IN THE UNITED STATES COURT OF FEDERAL CLAIMS

In re UPSTREAM ADDICKS AND BARKER (TEXAS) FLOOD-CONTROL RESERVOIRS	Sub-Master Docket No. 17-9001L Judge Charles F. Lettow
THIS DOCUMENT APPLIES TO: ALL UPSTREAM CASES	

TEST PROPERTY PLAINTIFFS' OPENING POST-TRIAL BRIEF

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OVERVIEW

The Takings Clause is designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole.

Arkansas Game & Fish Comm'n v. United States, 568 U.S. 23, 31 (2012).

In the 1940s, the United States determined that the growing city of Houston, Texas, and the significant commerce produced by the Houston Ship Channel, needed protection against the devastation wreaked by the recurrent flooding on Buffalo Bayou. To achieve that public purpose, the United States Corps of Engineers built the operative federal project: two earthen dams that the Government operates to capture and control store stormwater runoff from the nearly 400-square mile area comprising the upper Buffalo Bayou watershed so that the runoff can be slowly, and safely, released into Buffalo Bayou without risk to the City of Houston or the Houston Ship Channel. For almost seventy years the Project provided that protection without significant incident.

But in August 2017, consistent with the Government's operating concept, stormwater impounded by the Government's flood control project immersed the private property of thousands of citizens living upstream of the Government-owned land behind the dams, bringing to public light what the Government has always known: that the design, construction, and operation of the Addicks and Barker dams would inundate properties it had no legal right to flood for the sole purpose of protecting downtown Houston and the Houston Ship Channel.

The Class 3 contaminated "dark water" held back by the Government's project submerged each of the properties owned by the thirteen Test Property Plaintiffs in this action, divesting each of them of their right to exclusively possess and enjoy their property, and causing each devastating economic losses and property destruction. The Government has always known, and indeed intended, to use and occupy these properties to maximize the available storage behind the Addicks and Barker dams and fulfill the public purpose of its flood control project.

The Government's actions, which forced these Test Property Plaintiffs to bear the public burden of safeguarding downtown Houston and the Houston Ship Channel from Harvey's floodwaters, is a paradigmatic taking under the Fifth Amendment to the United States Constitution.

ARGUMENT

THE GOVERNMENT'S DESIGN, CONSTRUCTION, AND OPERATION OF THE ADDICKS AND BARKER DAMS INTENTIONALLY CAPTURED AND STORED STORMWATER RUNOFF ON PLAINTIFFS' PROPERTIES, CAUSING THE TAKING OF EACH.

Part of the Buffalo Bayou and Tributaries, Texas Project authorized by Congress in 1938 was to provide flood risk reduction by temporarily impounding and then slowly releasing stormwater runoff from the Addicks and Barker reservoirs into Buffalo Bayou at a rate that does not result in flooding downtown Houston or the Houston Ship Channel.[1] During Tropical Storm Harvey the Addicks and Barker dams retained sufficient runoff that the ensuing reservoir pools inundated private property upstream of the Government-owned portion of the reservoirs.[2] As the Department of Justice has acknowledged to the Supreme Court, such an "inundation of land by backwaters behind a dam" is "now recognized as the archetypal taking by floodwaters." Brief for the Respondent, the United States of America, *Arkansas Game & Fish Comm'n v. United States*, No. 11-597, at 18-19 (U.S. Aug. 27, 2012); *see also* Brief for United States, *St. Bernard Parish Gov't v. United States*, No. 16-2301, at 24, 44-45 (Fed. Cir. Dec. 9, 2016) (noting that "when the water impounded in [a] reservoir created by a government-constructed dam submerges private property," such flooding is a "classic taking").

[1] Dkt. No. 211, Stipulations of Fact for Trial No. 86; JX 91, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, Fort Bend and Harris Counties, Texas, *2009 Master Plan* at 1 (August 2009, USACE 016051).

[2] PX 1747, Email from Richard Long to Jon Sweeten at 1 (September 5, 2017, USACEII 00655687) ("[W]e far exceeded the government-owned land …. This operation resulted in the flooding of thousands of homes upstream …."); 1 RR 153:1-157:3 (Thomas).

The test from *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003) speaks to whether the Government is liable to each Test Property Plaintiff for the physical occupation of their property with stormwater impounded by the federal project:

> First, [Plaintiff] must establish that treatment under takings law, as opposed to tort law, is appropriate under the circumstances. The tort-taking inquiry in turn requires consideration of whether the effects [Plaintiff] experienced were the predictable result of the government's action, and whether the government's actions were sufficiently substantial to justify a takings remedy. If these inquiries reveal that a takings remedy is potentially available, [Plaintiff] must show that it possessed a protectable property interest in what it alleges the government has taken.

The answer to all those questions is Yes. The undisputed evidence adduced at trial demonstrates that the maximum, sustained inundation of every single test property was due to the Government's standard operating procedure for its flood-control project. The Government therefore owes a categorical, Constitutional obligation to compensate Plaintiffs for the use and occupation of their property to effectuate the Project's public purpose: protect Houston and the Houston Ship Channel from the devastating flooding they would have experienced if Plaintiffs had not borne that burden.[3]

I. The Buffalo Bayou and Tributaries Project: The Government's Plan to Protect Downtown Houston from Devastating Flooding.

"The sole authorized purpose for the Addicks and Barker Reservoirs is to reduce potential flood damage along the downstream reach of Buffalo Bayou."[4] The only objective of the Project has

[3] As discussed herein, Plaintiffs have briefed this case pursuant to the *Ridge Line* test as well as the multi-factor inquiry discussed in *Arkansas Game & Fish* as well.

[4] PX 59, Draft Operational Assessment of the Addicks and Barker Reservoirs, Fort Bend and Harris Counties, TX at 8 (October 2009, USACE 464077). *See also* JX 5, Buffalo Bayou, Texas Definite Project Report at 3 (June 1, 1940, USACE 129504) ("It is a plan … to provide for complete control of floods on the Buffalo Bayou watershed and the protection of the city of Houston, Texas, and the Houston Ship Channel against the estimated probable maximum flood."); JX 110, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 3-1 (November 2012, USACE 016311) ("The existing project, as authorized, provides for flood risk management, the protection of the City of Houston from flood damages, and the prevention of excessive velocities and silt deposits in the Houston Ship Channel Turning Basin.").

always been to protect downtown Houston and the Houston Ship Channel from flooding—without regard to the impact on any private property upstream of the dams where stormwater runoff was unquestionably intended to be stored.[5] Critically, the flood control project at issue in this case has never been intended, or operated, in a manner to confer any flood-mitigation benefits on the upstream property owners damaged by the runoff held back and controlled during and after Harvey.[6]

During Harvey, the Project operated as expected, including the damage the Government knew would be inflicted on the upstream property owners as a direct result of those operations.[7] As Richard Long admitted from the top of the Barker dam:

> In this event, as the water backed up, we began releasing after the storm because the water was rising so fast in the reservoirs, but there was no way that we could let the water out fast enough to prevent these homes from going under up here. And it -- but with that being said, this area is designed to hold that water if necessary. It's unfortunate for you all, but that's how it's designed.[8]
>
> Did we know you would have five-foot of water in your home? We knew that if we got this event, there would be homes with water in them, yes.[9]

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[5] PX 59, Draft Operational Assessment of the Addicks and Barker Reservoirs, Fort Bend and Harris Counties, TX at 21 (October 2009, USACE 464090) ("The dams are operated strictly to prevent downstream flooding; therefore, the gates remain shut even if pool levels increase and flood upstream properties.").

[6] 6 RR 1453:21-24; 6 RR 1458:7-16; 2 RR 429:4-7; 4 RR 1011:1-3. Richard Long, the Natural Resource Management Specialist for the Corps, explained that the purpose of opening the gates was not to help the upstream landowners. 6 R.R. 1473:1-7. This testimony correlates with that of the Government's representative at trial, Robert Thomas, who explained that the project is not operated, constructed, or used to provide flood mitigation benefits to the upstream area. 1 RR 65:10-16; JX 94, Addicks and Barker Upstream Meeting Summary Report (February 2010, USACE 594485)(stating "these structures were built to hold back and control water runoff from the upper Buffalo Bayou watershed.").

[7] PX 25, Memorandum for Commander, Southwestern Division at 1, (October 27, 2017, USACE 016689); 1 RR 170:19 – 171:20 (Thomas trial testimony).

[8] PX 2176 at 2:4-18 (transcript of video of Richard Long) (emphasis added). (By separate motion, Upstream Plaintiffs are seeking admission into the record of the transcription of admitted video exhibit PX 2176 as PX 2176A. For accuracy, when this brief cites to PX 2176, the transcript prepared by the CFC's Court Reporter will be utilized and the page/line references included within the citation form.).

[9] PX 2176 at 3:11-13 (transcript of video of Richard Long) (emphasis added).

A. The Need for, and Public Purpose of, the Federal Flood Control Project.

Arising in eastern Waller County and western Harris County, Buffalo Bayou flows in an eastward direction for approximately 75 miles.[10] Below its confluence with South Mayde Creek in western Harris County, Buffalo Bayou continues through downtown Houston and then further east into the Houston Ship Channel, Galveston Bay, and eventually the Gulf of Mexico.[11]

Storms in May 1929 and December 1935 over the Buffalo Bayou watershed resulted in severe flooding of downtown Houston and served as the immediate impetus for Congressional action. The May-1929 and December-1935 storms were two of six floods that occurred in Buffalo Bayou between 1854 and 1935.[12] The May 1929 storm generated rainfall that varied from 6 to 12 inches over the White Oak Bayou and Buffalo Bayou basins and resulted in reported property losses within the City of Houston of $1,392,000.[13] The storm of December 1935 resulted in a 3-day rainfall that averaged about 15 inches over the White Oak Bayou and Buffalo Bayou basins and caused the loss of eight lives and property damage estimated at $2,528,000.[14]

In response, pursuant to the River and Harbors Act of 1938, Congress authorized the U.S. Army Corps of Engineers (the "Corps" or "USACE") to design and build the Addicks and Barker dams as part of the Buffalo Bayou and Tributaries, Texas Project.[15] Located approximately 17 miles

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[10] Dkt. No. 211, Stipulations of Fact for Trial No. 84.

[11] Dkt. No. 211, Stipulations of Fact for Trial No. 84, 85.

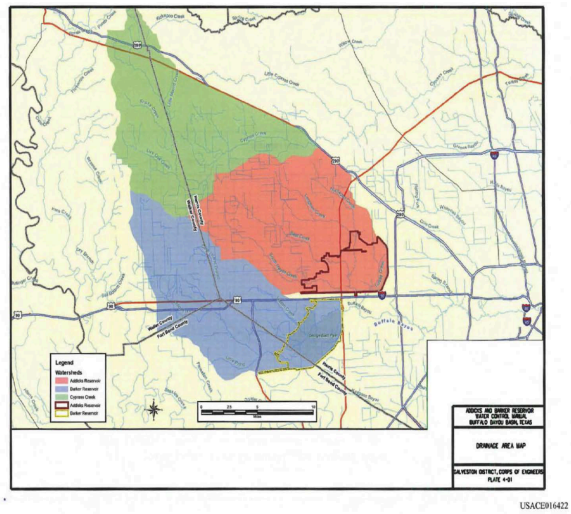
[12] JX 5, Buffalo Bayou, Texas, *Definite Project Report* at 6 (June 1, 1940, USACE 129507); Dkt. No. 211, Stipulations of Fact for Trial No. 81; *see also* PX 777, Buffalo Bayou, Texas, Flood Control Project, Houston Texas: Addicks Dam, *Analysis of Design* at 4-5 (September 1945, USACE 010327-28).

[13] Dkt. No. 211, Stipulations of Fact for Trial No. 82.

[14] Dkt. No. 211, Stipulations of Fact for Trial No. 83; *see also* JX 91, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, Fort Bend and Harris Counties, Texas, *2009 Master Plan* at 1 (August 2009, USACE 016051). According to NOAA Atlas 14, rainfall from the 1935 storm translates to a 25-year storm. PX 2293, NOAA Atlas 14, Vol. 11, Version 2 (November 2018).

[15] JX 52, Buffalo Bayou and Tributaries, Texas, *Reconnaissance Report: Section 216 Study, Addicks and Barker Reservoirs, Houston, Texas* at 2 (October 1995, USACE 015131). The 1938 Act was subsequently amended by the 1939 and 1954 Flood Control Acts, but no additional project structures were

west of downtown Houston,[16] the Project's sole purpose has always been to provide flood risk reduction to the City of Houston by temporarily detaining stormwater runoff from the massive Addicks and Barker watersheds (as well as a portion of the Cypress Creek basin which overflows into Addicks during heavy rains) and then releasing it into Buffalo Bayou at a rate that does not endanger downtown Houston or the Houston Ship Channel.[17] Joint Exhibit 110, the Project Drainage Area Map (Plate 4-1 of the November 2012 Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual*, USACE 016422) depicts the enormous area from which storm runoff flows into the Addicks and Barker reservoirs:



authorized or constructed pursuant to those Acts. JX 22, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs, *Hydrology* at 1 (August 1977, USACE 234615); Dkt. No. 211, Stipulations of Fact for Trial Nos. 79-81.

[16] Dkt. No. 211, Stipulations of Fact for Trial No. 100; JX 91, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, Fort Bend and Harris Counties, Texas, *2009 Master Plan* at 3 (August 2009, USACE 016053).

[17] Dkt. No. 211, Stipulations of Fact for Trial No. 86; JX 91, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, Fort Bend and Harris Counties, Texas, *2009 Master Plan* at 1 (August 2009, USACE 016051). The drainage area for the Addicks Reservoir watershed is approximately 136 square miles, and that of the Barker Reservoir watershed is approximately 130 square miles. Dkt. No. 211, Stipulations of Fact for Trial Nos. 88, 89. The portion of the Cypress Creek watershed that flows in to the Addicks Reservoir watershed is approximately 130 square miles as well. JX 110, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 3-1 (November 2012, USACE 016316.

B. The Original Design and Construction of the Project; the Corps Built Dams to Hold More Water Than It Can Legally Store.

Three storms were used in the design of the Buffalo Bayou Flood Control Project: a 1899 storm centered on Hearne, Texas; a 1921 storm over Taylor, Texas; and the 1935 Houston, Texas storm.[18] The 1899 Hearne, Texas storm (as modified using the rainfall intensities from the 1921 Taylor, Texas storm) was called the "design storm" and was used to establish the maximum amount of runoff the dams would be expected to capture and store.[19] After calculating that the "savings in annual interest would be in excess of the probable damages,"[20] the Government elected to acquire real estate to store impounded runoff by reference to the reservoir pool resulting from the 1935 Houston, Texas storm, plus another 3 feet of freeboard or allowance.[21]

As originally designed, the Project included the following: three detention reservoirs (Addicks, Barker, and White Oak); a levee to prevent overflow from the Cypress Creek basin into the Addicks reservoir; and a system of canals to convey releases from the proposed White Oak reservoir to the San Jacinto River, and from the proposed Addicks and Barker reservoirs south to empty directly into Galveston Bay.[22] Joint Exhibit 7, the Project Plan (Plate 13 of the Buffalo Bayou, Texas Definite Project Report (June 1, 1940, USACE 010165) shows the design of the entire original Project.

