results thus far depict a reproductively viable and highly functioning population in Buffalo Bayou. To date, specimen captures in the 14.4 km segment of the 85 km bayou exceed those of the statewide sampling effort conducted by Rudolf et al. 2001. Of the 68 specimens captured, a 28 male to 24 female to 14 juvenile sex ratio is observed. Although no hatchlings have been captured, yearlings and other young juveniles have been recorded in our study. Furthermore, personal communication with county park staff and residents, of nesting activity by *M. temminckii* within the bayou's riparian zone lends further evidence to a breeding population. The sample size observed to-date demonstrates both the largest and densest known population of *M. temminckii* in the state. Studies by Dr. Day Ligon, Missouri State University, give credence to the hypothesis that this may in fact be the densest known population of *M. temminckii* under study in the United States. These findings rebuke the previous notion of a purported extirpation of functioning populations of this species in Harris County. Additionally,

-03

results from our radio-telemetry work show that individual specimens utilize finite home ranges, typically centered around adequate riparian habitat, submerged deadfall, and/or overhanging embankments, with a preference for these structures at or near bends along the bayou's sinuous meander. These findings are congruent with habitat preference and home range findings for the species in other areas of its range.

As the principal waterway of Harris County and the City of Houston, numerous alterations have been made to the bayou's structure and riparian zone in an effort to drain water from the Greater Houston metropolitan area with greater efficiency during period of large precipitation. These alterations turn segments of a formerly low-energy, meandering, aquatic system into segments with a higher energy system. Such areas are thought to be less favorable habitat for *M. temminckii* due to altering an aquatic system with high habitat diversity into one with low habitat diversity. Along with overharvesting and incidental drowning from refuse fishing equipment, habitat alteration and pollution are considered to primary causes for the decline of this species. The results from our research lend to the hypothesis that *M. temminckii* has thus far been able to adapt to localized habitat alterations and widespread pollution of the Buffalo Bayou habitat.

-04 The surprise discovery of a robust, reproductively functioning population of M. temminckii in the Buffalo Bayou is encouraging for the population's longevity in the Buffalo Bayou habitat. Results from our research thus far lend credence to the hypothesis that the natural segments of the bayou offer an oasis in one of the nation's largest cities and has acted as a refugia for this species in Harris County. In a July 2018 meeting to discuss the status of this species in Texas, the paucity of information across its range led to its state ranking as an S2 (Critically Imperiled) taxa. Based on this and the findings of our research to-date, the Texas Parks and Wildlife Department has encouraged more sampling and population monitoring efforts to be carried out in this high-priority waterway and its accompanying watershed in Harris County.

-05 It is our stance that riverine and land-management practices should continue be scrutinized, and any planned alterations to the bayou take this important population of western alligator snapping turtle into account. Additional alterations to channelize water flow could lead to further degradation of the natural habitats that do still exist, turning more low-energy, meandering, aquatic systems with high biodiversity, into ones with high-energy and low biodiversity. This could potentially lead to the decline of this State Threatened and other species of wildlife in and along the bayou.

If you would like to learn more about the population of western alligator snapping turtle in Buffalo Bayou, I would be happy to meet with USACE staff to discuss this unique population. If you have any questions, or would like to discuss further, please contact me at: emunscher@turtlesurvival.org or 717-676-8497.

Sincerely,

Eric Munscher
Director
North American Freshwater Turtle Research Group
Turtle Survival Alliance
1030 Jenkins Rd. Ste. D
Charleston, SC 29407

From: Richard Hyde
To: CESWT-BBTRS
Subject: [Non-DoD Source] Buffalo Bayou and Tributaries Resiliency Study (BBTRS)
Date: Friday, May 31, 2019 9:16:53 PM

A) Flooding upstream of the reservoirs

1) Addicks Reservoir no longer functions as a single reservoir.
2) Addicks Reservoir has been subdivided into 5 sub-reservoirs with internal boundaries created by the Clay Road Dam, the North Eldridge Parkway Dam and the State Highway 6 "High" Dam.
3) Storm water draining N.W. Harris County can not flow across the Clay Road Dam until high water tops the roadway which is holding back about 1/2 the input into Addicks Reservoir within only 1/9 the area 1100 acres/12500 acres.
4) Storm water then backs up north of Clay Road Dam, thus impeding drainage.
5) Current development and HCFCD drainage projects in Northwest Harris County are designed get water into Addicks Reservoir without a way to get it out safely.
6) This may result in an even worse flooding issue should we get another Harvey-like storm. Our reservoirs can no longer adequate.

B) Solutions to the upstream Clay Road dam could be:
1) many very large culverts under Clay Road (the road will still flood)
-01 2) raising clay road as a causeway (long bridge) to allow unimpeded flow throughout the reservoir and allow traffic to pass during frequent high water events.

C) Solutions to Addicks and Barker Reservoirs catastrophic flooding issues:
1) Build one or two 40+ foot wide tunnels under I-10 in order to drain
-02 the reservoirs as they fill, to avoid emergency releases resulting in catastrophic flooding of Houston (Harvey, lesser extent Tax Day flood) to keep the dams from failing.
2) Also build a Third Reservoir or several smaller reservoirs NW of
-03 Addicks Reservoir to help handle the rapid additional development happening since Harvey.
3) Requiring excavation of deep depressions and then going deeper
-04 for building foundations to create buildings in (over) retention ponds. This is needed for new development along freeways to mitigate runoff. The city likes these areas for tax revenue. The scenic beauty and desirability would pay for itself. Housing developers that had to build lakes fought it, until they discovered that people would pay more for these properties.

From: Darlene Marmottin
To: CESWT-BBTRS
Subject: [Non-DoD Source] Public Information Meeting Comment Form
Date: Friday, May 31, 2019 10:19:58 PM

As a resident of Twin Lakes Subdivision, the community just north of Addicks Reservoir, we experienced approximately an 80% flood rate within our subdivision during Hurricane Harvey. My husband and I attended one of your Public Information Meetings to see what was on the agenda.

-01 After considering the possible options, we definitely need a third reservoir in the Hwy 290/Hwy 99 area. It will not only help the upstream communities, but also the downstream as well.

-02 There was mention of raising the edge of the reservoir wall down Tanner Road from the current 108 foot level. If this occurs it would place multiple existing communities in peril from future flooding.

Buffalo Bayou also needs to be dredged and have its flow volume increased throughout its entire length, independent of the objections of the upscale sections of neighborhoods along the area.

We were also at the Dan Crenshaw event today concerning the sandbar removal on Langham Creek. Concerns were expressed about dredging the area south of this current project extending to Clay Road where the bridge is an obstruction then throughout the reservoir itself.

Understanding that this will be a multi-faceted long-term endeavor, as a community we hope that you will keep the needs of Twin Lakes and the surrounding communities in the forefront of your decision making.

Darlene Marmottin
Harris County MUD No. 255

Phone: 713-849-1925

Cell: 713-502-9852

5506 Peace Court
Houston, TX 77041

Comment #: ES259

From:	Jeff Peters
To:	CESWT-BBTRS
Subject:	[Non-DoD Source] Buffalo Bayou and Tributaries Resiliency Study
Date:	Friday, May 31, 2019 10:55:31 PM
Attachments:	USCE Buffalo Bayou response - Peters, 053119.pdf

To whom it may concern,

Please find attached my comments regarding the US Army Corps of Engineers Buffalo Bayou and Tributaries Resiliency Study.

Jeffrey H. Peters, P.E.
President, Near Southwest - Super Neighborhood Council #38
Treasurer, Brays Bayou Association
Vice President, Willow Meadows Civic Club
713-553-0476

Public Information Meeting

US Army Corps of Engineers:

Comment Form (Formulario do Comentarios Escritos)

Buffalo Bayou and Tributaries Resiliency Study

Comment Period: April 29, 2019 through May 31, 2019

We need your thoughts and comments on the effort to develop the Buffalo Bayou and Tributaries Resiliency Study. Your participation is a key element in producing a meaningful and useful feasibility report. The information presented at the public information meetings can be viewed at the website listed below. Please write your questions, comments, or suggestions in the space provided below. Feel free to use additional pages if needed. Forms may be submitted at the public information meeting, mailing to the address on the back of this form, or emailed to BBTRS@usace.army.mil. Comments should be postmarked by May 31, 2019. Thank you for your participation!

As a Professional Engineer, as a forensic engineering expert who has previously testified on Brays Bayou flooding disputes, as a Brays Bayou Association Board member, as a life-long resident of the Brays watershed who flooded during Harvey and who has spent over 30 years studying the Brays watershed, I would respectfully like to offer the following observations:

-01

1. Before any water is diverted from Buffalo Bayou into Brays Bayou additional flood mitigation work within Brays must be done first.
2. The Brays watershed is still desperately in need of additional flood mitigation efforts on its own and should not be considered for diverting any excess water from any other watershed without appropriate offsetting mitigation of the Brays watershed first.
3. The construction of a network of tunnels to provide for offsetting mitigation is the best cost-effective and least disruptive solution, all above ground efforts are much less viable.
4. A more effective funding method must be considered to pay for the flood mitigation efforts including perhaps a “Brays Flood Mitigation - Tax Incentive Revitalization Zone”.

-02

5. Tunnels for the Brays Bayou should be built first that are sufficiently large enough to handle Brays flooding and any additional watershed’s water before any other watershed’s water be allowed to be diverted into Brays Bayou.

Brays Bayou Association, Treasurer
Super Neighborhood #38, President
Willow Meadows Civic Club, VP

Name
Nombre Jeffrey H. Peters, P.E.

Affiliation
Afiliacion

Address
Direccion de Envio 4419 Osby Drive

City Ciudad Houston

State Estado Texas

Zip Code Codigo Postal 77096

E-mail
Correo Electronic° JeffPeters81@gmail.com

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

Comment #: ES260

From: Michael E Hill
To: CESWT-BBTRS
Subject: [Non-DoD Source] Comments on BBTRS
Date: Friday, May 31, 2019 10:57:40 PM
Attachments: 2019-05-31_BBTRS_JJH Comment.pdf

Public Information Meeting

US Army Corps of Engineers®

Comment Form (Formulario do Comentarios Escritos)

Buffalo Bayou and Tributaries Resiliency Study

BBTRS@usace.army.mil / sent 5/31/2019

Comment Period: April 29, 2019 through May 31, 2019

We need your thoughts and comments on the effort to develop the Buffalo Bayou and Tributaries Resiliency Study. Your participation is a key element in producing a meaningful and useful feasibility report. The information presented at the public information meetings can be viewed at the website listed below. Please write your questions, comments, or suggestions in the space provided below. Feel free to use additional pages if needed. Forms may be submitted at the public information meeting, mailing to the address on the back of this form, or emailed to BBTRS@usace.army.mil. Comments should be postmarked by May 31, 2019. Thank you for your participation!

Brays Bayou area has flooded in 2001 Allison, 2015, 2016 + the big one Harvey 2017.

The Meyerland area flooding was supposed to be fixed by 2009 BUT was delayed for other projects.

1- Tunnels - With the cost projection of $100-170 million and 30 years - Really?
- We always hear fixed by ---- but the project always gets diverted & money spent for pet projects - like Medical Center.

2- Diversion Points
- Places storm water into Brays that used to flow into Buffalo. So who chooses Buffalo flooding or Brays flooding — who chooses according to losses (financial or political) if pushed Buffalo wins & Brays loses.
- Brays can't support more water coming in because ~~we don't~~ we can't increase the flow into Brays from our own streets. How can we take more flow from Buffalo?

-01

Name Nombre: Janet Hill

Affiliation Afiliación: Homeowner flooded Out before

Address Dirección de Envío: 4314 Wigton Dr (after Harvey) 5350 Greenlock Dr

City Ciudad: Houston **State** Estado: TX **Zip Code** Código Postal: 77096

E-mail Correo Electrónico: janetjhill@gmail.com

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

No Substantive Comments Identified.