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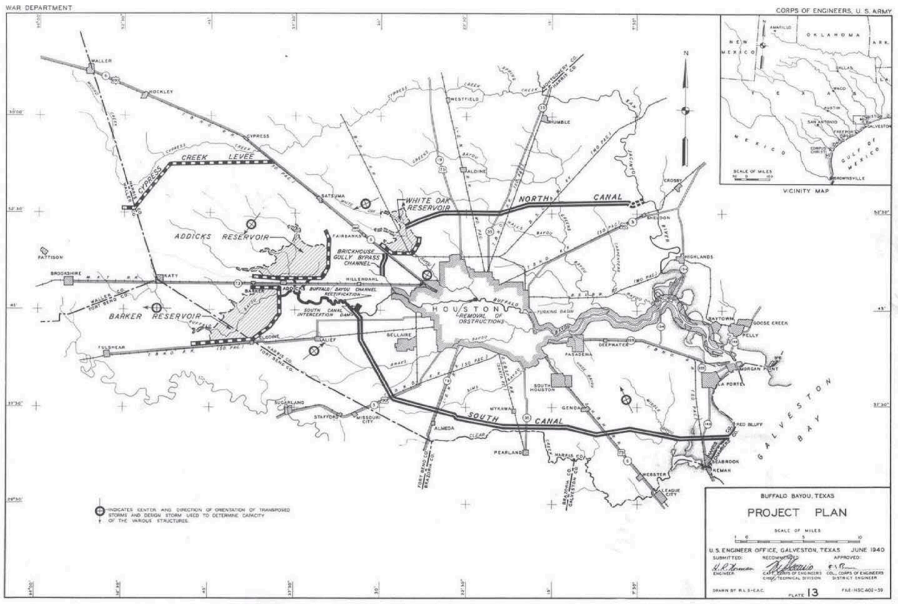
[18] PX 87, Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Environmental Assessment: Dam Safety* at 1, §3.02 (November 1981, USACE 012906).

[19] PX 87, Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Environmental Assessment: Dam Safety* at 1, §3.02 (November 1981, USACE 012906); PX 777, Buffalo Bayou, Texas, Flood Control Project, Houston Texas: Addicks Dam, *Analysis of Design* at 5 (September 1945, USACE 010328).

[20] JX 5, Buffalo Bayou, Texas Definite Project Report at 26-27 (June 1, 1940, USACE 129527-28).

[21] PX 87, Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Environmental Assessment: Dam Safety* at 1, §3.02 (November 1981, USACE 012906).

[22] *See* PX 59, Draft Operational Assessment of the Addicks and Barker Reservoirs, Fort Bend and Harris Counties, TX at 2 (October 2009, USACE 464071) ("The dams were designed to work in tandem with a large diversion canal, taking peak flows in the Buffalo Bayou and diverting then to Galveston Bay near Clear Lake."); JX 110, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 3-2 (November 2012, USACE



The Corps began construction of Addicks dam in May 1946 and completed it in December 1948.[23] Addicks dam consisted of an earthen embankment that measures approximately 61,166 feet or 11.6 miles in length with five outlet conduits.[24] Construction of Barker dam began in February 1942 and was completed in February 1945.[25] Barker dam consisted of an earthen embankment that measures approximately 71,900 feet or 13.6 miles in length with five outlet conduits.[26]

Behind the Addicks dam, the United States acquired all land at and below an elevation of 103 feet NAVD 1988 (2001 adjustment); approximately 12,460 acres of property.[27] Behind the Barker dam, the

016312) ("A system of canals was to convey releases from White Oak Reservoir, north of Houston, to the San Jacinto River, and from Addicks and Barker Reservoirs, south of Houston, to Galveston Bay.").

[23] Dkt. No. 211, Stipulations of Fact for Trial No. 90.

[24] Dkt. No. 211, Stipulations of Fact for Trial No. 92, 93.

[25] Dkt. No. 211, Stipulations of Fact for Trial No. 95.

[26] Dkt. No. 211, Stipulations of Fact for Trial No. 97, 98.

[27] Dkt. No. 211, Stipulations of Fact for Trial No. 94, 102.

government acquired all land at and below an elevation of 95 feet NAVD 1988 (2001 adjustment); approximately 12,060 acres of property.[28]

Based on the dams' design, the Government has always known that each reservoir would store significantly more stormwater runoff than the Government-owned land would contain.[29] The Government decision to acquire inadequate land to store the runoff held back and controlled by the Project was "considered an acceptable low-frequency risk because of the relatively remote rural project location" based on a cost/benefit analysis of the circumstances at the time of construction.[30] Corps documents recognize that the failure to acquire—in fee—all land up to the top of the flood control pool (the highest level that would be flooded as a result of the Project's design) violated its standing land acquisition policy.[31] And since their original construction, the Government has routinely decided to forgo even requesting authority to acquire any additional private property behind either dam based a cost/benefit analysis. As Paula Johnson-Muic, the Chief of Real Estate for the Southwestern Division of the Corps of Engineers, testified:

> Q. And in each case, the '70s, the '80s, the '90s, and the 216 report [1995], the government evaluated the option to acquire more land upstream, within the Addicks and Barker reservoirs, to address the risk of inundation of private property by water retained from the Addicks and Barker dams, and at each decision the government rejected that option based on a cost/benefit analysis performed by the Corps; correct?

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[28] Dkt. No. 211, Stipulations of Fact for Trial No. 99, 104.

[29] PX 87, Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Environmental Assessment: Dam Safety* at 4, §5.04 (November 1981, USACE 012909) ("The inadequacy of Government owned land upstream of the reservoir embankments to contain water from the SPF was recognized in the original design of the reservoirs.").

[30] JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 5 (October 1995, USACE 015134); *see also* 4 RR 834:2-15.

[31] PX 84, Report to the Congress, *Review of Policies and Practices for Acquiring Land for Reservoir Projects: Corps of Engineers, Department of the Army* at 5 (February 3, 1969) ("Prior to 1953, the Corps followed a policy of acquiring fee title to most reservoir land up to the top of the flood control pool [the highest level that could be flooded as a result of the Project as designed] and to additional land needed to block out property lines in accordance with sound real estate practices.").

A. In the reports that -- excuse me, that evaluated land, ultimately those options were screened out due to the economics of the project, yes.[32]

Moreover, the Government stuck to this philosophy of employing a cost/benefit analysis to rationalize its operating concept of imposing flooding on private lands without any legal right to do so even after it had recognized that "[i]n no instance can 'too high a cost' be used as a justification for not acquiring land or an interest therein when it will or may be adversely affected by project operations."[33] Indeed, the Corps' own regulations recognize it should have acquired all the land within the reservoirs that the Project was designed to submerge.[34] Yet, the Government stuck to its decision to accept the risk of imposing flooding on the upstream private properties based on a cost/benefit analysis despite the fact that its own regulations forbid such a callous rationalization as "discredited from an ethical and public welfare standpoint."[35]

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[32] 5 RR 849:11-23.

[33] PX 39, Letter from LTC Russel J. Krutchen, U.S. Army Corps of Engineers to the Southwestern Division Chief Engineer Re: Buffalo Bayou and Tributaries, Addicks Dam, Texas, Inspection Report No. 2 at 1 (October 29, 1974, USACE 233664). That Letter also notes that with the passage of Public Law 91-646 in 1971, Congress has specifically directed that "no Federal agency head shall intentionally make it necessary for an owner to institute legal proceedings to prove the fact of the taking of his real property." Id (USACE 233664).

[34] PX 34, ER 405-2-150, *Change 3* at 5 (January 24, 1969, USACE 661148).

[35] PX 27, ER 1110-8-2, *Inflow Design Floods for Dams and Reservoirs* at 1 (March 1, 1991, USACE 019623); *see also* 1 RR 96:23-97:2.

It is important to note that Plaintiffs' position is not that the Government's failure to acquire additional land behind the dams upon which to store stormwater runoff is the "governmental action" which constitutes the taking in this case. Rather, the evidence adduced confirms the knowledge and intent of the Government to use private property to fulfill the Project's public purpose from the first day construction of the dams was completed. *See Hansen v. United States*, 65 Fed. Cl. 76, 114 (2005) (noting that a taking is foreseeable if it is the direct, natural or probable result of the alleged authorized action for a public purpose and not a mere eventual or consequential injury inflicted by those actions); (citing *Richard v. United States,* 282 F.2d 901, 904 (Ct. Cl. 1960) ("It is not necessary to show that the defendant intended to take plaintiff's land; all that plaintiff need show is that the taking of its land was the natural and probable consequence of the acts of the defendant. It is not even necessary for plaintiff to show that defendant was aware of the taking of an interest in its property would naturally result from its acts. It is only necessary to show that this was in fact the natural and probable consequence of them.")); *see also See Arkansas Game & Fish Comm'n v. United States*, 736 F.3d 1364, 1372-73 (Fed.

At trial, Robert Thomas discussed the Corps' engineering regulations and policies, and he agreed that the General Policy detailed in ER 1110-8-2 (1991) provides that dams operated by the Corps will not create a threat of loss of life or excessive property damage.[36] Thus, this Project stands out as an anomaly.[37]

C. Subsequent Corps Actions Ensure the Guarantee of Upstream Inundation.

In response to changing circumstances, updated engineering practices, and advanced scientific and hydrologic information, the Government effected multiple operational changes and Project modifications over the years. However, faced with the Project's sole purpose of downstream flood protection, every action, decision, and modification undertaken by the Corps for the last seventy years has worked to further the interests of those downstream properties at the expense of upstream properties, serving only to guarantee the inevitable flooding of the upstream properties which lie within the Project's true boundaries.

The original Project design called for only one of the conduits at each dam to be gated, thus allowing for the release of 15,700 cfs into a dedicated diversion canal that would carry the runoff all

Cir. 2013) (opinion after remand) (foreseeability encompasses both what the Corps knew at the time it built the Dams as well as what it could have foreseen would be the consequences of its actions).

[36] 2 RR 351:2-11.

[37] When asked whether there were any other Corps dams that failed to acquire either a flowage easement or fee simple up to a taking line or uncontrolled spillway, Robert Thomas proposed one, but was proved to be wrong. 2 RR 351:2-11; 4 R.R. 1011:14-1012:9; 1032:15 – 1033:2 (confirming that, at the Lewisville dam, the flowage easement elevation was actually above the uncontrolled spillway elevation); *see also* PX 3000.

the way to Galveston Bay.[38] But the diversion canal from the dams to Galveston Bay was never built, which served to limit the amount of water that could safely be released from the reservoirs.[39]

Moreover, in parallel 1974 reports the Corps noted the problems posed at each dam from the continued downstream development along Buffalo Bayou. The originally-envisioned maximum release of 15,700 cfs from four uncontrolled outlet conduits was jettisoned when those outlets were gated in 1948 and 1963.[40] Later, downstream flooding complaints from the increasing development along Buffalo Bayou resulted in the Corps decision to limit discharges from both dams to a total of about 2,000 cfs.[41]

Finally, in the 1970s and 1980s, the Corps undertook an evaluation of the dams in light of updated hydrologic criteria (including an updated Spillway Design Flood evaluation), which led to a

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[38] JX 32, Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *General Design Memorandum* at 3, §2.1.3 (June 1984, USACE 013288); PX 777, Buffalo Bayou, Texas, Flood Control Project, Houston Texas: Addicks Dam, *Analysis of Design* at 7-8 (September 1945, USACE 010330-31) (south channel would carry a total of over 15,000 cfs "without overflowing its banks"); 1 RR 192:18-25 (Thomas: south canal in original design would have had sufficient capacity to carry all surcharge releases directly to Galveston Bay from Addicks and Barker dams). As the Corps acknowledged in 2012, "The original standard project floods were computed in 1940. As with the original Spillway Design Flood the original Standard Project Flood was calculated incorporating features that were never actually constructed." JX 110 Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 8-2 (November 2012, USACE 016345).

[39] 1 RR 192:18-25 (Thomas: south canal with sufficient capacity to carry all surcharge releases to Galveston Bay from Addicks and Barker dams never built).

[40] PX 38, Memo: Buffalo Bayou and Tributaries, Barker Dam, Texas, Inspection Report No. 2 at 3 (August 6, 1974, USACE 233704); PX 39, Memo: Buffalo Bayou and Tributaries, Addicks Dam, Texas, Inspection Report No. 2 at 3 (October 29, 1974, USACE 233672); *see also* JX 32, Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *General Design Memorandum* at 3, §2.1.3 (June 1984, USACE 013288).

[41] PX 38, Memo: Buffalo Bayou and Tributaries, Barker Dam, Texas, Inspection Report No. 2 at 3 (August 6, 1974, USACE 233704); PX 39, Memo: Buffalo Bayou and Tributaries, Addicks Dam, Texas, Inspection Report No. 2 at 3 (October 29, 1974, USACE 233672); *see also* PX 105, Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams: Dam Safety Assurance, *Environmental Assessment* at 3, §3.4 (March 1986, USACE 681859).

decision to raise the embankments and install auxiliary spillways for each dam.[42] No other major modifications to the dams have ever been constructed.[43]

Crucially, however, at every turn the design, construction, and operational decisions and actions taken by the Corps have always been for the benefit and protection of downstream properties; never has the Corps modified or operated the Project to benefit (or protect) upstream property owners despite its knowledge they would be submerged by the use and operation of the Project.[44]

D. The Foreseeable Flooding of Private Property to Protect Houston.

The documentary record speaks volumes about the Government's knowledge and intent, as well as the predictability and foreseeability of the flooding experienced by Plaintiffs. It also shows the Government chose not to follow its own policy that "dams designed, constructed, or operated by the Corps will not create a threat of loss of life or inordinate property damage."[45]

According to the original 1940 *Definite Project Report* for the Project, the Government decided to not purchase enough land to store the stormwater it intended the dams to impound based on a cost-benefit analysis since "the land's primary use at that time was for agricultural purposes and any damage which might occur would be infrequent and relatively minor."[46] Throughout the years, the

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[42] 1 RR 127:10-22; 2 RR 348:20-25; 2 RR 486:15-487:2; 2 RR 497:16-498:3.

[43] 2 RR 349:7-10. There has, of course, been maintenance work done on the embankments and outlet structures. 2 RR 349:2-5.

[44] 6 RR at 1458:7-16 (testimony of Richard Long); 6 RR at 1473:3-7 (*id.*); 6 RR at 1474:13-16 (*id.*); *see also* 2 RR 428:23-429:6 (Thomas: there have never been any changes subsequent to 2009 concerning the operation of the Addicks and Barker dams to try to reduce the impact to upstream properties because the purpose of the project is to protect downstream properties).

[45] PX 27, ER 1110-8-2, *Inflow Design Floods for Dams and Reservoirs* at 1 (March 1, 1991, USACE 019623); *see also id.* at 5 (USACE 019627) ("An important objective of a project design will be to limit storage accumulation during floods to avoid excessive damage or a threat to life within reservoir areas upstream from the dam.").

[46] JX 5, Buffalo Bayou, Texas Definite Project Report at 26-27 (June 1, 1940, USACE 129527-28) ("Acquisition to a taking line, 3 feet above the computed pool elevations for the 1935 storm centered above each reservoir, is considered advisable, since the savings to annual interest would be in excess of the probable damages from storms producing pools greater than the taking-line limits."); PX 87,

Government held to this decision even though changed land use and rainfall data proved both of those premises wrong.

In 1945, the Corps internally acknowledged that it had selected the Project's location after determining "the entire watershed above the confluence of South Mayde Creek and Buffalo Bayou must be controlled," which refers to the Project's strategic location at the confluence of several incoming tributaries.[47]

In 1962, the Corps evaluated changed circumstances downstream along Buffalo Bayou and recognized that "Since 1945 extensive residential expansion has greatly increased the damage potential within the flood plain. Bridges and improvements within the channels, such as warehouses and docks, have restricted the flow of flood waters and increased flood heights."[48] Still, the Corps reaffirmed that its general plan of reservoir regulation was to use all currently available storage to mitigate downstream flood stages.[49]

In 1973, D.T. Graham, Chief of the Galveston District's Engineering Division realized that the Corps needed to come up with a plausible story to explain its operating concept, which necessarily involves flooding private property with impunity:

> "The fact that maximum impoundment in subject reservoirs will cause flooding of substantial amounts of private lands adjoining the fee-owned Government land is expected to soon become a public issue, primarily with respect to Addicks. We have already had one inquiry from an investor interested in land at the upper end of Addicks.

Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Environmental Assessment: Dam Safety* at 4, §5.04 (November 1981, USACE 012909).

[47] PX 777, Buffalo Bayou, Texas, Flood Control Project, Houston Texas: Addicks Dam, *Analysis of Design* at 4-5 (September 1945, USACE 010324).

[48] JX 16, Buffalo Bayou, Texas, Reservoir Regulation Manual for Addicks and Barker Reservoirs at 15 (April 1962, USACE 011648).

[49] JX 16, Buffalo Bayou, Texas, Reservoir Regulation Manual for Addicks and Barker Reservoirs at 23 (April 1962, USACE 011656).

> *It is suggested that the project engineer research the background of the situation and develop a history and rationale for our operating concept of imposing flooding on private lands without benefit of flowage easement or other legal right*."[50]

In 1974 the Government again admitted that it did not have fee title or flowage easements on the land within its reservoirs, and that development of the area in between the limit of Government-owned land and the reservoirs' limits (the so-called "fringe area") "will eventually place the Government in the position of having to flood the area within the reservoir with the accompanying damage in order to protect downstream improvements in the event of a severe future storm."[51] The Corps similarly recognized that intended Project operations would impose flooding on 9,100 acres of privately-owned land (4,000 acres behind the Addicks dam and 5,100-acres behind Barker).[52]

In 1977, the Government commissioned a comprehensive restudy and analysis of the general hydrology concerning the dams, which it deemed necessary because new information and engineering analysis made it "apparent that urbanization of the subject watersheds will soon reach levels in excess of those considered in the original design and updated hydrologic criteria prescribe more severe design standards than those addressed in the original hydrologic investigation."[53] While the main focus of the Corps efforts at the time was on the lack of adequate spillway capacity, a condition that could lead to failure of either dam resulting in catastrophic downstream flooding,[54] the study also noted that the

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[50] PX 37, Memo: Addicks and Barker Reservoirs – Encroachment on Private Lands at 1 (May 3, 1973, USACE 667927) (emphasis added).

[51] PX 39, Memo: Buffalo Bayou and Tributaries, Addicks Dam, Texas, Inspection Report No. 2 at 5 (October 29, 1974, USACE 233674); PX 38, Memo: Buffalo Bayou and Tributaries, Barker Dam, Texas, Inspection Report No. 2 at 4-5 (August 6, 1974, USACE 233705-706).

[52] PX 39, Memo: Buffalo Bayou and Tributaries, Addicks Dam, Texas, Inspection Report No. 2 at 5 (October 29, 1974, USACE 233674), and PX 38, Memo: Buffalo Bayou and Tributaries, Barker Dam, Texas, Inspection Report No. 2 at 4-5 (August 6, 1974, USACE 233705-706).

[53] JX 22, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Hydrology at 1 (August 1977, USACE 234615).

[54] JX 26, Memo: Buffalo Bayou and Tributaries – Spillways for Addicks and Barker Dams at 1 (September 5, 1980, USACE 530470).

extensive suburban development of the Addicks and Barker watersheds, which had contributed to the problem, should be expected to continue.[55] Indeed, in an internal 1978 memo the Corps noted "Rapid residential development in the area immediately above Government-owned real estate [at both Addicks and Barker reservoirs] was in progress," and that current studies showed that reservoir pool elevations which would retain stormwater runoff well in excess of that which could be stored on Government-owned land was clearly possible "under existing conditions;" an occurrence that would cause "[e]xtensive damage … in the reservoir area from an event of [such] magnitude."[56]

By 1980, the Corps recognized that the original takings lines for the Project "are now 4.5 and 3.1 feet below the current Standard Project Flood levels for Addicks and Barker, respectively."[57] In that same 1980 memo, the Corps admitted that the amount of Government-owned land behind Addicks and Barker dams did not comply with its existing hydrologic criteria for acquisition of reservoir lands (ETL 1110-2-22), and that "Should additional lands (primarily the undeveloped ones) not be purchased now, the opportunity will probably be lost forever."[58] And in the 1981 Environmental Assessment of the Project following the Corps' earlier hydrologic review, District Engineer Col. James Sigler concluded:

> "I find that design and construction of the dams in the late 1930's and 1940's was consistent with criteria applicable at that time; however, since their design and

[55] JX 22, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Hydrology at 5 (August 1977, USACE 234619).

[56] PX 42, Memo: Water Control Manuals for Addicks Reservoir and Barker Reservoir (May 1, 1978) at USACE 541551 (Addicks) and USACE 541562 (Barker).

[57] JX 26, Memo: Buffalo Bayou and Tributaries – Spillways for Addicks and Barker Dams at 2 (September 5, 1980, USACE 530471); Robert Thomas explained that the Standard Project Flood is one that is "reasonably expected to occur." 1 RR 98:25-99:5.

[58] JX 26, Memo: Buffalo Bayou and Tributaries – Spillways for Addicks and Barker Dams at 2 (September 5, 1980, USACE 530471); *see also* PX 45, Memo: Buffalo Bayou and Tributaries – Spillways for Addicks and Barker Dams at 1 (June 2, 1980, USACE 327041) ("In order that Addicks and Barker Reservoirs be in strict compliance with SWD ETL 1110-2-22, we determined that it would be necessary to acquire real estate interests in the area encompassed by a line representing the elevation of the SPF plus appropriate freeboard for the selected plan.").

> construction, the state-of-the-art in flood analysis and the recorded occurrence of much larger floods than previously considered possible have resulted in significant changes in design criteria for reservoirs, particularly those which protect urban areas. These changes in design criteria have resulted in a design flood, termed the Spillway Design Flood (SDF), of much larger magnitude than the dams were designed for originally."[59]

Finally, after seven years of investigating and screening seventeen alternatives to fix the inadequate spillway capacity at the Addicks and Barker dams, the Corps narrowed the potential choices to seven and evaluated each in a 1984 General Design Memorandum. In discussing the "No Action" alternative, the Corps noted that under current conditions during the occurrence of a Standard Project Flood (SPF), "the reservoirs could be operated to maintain integrity of the dams from failure and overtopping; however, the flooding would extend beyond the Government-owned land upstream of the reservoirs …."[60] Of note, in that same year the Corps internally remarked that "The PMF [Probable Maximum Flood] on an empty pool is considered a probable occurrence when compared with the 1979 Claudette rainfall event which occurred some 40 miles to the south of the reservoirs."[61]

In 1992 the Corps prepared a "Addicks and Barker Reservoirs Special Report on Flooding," specifically to "give an overview of the order of magnitude of the anticipated flooding damages which

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[59] PX 87, Environmental Assessment: Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Proposed Finding of No Significant Impact* at 1 (November, 1981, USACE 012895); *see also* PX 85, Public Information Notice: Buffalo Bayou and Tributaries, Texas – Addicks and Barker Dams at 6 (October 23, 1980, USACE 543334) ("Since construction, major changes have evolved in design criteria, resulting in the necessity to consider a more severe flood event to insure the safety of the dams. This flood which is of larger magnitude than the dams were designed for originally is termed the Spillway Design Flood (SDF). The magnitude of this flood is about twice that of the SPF."). Still, in the 1981 Press Release announcing the upcoming work at the dams, the Corps made absolutely no mention concerning the problem of expected upstream flooding. *See* PX 446, News Release, Public Affairs Office, U.S. Army Corps of Engineers, *Dam Safety Plans Announced by Corps For Addicks and Barker Reservoirs* at 1-3 (November 19, 1981, FB 0017431-33).

[60] JX 32, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Dams, Dam Safety Assurance, *General Design Memorandum* at 5 (June 1984, USACE 013290).

[61] JX 31, Memo: Consideration of Alternatives for preserving Integrity of Addicks & Barker Reservoirs Embankments at 2 (February 13, 1984, USACE 487626).

could occur off of Government property assuming different flood events."[62] Even though the Director of Planning at the time, Eugene Sikes, P.E., called the title of the report "misleading" since the report did not include details about the storms most recently endured in the spring of 1992,[63] the Report does recognize that Corps regulations required that the available storage capacity behind the Addicks and Barker dams be utilized "to the maximum extent possible" in order to achieve their primary flood control objective: prevention of "damaging stages on downstream Buffalo Bayou."[64] The report concluded that the failure to construct a channel to carry runoff directly to Galveston Bay, and the 2,000 cfs release limit for the dams meant that "single occurrence damages for the Possible Maximum Flood [PMF] would affect over 4,000 structures valued at approximately $725 million and cause damages of $245 million. The Standard Project Flood would impact 2,800 structures worth $400 million and cause $100 million in damages."[65] The soaring numbers associated with upstream flooding impacts was due to what the report recognized as "the extensive urban growth of the western portion of the Houston metropolitan area" which had "resulted in both reservoirs being surrounded by intense

[62] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 1 (May 1992, USACE 314495).

[63] PX 1406, Memo: Review of Report on Flooding, Buffalo Bayou and Tributaries (June 12, 1992, USACE 529851).

[64] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 5 (May 1992, USACE 314499); JX 110 Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 7-2 (November 2012, USACE 016336) ("Addicks and Barker Reservoirs will be operated to provide maximum downstream flood protection on South Mayde Creek and Buffalo Bayou."); *see also id.* at 7-4 (USACE 016338) ("In keeping with the primary objective of flood control for Addicks and Barker reservoirs, the general plan for reservoir regulation will be to operate the reservoirs in a manner that will utilize to the maximum extent possible, the available storage to prevent the occurrence of damaging stages on Buffalo Bayou within the limits placed by the constraints on project operations.").

[65] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 9 (May 1992, USACE 314503).

commercial and residential development."[66] And critically, as the Corps representative, Robert Thomas, testified, the Corps knew that such a PMF was actually probable to occur given the experience Houston had endured during Tropical Storm Claudette in 1979.[67]

Nevertheless, the Corps recognized that given the absence of any public awareness program, the residents would remain unaware of or ignore the flood threat—and that turnover in home ownership could also "result in a significant number of residents being unaware of the risk."[68] The Corps never implemented any program to alert any resident of the fact that they were living in a Government reservoir, even though it recognized that such a program (coupled with an early warning system and evacuation plan), "could substantially reduce health and safety risks and moderately reduce flood damages."[69] Nor did the Government undertake to obtain flowage easements "as a means to avoid damage claims in the event of flooding," even though such an acquisition strategy "would be a positive step toward fairness to the property owners, public awareness of the flood threat, and elimination of legal actions on claims."[70] Instead, once again the Corps ignored the known (and intended) effect of its flood control project and opted for the "No Action" alternative, which recognized that the Government was content to continue

> accepting the risk that substantial numbers of houses will be damaged by rare, severe flood events. Residents will be forced to evacuate and remain in temporary housing for long periods. Health and safety risks will be perpetuated. The Government will be

[66] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 6 (May 1992, USACE 314500).

[67] 2 RR 337:17-339:1.

[68] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 11 (May 1992, USACE 314505).

[69] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 11 (May 1992, USACE 314505).

[70] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 12 (May 1992, USACE 314506).

> subject to potential claims for monetary losses, and the Corps will be faced with a continuing adverse public image.[71]

Instead of initiating any preventative action, yet another study of a problem that the Corps already knew about, and which was only getting worse, was suggested.[72] That study was begun in 1994 and completed in 1995.[73]

While the 1995 *Reconnaissance Report: Section 216 Study, Addicks and Barker Reservoirs, Houston, Texas* identified "the existing and potential problems caused by changed conditions and operations," it did not "identify a feasible solution to reduce existing problems" – including the potential liability of future flooding.[74] The *Report* notes the gating of all dam outlets "and the need to control outflow has resulted in prolonged ponding in the reservoirs, which was not intended in the original design."[75] The 2,000 cfs limit on outflows into Buffalo Bayou also acts to prolong the storage of flood waters in the detention facilities and requires that available storage capacity within the reservoirs be utilized "to the maximum extent possible" to prevent damaging stages on downstream Buffalo Bayou.[76] Because of the changes in use and operation of the dams, the *Reconnaissance Report* admits

> There is also a potential threat of property damage upstream of the reservoir lands. The dams and reservoir lands acquired for upstream temporary reservoir storage are now surrounded by residential and commercial developments. Densely populated housing developments essentially fill the fringe areas between government owned

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[71] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 10 (May 1992, USACE 314504).

[72] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 16 (May 1992, USACE 314510).

[73] *See* DX 896, Addicks & Barker Reservoirs, Section 216 Study: Coordination Meeting (June 16, 1994, USACE 314829); JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* (October 1995, USACE 015108-423).

[74] *See* JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 1 (October 1995, USACE 015130).

[75] *See* JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 5 (October 1995, USACE 015134).

[76] *See* JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 6 (October 1995, USACE 015135).

> lands (GOL) and the maximum pool elevation adjacent to Addicks Reservoir. Much of the fringe areas of Barker Reservoir are bordered by similar developments and the rest are rapidly developing.[77]

The *Report* also states "[p]rior to study initiation, it was assumed there would be a wide range of feasible alternatives to resolve the problems of the reservoirs," and sets forth ten (10) possible courses of action—including "Accept existing conditions and risk through No Action."[78] Ultimately, the Government chose the "No Action" alternative that was chosen because "economic evaluations for the study show that economic justification for providing solutions of major scope and size is lacking."[79]

Nor did the Corps ever take any steps to address the insufficient storage area behind the Addicks and Barker dams, even in the face of mounting operational pressures on the dams caused by more and more development in the watersheds.[80] As the Corps' 2012 *Water Control Manual* noted, "continual upstream development has increased inflow into the Reservoirs due to these developments and is likely to continue."[81] And that "[p]resently, pool levels in excess of Government-owned land will damage residential developments adjacent to Government-owned lands."[82]

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[77] *See* JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 7 (October 1995, USACE 015136).