Comment #: ES261

From: billware@energybusiness.com
To: CESWT-BBTRS
Subject: [Non-DoD Source] Comments BBTRS, May 7 Meeting, Houston
Date: Friday, May 31, 2019 11:39:34 PM
Attachments: bill-ware-comments-bbtrs.pdf

Attached are my comments for BBTRS May 7 Houston Meeting

Bill Ware
713-680-2500

Public Information Meeting, Tuesday, May 7, 2019
Buffalo Bayou and Tributaries Resiliency Study (BBTRS)

Comments from Bill Ware, Houston citizen
685 North Post Oak Lane, Houston TX 77024, 713-680-2500
(email: bill.ware@energybusiness.com, age 60+, self employed, energy business and pricing training)

I appreciated The US Army Corps Of Engineers holding the open meeting presentation on May 7, 2019.

After a little background - regarding my evolution in the Houston flooding issue - I will mention two newspaper articles below, one Houston and one Dallas, that were particularly eye-opening for me regarding the messy issues regarding land development and regulatory and protection functions at the city, county, state, and federal level.

I am familiar with Gulf Coast weather and terrain. I grew up in Baytown TX, went to school in Austin, spent some 4 years out of state, returned to Houston, went back to school in Austin, and returned to Houston in 1974. I have lived within about 3 miles of my current address since 1974. Consequently I have some awareness of Buffalo Bayou, Houston traffic, and TxDOT highway projects, including commenting and keenly criticizing major highway project plans – particularly with respect to highway noise (above levels requiring mitigation) that permanently and unnecessarily damage adjoining neighborhoods and parklands.

This experience has caused me to be greatly more questioning of city, county, state, and federal agencies.

I have never personally experienced any serious flooding within any of my homes in Houston or elsewhere.

During Harvey, I was keenly watching the late night TV presentation being made every night around 10 to 11 pm updating everyone regarding the water levels and the events at the Addicks and Barker Reservoirs. It all seemed normal except for the last night before the deluge, when I recall there was an admission that all their depth gauges had gone out. I could not believe it. The rest is history.

In trying to educate myself more about flooding, water retention, damn systems, and urban flooding, I found the following **2 articles (both attached)** that are must reads to start to begin to understand the issues.

(1) I searched on the web and found the attached Dallas Morning News Article dated September 5, 2017, describing some background issues surrounding the Buffalo Bayou water retention/damn system. I had never heard of any of this in my Houston existence.

(2) then, on January 21, 2018, the Houston Chronicle published the article "Engineer's 1992 Flood Pool Warning Ignored."

Both of these articles will allow any interested citizen to better understand and possibly contribute to a path to better flooding solutions for Houston.

I trust this is where the US Corp of Engineers will take us.

Personally, I think the problem lies with the trickery of some of the land developers who depend upon inside help that is elected or appointed. Uncovering this would be difficult.

Bill Ware
Attachments: 2 newspaper article regarding Houston flooding and Addicks and Barker Cypress dams

HARVEY SEP 2017

As Houston grew, officials ignored 'once-in-a-lifetime' chance to spare thousands from flooding

Steve Thompson, Staff Writer

Two decades ago, Harris County planners predicted with chilling accuracy just how devastating a storm like Hurricane Harvey would be to the Houston area. Far lesser storms, they determined, could wreck a large swath of the city and its western suburbs.

In a report dated May 1996, engineers for the Harris County Flood Control District concluded the area's reservoir system was severely insufficient and imperiled thousands of properties. The report's authors proposed a $400 million fix: constructing a massive underground conduit that would carry water out of the reservoirs and into the Houston Ship Channel more quickly.

Had the report's recommendations been heeded, the catastrophic flooding that struck Houston a week ago might have been greatly diminished, sparing thousands of homes from floodwaters.

Instead, the report got filed away and was all but forgotten. Government leaders ignored its advice.

weeks.

HARVEY

As floodwaters recede, Houston homeowners find more than nature to blame

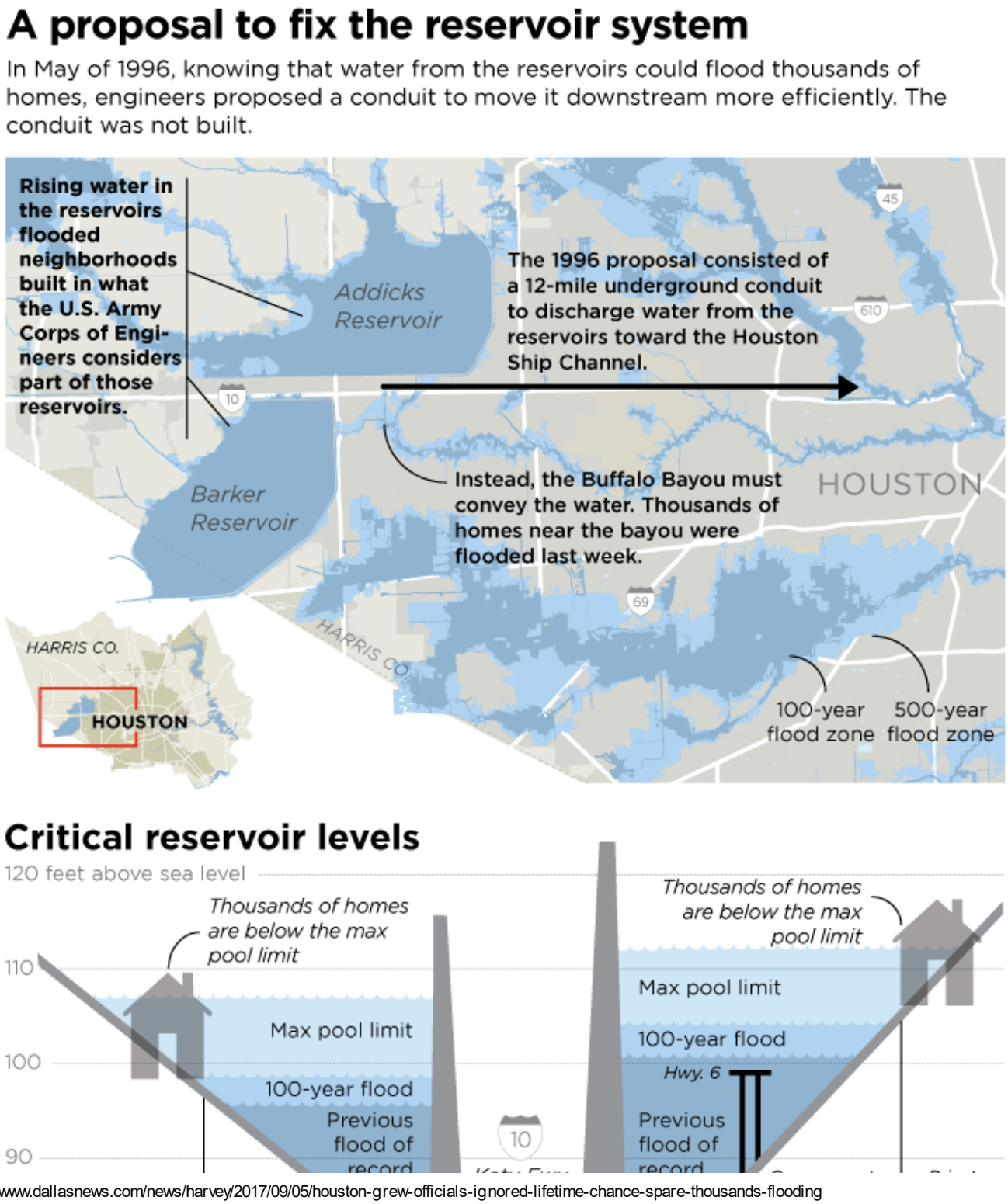
"The primary flood threat facing the citizens of west Harris County and west Houston comes from the inability to drain the Addicks and Barker reservoirs in an efficient manner," the report said.

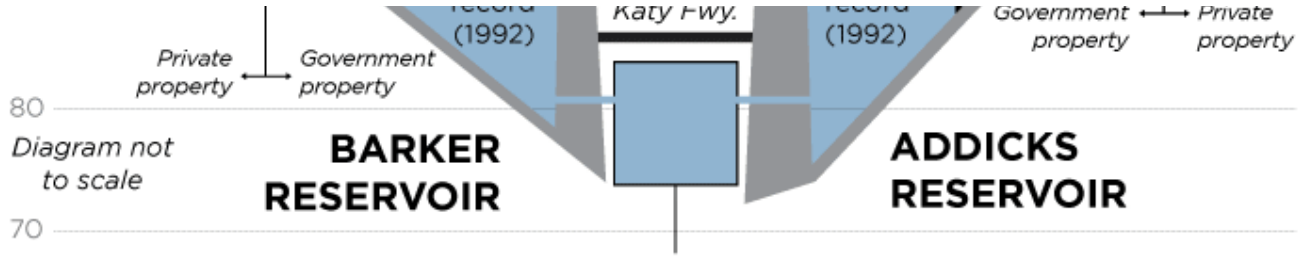
When built in the 1940s, the area's reservoir system was adequate, the report said. But because of changes made to the system, and given the pace of urban development 50 years later, "the project's original design parameters and assumptions are severely outdated and

invalid."

In addition to the report's main proposal of a conduit, its authors raised other alternatives, such as digging the reservoirs deeper, buying out properties at risk and creating new regulations on development.

And then there was a final, stark alternative: "Do nothing and accept risk of flooding."





The idea was to build a conduit consisting of perhaps eight channels, each 12 feet by 12 feet in size, much of which would've been underground along I-10.

SOURCES: Harris County Flood Control Planning Department; FEMA; *The New York Times*; Houston-Galveston Area Council

Michael Hogue/Staff Artist

Asked Monday about the report, Harris County flood control officials said they could not immediately locate a copy and were unfamiliar with the details.

"What I recall is, and I haven't read the report since back then, was that it was going to be very difficult to do physically," said Steve Fitzgerald, the flood control district's longtime chief engineer.

But Harris County's flood control director at the time the report was created, Arthur Storey, said Monday that he remembered the proposal well.

"This, what we have before us, is a massive engineering and governmental failure. I'm both angry about it and embarrassed about it," said Storey, who after his time as flood control director went on to lead the county's public infrastructure department. He retired in 2015 at 78 years old.

"My embarrassment is that I knew enough that this was going to happen," he said, referring to the destruction Harvey inflicted on west Harris County. "And I was not smart enough, bold enough to fight the system, the politics, and stop it."

Rising threat

After deadly floods in 1929 and 1935, the U.S. Army Corps of Engineers built two large reservoirs in what was then ranchland west of Houston. The idea was to store up water from heavy rains, rather than let it gush straight into the Buffalo Bayou, which runs through the city and carries stormwater to the Houston Ship Channel.

Most of the time, the Barker and Addicks reservoirs would be dry, and the land could be

used for soccer fields, golf courses and dog parks. Only in heavy rains would they hold water.

After a rain subsides, water within the reservoirs can be released into the bayou slowly. Originally, the earthen dams that hold water in the reservoirs were designed without floodgates. Once the water reached a certain level, it could spill out at up to 15,700 cubic feet per second.

But the threat of flooding in areas below the dams rose during the 1940s and 1950s, as urban development crowded the Buffalo Bayou upstream of Houston. To avoid such flooding, the corps installed floodgates that could release the water more slowly, at no more than 4,000 cubic feet per second. Any faster than that, the corps knew, and homes near the bayou would flood.

During hard rains in March 1992, the reservoirs reached record levels. State Highway 6, which runs through Addicks Reservoir, had to be shut down for 10 days while officials waited for the water to drain.

HARVEY

After Harvey's destruction, will a new and different Houston emerge?

The event worried Harris County flood control planners. Letting the water out too fast endangered development downstream from the reservoirs, because the bayou running toward Houston would overflow.

But letting the water out too slowly created another risk, because development was encroaching on the upstream fringes of the reservoirs. Entire neighborhoods were being built inside the reservoir bowls - in places that the Corps of Engineers and Harris County planners knew would flood if the reservoir levels got high enough.

The corps purchased all the land inside the reservoirs that would be covered by water in a 100-year rain event (one with a 1-in-100 chance of happening any given year). But on land at the western fringes of the reservoirs, which would be covered in water during a greater

than 100-year rain, developers were replacing pastures with neat rows of brick homes.

Action urged

In 1996, the planning department of the Harris County Flood Control District created its report urging action.

"Of primary concern is the fact that the reservoirs do not function as originally intended which translates into increased risk of flooding upstream of the reservoirs and less protection downstream," the report said. "As development continues behind the reservoirs, there is the potential to expose as many as 25,000 homes and businesses in the reservoir fringe areas to flooding."

The conceptual plan proposed a single underground conduit consisting of perhaps eight channels, each 12 feet by 12 feet in size, to carry water out of the reservoirs and safely past developed areas downstream.

The timing, the report said, was right. The Texas Department of Transportation was embarking on a reconstruction of the Katy Freeway, the stretch of Interstate 10 west of downtown Houston. It would be a good route for the drainage channel.

HARVEY

As storm's death toll rises to 60, Hurricane Harvey's displaced stream home to clean up

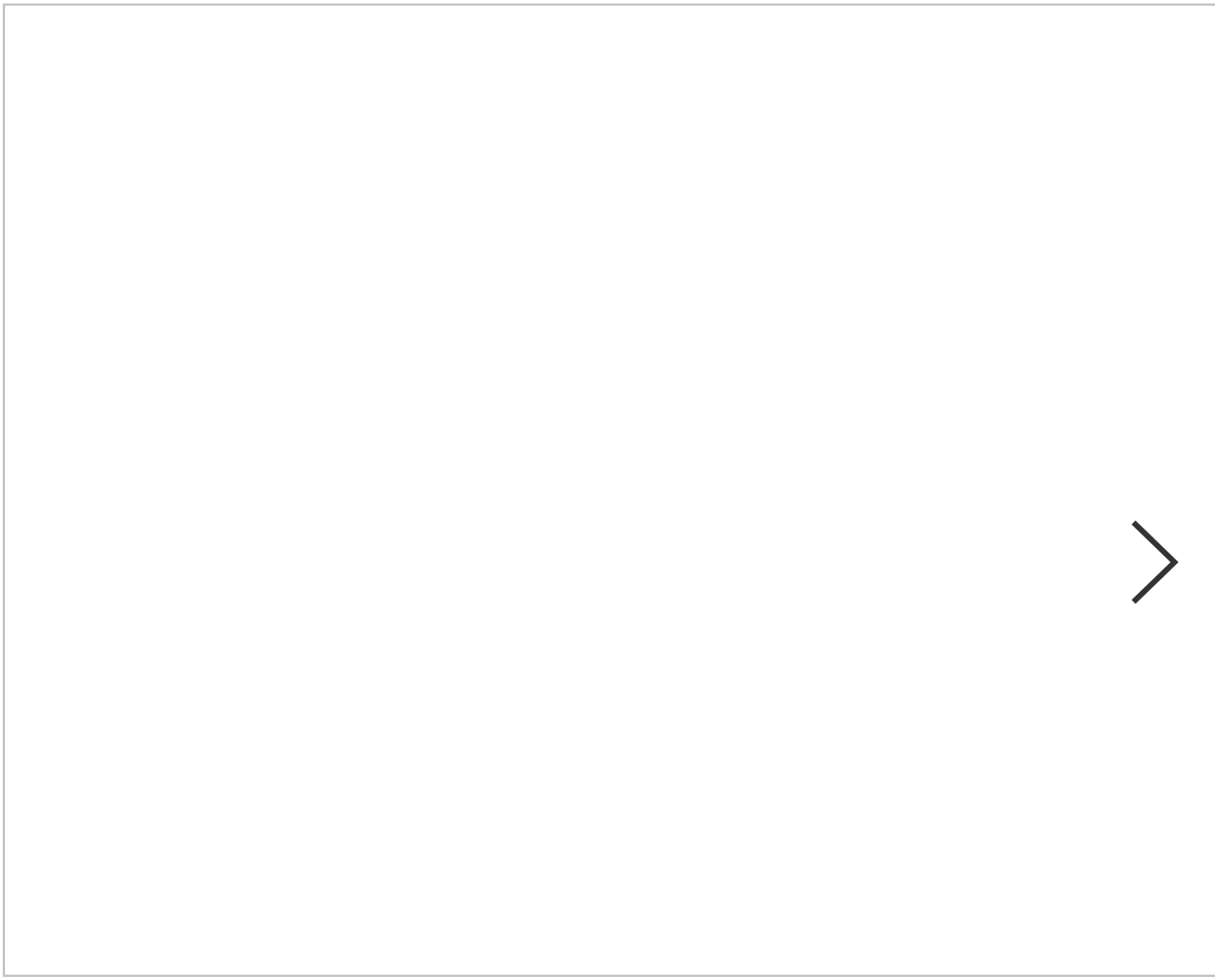
"The potential flood control problems are severe enough to consider this magnitude of project, and the major transportation construction in the Katy Freeway corridor presents a unique, once-in-a-lifetime opportunity to consider this type of flood control option," the report said. "To determine if a conduit system under the freeway is justified, it needs to be evaluated against other options."

Without such a conduit, the reservoirs posed an increasing risk, the report said. Because they had to be drained so slowly, there might not be time to empty the water between storms. That meant a series of smaller storms could raise the water level just as could one

big storm, a danger the report called "ratcheting."

"It is conceivable and not hard to imagine that a single storm event could have a catastrophic impact to several thousand people in the reservoirs and the fringe areas," the report said. "But, it's just as important to realize that a rainy season consisting of several 'normal' rain storms ... could be just as catastrophic because of the ratcheting effect."

Photo Gallery 1/6



(Tom Fox/The Dallas Morning News)

Slow drainage from the reservoirs also exacerbated the duration of flooding that would be experienced in the fringes of the reservoirs.

"Flood levels would not recede over the course of several hours like typically experienced with flooding from channels," the report said. Rather, houses being flooded by slow-draining reservoir waters "could be inundated for an extended period."

Tragic reality

Last week, the report's predictions became a tragic reality. The reservoirs became vast lakes, working as designed to spare Houston from a flood. But by Aug. 28, the reservoirs were nearly full.

The water had spread to the edge of the government-owned land and was overtaking the neighborhoods beyond.

Rather than let the water keep rising, the corps opened the floodgates to let a controlled amount escape. And instead of the normal 4,000 cubic feet per second, corps officials opened the gates wide to let water spill out at more than 13,000 cubic feet per second. They had to begin to get rid of it. They did so knowing it would flood neighborhoods downstream.

And just as the 1996 report described, water in many of the flooded homes would not drain for days or even weeks.

Storey, the former county flood control director, took a break from recovering belongings from his own flooded home Monday when reached by phone.

Long ago, Storey said, one of his best engineers came to him and an elected official about the reservoir problems. "He said, 'Let me draw you a picture.'"

"We both said, 'Oh s---, no kidding, really?' " Storey recalled.

"We really knew that at that time it would be a wise thing to stop development of any land upstream of the reservoir, have the feds buy it out, and make it part of the federally owned system," he said.

Storey said he laments that he and others did not do more.

"I wish I had gone to the commanding general of the Southwestern Division of the Corps of Engineers, and sat in his office, and said, 'Sir, I'm not going to leave your office until we come up with a better solution, because it damn well is gonna rain, and it's darn well gonna hurt people,'" Storey said. "I didn't do that."

He added: "Would I have been fired before I got halfway out of town? Maybe, but I didn't do it. And the irony is my house flooded. And all of my neighbors' did. And it was by intentional discharge by the people in command and in charge of the infrastructure."

Storey said the conduit proposal didn't go anywhere because it had no funding and required the cooperation of many agencies, and because the highway reconstruction was too far along to be slowed by another study.

"Anytime anybody comes up with a good idea, there are lots of studies and information about why it won't work, it can't be afforded, or it's not practical or politically expedient, and there was all of that," he said.

"They built the highway, and there's no storm sewer under it, and don't we wish it were today."

No funding

Richard Long has worked for the Army Corps of Engineers for more than three decades, much of it overseeing operations of the Addicks and Barker reservoirs.

"Sure, it would have been nice if we'd have had all the land necessary to hold the water on, and sure, it'd have been nicer if we had a conveyance system that would carry all these large releases that we have," Long said when asked about the 1996 report.

"Without federal funding we can't do anything like that," he said. But the county is "welcome to do that if they can work with whatever partners they need to do that, and we would encourage it to happen."

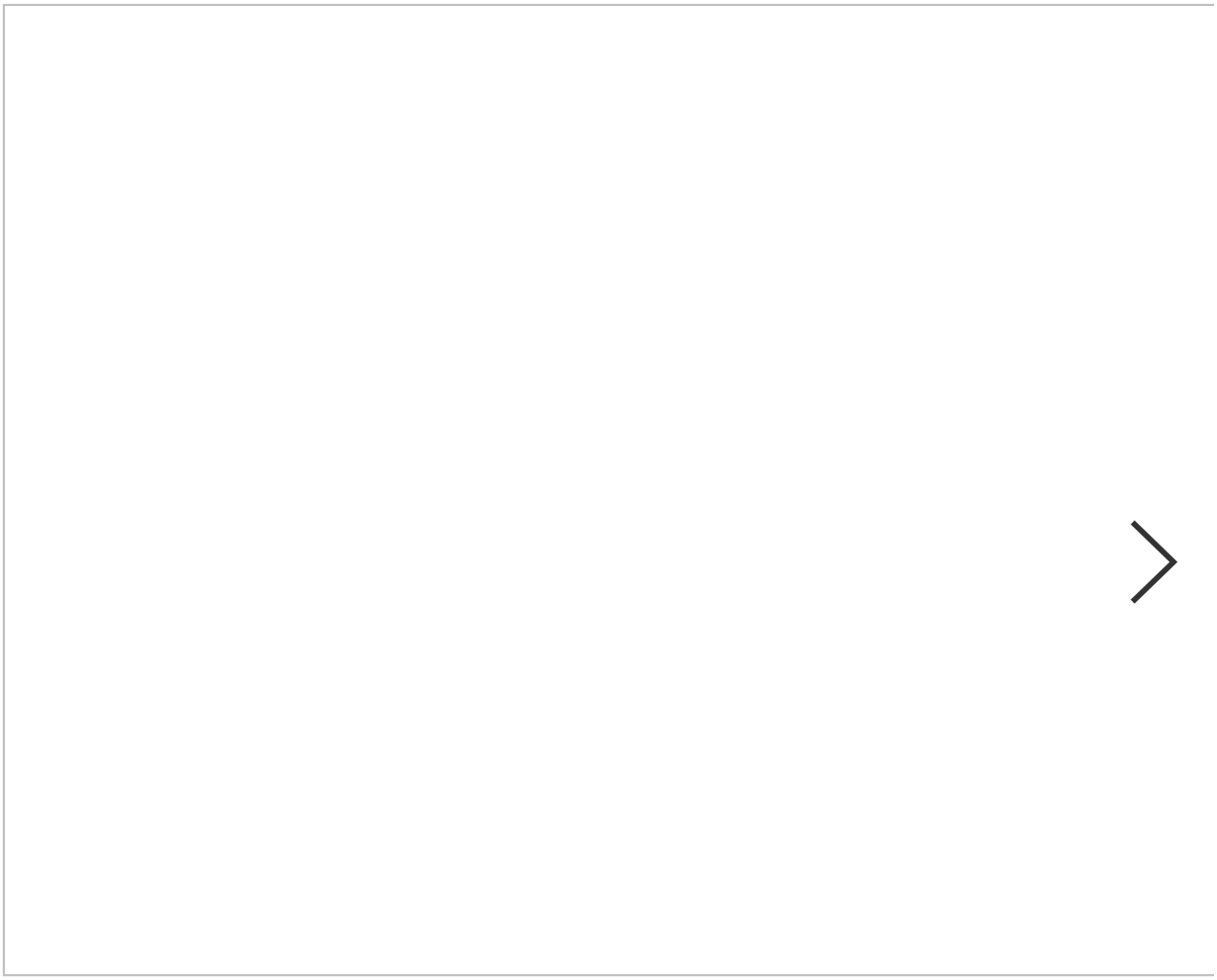
Steve Radack is Harris County commissioner of the precinct that contains the reservoirs, and has been since 1989. He said he and many others have long understood the reservoirs' problems. Radack said blame for the lack of a fix falls on the U.S. Congress, which never

allocated the money.