[78] JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 7-8 (October 1995, USACE 015136-37).

[79] JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 9 (October 1995, USACE 015138).

[80] *See* PX 104, Email from Joseph Hrametz, SWG to Fred Anthamatten, SWG at 1 (May 11, 2011) ("Both Addicks and Barker Dams can impound or store more water than the Corps owns real estate to store it on. The larger, longer lasting and more frequent pools addressed above increases the potential of this occurring. Should this occur a large number of residents, businesses and infrastructure located within the maximum possible pools could be severely impacted for an extended period of time.").

[81] JX 110 Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 3-5 (November 2012, USACE 016315).

[82] JX 110 Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 7-1 (November 2012, USACE 016335).

The gap associated with inadequate Government land is massive. According to the Water Impact Tables in the Corps' 2014 Emergency Action Plan (JX 118), Addicks reservoir can store 329,676 acre-feet of water in total during a Spillway Design Flood) and 191,652 acre-feet of water during a Standard Project Flood; but the Government only owns enough land to store 127,591 acre-feet of water. Likewise, the Barker reservoir can store 281,267 acre-feet of water during its Spillway Design Flood, and 133,879 acre-feet of water during a Standard Project Flood; but the Government only owns enough land to store 82,921 acre-feet of water.

Addicks

Elevation[1] (Feet)	Surface Area[3] (Acres)	Capacity[3] (Acre-Feet)	Capacity[4] (Percent)	Impacts
101.2	12,002	105,034	53	First street flooded upstream
103.0	13,016	127,591	64	Limits of government owned land
103.4	13,201	132,834	67	First home inundated upstream
103.8	13,387	138,151	69	Low point Barker-Cypress Road
107.5	15,764	191,652	96	Standard Project Flood
108.0	16,199	199,643	100	Natural ground at north end of dam
111.5	18,574	260,646		North spillway elevation
112.0	18,858	270,003		Natural ground at west end of dam
114.5	20,592	319,301		West spillway elevation
115.0	20,910	329,676		Spillway design flood

Barker

Elevation[1] (Feet)	Surface Area[3] (Acres)	Capacity[3] (Acre-Feet)	Capacity[4] (Percent)	Impacts
95.0	12,036	82,921	40	100 year flood frequency Limits of government owned land
96.6	12,451	102,483	49	First street flooded upstream in Harris County
97.1	12,638	108,750	52	First home inundated upstream in Harris County
98.1	13,259	121,698	58	First home inundated upstream in Fort Bend County
99.0	13,813	133,879	64	Standard Project Flood
104.0	16,543	209,600	100	Natural ground at both ends of dam
105.1	17,267	228,182		North spillway elevation
106.7	18,412	256,737		West spillway elevation
108.0	19,330	281,267		Spillway design flood

As the Corps now admits, government-owned land behind Barker dam is not even sufficient to store the stormwater runoff from a projected "100-year" flood.[83] And while the reservoir pool levels repeatedly grew and threatened to exceed government-owned land and flood private property upstream of the dams,[84] the Government did its best to ensure none of the upstream landowners knew of their danger.[85] In sum, there is overwhelming evidence of predictability, foreseeability, intent, and the causal link between Project operations and the occupation and use of upstream properties. It is difficult to imagine a case where more historical documentary proof could be available about the Government's knowledge and intent to eventually effect a taking of private property.

Then, only two months before Harvey struck, in its *FY 2016 Annual Water Control Report* the Corps discussed the April 17-18, 2016 "Tax Day" flood which (once again) generated record pool levels in both Addicks and Barker reservoirs, and for the first time stored water off government-owned land.[86] "The storm event of April 17-18, 2016, dropped 10-17 inches of rain over the Addicks

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[83] JX 110, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at A-2 (November 2012, USACE 016402); 1 RR 105:18-106:1 (Robert Thomas trial testimony).

[84] PX 59, Draft Operational Assessment of the Addicks and Barker Reservoirs, Fort Bend and Harris Counties, TX at 20 (October 2009, USACE 464089) ("The upstream watersheds are presently 25% developed and with increasing development, conditions would be expected to worsen. Additional development with increased impervious surface coverage will increase inflows to the Reservoirs. The combined effects of increased inflow and reduced outflow have resulted in an increase in the frequency of high stages within the reservoir. *Nine out of ten and eight out of ten of the top pool elevations in the Barker and Addicks Reservoirs, respectively, have occurred since 1992*.") (emphasis added).

[85] JX 26, Memo: Buffalo Bayou and Tributaries – Spillways for Addicks and Barker Dams at 1 (September 5, 1980, USACE 530470) (noting the completion of repairs to the dam embankments and outlet works, and stating that the general public "now probably perceives the dams to be safe" even though the repairs "*did not address the problem of …upstream areas subject to flooding outside existing government fee line*," and that the public "*has not been informed of any of these problems*") (emphasis added); *see also* PX 1406, Memo: Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 2 (June 30, 1992, USACE 529848) ("Urbanization of the privately owned land that borders the Government Owned Land (GOL) has resulted in the erection of structures within the maximum pool zone. *Homeowners are largely unaware of their situation*.") (emphasis added).

[86] JX 134, FY 2016 Annual Water Control Report at VII-5 (June 2017, USACE 869255).

and Barker Reservoir watersheds in less than 24 hours."[87] "Based on our record of previous storms, this storm event may have been the worst storm of record along main stem Buffalo Bayou through downtown Houston …"[88]

Approximately 60 days later, the Corp's assessment of the Tax Day event as the "worst storm of record" would be rendered obsolete by Harvey, and all of its predictions of massive upstream flooding and property damage would come true.

II. The Inevitable Occurs: Stormwater Runoff Held Back and Controlled by the Project Exceeds the Storage Capacity of Government-Owned Land and Floods Plaintiffs.

On August 25, 2017, Hurricane Harvey ("Harvey") made landfall along the Texas coast, near Rockport, Texas, as a Category 4 hurricane.[89] Harvey weakened into a tropical storm within 12 hours of making landfall, but stalled over the Houston area for four days.[90] Harvey maintained tropical storm intensity the entire time the storm was inland over southeast Texas.[91] By 2:26pm on August 25, 2017, the Corps knew that Harvey was expected to dump enough rainfall that the pool levels behind the Addicks and Barker Dams would extend "beyond the government owned land limits."[92]

On August 30, 2017, the water behind Barker dam crested at a record pool elevation behind the dam of approximately 101.6 feet,[93] and the water behind Addicks dam crested at a record pool

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[87] JX 134, FY 2016 Annual Water Control Report at VII-16 (June 2017, USACE 869266).

[88] JX 134, FY 2016 Annual Water Control Report at VII-3 – VII-4 (June 2017, USACE 869253-54). As the Report noted, even though there had been some subsidence in the Addicks Reservoir since its construction in the 1940s, the storage capability of government-owned land at both the Addicks and Barker Reservoirs had not been affected by any subsidence and had remained "basically the same." *Id.* at VII-21 (USACE 869271).

[89] Dkt. No. 211, Stipulations of Fact for Trial No. 107.

[90] Dkt. No. 211, Stipulations of Fact for Trial No. 108.

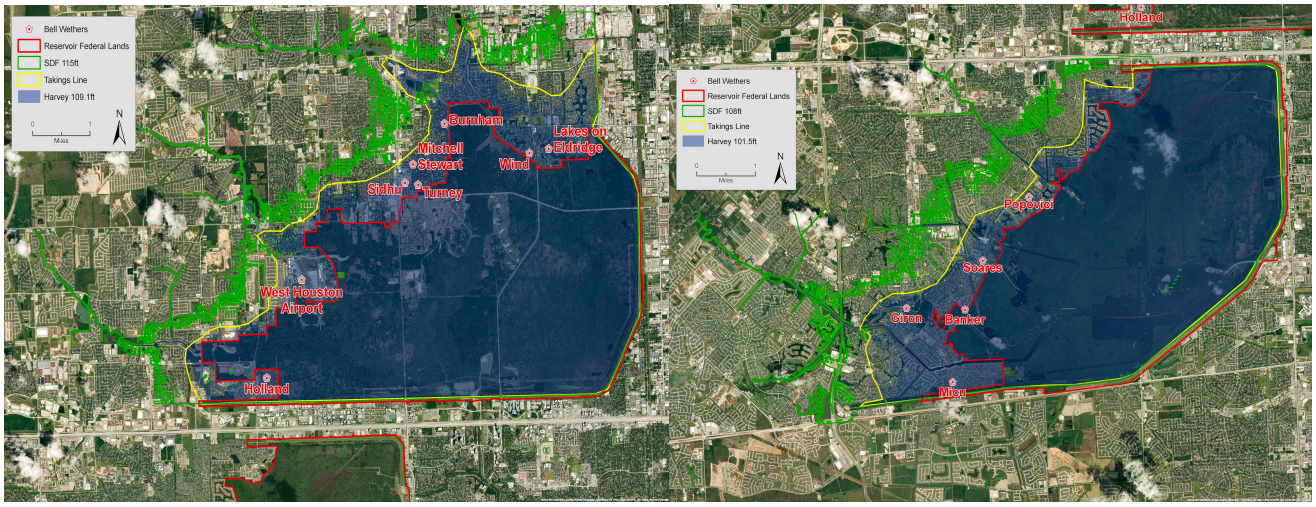
[91] Dkt. No. 211, Stipulations of Fact for Trial No. 108.

[92] JX 146, CWMS Forecast for August 25, 2017 at 1 (COH-DOJ 0008154).

[93] Dkt. No. 211, Stipulations of Fact for Trial Nos. 110, 114; PX 526, Expert Report of Philip Bedient at 2, 3 (Figures 2A & 2B).

elevation behind the dam of approximately 109.1 feet.[94] As the Expert Report of Dr. Philip Bedient shows, each of the Test Plaintiffs' properties are located beyond the limits of Government-owned land, but within the maximum reservoir pool created by the Addicks and Barker dams during Harvey:[95]

Addicks **Barker**



During Harvey, the Corps operated the Project completely consistent with its 2012 Water Control Manual by closing, and eventually opening, their floodgates.[96] Project operations resulted in both Addicks and Barker fulfilling their public purpose of retaining stormwater runoff from their respective watersheds.[97] The reservoir pool levels behind both Addicks and Barker reached heights that inundated private property upstream of the Government-owned land within the reservoirs.[98] As

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[94] Dkt. No. 211, Stipulations of Fact for Trial Nos. 111, 112.

[95] PX 526, Expert Report of Philip Bedient at 2-3 (Figures 2A & 2B); *see also* 7 RR 1935:14-1942:7 (discussing map figures and their demonstration of Harvey's peak reservoir pool flooding for both Addicks and Barker on August 30, 2017).

[96] Dkt. No. 211, Stipulations of Fact for Trial No. 109; 6 RR 1448:18-21.

[97] 6 RR 1452:18-1453:10.

[98] PX 1747, Email from Richard Long to Jon Sweeten at 1 (September 5, 2017, USACEII 00655687) ("[W]e far exceeded the government-owned land …. This operation resulted in the flooding of thousands of homes upstream …."); JX 228, FY 2017 Annual Water Control Report at VII-7 (June 2018, USACE 869494) ("The [Addicks] reservoir exceeded both 100% of government owned storage capacity and 100% of total reservoir capacity, resulting in impacts to local neighborhoods upstream

the Corps noted at the time, it expected those pools to hold water between approximately one to three months, and that "homes upstream will be impacted for an unknown period of time."[99] And precisely none of the impacts to the 13 Test Property Plaintiffs was a surprise to the Corps.[100] The use and occupancy of upstream properties to protect the City of Houston and the Houston Ship Channel was and had always been the intended and foreseen result of the operation of the Addicks and Barker dams.

III. The Government's Intentional Capture and Storage of Stormwater Runoff from Tropical Storm Harvey on Plaintiffs' Properties Constituted a Taking of Each.

As stated, the following inquiries determine whether the United States should be held liable to each Test Property Plaintiff for the physical occupation of their property with stormwater that the Government stored behind the Addicks and Barker dams during and after Tropical Storm Harvey: (1) were the effects each Plaintiff experienced the predictable result of governmental action, (2) were the government's actions sufficiently substantial to justify a takings remedy; and (3) does each Plaintiff possess a protectable property interest in what it alleges the government has taken. *Ridge Line, Inc. v. United States*, 346 F.3d 1346, 1355 (Fed. Cir. 2003). Because the answer to each of those questions is yes, the Government bears a Constitutional obligation to compensate Plaintiffs for the use of their property to protect Houston and the Houston Ship Channel from Harvey's devastating flooding.

A. Each Test Plaintiff held protectable property interests under Texas law that were subject to being taken by flooding from the Government's Actions.

Taking the last (and easiest) question first, the record is clear that each and every Test Property Plaintiff held protectable real and personal property interests under Texas law that were subject to

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of the reservoirs …."); *Id.* ("During Hurricane Harvey, the [Barker] reservoir surpassed 100% of government owned storage capacity and occupied 81.6% of its total reservoir capacity, causing impacts to local neighborhoods.").

[99] PX 1736, Addicks and Barker Proposed Talking Points at 1 (August 27, 2017, USACEII 00655338).

[100] 1 RR 273:3-7.

being taken by flooding from the Government's actions.

A protectable property interest under the Fifth Amendment includes every sort of real or personal property interest a citizen may possess. *See Horne v. Dep't of Ag.*, 569 U.S. 513 (2013) (personal property); *United States v. General Motors Corp.*, 323 U.S. 373, 378 (1945) (real property). Especially pertinent here, it has long been recognized that "[i]n the bundle of rights we call property, one of the most valued is the right to sole and exclusive possession—the right to exclude strangers, or for that matter friends, but especially the government." *Hendler v. United States*, 952 F.2d 1364, 1374-75 (Fed. Cir. 1991) (*citing Nollan v. California Coastal Comm'n*, 483 U.S. 825, 831(1987), *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426 (1982) (internal citations omitted)).

"Because the Constitution protects rather than creates property interests, the existence of a property interest is determined by reference to 'existing rules or understandings that stem from an independent source such as state law.'" *Phillips v. Washington Legal Found.*, 524 U.S. 156, 164 (1998) (quoting *Board of Regents of State Colleges v. Roth,* 408 U.S. 564, 577 (1972)). The State of Texas recognizes a broad definition of protected property rights. Under Texas law, the term property "does not only mean the real estate, but every right which accompanies its ownership." *State v. Moore Outdoor Properties, L.P.*, 416 S.W.3d 237, 242-43 (Tex. App.—El Paso 2013, pet. denied) (citing *DuPuy v. City of Waco*, 396 S.W.2d 103, 108 (Tex. 1965)); *see also El Dorado Land Co., L.P. v. City of McKinney*, 395 S.W.3d 798 (Tex. 2013) (future reversionary interest and a possible future right of reentry are protected property rights); *Urban Renewal Agency v. Trammel*, 407 S.W.2d 773 (Tex. 1966) (leasehold is a protected property right); *State v. Carpenter*, 89 S.W.2d 979, 980 (Tex. 1936) (fixtures and improvements are protected property rights). Each plaintiff has a protected property right in their home or business as well as in their personal property as is proven by each Plaintiff's deed or lease, the stipulations of the parties, and the Plaintiffs' testimony in court. *See State v. Moore Outdoor Properties, L.P.*, 416 S.W.3d 237, 242-43 (Tex. App.—El Paso 2013, pet. denied). Among the core rights recognized by the Texas Supreme Court are

the right to exclusive possession, the right to personal use and enjoyment, and the right to security. *Evanston Ins. Co. v. Legacy of Life, Inc.* 370 S.W.3d 377, 383 (Tex. 2012).