"The corps has done an outstanding job of managing this reservoir, outstanding," Radack said. "But the problem is if you don't give them the money to do what they need to do, they can't do it.

"They knew, they asked, they didn't receive," he said.

Photo Gallery 1/11



(Smiley N. Pool/The Dallas Morning News)

Many of the thousands of homeowners who live near the reservoirs, however, didn't understand the risks those reservoirs posed. Aaron Voges lives with his wife and two kids,

7 and 12, in a flooded neighborhood called South Park, one of those located inside the reservoir.

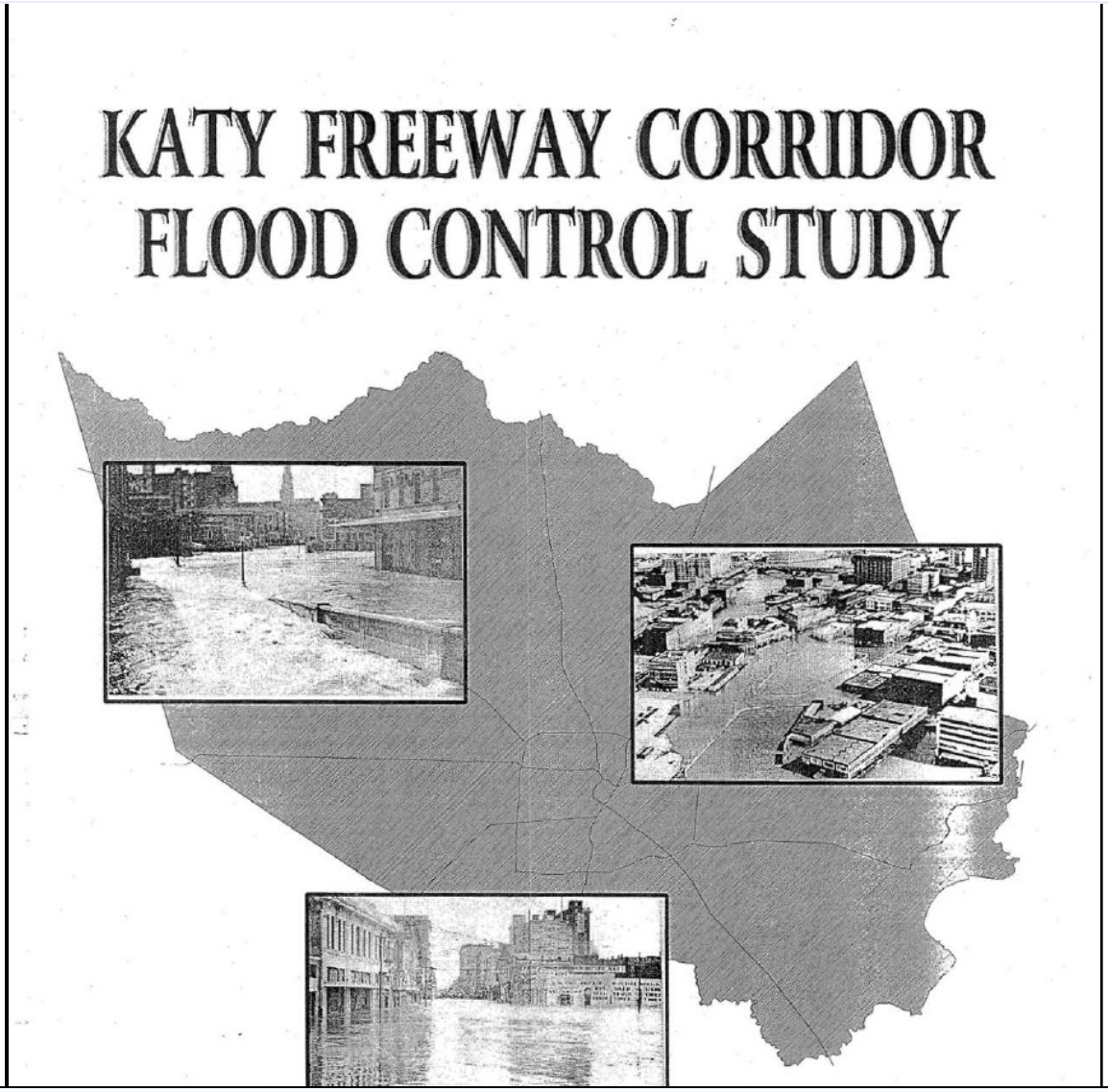
"For some stupid reason I thought that levee that I see on my way home, I thought that protected me," he said. "I had no idea that there were plans in place to flood me to protect other people, which blows my mind."

Voges says even if he can restore his home, it now won't be worth near what he owes on his mortgage.

"Why did they build the neighborhood? Why did they let people buy out there?" he said. "It lowers what little faith I have in my government."

Correction, 11:50 a.m., Sept. 5, 2017: An earlier version of this story incorrectly described the size of the proposed underground conduit. The proposal suggested a conduit of perhaps eight channels, each 12 feet by 12 feet in size.

Katy Freeway Corridor Flood Control Study by cityhallblog on Scribd



HURRICANE HARVEY'S IMPACT ON TEXAS

Texas leaders scrounge to boost Hurricane Harvey housing repairs, call on Congress to help

Will memories of Hurricane Harvey scare business away from Houston?

Huge fire burns at Houston-area chemical plant flooded by Harvey

More in this Collection

ring Harvey

James Drew

Jan. 20, 2018 | Updated: Jan. 22, 2018 7:24 a.m.

Former Assistant Fort Bend County Engineer Glen Crocker stands at the Barker Reservoir spillway Tuesday, Jan. 9, 2018 in Houston. Twenty-five years ago he discovered that new Cinco Ranch subdivisions could flood because the Barker reservoir footprint was bigger than the government-owned land. He reported his findings but was ultimately …

Photo: Michael Ciaglo, Houston Chronicle

Twenty-five years ago, Fort Bend County's assistant engineer emerged from a meeting with the U.S. Army Corps of Engineers. He had new information, and he was worried.

Charles Glen Crocker, then 38, had learned that the footprint for Barker Reservoir was bigger than the land owned by the government, placing future homeowners in the Cinco Ranch and Kelliwood subdivisions within what engineers called "flood pools." The reservoir, dry much of the time, could fill during a major rainstorm and spread into the homes of unsuspecting residents.

His resulting letter, written on July 6, 1992, was a warning to county officials: "...recent rainfall events and weather conditions have shown that many areas considered relatively safe from rising waters have been flooded."

The land in the reservoir was sinking, "subsidence" in engineering terms. Houses were being built at a level lower than the water level the dams were designed to hold. A long period of rain could mean trouble in the two massive planned communities.

Former Assistant Fort Bend County Engineer Glen Crocker stands at the Barker Reservoir spillway Tuesday, Jan. 9, 2018 in Houston. Twenty-five years ago he discovered that new Cinco Ranch subdivisions could

flood because the Barker reservoir footprint was bigger than the government-owned land. He reported his findings but was ultimately ignored.
Photo: Michael Ciaglo, Houston Chronicle

Crocker alerted everyone he could think of: the county judge, county commissioners, the Fort Bend County Drainage District and the county's emergency management coordinator.

He wanted the county to look at the matter more closely. Instead, a special purpose district formed to benefit developers by paying for drainage improvements attacked Crocker. Its letter criticized him for writing the memo, questioned his credentials and said Crocker's assertion could hold back development in the county.

LAWSUIT: Army Corps knew for decades about Katy flooding risks

Crocker describes the period as a "firestorm." He said the furor was a big factor in his decision to leave his county government post two years later.

The county ignored Crocker's warning. By 2017, development in the flood pools in Fort Bend and Harris counties would swell to 30,000 homes and businesses.

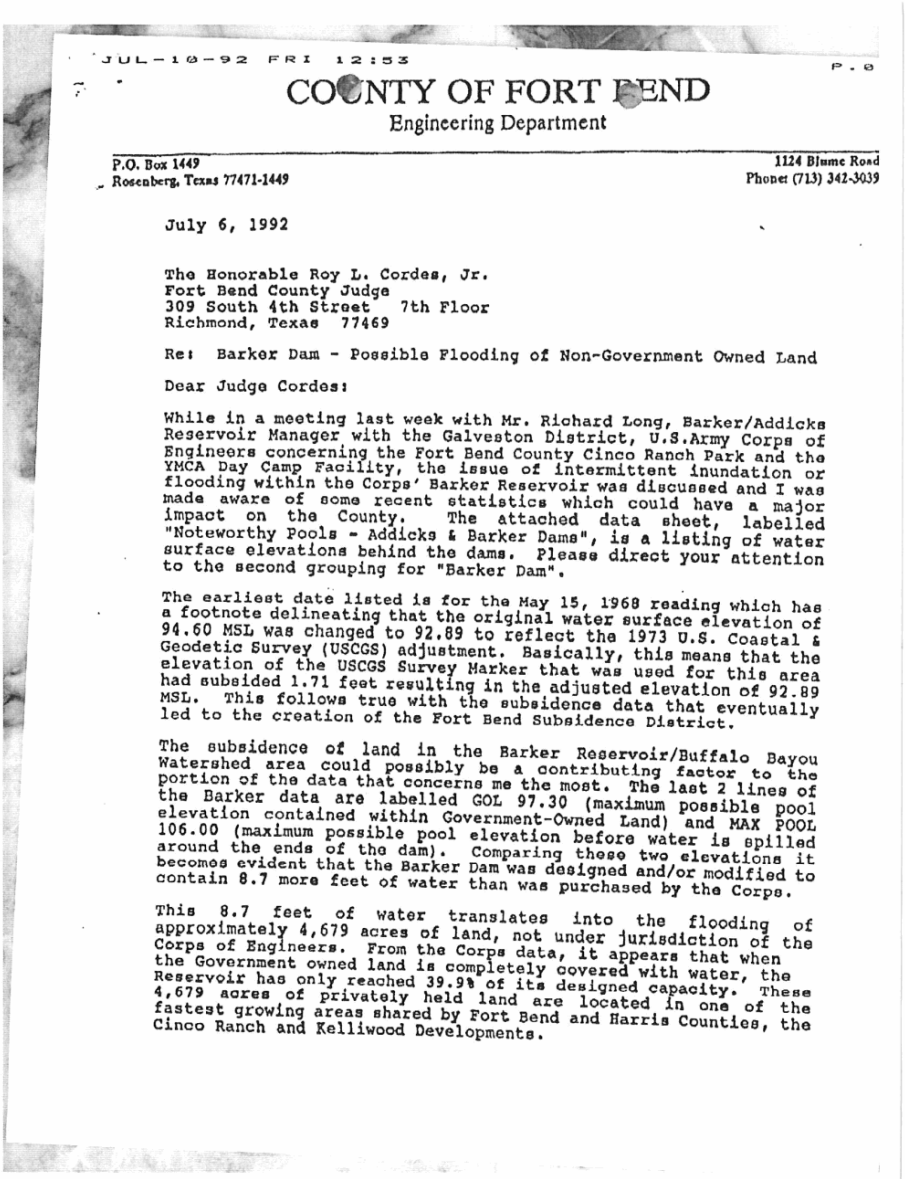
Last August, as huge pools from Hurricane Harvey flooded more than 9,000 structures upstream of the Addicks and Barker dams, Crocker strode into the second-floor office of his Sugar Land home.

There, in a manila folder, he found the two-page letter he had written so many years ago. He looked at the subject line: "Barker Dam – Possible Flooding of Non-Government Owned Land."

The Houston Chronicle found the document through a public records request filed late last year with the Willow Fork Drainage District and contacted Crocker to discuss it.

Crocker's letter was addressed to Roy Cordes, then the Fort Bend County judge, now its county attorney.

Page 1 of Charles Glen Crocker is silenced by county officials and by an engineering firm that was working on developments within the reservoir flood pool
DocumentCloud



JUL-10-92 FRI 12:53 P.0

COUNTY OF FORT BEND
Engineering Department

P.O. Box 1449
Rosenberg, Texas 77471-1449

1124 Blume Road
Phone: (713) 342-3039

July 6, 1992

The Honorable Roy L. Cordes, Jr.
Fort Bend County Judge
309 South 4th Street 7th Floor
Richmond, Texas 77469

Re: Barker Dam - Possible Flooding of Non-Government Owned Land

Dear Judge Cordes:

While in a meeting last week with Mr. Richard Long, Barker/Addicks Reservoir Manager with the Galveston District, U.S.Army Corps of Engineers concerning the Fort Bend County Cinco Ranch Park and the YMCA Day Camp Facility, the issue of intermittent inundation or flooding within the Corps' Barker Reservoir was discussed and I was made aware of some recent statistics which could have a major impact on the County. The attached data sheet, labelled "Noteworthy Pools - Addicks & Barker Dams", is a listing of water surface elevations behind the dams. Please direct your attention to the second grouping for "Barker Dam".

The earliest date listed is for the May 15, 1968 reading which has a footnote delineating that the original water surface elevation of 94.60 MSL was changed to 92.89 to reflect the 1973 U.S. Coastal & Geodetic Survey (USCGS) adjustment. Basically, this means that the elevation of the USCGS Survey Marker that was used for this area had subsided 1.71 feet resulting in the adjusted elevation of 92.89 MSL. This follows true with the subsidence data that eventually led to the creation of the Fort Bend Subsidence District.

The subsidence of land in the Barker Reservoir/Buffalo Bayou Watershed area could possibly be a contributing factor to the portion of the data that concerns me the most. The last 2 lines of the Barker data are labelled GOL 97.30 (maximum possible pool elevation contained within Government-Owned Land) and MAX POOL 106.00 (maximum possible pool elevation before water is spilled around the ends of the dam). Comparing these two elevations it becomes evident that the Barker Dam was designed and/or modified to contain 8.7 more feet of water than was purchased by the Corps.

This 8.7 feet of water translates into the flooding of approximately 4,679 acres of land, not under jurisdiction of the Corps of Engineers. From the Corps data, it appears that when the Government owned land is completely covered with water, the Reservoir has only reached 39.9% of its designed capacity. These 4,679 acres of privately held land are located in one of the fastest growing areas shared by Fort Bend and Harris Counties, the Cinco Ranch and Kelliwood Developments.

Contributed to DocumentCloud by Houston Chronicle of Houston Chronicle • View document

"I think the letter was very informative and raised issues about the possibilities with the [reservoir] elevations," Cordes said in an interview Friday. "He was well-entitled to raise the issue."

Cordes said he didn't recall what happened, if anything, after he received the letter. "I can't cite any specific action based on the letter," he added.

Jim Blackburn, an environmental lawyer and planner who has studied the Houston area's vulnerability to flooding for years, said Crocker's letter sheds light on what he calls the "flood disease" that has gripped the Houston area for several decades. It's a development attitude that resulted in magnifying the impact of the rainstorm of the century, he said.

"The flood disease keeps information from being brought forward," Blackburn said. "It's about the failure to allow for exchange of ideas, a failure to hear, and a decision to attack those who don't agree. It's been going on for a long time. The reaction to Crocker's letter is a perfect example of the pervasiveness and the insidiousness of the flood disease."

'Noteworthy' flood pools

It would take a while for Crocker to grasp those attitudes. A graduate of Sharpstown High School, Crocker earned a bachelor of science degree in construction management in 1983 from the University of Houston.

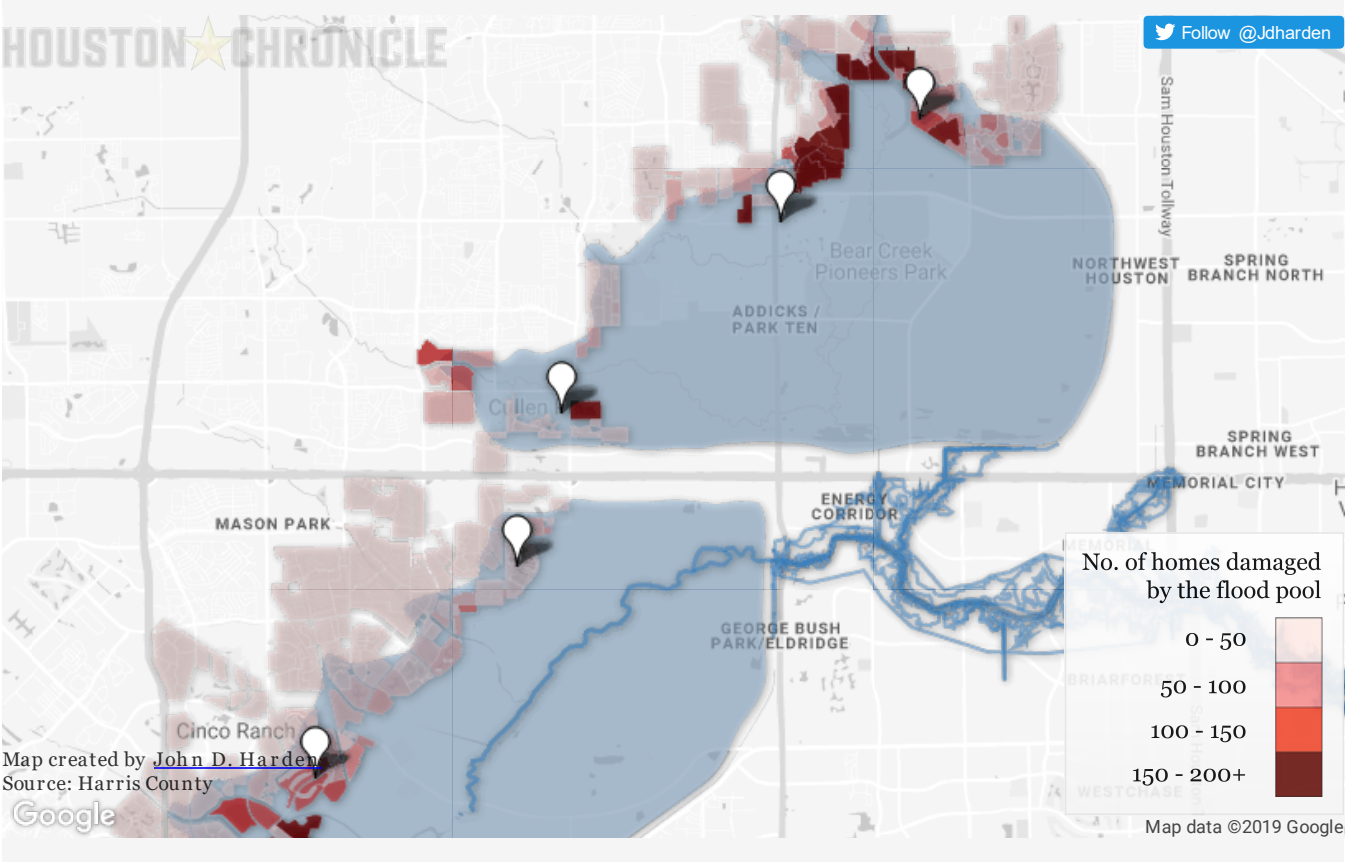
Two years later, Fort Bend County officials recruited him away from a construction company to help open the new engineering department. He was hired as the assistant engineer and worked in a two-room hut that was part of the former World War II prisoner of war camp in Rosenberg.

The tasks of the employees, who wore jeans and drove pick-up trucks, captured the county's dramatic transition from rural to suburban, from pulling dead livestock out of ditches so roads didn't flood to reviewing subdivision maps. All around Crocker, streets were being built and holes dug to put in water and sewer pipes as plans for subdivisions sprouted.

In 1992, Crocker attended a meeting at the Corps of Engineers' office at the base of Barker Reservoir. The agenda: a discussion about Fort Bend County's plans to build a park, with the YMCA, with soccer fields on the land within the reservoir.

Homes damaged by the Addicks, Barker flood pool

Thousands of homes behind the Addicks and Barker reservoirs sit in what engineers call the “flood pool” — a muddy lake that would form behind the dam if the floodgates were closed long enough and it rained hard enough. During Hurricane Harvey, huge pools formed that forced the evacuation of 30,000 properties with 150,000 people in neighborhoods upstream of Houston’s two dams. The map shows the subdivisions that were threatened by the storm. Not all neighborhoods shown were impacted, but those closest to the dams suffered the most damage. An estimated 9,000 homes were damaged.



Crocker said during the meeting, Richard Long, then the Corps' manager for the Barker and Addicks reservoirs, showed him a piece of paper listing "noteworthy" flood pools. Crocker said he asked Long what it meant. Long replied that when the reservoirs fill, the water exceeds the land that the federal government had bought.

(Citing pending litigation filed against the Corps in response to Harvey flooding, an agency spokesman referred the Chronicle's request to interview Long to the U.S. Department of Justice, which did not immediately respond.)

DEVELOPING STORM: For buyers within 'flood pools,' no warnings from developers, public officials

It was Crocker's job to work with the developers of the Cinco Ranch and Kelliwood subdivisions, and the engineering firms they hired. Following the meeting with Long, Crocker said he consulted Fort Bend County Commissioner Alton Pressley, whose precinct included the two subdivisions.

Pressley said Crocker needed to write a letter to the entire county commissioners' court, then led by Cordes.

Crocker's letter, dated July 6, 1992, said the Barker Dam was "designed/and or modified" to contain 8.7 more feet of water than the land the federal government had purchased. That meant that the land where the subdivisions were being built would be part of the reservoir during times of heavy rain.

"This 8.7 feet of water translates into the flooding of approximately 4,679 acres of land, not under jurisdiction of the Corps of Engineers," Crocker wrote.

Crocker added that the "unofficial report" from the Corps found that if four more inches of rain had fallen in the storms of March 1992, "there would have been floodwaters inside of residences located in developments adjacent to the Reservoir."

He concluded that Fort Bend County officials and developers should work with the Corps on the issue. "Certainly additional data and studies will be required to determine the actual existence of/or extent of any problem with encroachment on privately held land," Crocker wrote.

But Ron Drachenberg, who was Crocker's boss as Fort Bend county engineer and now is retired, said last week that the county didn't have any options.

"We didn't have a way of stopping development because it wasn't our property," he said. "It wasn't governmental land. It was private land."

The Chronicle sent copies of Crocker's letter and the responses to Fort Bend County Judge Robert Hebert; to the sole current commissioner who was on the panel at that time, Grady Prestage; and to the commissioner whose precinct includes Cinco Ranch and Kelliwood, Andy Meyers.

Hebert said in a written statement: "The letters reflect the pressure applied to the County in 1992 to keep quiet about their concerns about the reservoir. While we received more than the 4" the letters discuss from Harvey in 2017, it is now obvious to all that the Corps will allow the reservoir to overflow onto homes behind it to protect downstream property. I will not comment further as I was a private citizen at the time and was completely unaware of this issue."

Prestage declined comment. Meyers didn't return messages seeking comment.

Bad for business

In 1985, the state created a special purpose district called the Willow Fork Drainage District. The focus was development, specifically to sell bonds to reimburse developers for drainage improvements and then levy property taxes to repay the money borrowed – with interest.

Crocker's letter soon came to the attention of the district's engineering firm, Turner Collie & Braden.

Michael B. Hunn, director of the engineering firm's land development division, responded to Crocker's correspondence in a four-page letter in November 1992.

He began by noting that concern had been expressed that Crocker's letter "could unnecessarily adversely impact sales of land in the high quality residential neighborhoods currently being developed in Fort Bend County."

He said Turner Collie & Braden had interpreted Crocker's letter as inferring that the "properties immediately upstream of Barker Reservoir are in imminent danger of being flooded and that the level of protection from flooding is not as secure as anticipated."