Equally clear is the fact that the United States does not have a fee simple, flowage easement, or any other legal interest or right to have inundated any of the Test Properties.[101] Therefore, proof showing the "direct government appropriation or physical invasion" of each Plaintiffs' property demonstrates a "paradigmatic taking requiring just compensation." *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528, 537 (2005); *see also Harris Cty. Flood Control Dist. v. Kerr*, 499 S.W.3d 793, 807 (Tex. 2016) (recognition by the Texas Supreme Court when the government makes a conscious decision to flood some areas in order to save others "of course the government must compensate the owners who lose their land to the reservoir").

Thus, each of the Plaintiffs held the right to the exclusive use and enjoyment of their real and personal property that was flooded and destroyed by the uninvited storage of stormwater held back and controlled by the Government's flood control project.

B. The Flooding of Each Test Property Plaintiff was the Predictable Result of the Government's Design, Construction, and Operation of its Flood Control Project.

The record also confirms that the effect each Plaintiff experienced was the predictable result of governmental action: the design, construction, and operation of its flood control project.

1. The inundation of private property located within the design reservoirs behind the Addicks and Barker dams was predictable and foreseeable.

Almost 150 years of case law confirms that the flooding of private property behind a dam constitutes a taking—a virtually self-evident proposition. *See Pumpelly v. Green Bay Co.*, 80 U.S. (13

[101] Dkt. No. 211, Stipulations of Fact for Trial No. 2 ("The United States does not own a flowage easement on any of the subject properties."); No. 211, Stipulations of Fact for Trial No. 3 ("The United States does not own a fee simple interest in any of the subject properties."); *see also* 4 RR 825:23-826:12 (Johnson-Muic, the Chief of Real Estate for the Southwestern Division of the Corps of Engineers: Government owns no fee or easement interest in any of the Test Properties).

Wall.) 166, 181 (1872) (flooding of upstream land behind a dam was a taking); *United States v. Cress*, 243 U.S. 316, 328 (1917); ("There is no difference of kind … between a permanent condition of continual overflow by backwater and a permanent liability to intermittent but inevitably recurring overflows."); *United States v. Dickinson*, 331 U.S. 745, 751 (1947) (taking found based on "an easement for intermittent flooding of land above the new permanent level" of a reservoir); *Stockton v. United States*, 214 Ct. Cl. 506, 519 (1977) (finding a taking where reservoir behind government dam flooded private land). As this Court has previously noted, cases involving inundation of private property within a federal flood control reservoir are somewhat rare since "engineers do not often fail … to acquire all the land below the contour line of the designed and intended pool." *Stockton*, 214 Ct. Cl. at 519.[102] This matter falls squarely within that legal lineage; because the Test Property Plaintiffs are located within the reservoirs' true Project boundaries, they are permanently predisposed to inevitably recurring submersion by the stormwater runoff that is held back and controlled by the Government's flood control project.

The invasion and occupation of Plaintiffs' property interests was not only foreseeable, it was the intended result of the design, construction, and operation of the Government's flood control Project. *Hansen v. United States*, 65 Fed. Cl. 76, 114 (2005) (taking is "foreseeable" if it is the direct, natural or probable result of the alleged governmental-authorized actions for a public purpose, citing *Richard v. United States*' 282 F.2d 901, 904 (Ct. Cl. 1960) ("It is not necessary to show that the defendant intended to take plaintiff's land; all that plaintiff need show is that the taking of its land was the natural and probable consequence of the acts of the defendant. It is not even necessary for plaintiff to show

[102] Indeed, as the Department of Justice has previously acknowledged to the U.S. Supreme Court, the inundation of upstream areas where backwaters may form in connection with operations that raise the reservoir level constitute "*a form of inevitably recurring flooding under this Court's cases*." Brief for the Respondent, the United States of America, *Arkansas Game & Fish Comm'n v. United States*, No. 11-597, at 26 (U.S. Aug. 27, 2012) (emphasis added).

that defendant was aware of the taking of an interest in its property would naturally result from its acts. It is only necessary to show that this was in fact the natural and probable consequence of them.")).

Plaintiffs met their burden to demonstrate that the inundation of private properties from the reservoir pools behind each dam was the predictable result of the Government's actions. The record here confirms that the United States designed, built, and structured the mandatory operation of the Addicks and Barker dams to impound stormwater runoff to protect downtown Houston by storing that water on private property beyond the boundaries of government-owned land.[103] The Government constructed these permanent dam structures *because* it knew there would be recurrent storms of such a magnitude—such as the 1899 Hearne storm which served as the basis for the dams' original design—that downtown Houston and the Houston Ship Channel would be at risk of devastation.[104] As the Corps has admitted, history has shown that "only chance has prevented the occurrence of a storm over the [Addicks/Barker] basin much larger than the 1935 storm" which served as a basis for the Project's land acquisition.[105] A review of the record likewise confirms the predictable and foreseeable

[103] Dkt. No. 211, Stipulations of Fact for Trial Nos. 86, 88, 89; JX 91, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, Fort Bend and Harris Counties, Texas, *2009 Master Plan* at 1 (August 2009, USACE 016051); 7 RR 1936:1-19; 1 RR 72:10-18; 1 RR 100:8-10; 1 RR 170:19-25; 2 RR 365:7-25; 6 RR 1461:1-6.

[104] JX 5, Buffalo Bayou, Texas Definite Project Report at 7 (June 1, 1940, USACE 129508) (emphasis added) ("The storm showing the greatest depth of rainfall over a large area, of record in the United States, occurred in 1899 at Hearne, Texas, only 90 miles from Houston, *under meteorological conditions that could be approximated closely over the Buffalo Bayou watershed*."); *see also* JX 5, Buffalo Bayou, Texas Definite Project Report at 8 (June 1, 1940, USACE 129509) ("Should such a storm visit the area, the average rainfall over the basin would be in excess of 27 inches, almost twice the average of 15 inches that produced the record flood of 1935."). In fact, it could virtually be the subject of judicial notice that the Houston area is "affected by torrential rainfall associated with hurricanes and other tropical disturbances." JX 110 Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 4-5 (November 2012, USACE 016320).

[105] JX 5, Buffalo Bayou, Texas Definite Project Report at 7 (June 1, 1940, USACE 129508); *see also id.* at 26 (USACE 129527: "The maximum storm of record in the basin was that of December 6-8, 1935, *and it is expected that storms of similar intensities will occur several times during the lives of these structures*.").

nature of significant rainfall over the Addicks and Barker watersheds and the predictable and foreseeable concomitant flooding of these specific upstream properties.[106]

- 1940: The Government constructs the Addicks and Barker dams in a configuration and size that will inundate property with retained stormwater runoff over a designed maximum area.[107]
- 1960: The Government determines that sufficient storage capacity must be available at all times to accommodate the maximum probable (or spillway design) flood.[108]
- 1962: The Government recognizes that "extensive residential expansion has greatly increased the damage potential within the flood plain" from operation of the dams.[109]
- 1973: The Government internally admits its "operating concept" will impose flooding on private lands without any legal right to do so.[110]
- 1974: The Corps notes that the lack of fee title or flowage easements on land located between the elevation of Government-owned land and the ends of either of the dams "will eventually place the Government in the position of having to flood the area

[106] And that it would be these Test Plaintiffs, located in the Corps' so-called "fringe area," who would be flooded was foreseeable since the Corps had previously hired a private contractor to collect first floor elevation surveys for over 10,000 structures in the upstream area subject to being submerged by the impounded runoff. 1 RR 100:11-16. The Corps of Engineers wanted the information in order to know, when the pool gets high enough to go beyond government owned land, then the Corps has "the addresses, the names, the elevations" of the homes which will be submerged. 1 RR 100:2-19. When asked whether the flooding of these upstream homes during Harvey was a surprise, Mr. Thomas admitted that "we had data indicating the first level elevations of those homes and information about the pool level."[106] 1 RR 273:3-7. Likewise, Mr. Long admitted that "it was known that if a severe enough rain event occurred, that water impounded behind the [Addicks and] Barker Dam would exceed the government owned property limits." 6 RR 1473:15-17; *see also* 6 RR 1475:20-24; PX 1747, Email from Richard Long to Jon Sweeten at 1 (September 5, 2017, USACEII 00655687) ("the fact that this could happen [upstream flooding] has always been known")..

[107] JX 5, Buffalo Bayou, Texas Definite Project Report at 26 (June 1, 1940, USACE 129527); *see also* PX 87, Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Environmental Assessment: Dam Safety* at 4, §5.04 (November 1981, USACE 012909) ("The inadequacy of Government owned land upstream of the reservoir embankments to contain water from the SPF was recognized in the original design of the reservoirs.").

[108] JX 15, Buffalo Bayou Report on the Feasibility of Gating the Uncontrolled Conduits at Barker and Addicks Dams at 40 (April 1962, USACE 000433).

[109] JX 16, Buffalo Bayou, Texas, Reservoir Regulation Manual for Addicks and Barker Reservoirs at 15 (June 30, 1960, USACE 011648).

[110] PX 37, Memo: Addicks and Barker Reservoirs – Encroachment on Private Lands at 1 (May 3, 1973, USACE 667927) (emphasis added).

within the reservoir with the accompanying damage in order to protect downstream improvements in the event of a severe future storm."[111]

- 1977: The Government foresees that it is "apparent that urbanization of the subject watersheds will soon reach levels in excess of those considered in the original design and updated hydrologic criteria prescribe more severe design standards than those addressed in the original hydrologic investigation."[112]

- 1978: The Corps recognizes that the "[r]apid residential development in the area immediately above Government-owned real estate [at both Addicks and Barker reservoirs] was in progress," and that current studies showed that reservoir pool elevations which would retain stormwater runoff in excess of that which could be stored on Government-owned land was possible "under existing conditions;" an occurrence that would cause "[e]xtensive damage … in the reservoir area from an event of [such] magnitude."[113]

- 1980: The Government notes that the original takings lines for the Project "are now 4.5 and 3.1 feet below the current Standard Project Flood levels for Addicks and Barker, respectively,"[114] thus a Standard Project Flood—an event that is expected to occur—would inundate private property.[115]

- 1981: The Corps "discovers" that the amount of private property to be inundated is actually greater than that previously known based on updated analyses: "since their design and construction [Addicks and Barker], the state-of-the-art in flood analysis and the recorded occurrence of much larger floods than previously considered possible have resulted in significant changes in design criteria for reservoirs, particularly those which protect urban areas."[116]

- 1984: The Government internally recognizes that the probable maximum flood on an empty pool is considered a probable occurrence in light of Tropical Storm Claudette.[117]

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[111] PX 39, Memo: Buffalo Bayou and Tributaries, Addicks Dam, Texas, Inspection Report No. 2 at 5 (October 29, 1974, USACE 233674); PX 38, Memo: Buffalo Bayou and Tributaries, Barker Dam, Texas, Inspection Report No. 2 at 4-5 (August 6, 1974, USACE 233705-706).

[112] JX 22, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Hydrology at 1 (August 1977, USACE 234615).

[113] PX 42, Memo: Water Control Manuals for Addicks Reservoir and Barker Reservoir (May 1, 1978) at USACE 541551 (Addicks) and USACE 541562 (Barker).

[114] JX 26, Memo: Buffalo Bayou and Tributaries – Spillways for Addicks and Barker Dams at 2 (September 5, 1980, USACE 530471).

[115] 1 RR 97:9-100:10 (Thomas).

[116] PX 87, Environmental Assessment: Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Proposed Finding of No Significant Impact* at 1 (November 1981, USACE 012895).

[117] JX 31, Memo: Consideration of Alternatives for preserving Integrity of Addicks & Barker Reservoirs Embankments at 2 (February 13, 1984, USACE 487626).

- 1992: Corps water control regulations require that the available storage capacity behind the Addicks and Barker dams be utilized "to the maximum extent possible" in order to achieve their primary flood control objective: prevention of "damaging stages on downstream Buffalo Bayou;" therefore the Corps concedes that a "Standard Project Flood would impact 2,800 structures worth $400 million and cause $100 million in damages."[118]

- 1995: "There is also a potential threat of property damage upstream of the reservoir lands. The dams and reservoir lands acquired for upstream temporary reservoir storage are now surrounded by residential and commercial developments. Densely populated housing developments essentially fill the fringe areas between government owned lands (GOL) and the maximum pool elevation adjacent to Addicks Reservoir. Much of the fringe areas of Barker Reservoir are bordered by similar developments and the rest are rapidly developing."[119]

- 2009: The Corps confesses that "judging from the magnitude of past storms experienced in our area, it is only a matter of time before the reservoirs flood off government-owned land."[120]

- 2012: The Government notes that the "continual upstream development has increased inflow into the Reservoirs due to these developments and is likely to continue," and that "[p]resently, pool levels in excess of Government-owned land will damage residential developments adjacent to Government-owned lands." [121]

The Corps also prepared internal "Reservoir Structure" maps depicting the elevations of upstream structures located within Addicks and Barker's respective pools.[122]

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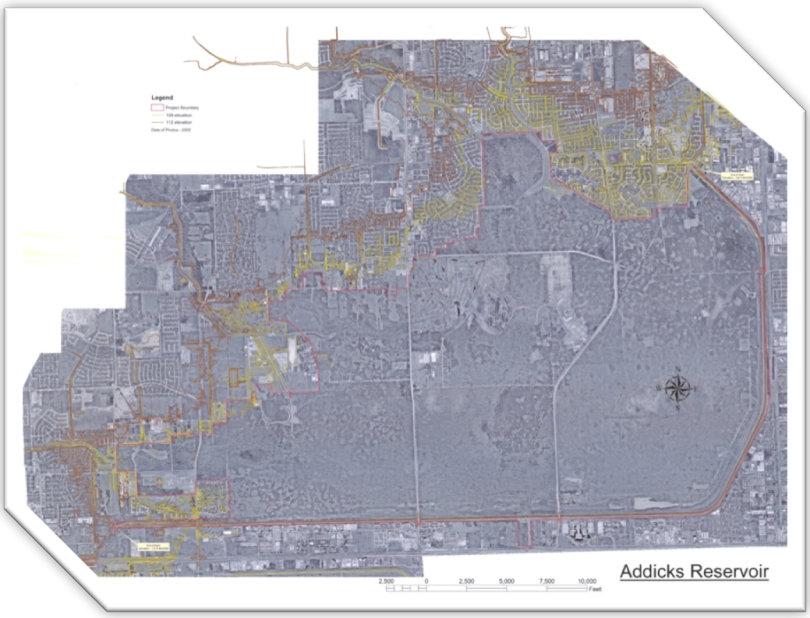
[118] JX 44, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 5, 9 (May 1992, USACE 314499); *see also* 4 RR 847:7-20 (Johnson-Muic: in 1992 the Government knew it did not own sufficient property to accommodate the maximum flood storage behind the dams).