Hunn wrote that the "properties within the Willow Fork Drainage District are well protected from individual storm events and/or ponding levels in Barker Reservoir that have a 1 percent or greater chance of occurring." This meant that the subdivisions were safe from 100-year floods, he wrote.

Hunn could not be reached for comment. A Turner Collie & Braden engineer who was copied on Hunn's letter didn't return messages seeking comment.

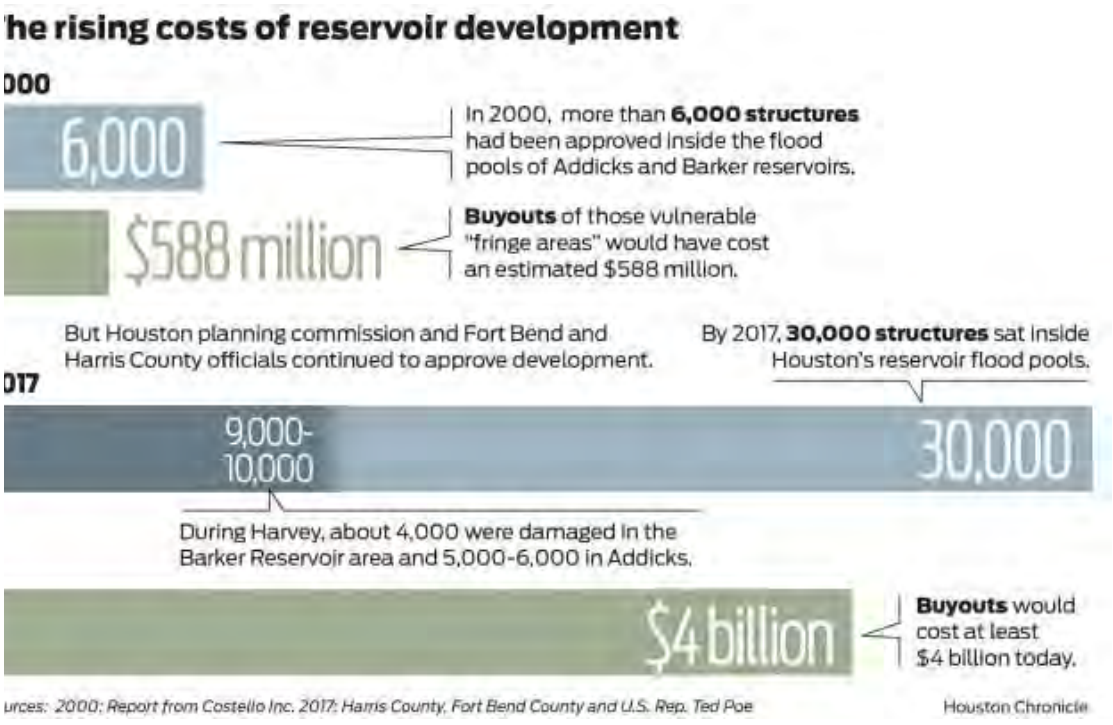
George Nilsson, president of the Willow Fork Drainage District board of directors, also took aim at Crocker's letter in a response sent to Cordes, the county's top official.

"Mr. Crocker's conclusions were made without the benefit of adequate research, independent verification or proper scientific methodology," he wrote.

The drainage district, according to Nilsson, was surprised that Fort Bend County would allow someone "who is not a registered professional engineer" to use county letterhead to "make such baseless, unfounded and potentially damaging assertions." The Chronicle gave Nilsson copies of Crocker's letter, his rebuttal, and Turner Collie & Braden's response. He said he was too ill to discuss them.

In a recent interview, Crocker said he intentionally did not pursue a professional engineering license from the state.

Having known engineers who worked for counties and cities before who were asked to put their seal on things that weren't quite copacetic, I just dropped my pursuit of getting a PE," he said.



Sad to be vindicated

Crocker said the responses to his letter were among the reasons why he left his job in 1994. He said the

commissioners' court had meetings about what he wrote, but he was not allowed to attend.

In retrospect, Crocker said he was "young and naïve" and thought he was raising a technical issue that Fort Bend County needed to examine. He said he was not thinking that Turner Collie & Braden worked for the drainage district, some municipal utility districts in Cinco Ranch, and as a result, "there might be some political fallout."

After leaving his county job in 1994, Crocker worked for four utility billing, development, and engineering firms and later moved to the Middle East to work on development projects. He returned to Houston in 2015 and now is a land development construction manager for Cobb, Fendley & Associates, a Houston engineering firm.

When Harvey struck, Crocker said news accounts of floodwaters backing up behind the Barker Dam reminded him that he had written the letter in 1992. He said he hoped that what he had written about subdivisions being threatened by the flood pool would not come true.

"But then it did," he said. "I feel vindicated – but in a bad way. For me to be vindicated, millions of dollars in damage was done to people's houses."

From: Vanessa Sommer
To: CESWT-BBTRS
Subject: [Non-DoD Source] BBTRS Comments
Date: Friday, May 31, 2019 11:59:39 PM

-01 My name is Vanessa Sommer and I live at 2430 Randa Point Court, Spring, TX 77388. We live off the Cypress Creek watershed in the neighborhood of Lakes at Cypress Forest in water District WCID110. Please consider Cypress Creek in your study especially near I 45 in Cypress Creek. Do you to text a flood, memorial day flag and hurricane Harvey, the Cypress Creek channel has continually reduced in size. During hurricane Harvey, the creek backed up like a damn at Interstate 45. This needs to be looked at. Also, Please consider widening the channel and dredging the creek.

Thank you!
Vanessa Sommer
Sent from my iPhone

May 31, 2019

U.S. Army Corps of Engineers Galveston District
Attn: BBTRS
P.O. Box 1229
Galveston, TX 77553-1229

Comments on the scope of the Buffalo Bayou and Tributary Resiliency Study:

Here are some possible remedies for your consideration that I feel that could have a positive impact on reducing the flooding impact on improved property during a major storm of the magnitude of Hurricane Harvey as well as addressing other environmental considerations:

- **Upstream of Barker and Addicks reservoirs.** Clean out and possibly widen existing draining paths to reduce resistance to runoff to the reservoirs. Smaller upstream dams/containment basins may be possible. Small reservoirs might be considered to collect water for use by MUDs as an alternative to using well water – collected water would be treated and used to maintain low levels that could be utilized for containing rain off from heavy rains. -01

- **Barker and Addicks reservoir flood pools.** When the reservoirs were constructed, the spillway level was above the elevation of land purchased by the Corps. The land between that purchased and the spillway elevation was in many cases used for commercial and residential construction. Why this land was allowed to be used for construction is questionable, but it is reality. Unfortunately, few people who purchased homes below the spillway were aware of the situation. I live behind Barker reservoir where the spillway elevation is 104' and elevation of the extent of the Corps land is 97'. The slab for my home in Windsor Parks Lakes is at 102' and Harvey waters got within about 6 inches.

  The strategy for managing the water level behind these reservoir needs to be given high priority in order to reduce the risk of flooding improved properties located behind the dams and below the spillway elevation. Considerations include:
  - Discharging water during heavy rains to the extent possible without endangering downstream properties. Particularly if the main storm is upstream of the reservoirs.
  - Increasing reservoir capacity by excavating deeper in areas where park and recreational areas are not impacted. As mentioned earlier, these deeper portions of the reservoir could be used to accumulate water for use by area MUDs in place of well water. The strategy would be to keep the water level in these deeper areas well below that the recreational areas so if needed for flood capacity it would be there. It should be noted that due to ground water consumption, land subsidence in the Katy area is occurring at the rate of about 1"/year. While this may not seem significant some areas over time could become more flood prone. Also, this water use might be an alternative to ongoing drilling of wells due to a declining aquifer. -02 -03
  - Would like to see the elevation of the spillways lowered, but while that might not be feasible, it should be considered.
  - Buyout of homes below the spillway levels might be considered as well. Especially for those closest to the Corps property line.

- **Buffalo Bayou.** The main problem seems to be bottlenecks in the drainage from the dams to Galveston Bay. Here are several considerations:
    - Between the dams and Beltway 8, the Bayou area is reasonably wide and straight. However, there are a consider number of trees along the banks that do provide significant flow resistance when the water gets high. Also at street crossings the flow area is reduced and probably contributes significantly to restricting flow. Suggest that bottlenecks be identified, prioritized and modified by removing vegetation and widening. Looks like the south side of the Bayou might be addressed first to minimize impact on the recreational amenities in place on the north side. I think with modest effort the flow rate thru this section can be significantly improved. But improvements will have to be made down stream as well to see the full benefits of work on this section. -04
    - Between Beltway 8 and Interstate 610. Cleanout of trees and some straightening would help, but this is a very tortuous section of the Bayou and would impact many property owners if significant widening is to be achieved. It seems that this might be a section where an underground by-pass tunnel might be considered. This is about a 6 mile straight path vs 20+ being considered to the North. This additional capacity would reduce the environmental and cost impact of extensive widening in this section. -05
    - Interstate 610 to the Ship Channel and Galveston Bay. It seems like the main issue here would be the confluence of Buffalo Bayou and White Oaks Bayou and the bottle neck of the combined streams flowing past downtown Houston. Possibly a short tunnel by-pass here could reduce the impact as opposed to widening an area that is loaded with infrastructure. -06

If you have any questions or want more information, I would be glad to help. The above are just a rough outline of my thoughts and I could provide more detail.

Thor Hanson

Thor Hanson
19019 Lakeside Cove
Houston, TX 77094
281-717-4338
thorhanson@comcast.net

Comment #: 264

Public Information Meeting

US Army Corps of Engineers®

Comment Form (Formulario do Comentarios Escritos)

Buffalo Bayou and Tributaries Resiliency Study

Comment Period: April 29, 2019 through May 31, 2019

We need your thoughts and comments on the effort to develop the Buffalo Bayou and Tributaries Resiliency Study. Your participation is a key element in producing a meaningful and useful feasibility report. The Information presented at the public information meetings can be viewed at the website listed below. Please write your questions, comments, or suggestions in the space provided below. Feel free to use additional pages if needed. Forms may be submitted at the public information meeting, mailing to the address on the back of this form, or emailed to BBTRS@usace.army.mil. Comments should be postmarked by May 31, 2019. Thank you for your participation!

-01 STUDY THE OVERFLOW OF CYPRESS CREEK INTO BUFFALO BAYOU/CANE ISLAND CREEK. FOR BOTH THE TAXDAY FLOOD AND THE HARVEY FLOOD I OBSERVED OVERLAND SHEETFLOW OVER FM529 INTO THE BARKER RESEVOIR FROM CYPRESS CREEK.

-02 STUDY THE CREATION OF A RESEVOIR SIMILAR TO BARKER WEST OF HWY 99 ON CYPRESS CREEK. THIS ALLOWS FOR CONTAINING THE DRAINAGE OF CYPRESS CREEK.

-03 STUDY A DIVERSION LEVEE SOUTH AND WEST OF CYPRESS CREEK TO PREVENT CYPRESS CREEK FROM DRAINING INTO ADDICKS AND BARKER RESEVOIR. THE CURRENT PLANNED LEVEE SOUTH OF CYPRESS WILL DIVERT MORE WATER INTO BARKER RESEVOIR. THIS LEVEE SHOULD BE EXTENDED FARTHER WEST.

-04 PLEASE STUDY THE OPTION OF INCREASING THE CAPACITY OF BARKER AND ADDICKS RESEVOIR BY LOWERING THE ELEVATION INSIDE THE RESEVOIR.

Name Nombre CLET LANDRY

Affiliation Afiliación HOME FLOODED TWICE

Address Dirección de Envío 6201 PECAN LN

City Ciudad KATY

State Estado TX

Zip Code Código Postal 77493-1104

E-mail Correo Electrónico MARSHA_LANDRY50@YAHOO.COM

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

No Substantive Comments Identified.

Comment #: ES265

US Army Corps of Engineers

Public Information Meeting

Comment Form (Formulario do Comentarios Escritos)

Buffalo Bayou and Tributaries Resiliency Study

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This is way too costly and results not certain

Rita Marsales

Name
Nombre Rita Marsales

Affiliation
Afiliación Neighbor

Address
Dirección de Envío 4729 Spellman Rd

City
Ciudad Houston

State
Estado Texas

Zip Code
Código Postal 7705

E-mail
Correo Electrónico marita@lobal.net

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

Comment #: ES266

Public Information Meeting

US Army Corps of Engineers

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35 years and not one drop of water in our house. Then Harvey and we got flooded - 6"
It is my strong belief, based on facts, that had not the "upgrade" occurred at Main & Brays Bayou, we would not have gotten flooded. The few other neighbors probably would not have either.
I am asking that you consider another plan for Brays Bayou all other than the one you have on the boards. Our neighborhood, one of the best in the city, doesn't need any flooding. Neither does the Texas Medical Center down the street.
Please do not go through with your present plans & come talk to our neighborhood. We have an active POA.

Sally E Miller MD

-01

Name Nombre: Sally E Miller
Affiliation Afiliación: Old Braeswood Resident
Address Dirección de Envío: 7516 Morningside
City Ciudad: Houston
State Estado: TX
Zip Code Código Postal: 77030
E-mail Correo Electrónico: sallymillerphd@gmail.com

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

Comment #: ES267

Public Information Meeting

US Army Corps of Engineers

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We are still recovering from flooding (our house was flooded for the first time in Hurricane Harvey in 2017) that coincided with construction on Brayes Bayou as part of the effort to widen. While mitigation efforts are good, overflow from Buffalo Bayou could have a devastating effect again. (-01) If new construction does not stop on the floodplain in west + Northwest Houston, everything south/southeast is threatened. (-02) Additionally Levee walls should be raised at the Barker and Addicks Resovoirs.

Please help protect the more than 800,000 residents of the Bray's Bayou watershed!

Name Nombre: Breisen Miller

Affiliation Afiliación: Old Braeswood

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City Ciudad: Houston

State Estado: TX

Zip Code Código Postal: 77030

E-mail Correo Electrónico: breisen@gmail.com

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

Comment #: ES268

Public Information Meeting

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Comment Form (Formulario do Comentarios Escritos)

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-01

The 40-50 miles of tunnels is impractical because it costs too much and takes too long. By the time it is completed we will all be dead.

Please do not create any possibility of dumping water from Sabeta Bayou into Brays Bayou.

Pouring Brays Bayou water into Sims would help us but hurt the folks along Sims. Please see attached sheets for details.

Name Nombre Ann Vise Nunes **Affiliation** Afiliación

Address Dirección de Envío 5411 Rutherglenn Drive

City Ciudad Houston **State** Estado Texas **Zip Code** Código Postal 77096

E-mail Correo Electrónico amvnunes@gmail.com

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

Comments on proposals to limit flooding of homes and businesses.

I live near Brays Bayou and here are my thoughts on the suggestions on page 18:

1) 40-45 miles of tunnels. The estimates being bounced around for the tunnels from those in the private industry and government are between $100-120 million a mile = $4-5 billion total. *The soils, water table and other issues that might hinder or make impossible, subterranean construction of this magnitude are currently being looked into and I am sure will be studied in great detail before going much further down the road (tunnel, pun intended).

This would be great IF it could be done. But it would take too many years and would cost too many millions of dollars and, worst of all, it would probably not be completed. Someone would drop the ball before it was completed.

2) Two Diversion Points bringing stormwater into the far west reaches of the watershed. Guesstimate...$175 million for dam modifications, release structure and channel improvements to Upper Brays that will be needed to handle flow, plus possible land acquisitions.

This is a terrible possibility. It would cause more flooding for us near Brays Bayou, not less. PLEASE DO NOT DO THIS!!!.

This places stormwater into Brays that had previously flowed into Buffalo. What if we find ourselves in another Harvey type pattern and the decision comes down to the USACE performing another huge release into Buffalo and "accepting" $2-10 billion plus in loses or do they dump the release into Brays where they'll "only have to accept" $1-4 billion in loses??? I would not feel safe with that release device in place. I don't have much confidence in Brays winning out over Buffalo in this scenario. *Please do not do this!!!* -02

The Clodine Area Ditch currently serves a sizable area south and east of the Westpark Tollway and the Grand Parkway (99) interchange and runs along the outside of the south and east edges of the Barker Reservoir Dam until it enter Buffalo. Project Brays can only provide relief for what is currently flowing in, thus the reason the outflows from our streets and neighborhoods are not allowed to be increased unless there is some mitigation offset. We are struggling to find any detention sites much less any of decent size in the Brays Watershed. The Brays Watershed cannot support this additional unrestricted flow. *Please do not do this!!!* -03

3) One Diversion Point taking storm water out of the Brays and into Sims. Cost...???

Anything that removes stormwater from the Brays Watershed is good for its occupants, structures, livelihood, etc. Could reverse flow on existing features such as the Fondren Diversion Channel to at least get the flow half way to Sims where some land is still available to further conveyance to Sims. -04

But the folks along Sims would object, just as we on Brays object to getting Buffalo Bayou's water dumped into our homes.

I see they are digging to make Brays Bayou a tiny bit wider. Make it a LOT wider, & deeper, too.

Also please disallow towns upstream from building ANYTHING within the Brays Bayou flood plain as they have been doing for the past several years.

I have linked the presentation and attached the COMMENT FORM with instructions on how to submit. Being the military and a stickler for protocol, they have asked that comments be submitted via email or mail using the supplied form. If you don't have a scanner, you can fill out the comment form and take a picture with your phone, then email it directly. I am not sure if they will accept comments just emailed in "free form"...but, if that is all you can do it's definitely better than not commenting at all.

No Substantive Comments Identified

Comment #: ES269

Public Information Meeting

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Comment Form (Formulario do Comentarios Escritos)

Buffalo Bayou and Tributaries Resiliency Study

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Do not make any plans which will add more water under any circumstances to the Brays Bayou Watershed.

Name Nombre: Rhonda Sampier

Affiliation Afiliación: resident

Address Dirección de Envío: 8902 Ferris Dr.

City Ciudad: Houston

State Estado: TX

Zip Code Código Postal: 77096

E-mail Correo Electrónico: rhonda.sampiere@gmail.com

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

Comment #: ES270

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Comment Form (Formulario do Comentarios Escritos)

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EXPEDITED REVIEW
FLOOD PROOFING SANITARY PLANTS & PUMPING STATIONS
BUFFALO BAYOU

I attended various public meetings/presentations related to the study by USACE of the resiliency of Buffalo Bayou during flooding. Speaking w/ EDMOND J. RUSSO, Deputy Dist. Engineer, I conveyed the necessity of EXPEDITED REVIEW for
-01 immediate ACTION regarding the prevention of the failure of sanitary sewer processing during flooding of this bayou. Mr. RUSSO directed me to submit my comments in this missive. As president of Briarbend HOA, having Buffalo Bayou on our north boundary, I was on the front line to handle a solution to stop the discharge of RAW SEWAGE from the manholes on Woodway and Stoney Brook. In conjunction w/ District "G", the City provided a pump truck & EPA container vehicles to collect the sewage and deliver it to a working plant.
-02 RAW SEWAGE had been discharging into the flood waters for 1½ weeks before help was provided. This solution took three days/24 hrs/day until the discharge stopped. Failure of Turkey Creek Plant West of Briarbend was major. An estimated 100 million gallons of RAW SEWAGE was discharged into the bayous. All processing of sewage along Buffalo Bayou was under water.

Name Nombre: WILLIAM L. STANTON
Affiliation Afiliación: PRESIDENT BRIARBEND HOA

Address Dirección de Envío: 7802 ELLA LEE @ STONEY BROOK

City Ciudad: HOUSTON **State** Estado: TX **Zip Code** Código Postal: 77063

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Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

Comment #: ES271

Mary A. Van Kerrebrook
777 Preston, Apt. 40F
Houston, Texas 77002

May 31, 2019

United States Army Corps of Engineers
Attention: BBTRS
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Sir or Ma'am:

I am writing in reference to the Corps' Buffalo Bayou study. I am a native Houstonian, and have lived here most of my life. I now live in downtown Houston and walk along Buffalo Bayou every day.

-01

My over-arching concern is that the Corps and the Harris County Flood Control District ("HCFCD") remain mired in the past and that their proposals call primarily for gray infrastructure with static capacity and propensities to fail and underperform. This is especially troubling as climate change is worsening at a rapid pace and massive storms are now a regular occurrence in Harris County. Purported "solutions" with fixed capacities—such as the idea to build a massive underground pipeline to convey water—are doomed to rapid obsolescence and failure. Conversely, green infrastructure, such as protection of remaining undeveloped land on the Katy Prairie, widening of unpaved streamsides and the like, demonstratively work better.

Last month I attended a program at which Alan Black (HCFCD's Director of Operations) spoke. Mr. Black admitted that the Sims Bayou project—the only truly significant green infrastructure project undertaken to date by the Corps and HCFCD is—in Mr. Black's words—the "Gold Standard" of Corps/HCFCD flood mitigation projects. The project area of Sims Bayou was the only local bayou that did not flood during Hurricane Harvey, as Mr. Black acknowledged.

However, Mr. Black explained, HCFCD is not inclined to undertake similar projects along Buffalo Bayou because—in Mr. Black's words—"can you imagine how many rich people in River Oaks would get mad!" That perspective ignores the science and suggests that HCFCD is still uninterested in mitigating flooding in a meaningful way. I also am fairly confident that most people—whatever their means—would prefer flood control solutions that work.

-02

Many American cities are traversed by waterways. Those that are equipped for the future practice thoughtful, green and truly resilient treatment of those waterways. For example, in the wake of massive floods that killed 21 people, the City of Denver created along the Platte River and its tributaries more than twenty parks, including ten built on former landfill sites; and spent of $130 million in cleanup and land protection (starting well upstream of Denver) to absorb water and mitigate major rains. Notably, economic studies now show that the $130 million cost to the City of Denver is largely responsible for the subsequent over $13 billion of economic development that later occurred near the riverside in the City of Denver.

-03

Smart, effective floodplain management is not mysterious. It means preserving wetlands and restoring upstream grasslands; oxbows, streamside corridors planted with native grasses and other plants with robust root systems, increased setbacks for impervious cover, greenspace, neighborhood detention, and generally working with nature instead of against it.

Outdated and ineffective "solutions" include dredging, deepening and widening the bayou, sinking massive pipelines underground, or building a third reservoir—this last having been shown by the Greater Houston Flood Mitigation Consortium to be another bad idea.

I appreciate your interest in my comments.

Yours truly,

Mary A. Van Kerrebrook

cc: Harris County Judge Lina Hidalgo
Harris County Commissioner Jack Cagle
Harris County Commissioner Adrian Garcia
Harris County Commissioner Rodney Ellis
Harris County Commissioner Steve Radack
File

Comment #: ES272

US Army Corps of Engineers

Public Information Meeting

Comment Form (Formulario do Comentarios Escritos)

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1) Cypress Creek overflow into Barker Reseuoir and proposed Addicks Reseuoir should be prevented

-01 2) Cypress Creek requires maintanance. It currently has flow restrictions and should have drainage improved from Sharp Road to 99.

-02 3) Extend Cypress Creek Diversion Farther west into Waller County not the proposed Cane Island Creek.

4) Create a Reseuoir west of 99 on Cypress Creek

-03 5) Dig out the Addicks and Barker reseuoir to lower inside level and increase capasity.

Name Nombre: Louis Lester

Affiliation Afiliación:

Address Dirección de Envío: 6518 Eucahill cir

City Ciudad: Katy **State** Estado: Tx **Zip Code** Código Postal: 77450

E-mail Correo Electrónico: Lesterlouis1@gmail.com

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

From: Susan Thacker
To: CESWT-BBTRS
Subject: [Non-DoD Source] Bellaire flooding feedback
Date: Saturday, June 1, 2019 9:01:42 AM

-01 I am requesting that a manual valve be installed in the ditch in Southdale (the ditch that feeds into Braes Bayou). In the event of a flood, the valve can be shut to prevent water from the Bayou coming up into the ditch backwards and flooding our little section which has happened three times in this fashion.