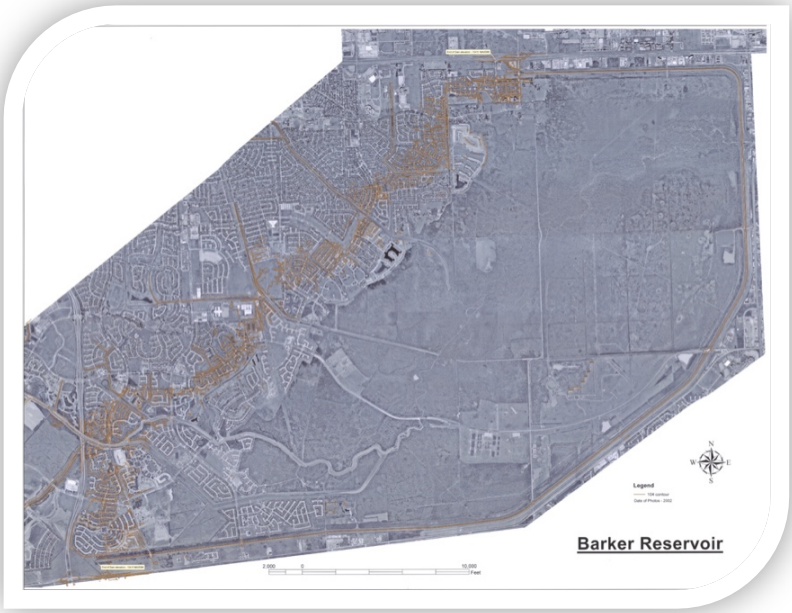
[119] JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 7 (October 1995, USACE 015136).

[120] DX 206, Addicks & Barker Reservoirs, Multi-Agency Table Top Exercise, *After Action Report* at 1 (September 30, 2009, USACE 467209).

[121] JX 110 Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, TX, *Water Control Manual* at 3-5, and 7-1 (November 2012, USACE 016315, USACE 016335).

[122] PX 268, Addicks and Barker Reservoir Structures Maps (USACE668672-75); PX 271, Addicks and Barker Inundation Maps (USACE 668684-85) (depicting the area covered by an Addicks reservoir pool of 108 and 112 feet, and the area covered by a Barker reservoir pool of 104 feet).





Notably, even these internal maps depict the "Project Boundaries" to be coequal with Government land, despite the fact that the same maps graphically illustrate how many privately-owned homes and businesses would be submerged at reservoir pool elevations well below their corresponding "full pool" elevations.

Evidence of the Government's intent, and the predictable, foreseeable, and indeed intentional flooding of private properties by the operation of the dams was overwhelming—as confirmed by the Government's own witnesses. **Robert Thomas** testified that the Government does not own enough land to hold all the water that can be impounded by the dams;[123] that the Government-owned land behind Barker dam is not even sufficient to contain a pool associated with a 100-year event;[124] that the Corps of Engineers has been wrestling with the inadequate Government land issue for Addicks and Barker since about 1972 and that it has been the subject of a lot of studies and investigation and research;[125] and that beginning in the early 2000s the Corps had a private contractor conduct first floor elevation surveys for over 10,000 structures in the area that's subject to being submerged behind the dams so that it literally has the addresses, the names, and the slab elevations of all those people and knows precisely which homes would be the first to flood behind each dam.[126] Thus, the actions that submerged Plaintiffs' properties—the use and operation of its flood control project—were consistent with the Government's required water control regulations.[127]

Richard Long, the Natural Resource Management Specialist for the Corps testified, that the dams *by design* are intended to inundate upstream private property if sufficient stormwater runoff

[123] 1 RR 67:16-22; 1 RR 171:1-20; 1 RR 210:12-16; 1 RR 252:14-18.

[124] 1 RR 105:18-106:1.

[125] 1 RR 125:1-9; 1 RR 218:4-7 ("certainly there were many engineers and scientists that were doing studies and recommending [acquisition of additional land] throughout the process, but ultimately the decision was not to get it").

[126] 1 RR 100:2-19; 123:2-5.

[127] *See generally* 1 RR 175:1-14 (Thomas: flooding of homes upstream during Harvey was no accident, was mandated by dictates of Water Control Manual); 1 RR 176:12-177:1 (Thomas: upstream homes flooded by runoff held back by federal project); 6 RR 1448:18-21 (Long: during Harvey the Government did not depart from the dictates of the Water Control Manual); 6 RR 1449:5-8 (Long: everything the Corps did during the Harvey event was covered by the Water Control Manual). As Richard Long testified, in his 41 years at the Corp, he is unaware of a single instance when the Water Control Manual had ever been disregarded. 6 RR 1446:16-24.

occurs.[128] Long confirmed that the flooding of upstream properties in the event of a large enough storm event "has always been known;"[129] that the rainfall experienced during Tropical Storms Allison and Claudette merely confirmed what the Government has always known: storms of a sufficient magnitude to flood private property would occur;[130] and that Addicks and Barker dams protect Houston by impounding water and storing it "not only on government lands *but also [on] private property by design and intent*."[131] And Long acknowledged that the Project would be operated to protect *downstream* interests and not in any way for the benefit of the upstream properties because the Project was never intended to provide flood control protection *upstream* of the dams—only to protect life and property *downstream*.[132]

And **Paula Johnson-Muic**, the Government's Chief of Real Estate for the Southwestern Division of the Corps of Engineers, agreed that despite knowing full well that thousands and thousands of people lived in homes on private property within the flood zone of the Addicks and Barker reservoirs upstream, and knowing full well that those areas were subject to inundation by water impounded behind the Addicks and Barker dams, the Corps never even tried to obtain authorization to acquire additional property for stormwater storage because it could not be economically justified.[133]

Nor can the Government feign surprise that a storm of Harvey's magnitude would occur and directly cause the flooding of Plaintiffs' upstream properties; other prior flooding events confirmed that eventuality. In 1981, the Corps noted it had "calculated that the 'Claudette' storm, centered over the Addicks Watershed would have resulted in 30 inches of rainfall in about 44 hours, and produced

[128] 6 RR 1471:15-20; 6 RR 1472:20-1473:2; 6 RR 1475:20-24 6 RR 1477:5-14.

[129] 6 RR 1475:20-24; 6 RR 1477:5-14.

[130] 6 RR 1479:22-1480:13; 6 RR 1482:13-1483:3.

[131] 6 RR 1454:13-19.

[132] 6 RR 1453:21-24; 6 RR 1458:7-16; 6 RR 1473:3-7; 6 RR 1474:13-16.

[133] 4 RR 852:13-853:6.

a flood that could overtop Addicks Dam and possibly cause its failure."[134] And in its 2009 *Operational Assessment of the Addicks and Barker Reservoirs*, the Corps stated "Tropical Storm Allison (2001) as well as Hurricane Ike (2008), Hurricane Rita (2005), and Tropical Storm Arlene (1993) are strong evidence that disastrous rainfall events could occur anywhere in the Houston area. It was indicated that if Tropical Storm Allison or any rainfall of similar magnitude occurred upstream of the Reservoirs, the effects would be disastrous for the upstream areas."[135] As the Government admitted:

> Q. So, Mr. Thomas, it says here on page 1 of Exhibit 446, at the bottom, after talking about the changes in hydrology, Tropical Storm Claudette, which inundated the Houston area in July '79, could have dropped 30 inches of rain on Addicks and Barker; correct?
>
> A. Correct.
>
> Q. So the point that's making is, if a storm like that had come into these watersheds, it would have caused potentially dam failure; right?
>
> A. Correct.
>
> Q. And, of course, that also would have caused a corresponding reservoir pool that would have submerged private property; right?
>
> A. Correct.[136]

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[134] PX 87, Environmental Assessment: Buffalo Bayou and Tributaries, Texas Addicks and Barker Dams, *Background Information* at 2 (November 1981, USACE 012899).

[135] PX 59, Draft Operational Assessment of the Addicks and Barker Reservoirs, Fort Bend and Harris Counties, TX at 20 (October 2009, USACE 464089); *see also* DX 737, Federal Briefing 2018 at 1 (Spring 2018, FEMA 078357) ("When Tropical Storm Allison drowned most of Harris County in 2001, it was an extraordinarily devastating flood. We knew it was not the last. Tropical rain and flooding will always be the primary natural threats to Harris County and the Gulf Coast."); 2 RR 581:24-582:4 (Lindner: had Allison centered over Addicks/Barker basins reservoir pools would have exceeded government-owned land by "a significant amount").

[136] 2 RR 333:12-334:1; *see also* 2 RR 337:22-338:1 (Thomas: probable maximum flood on an empty pool is considered a probable occurrence given the 1979 Claudette storm); 2 RR 380:23-381:13 (noting Houston had suffered three "500-year storms" in three years); 2 RR 571:6-11 (Lindner: rainfall amounts for Allison exceeded those of Harvey over different periods of time); 5 RR 1198:4-8 (Kappel: a rain event similar to Harvey will occur again over the Addicks and Barker watersheds); 5 RR 1199:23-1200:7 (Kappel: Harvey's maximum five-day rainfall into the Addicks and Barker watersheds was not unprecedented in Harris County); 6 RR 1494:3-11 (Long: storm events sufficient to flood private property upstream of the reservoirs will inevitably reoccur).

And finally, in light of the Government's required water control regulations for this project, a single large storm is not required to cause the submersion of upstream properties. The Corps prepared its 1992 *Special Report on Flooding* after the Addicks and Barker pools reached new record levels without a single large storm event; rather the record pools were formed by what is known as the "ratcheting effect"—the filling of the pools by several small storms because of the Government's policy of using and operating the project to only provide downstream flood mitigation benefits.[137] In fact, as Mr. Thomas acknowledged, the Corps cannot change its operating procedures in a manner to protect or benefit the upstream properties to the detriments of those downstream *without authorization from Congress that alters the designated public purpose of the project.*[138] Thus, as Dr. Bedient concluded following a review of Corps data:

> Due to the design, construction, and operation of the dams, flooding of upstream private property is inevitable to re-occur. The dams are permanent, immovable structures. As part of their purpose, they are operated to capture and impound rainfall runoff in the Addicks and Barker watersheds when heavy rains come to the greater Houston area. The upstream properties are located within the intended reservoir pools of the Addicks and Barker dams. The rainfall during Harvey was not unprecedented for the Houston region, and there will continue to be rainfalls of similar magnitude or greater.[139]

As this Court has previously noted, while cases involving inundation of private property within a federal flood control reservoir are somewhat rare since "engineers do not often fail … to acquire all the land below the contour line of the designed and intended pool," when they do arise, the obvious foreseeability that land within a government-built flood control reservoir will be flooded means that, "only one actual flooding is enough when the property is upstream of the dam and below the contour line to which the dam is designed to impound water." *Stockton*, 214 Ct. Cl. at 519; *see also Quebedeaux v.*

[137] 2 RR 363:11-364:11.

[138] 2 RR 428:23-429:12.

[139] PX 526, Expert Report of Dr. Philip Bedient at 57.

United States, 112 Fed. Cl. 317, 323 (2013) (noting that "a takings might lie where defendant, using a permanent structure, purposefully flood a property once and expressly reserves the right to do so in the future"). Even the Department of Justice itself has admitted to both the Federal Circuit and the U.S. Supreme Court that "when the water impounded in [a] reservoir created by a government-constructed dam submerges private property," such flooding is a "classic taking." *See, e.g.*, Brief for United States, *St. Bernard Parish Gov't v. United States*, No. 16-2301, at 24, 44-45 (Fed. Cir. Dec. 9, 2016). For all these reasons, the flooding of private upstream properties was the predictable and foreseeable, indeed intended, result sought by the Government from the design, construction, and operation of the Addicks and Barker dams.

2. Moreover, each Test Plaintiffs' Property flooded solely as a result of the Government's storage of stormwater runoff behind Addicks or Barker Dam.

The next issue is whether, on these facts, it was the consequence of the Government's actions that flooded these Test Plaintiffs' properties. The answer to that question is also yes.

Case law directs that the *Ridge* Line test establishes a "but-for" test of causation comparing what the result was with the government-authorized actions for a public purpose with what the result would have been without or but for those government-authorized actions. *St. Bernard Parish Gov't v. United States*, 887 F.3d 1354, 1362 (Fed. Cir. 2018) (citing *United States v. Archer*, 241 U.S. 119, 132 (1916)); *see also Banks v. United States*, 69 Fed. Cl. 206, 214 (2006) (noting that "but for" is consistent with the Federal Circuit's guidance as to causation in *Ridge Line* and *Moden v. United States*, 404 F.3d 1335, 1343 (Fed. Cir. 2005), which itself noted that the plaintiffs' injury need only be the likely result of the Government's act).

a. The expert testimony and report of Dr. Philip Bedient confirms that the flooding of each Test Property was exclusively caused by stormwater runoff from Harvey stored by the Government's flood control dams.

On the issue of causation, Plaintiffs presented the testimony and Expert Report of Dr. Philip Bedient. Dr. Bedient is currently the Herman Brown Professor of Engineering, an endowed chair in the Department of Civil and Environmental Engineering, at Rice University; and he has been a professor at Rice in environmental engineering since the 1970s.[140] He has a B.S. in Physics, and an M.S. and Ph.D. in Environmental Engineering, all from the University of Florida.[141] His teaching and research focus on numerous topics in hydrology: he teaches courses in surface water hydrology, groundwater hydrology, floodplain analysis, flood prediction systems and coastal resiliency; and has directed over 60 research projects on these topics in the past 4 decades.[142] Dr. Bedient also has experience with modeling technology and flood control systems and has served as a hydrology expert witness in multiple cases.[143] He has extensive experience in the Houston area, performing research for 40 years in areas such as rainfall runoff analysis and flood prediction systems, and he created the award-winning flooding warning system for the Texas Medical Center.[144] He has published over 180 articles in journals, and his hydrology textbook is used in about 75 universities in the United States.[145] At trial the Court qualified Dr. Bedient to give opinion testimony as an expert in hydrology, hydraulics, and floodplain analysis.[146]

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[140] 7 RR 1902:4-6; PX 526, Expert Report of Dr. Philip Bedient at 9.

[141] PX 526, Expert Report of Dr. Philip Bedient at 9.

[142] 7 RR 1902:17-21.

[143] 7 RR 1903:2-13; PX 526, Expert Report of Dr. Philip Bedient at 9-10 (Appx. B).

[144] 7 RR 1905:1-1906:22.

[145] 7 RR 1909:7-11.

[146] 7 RR 1934:11-13.