There had been talk of adding a flap valve but that was tabled because some supposed expert said that it would be a source of constant maintenance and problems. However Bellaire needs a protocol in which certain steps are taken to secure the city when a big storm is coming. Part of that protocol could be manually shutting this valve and securing city vehicles to higher grounds along with many other needed tasks. So I don't see why this could not be part of the protocol.

If we had had this manual valve, our section would not have been flooded. There Had been no standing water in the street at 2 AM prior to the massive amount of water that came flowing from the ditch at 5 AM was up to my door and 8 AM had 2 feet in my house.

Sincerely,
Susan Thacker

Form Letter # 1

Comment #: ES274

From:	ericpgrossman
To:	CESWT-BBTRS
Cc:	Mr. Eric P Grossman, - Shell**
Subject:	[Non-DoD Source] barker reservoir
Date:	Saturday, June 1, 2019 10:42:56 AM

May 16, 2019
U.S. Army Corps of Engineers Galveston District
Attn: BBTRS
P.O. Box 1229
Galveston, TX 77553-1229

Dear Sir/Madam:
Thank you for the opportunity to provide community input for the Buffalo Bayou and Tributaries Resiliency Study meeting held on April 30. I hope it will yield valuable feedback.

As requested, i provide the following recommendations:

1. Limit the Barker Reservoir flood pool to the current government owned land.

2. Increase conveyance out of the Barker and Addicks Reservoirs. Solutions we support include flood tunnel(s), diversion channels, channel improvements and/or bypass.

3. Improve and restore channel conveyance and capacity upstream and downstream of Barker Reservoir and within the reservoir, including dredging, desilting and de-snagging.

4. Add capacity within Barker and Addicks Reservoirs through select excavation in the reservoirs. (Ex. 737-acre project that has been presented to the Corps located due east of Canyon Gate in the Cinco Ranch Area.)

5. Add intermediate detention/retention capacity upstream and downstream of Barker and Addicks Reservoirs.

6. Build infrastructure through a combination of viable solutions to manage Cypress Creek overflow to prevent Cypress Creek runoff from adversely impacting the Barker and Addicks watersheds.

7. Do not increase the Barker Reservoir flood pool by extending spillways or 8m the alternative compensate private landowners on whose property you claim the right to impound water without any current rights.

I would welcome the opportunity to discuss these further with you.

Yours sincerely,
eric and lana grossman

eric grossman
cell 713 851 2228
ericpgrossman@comcast.net
19914 westside forest drive
houston, texas 77094

Form Letter #1

Comment # ES276

From: Beta Fox
To: CESWT-BBTRS
Subject: [Non-DoD Source] Tributary Resiliency Study
Date: Saturday, June 1, 2019 1:14:51 PM

U.S. Army Corps of Engineers Galveston District
Attn: BBTRS

Dear Sir/Madam:

On behalf of the Barker Flood Prevention advocacy group, thank you for the opportunity to provide community input for the Buffalo Bayou and Tributaries Resiliency Study meeting held on April 30. We were pleased with the turnout and hope it will yield valuable feedback.

Our steering committee members also attended, and after careful consideration, have adopted the following recommendations:

1. Limit the Barker Reservoir flood pool to the current government owned land.
2. Increase conveyance out of the Barker and Addicks Reservoirs. Solutions we support include flood tunnel(s), diversion channels, channel improvements and/or bypass.
3. Improve and restore channel conveyance and capacity upstream and downstream of Barker Reservoir and within the reservoir, including dredging, desilting and de-snagging.
4. Add capacity within Barker and Addicks Reservoirs through select excavation in the reservoirs. (Ex. 737-acre project that has been presented to the Corps located due east of Canyon Gate in the Cinco Ranch Area.)
5. Add intermediate detention/retention capacity upstream and downstream of Barker and Addicks Reservoirs.
6. Build infrastructure through a combination of viable solutions to manage Cypress Creek overflow to prevent Cypress Creek runoff from adversely impacting the Barker and Addicks watersheds.
7. Do not increase the Barker Reservoir flood pool by extending spillways.
8. Do not destroy existing neighborhoods, schools and businesses via large scale buyouts.

Barker Flood Prevention has a membership and support base of more than 600 people. We expect that the Corps can rely on this substantial support base in addition to our steering committee and leadership when considering and valuing these recommendations.

We would welcome the opportunity to discuss these further with you.

Sincerely, (Ms.) Beta Fox

Comment #: ES276

Public Information Meeting

US Army Corps of Engineers®

Comment Form (Formulario do Comentarios Escritos)

Buffalo Bayou and Tributaries Resiliency Study

Comment Period: April 29, 2019 through May 31, 2019

We need your thoughts and comments on the effort to develop the Buffalo Bayou and Tributaries Resiliency Study. Your participation is a key element in producing a meaningful and useful feasibility report. The information presented at the public information meetings can be viewed at the website listed below. Please write your questions, comments, or suggestions in the space provided below. Feel free to use additional pages if needed. Forms may be submitted at the public information meeting, mailing to the address on the back of this form, or emailed to BBTRS@usace.army.mil. Comments should be postmarked by May 31, 2019. Thank you for your participation!

-01 Tunnels don't seem feasable. To expensive, to Limited, cost TOMuch. MAINTENANCE a problem.

Name Nombre: Jane Bock

Affiliation Afiliación: Braes Bayou Assoc.

Address Dirección de Envío: 6211 Braes Heather DR

City Ciudad: Houston

State Estado: TX

Zip Code Código Postal: 77096

E-mail Correo Electrónico: janebock@comcast.net

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

From: john
To: CESWT-BBTRS; bobx@hal-pc.org; COH - Mayor
Subject: [Non-DoD Source] Brays Bayou
Date: Sunday, June 2, 2019 2:29:09 PM

To: BBTRS@usace.army.mil

mayor@houstontx.gov

bobx@hal-pc.org

From: mccrevey@yahoo.com

Braes Bayou

-01 Tunnels, bypasses, diversions, and levees are too expensive and only shift the problem from one place to another.

-02 Buyouts and acquisitions in areas convertible to detention ponds along with channel improvements are more economical and address problems where they exist.

Acquiring land for additional sewage plants along Brays Bayou should also be a part of the planning.

We live eight tenths of a mile north of Brays Bayou and during Harvey for the first time since 1970 we had flooding in our neighborhood.

From: Neil McHugh
To: CESWT-BBTRS
Subject: [Non-DoD Source] Buffalo Bayou Project Feedback
Date: Sunday, June 2, 2019 3:10:32 PM
Attachments: Scan_0031.pdf

Public Information Meeting

US Army Corps of Engineers

Comment Form (Formulario do Comentarios Escritos)

Buffalo Bayou and Tributaries Resiliency Study

Comment Period: April 29, 2019 through May 31, 2019

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I READ THROUGH ALL THREE OPTIONS and OPTION 1 IS PREFERRED FROM a SOLUTIONS POINT OF VIEW. HOWEVER the TIME PERIOD IS TOO LENGTHY.

-01 IF there IS a WAY to SPEED UP the ENGINEERING, OTHERWISE a PROJECT THIS LONG COULD FAIL DUE to BUDGET or POLITICS

Name Nombre NEIL MCHUGH **Affiliation** Afiliación

Address Dirección de Envío 5435 GRAPE ST

City Ciudad HOUSTON **State** Estado TX **Zip Code** Código Postal 77096

E-mail Correo Electrónico neilmchugh@outlook.com

Additional information can be found at:
https://www.swg.usace.army.mil/Missions/Projects/Buffalo-Bayou-and-Tributaries-Resiliency-Study/

From: Ed Browne
To: CESWT-BBTRS
Subject: [Non-DoD Source] Our comments
Date: Sunday, June 2, 2019 9:31:47 PM
Attachments: RAF BB recommendations.pdf

Attached are some limited comments about Buffalo Bayou. Please feel free to contact us with any questions.

Kind Regards,
Ed Browne, Chair, Residents Against Flooding

Residents Against Flooding

a 501c(3) nonprofit

May 31, 2019

U.S. Army Corps of Engineers Galveston
District Attn: BBTRS

P.O. Box 1229
Galveston, TX
77553-1229

Dear Sir/Madam:

Formed in 2009, Residents Against Flooding (RAF) has been pushing for common sense solutions to Houston's flooding crisis. Now that we are a member of a national group seeking remedy for many communities across the nation, we recognize that Houston's flooding issues are by no means unique.

Although by no means the only reason for flooding, we have focused on our development practices because that is something that we should surely be able to control. Sadly, the development community whines that they will not be able to make a profit with stricter regulations. We feel certain that this Is not true.

Below are a few general recommendations that universally apply. In addition, before hurricane Harvey devastated the region, RAF and another flood group wrote a petition recommending specific actions be taken. Over a 1000 homeowners signed it. It can be found here.

-01 1. The Buffalo Bayou (BB) watershed is affected by water from several other watersheds, such as Cypress Creek, Brays, White Oak, etc., that accept water from several different counties. FEMA, the City of Houston and the various area counties all have regulations that should be strengthened and enforced. More importantly, these should be uniformly applied across the entire watershed, where the strictest rules should apply.

-02 2. RAF calls for the immediate adoption of new NOAA FIRMs in BB and all watersheds, then base local detention on these new rain rates;

-03 3. Large regional detention ponds are good and necessary for Houston to solve our flooding problems; however, they will not solve local flooding simply because our stormwater drainage systems are woefully inadequate, particularly for newer NOAA rain rates. Therefore, it is imperative that local building codes be rewritten to include onsite detention and mitigation for fill for all commercial and residential structures;

4. Harris County Flood Control District (HCFCD) has a propensity to grant Letters of Map Revision (LOMR's) to almost any developer who wants to build in the floodplain. It's insane to buy out houses that have flooded in the floodplain while granting others

the ability to build there.

-04 5. The City of Houston (CoH) has modified its City Code to allow the use of fill dirt both in the floodplain and in the floodway. No building should be allowed in any floodway in BB or any other watershed, and any building in the floodplain should only be using pier and beam construction a minimum of 2 feet above the BFE. NFIP rates should still reflect that the home is located in the floodplain;

-05 6. Where safe to do so, USACE should dredge existing reservoirs and lakes to provide more capacity;

-06 7. The USACE should establish accurate (up to date) LIDAR elevations for the entire area and identify topology that would be flood prone, i.e., establish a local BFE, then require building 2 feet above that BFE. Commercial businesses are using high altitude Geiger LIDAR to rapidly map large areas and geophysicists have demonstrated the ability to rapidly determine water flow and pooling patterns that can show the public and FEMA where flooding will occur. Use them.;

-07 8. Immediately stop allowing fill dirt and levees to be built in any floodplain. These structures displace water to cause flooding elsewhere;

-08 9. Specifically for BB, be particularly careful about channelizing the bayou to protect homes built in the floodplains both behind the dams and near the outflow. There may be unintended consequences. The serpentine path of BB slows water flow and, yes, backs it up in areas west of Beltway 8 where it has already been straightened. But these restrictions may also have saved downtown from higher water levels.;

-09 10. In an area as flat as ours, acknowledging only riverine floodplains is a mistake. 66% of the homes that flood in major events are not in any mapped floodplain (see 7). All Houston must be treated as if it is in a floodplain and floodplain development rules applied. Otherwise, we simply move flooding from one neighborhood to another.

We welcome the opportunity to discuss these and other recommendations further with you.

cc: U.S. Congresswoman Lizzie Fletcher, Texas Congressional District 7 Texas Lt. Governor Dan Patrick

Texas State Senator Joan Huffman, District 17

Texas State Representative Jim Murphy, District 133 Mayor Sylvester Turner, City of Houston

Councilmember Greg Travis, City of Houston

District G Harris County Judge Lina Hildago

Harris County Precinct 3 Commissioner Steve Radack

Russ Poppe, Executive Director, Harris County Flood Control District