In reaching his opinions, Dr. Bedient employed multiple data sources to conclude that the Government's operation of the Addicks and Barker dams, as designed and constructed, was the sole cause of the Plaintiffs' flooding. Amongst other data sources, he used slab elevations of the test properties, LiDAR data which shows ground elevations, USGS and Harris County water level gauge data for creeks and the reservoir pools, the National Oceanic and Atmospheric Administration ("NOAA") aerial images which depicted the reservoir pool at its height on August 30, 2017, and eyewitness photos and videos.[147] Using these data sets, in combination with his knowledge of how a dam works hydrologically, Dr. Bedient was able to analyze the dams' impoundment of stormwater, the reservoir pools' maximum elevation, and the siting of the plaintiffs' structures and properties within the elevation of those reservoir pools to reach his opinions in this matter.[148]

As Dr. Bedient explained, pool elevations for Addicks and Barker provided by USGS gages at the dams were plotted as shown Figures 12A and 12B of his Report.[149] The pools left Government-owned land early on August 28th, reached their peak elevation on August 30th (with the peaks lasting throughout most of the 30th), and took over a week to leave private property.[150] The maximum pool elevations were 109.1 feet for Addicks and 101.6 feet for Barker—data points which can be used to determine how long the pool water inundated any particular property.[151] As demonstrated by USGS

[147] 7 RR 1910:7-1911:17.

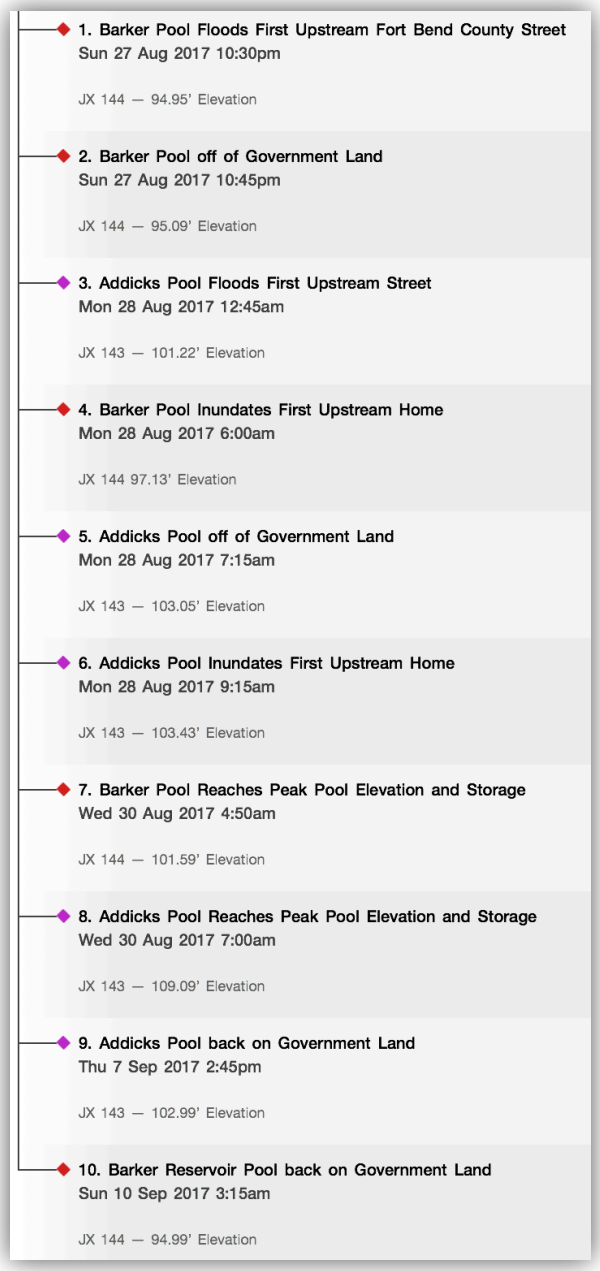
[148] *See* PX 526, Expert Report of Dr. Philip Bedient at 7 (Opinion 6); *id.* at 42-43 (graphs depicting pool height and elevations); and *id.* at 46 (chart of elevation of structures of test properties).

[149] *See* PX 526, Expert Report of Dr. Philip Bedient at 42-43.

[150] PX 526, Expert Report of Dr. Philip Bedient at 43.

[151] 7 RR 1941:19-1944:11.

gauge readings and the Corp's water impact tables, this table shows significant pool elevations during and after Harvey:[152]



[152] *See* JX 143, USGS 08073000 Addicks Reservoir (DEPO_0039687); JX 144, USGS 08072500 Barker Reservoir (DEPO_0039680); JX 118, Water Impact Tables in the Corps' 2014 Emergency Action Plan at E-2 and E-4 (USACE 019883-85).

Each Test Property had its first floor/slab elevation surveyed for this matter by a professional surveyor and those elevation certificates are part of the record.[153] Dr. Bedient then compared each Test Property Plaintiff's slab elevation to their respective maximum pool elevation to determine if the pools caused the structural flooding of each Test Property. Table 13 of Dr. Bedient's report provides the building slab elevation of each Test Property (with a 0.3' adjustment being made to be compatible with the USGS pool readings due to the different benchmarks used for the two sets of elevation data), as compared to the Harvey maximum pool for Addicks and Barker.[154] Dr. Bedient's work establishes that each of the Test Properties' structural flooding was in fact caused by the Addicks or Barker dam impoundment.[155] Table 13 also shows that the Popovici home has a first floor elevation higher than the Barker maximum pool elevation during Harvey, indicating that her home did not flood, although the pool did rise to within about 5 inches from getting into her home and caused the inundation of her real property for a prolonged period of time nonetheless.[156] In addition, the NOAA aerial photos taken August 30th show the extent of the maximum impoundment behind Addicks and Barker Dams;[157] and a zoomed-in view of that aerial was provided for each Test Property in Dr. Bedient's report in Appendix D showing the applicable data and inundation of each property by the pool on the 30th of August.[158] In sum, it was Dr. Bedient's opinion that "had these two dams not captured and stored any of the rainfall runoff waters during Harvey … none of the private properties upstream of these two dams would have had reservoir pool flooding.[159]

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[153] 7 RR 1911:19-25; PX 526, Expert Report of Dr. Philip Bedient at 136 (Appx. F).

[154] PX 526, Expert Report of Dr. Philip Bedient at 46; 7 RR 2043:10-2044:21.

[155] 7 RR 1943:16-1944:15; 7 RR 1947:18-1948:5.

[156] 7 RR 1948:6-12.

[157] 7 RR 1910:15-23.

[158] PX 526, Expert Report of Dr. Philip Bedient at 61-115.

[159] PX 526, Expert Report of Dr. Philip Bedient at 7; *see also id.* at 46 ("[I]t is clear that all of the test properties were flooded due to the impounding of rainfall runoff waters by the USACE behind the

Once the cause of the flooding of each Test Plaintiffs' property was established, Dr. Bedient then considered all other possible causes of flooding both to negate any other cause of the Plaintiffs' flooding and to establish what would have happened had the authorized Government actions (*i.e.* the design, construction, and operation of the Addicks and Barker Dams) not occurred (i.e. the "but for" analysis).[160] Dr. Bedient identified two other possible causes of flooding for the Test Properties; localized drainage system flooding and riverine flooding.[161] Dr. Bedient found that neither of these caused the flooding being complained of by the Test Plaintiffs.

Regarding localized flooding, Dr. Bedient testified that one typically looks at the 1-hour duration for the rainfall to determine if the rainfall would exceed the system's design, but here the local storm sewer system is designed for a 2-year storm event (about 1.9 inches in an hour) with the local streets sufficient to carry runoff amounts up to a 100-year storm event.[162] Dr. Bedient then reviewed the rainfall data for Harvey as provided by the Harris County Flood Control District for its various rain gauges in the vicinity of the Test Properties, as shown in Figure 14B of his report, and determined that the maximum rainfall intensities recorded at these rain gauges for up to the 1-hour duration were greater than the 2-year event but much less than the 100-year event; indicating that stormwater from the maximum Harvey rainfall intensities would have exceeded the storm sewer

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Addicks and Barker Dams that reached maximum water levels of 109.1 feet and 101.5 feet, respectively."); 7 RR 1947:18-1948:12. As for the Popovici property, Dr. Bedient opined that riverine flooding did not cause her flood damages during Harvey—those were due to multi-day inundation of her property from the Barker pool—and "but for" Barker Dam, Ms. Popovici would not have had any flood damage. 7 RR 1991:4-17.

[160] 7 RR 1909:7-11.

[161] 7 RR 1951:10-17.

[162] 7 RR 1951:22-1953:3. On this localized street design point, Dr. Bedient confirmed his opinion was supported by the testimony of Mark Vogler, Chief Engineer for the Fort Bend County Drainage District. 7 RR 1953:4-7.

capacity and gotten into the local streets which were able to handle such stormwater without creating a localized flooding condition nor causing structural flooding.[163]

Dr. Bedient also relied on other information to conclude that localized drainage system was not the cause of the Plaintiffs' flooding. For example, he was aware of the testimony from the various Plaintiffs, as well as from talking to people in the community, that there was no structural flooding early in the Harvey storm event.[164] Dr. Bedient also visited each Test Property to verify that the structures had been elevated at least 18 inches above the curb in accordance with local requirements.[165] He likewise reviewed the study by AECOM regarding the flood impacts to the Lakes on Eldridge community from Harvey which confirmed Dr. Bedient's opinion about the local drainage system not being the cause of structural flooding in that community.[166] Thus, with all these reference points, Dr. Bedient concluded that the local drainage systems in the neighborhoods (*i.e.*, the storm sewers and associated capacity) would not have been so overwhelmed during the Harvey rainfall so as to lead to flooding of the properties.[167]

The second possible cause of the Test Plaintiffs' flooding that Dr. Bedient considered was riverine flooding. Dr. Bedient's methodology used the latest FEMA 100-year and 500-year flood profiles for the major creeks and bayous closest to the Test Properties to identify the 100-year, 500-year and Harvey flood levels at each of the stream gages along those creeks closest to each Test Property.[168] Dr. Bedient and his team looked at the maximum rainfall amounts over the watersheds

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[163] 7 RR 1955:6-1957:5; 7 RR 1958:9-11 ("the [rainfall] intensities really weren't there to—to create a localized flooding condition").

[164] 7 RR 1959:10-1960:22.

[165] 7 RR 1953:8-21.

[166] 7 RR 1961:8-1963:11; 1965:5-23.

[167] 7 RR 1920:16-1921:5; PX 526, Expert Report of Dr. Philip Bedient at 48-49.

[168] PX 2296, Expert Report of Dr. Philip Bedient at Appx. D-1, Table 14-1; 7 RR 1978:8-22.

for the 6- and 12-hour durations, and whether they would produce flood levels in the creeks consistent with a 100- or 500-year event for those durations.[169] They also looked at the available stream gage data and high-water marks, and reviewed the Federal Emergency Management Agency's ("FEMA") flood data of the relevant creeks.[170] Dr. Bedient then used linear extrapolation to provide a reasonable estimate of the Harvey floodplain level at each of the Test Properties.[171] This methodology allowed him to compare the water levels in the relevant creeks with the levels of the creeks from the gauges near the Plaintiffs' properties to see if those creeks were overflowing or not at the Plaintiffs' locations.[172] Dr. Bedient also considered eyewitness testimony and photos of the pertinent water courses and ultimately concluded that riverine flooding was not a cause of Plaintiffs' food damages.

The results of Dr. Bedient's analysis as to each Test Property are presented in Table 15-1 of his expert report which shows the Harvey floodplain level at each of the Test Properties and proves that none of the Test Properties had structural flooding due to riverine flooding, nor would they have had such flooding "but for" the Addicks and Barker dams, with the exception of the West Houston airport.[173] As regards the West Houston Airport Corporation (WHAC) property, even though the estimated Harvey floodplain level was higher than the WHAC terminal building, record evidence proves that Bear Creek never overtopped its south bank to cause any flooding on the WHAC

[169] PX 526, Expert Report of Dr. Philip Bedient at 52.

[170] 7 RR 1923:13-22; PX 526, Expert Report of Dr. Philip Bedient at 52.

[171] 7 RR 1980:10-1981:16. For Langham Creek, Dr. Bedient also used the high water marks for the 2016 Tax Day event obtained from the Harris County Flood Control District to inform a more up-to-date and accurate flood profile for his linear extrapolation. 7 RR 1981:17-1982:4. And for the Lakes on Eldridge property, Dr. Bedient relied on the AECOM study to estimate the Harvey floodplain level for that Test Property of being less than 107 feet. 7 RR 1982:15-16.

[172] 7 RR 1925:17-1926:23; PX 526, Expert Report of Dr. Philip Bedient at 54.

[173] 7 RR 1983:14-1984:25; PX 2296, Expert Report of Dr. Philip Bedient at Appx. D-1, Table 15-1.

property.[174] This was also confirmed by the testimony of Stacey Lesikar, who was on the airport property and observed the flooding conditions during Harvey.[175] In addition, the Harvey flood level at the Clay Road gauge showed a flood level less than the Tax Day flood of 2016, when the WHAC reported no flooding of its terminal building.[176] Finally, Dr. Nairn's analysis confirms that the WHAC had no flooding from Bear Creek and only from the reservoir pool.[177] Thus, as Dr. Bedient concluded:

> I have also considered other possible causes of flooding of the private properties within these two reservoirs, particularly the 13 test properties, due to the Harvey rainfall, such as flooding from the local drainage system due to rainfall over that particular subdivision, and from overbank flooding from an adjacent stream or creek. None of the test properties' structures would have flooded but for the impoundment of rainfall runoff waters behind Addicks and Barker Dams. Popovici did not have any flooding within the home during Harvey but would not have had any flooding on her property but for the impoundment behind Barker Dam.[178]

b. Even the expert testimony and report of the Government's hydrology expert, Dr. Robert Nairn, confirms the direct causal link between the flooding experienced by the Test Property Plaintiffs and the Harvey reservoir pool created by the Government's flood control project.

The most important aspect of the testimony from Dr. Robert Nairn, the Government's causation expert, is that it agrees with Plaintiffs on several key causation points. First, Nairn concedes causation altogether with respect to ten of the thirteen upstream Test Properties: he agrees that the Popovici, Soares, Holland, Lakes on Eldridge, West Houston Airport Corporation, Banker, Stewart, and Wind properties would not have flooded during Harvey but-for the Addicks and Barker

[174] 7 RR 1987:5-1988:5; Lesikar 1-A (August 28, 2017 photograph of Bear Creek Diversion Channel); Lesikar 1-J (August 28, 2017 photograph of Bear Creek Diversion Channel); Lesikar 3 (August 28, 2017 video of Bear Creek Division Channel.)

[175] 7 RR 1988:6-18. As Dr. Bedient's report notes, his opinion is further buttressed by the preliminary FEMA floodplain map which shows the WHAC property to be outside of the 500-year floodplain of Bear Creek. PX 526, Expert Report of Dr. Philip Bedient at 54, 90 (November 5, 2018).

[176] PX 526, Expert Report of Dr. Philip Bedient at 54.

[177] 7 RR 1989:15-1990:15.

[178] PX 526, Expert Report of Dr. Philip Bedient at 7-8.

projects.[179] This is consistent with the Modeling Mapping and Consequences Production Center's ("MMC") own modeling of the upstream area, which demonstrates that "had the Addicks and Barker reservoirs not been in existence," zero upstream structures behind Addicks and Barker would have flooded.[180]

Nairn also concedes that the peak flood level at each of the thirteen upstream Test Properties was caused by the impoundment of stormwater behind Addicks and Barker dams.[181] As a result, the only causation dispute in this case pertains to the Burnham, Giron, and Micu properties, which Nairn claims would have flooded during Harvey due to local reasons under his "No Project" modeling scenario.[182] Importantly, however, Nairn's "No Project" scenario does not establish that "but for" the Government's Project, the Micu, Giron, and Burnham properties would not have had multi-day maximum levels of flooding in their homes. Nor could it, because Nairn conceded the maximum

[179] 9 RR 2777:13-23 (Nairn); DX 608, Expert Report of Dr. Robert Nairn at iii ("Our modeling efforts demonstrate that finished first floors on three of the thirteen upstream Test Properties would have experienced some flooding even in the absence of the federal project, which includes the Addicks and Barker Reservoirs.").

[180] 5 RR 1276:2 – 1278:7 (Buchanan); PX 164, Consequences Evaluation Pertaining to Hurricane Harvey in the Houston Area (September 6, 2017); PX 168, Graphic Depiction of Corps' Modeling of Upstream Area.

[181] 9 RR 2777:1-6 (Nairn); DX 608, Expert Report of Dr. Robert Nairn at 94 ("Peak flood elevations at all the upstream Test Properties are attributed to backwater due to high pool elevations in Addicks or Barker Reservoirs."); *see also* 7 RR 1947:9-14 ("Q. And what did you understand, based on Dr. Nairn's work, does his model show as being the maximum level of flooding throughout all of the 13 test properties in terms of the reason for it? [Bedient] A. His finding in his analysis was that, indeed, all of the test properties, the maximum flooding there was from the pool.");); 7 RR 1960:23-1961:3 ("Q. And focusing on Dr. Nairn's work, all right, to ten of the test properties, what does Dr. Nairn say about the sole cause of structure flooding as to the ten? [Bedient] A. Well, the ten properties, his models indicate the sole cause was the pool, the flood pools.").

[182] Nor does the "No Project" scenario Dr. Nairn testified about undercut his concession that the peak flooding that occurred on August 30, 2017 and which lasted for several days, was due to the reservoir pools created by the Addicks and Barker dams. It is significant that Nairn did not opine on where flood water came from; he could have, his model allowed for it. But instead he simply conceded that the maximum level of inundation for each property was caused by the reservoir pools. Therefore, the Government has not proved that "no taking" occurred with the "No Project" scenario.

flooding for all Test Properties was due to the Government's Project. For this reason, the Government has actually conceded causation as to the severe, multi-day flooding for the Micu, Giron, and Burnham properties and has not shown that the maximum flooding was rendered worse due to any local causes.

Further as is shown below in Section III(C)(3)(b), (c), and (f), Dr. Nairn's computer model challenging causation as to the Burnham, Giron, and Micu properties is based on deficient data and an irreparably flawed methodology. As a result his opinions as to these properties should be given no weight and certainly should not override contemporaneous photographs and videos of these areas.

Thus, following from Dr. Bedient's analysis, as buttressed by Dr. Nairn's concession, the evidence establishes that the Test Plaintiffs' injuries were the predictable and likely (indeed, foreseen) result of the Government's Project operations; no intervening cause "broke the chain of causation." *Caquelin*, 140 Fed. Cl. at 577 & n.19 (citing *Arkansas Game & Fish Comm'n v. United States*, 87 Fed. Cl. 594, 621-24 (2009), *rev'd*, 637 F.3d 1366 (Fed. Cir. 2011), *rev'd & remanded*, 568 U.S. 23 (2012), *aff'd on remand*, 736 F.3d 1364 (Fed. Cir. 2013); *Cary v. United States*, 552 F.3d 1373, 1380 (Fed. Cir. 2009); and *Moden v. United States,* 404 F.3d 1335, 1343 (Fed. Cir. 2005)).

3. The Test Property Plaintiffs received no benefit from this federal flood control project, <u>or any other</u> government action "directly related to preventing the same type of injury on these same properties where the damage occurred."

Finally, in the recent case of *St. Bernard Parish Gov't v. United States*, 887 F.3d 1354, 1358-62 (Fed. Cir. 2018), the Federal Circuit ruled that plaintiffs had not taken into account the possible effect(s) of a second government action—the Lake Pontchartrain and Vicinity Hurricane Protection Project ("LPV project")—which had been "designed to, and did, reduce the risk of flooding in New Orleans, including specifically along the banks of MRGO." The Court directed that "[w]hen the government takes actions that are directly related to preventing the same type of injury on the same property where the damage occurred, such action must be taken into account even if the two actions were not the result of the same project." *St. Bernard Parish*, 887 F.3d at 1366. Here, the record confirms

that there is no Government action directly related to upstream flood-mitigation; accordingly, there is no flood-mitigation benefit for any Test Property Plaintiff.

First, Dr. Bedient was asked about this issue and directly testified that no other government action directly related to preventing the same type of injury on these same properties where the damage occurred provided any benefit or altered his causation analysis with regard to any Test Property Plaintiff.

Q. Great. And when we left off, you had just told the Court that your conclusion was that the cause of the inundation at the test property locations that we've discussed was the Addicks and Barker dams; correct?

A. That is correct.

Q. All right. Are you aware of -- what other -- let me step back. Are you aware whether or not there are other federal government construction projects in and around Houston that are aimed at providing flood prevention control?

A. There are.

Q. Are any of them located such that they would help any of the upstream properties in terms of reducing risk and reducing flood control -- or reducing flood risk?

A. I don't believe so.[183]

Q. Tell the Court, if you know, whether or not your conclusion about the dams being the cause of the flooding we described includes or does not include the evaluation of all federal projects in and around the Houston area.

A. It does, and there aren't any up in this area that I know of.[184]

And Dr. Bedient's testimony that there is no other federal government project related to preventing the same type of injury on the same property where the damage occurred was confirmed by the Government's representative, Robert Thomas.

Q. Is it correct, Mr. Thomas, that the Buffalo Bayou and Tributaries project as we have defined it in your testimony over these many days is the only federal project affecting the upper Buffalo Bayou watersheds?

A. I think that's true.

[183] 7 RR 1950:1-18.

[184] 7 RR 1951:2-8

Q. And those watersheds again are the Addicks watershed, Barker watershed, and that portion of Cypress Creek that flows into Addicks?

A. Yes, sir.

Q. So it's just Addicks dam and structures, Barker dam and structures, and those 7-1/2 miles of improved channel downstream.

A. I should clarify my last answer: Only federal USACE-led civil works projects.

Q. And you're not aware of any other federal flood detention or flood control projects in the upper Buffalo Bayou watersheds; true?

A. True.[185]

Finally on this point, while the Government introduced evidence that Fort Bend and Harris County agencies/and or private developers had undertaken some channel widening on government-owned land within the reservoirs, as Ms. Johnson-Muic testified none of the improved channels that extend on to Government land are part of the Buffalo Bayou federal flood control project, or any federal project for that matter.[186] The record evidence and testimony here comports with the sole purpose of federal government flood control efforts regarding the Buffalo Bayou watershed: the protection of downstream properties without a single action directed, intended, or effective to provide flood mitigation benefits to upstream properties (including these Test Plaintiffs).

C. The Complete Expropriation of the Use of Each Plaintiff's Property Interests was Sufficiently Severe to Constitute a Taking.

The second part of the *Ridge Line* inquiry considers the nature and magnitude of the government action as well as consideration and assessment of the severity and duration of the government-induced flooding; there must be a showing that the "invasion preempted the owner's right to enjoy his property for an extended period time, rather than merely inflict an injury that reduces

[185] 4 RR 1023:10-1024:3. In documents produced in this case, the Government concedes that the so-called "relative benefits" doctrine is one that does not generally apply to upstream properties behind a dam. JX 52, Buffalo Bayou and Tributaries, Texas, *Reconnaissance Report: Section 216 Study, Addicks and Barker Reservoirs, Houston, Texas* at 2 (October 1995, USACE 015301–302) ("The relative benefits doctrine often protects the United States from liability for downstream flood damages, but is rarely applicable as a defense to upstream claims.").

[186] 4 RR 910:20-911:13.

its value." *Ridge Line*, 346 F.3d at 1356. "It is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial, that determines the question whether it is a taking." *Big Oak Farms*, *Inc. v. United States*, 105 Fed. Cl. 48, 53 (2012) (quoting *United States v. Cress,* 243 U.S. 316, 328 (1917)). The question is "whether the injury constituted a sufficiently severe invasion that interfered with the landowner's reasonable expectations as to the use of their property." *Arkansas Game & Fish*, 736 F.3d at 1370.

As shown above, the Government's actions resulted in an invasion by flooding that preempted each Plaintiffs' right to use and enjoy the protectable real and personal property interests they owned in the manner expected. The record likewise proves that the Government's appropriation of those property interests was sufficiently severe to constitute a taking.

1. Severity is established by interference with the intended use of property, an issue informed by the effects of the intrusion on the property owner.

"[F]or purposes of establishing severity, it is sufficient for plaintiffs to show that government-induced flooding has interfered with plaintiffs' ability to use their land for its intended purposes." *Ideker Farms, Inc. v. United States*, 136 Fed. Cl. 654, 679–80 (2018), *reconsideration denied*, 142 Fed. Cl. 222 (2019). As the *Ideker Farms* court noted, in its opinion on remand in *Ark. Game & Fish*, the Federal Circuit stated that it is not "unreasonable to measure the severity of the interference with a property owner's rights by looking to the effects of the interference[;] [the] interference with the Commission's property rights [is considered to be] as depriving the Commission 'of the customary use of the Management Area as a forest and wildlife preserve.'" *Id.* (citing *Ark. Game & Fish*, 736 F.3d at 1375 (quoting *Ark. Game & Fish Comm'n v. United States*, 568 U.S. 23, 37-38 (2012)).

And while it is the preemption of the property owner's right to use and enjoy their property—or to exclude others from that property—that is the focus of the severity inquiry, because "it may often be difficult to say, in the abstract, whether a particular intrusion is severe or only incremental in nature; consideration of the effects of the intrusion on the property owner will often make that

distinction easier to draw." *Id.* (citing *Ark. Game & Fish*, 736 F.3d at 1375 ("Nor is it unreasonable to measure the severity of the interference with a property owner's rights by looking to the effects of the interference.")).[187] Thus, the impact on each Test Plaintiff's real property, as well as the complete destruction of literally tons of personal property and effects, caused by the inundation from the stormwater runoff stored by the Government's Project is relevant to the severity analysis as well.

2. Expert testimony confirmed that the storage of Harvey stormwaters on each Test Plaintiff's real property, and the destruction of their personal property, sufficiently interfered with the use and enjoyment of that property to constitute a taking.

Test Plaintiffs presented expert testimony and documentary evidence which demonstrated how the storage of Harvey stormwaters on the Test Plaintiffs' properties severely interfered with its intended use as well as the devastating effect of the intrusion on each Plaintiff. Each Plaintiff lost normal use of their property, lost access to and from their property, and had economic losses in the form of property diminution, property repair, and/or the destruction of personal property. Indeed, the MMC's Consequence Evaluations, albeit based on outdated records understating the number and value of structures, demonstrate severity as they show the average amount of "direct damages" resulting from submersion by impounded stormwater runoff was roughly $90,000 per structure.[188]

a. Dr. Randall Bell.

First, Plaintiffs presented the testimony of Dr. Randall Bell, Ph.D., the chief executive officer of the Landmark Research Group which specializes in real estate damage economics.[189] Dr. Bell has

[187] As the Court noted during *voir dire* of Dr. Bell, "severity is a relatively new term that appears in Justice Ginsberg's decision. It is a relative term. It depends on the context." 5 RR 1351:5-24.

[188] PX 163, Consequences Evaluation Pertaining to Hurricane Harvey in the Houston Area (August 30, 2017); 5 RR 1260:1 – 1261:6 (Buchanan trial testimony indicating he used 2003 parcel data that totally excluded Fort Bend County homes behind Barker Reservoir from the analysis).

[189] 5 RR 1330:23-1331:3.

an MBA from UCLA and a Ph.D. from Fielding Graduate University.[190] He is a licensed appraiser, and holds the MAI designation from the Appraisal Institute.[191] Dr. Bell has over 30 years of experience in the assessment of property, and since 1992 has specialized in real estate damage economics including valuation related to detrimental conditions such as environmental and natural disaster issues.[192] He is the author of numerous published articles as well as the book "Real Estate Damages"—widely regarded as the authoritative text on impacts of detrimental conditions on property values.[193] Dr. Bell has provided expert services in hundreds of diminution in value assignments ranging from the World Trade Center to Hurricane Katrina.[194]

Indeed, it can literally be said that Dr. Bell "wrote the book" on assessing the detrimental impacts on property from natural and man-made disasters; that book is *Real Estate Damages* in which he developed the "detrimental conditions matrix"—the methodology that has been adopted by the Appraisal Institute into the governing regulations for the profession, the Uniform Standards of Professional Appraisal Practice ("USPAP").[195] He is also the author of the Appraisal Institute's course titled "The Valuation of Detrimental Conditions in Real Estate," which includes studies of valuing properties that have been impacted with detrimental conditions, such as flooding impaired properties—a course he has taught to other appraisers dozens of times.[196] At trial the Court qualified Dr. Bell to give opinion testimony as an expert on real estate damage and economics and real estate

[190] 5 RR 1330:14-20.

[191] PX 660, Expert Report of Dr. Randall Bell at 1.

[192] PX 660, Expert Report of Dr. Randall Bell at 1.

[193] PX 660, Expert Report of Dr. Randall Bell at 2.

[194] PX 660, Expert Report of Dr. Randall Bell at 2.

[195] 5 RR 1335:1–11, 5 R.R. 1336: 1–6; PX 660, Expert Report of Dr. Randall Bell at 60–63

[196] PX 660, Expert Report of Dr. Randall Bell at 2.

valuation to include severity.[197]

For any damaged real estate, the detrimental conditions matrix assesses three components: "cost, use and risk."[198] The data underlying and employed by the methodology includes sales data from the pertinent Multiple Listing Service (MLS) regarding those properties which had flooded, as well as interviews of area real estate agents, brokers, and property owners.[199] In gathering his data, Dr. Bell ensured that only "arm's length" transactions were included in his study.[200] Dr. Bell then segregated the data for damaged properties into "unrepaired or repaired" and looked at the pre-Harvey values as against each post-Harvey comparable sale, and finally factored in the repair costs to the analysis.[201] As Dr. Bell also noted, these properties were being used for their highest and best use,[202] a use which significant literature and numerous studies have recognized that, for the average individual, also entails a homeowner's largest single investment.[203] As Dr. Bell noted, his work provided "more than enough data" to assess the severity of the impact of the Government's flooding on the valuation of Plaintiffs' properties.[204]

While each context is unique, Dr. Bell opined that in general the literature reflects that there can be a 20% or 30% decline in value from this type of flooding.[205] The decrease in value in the

[197] 5 RR 1352:4-6.

[198] 5 RR 1335:11–25 (describing each component).

[199] 5 RR 1336:22-1338:3; 5 RR 13-18.

[200] 5 RR 1339:8-13.

[201] 5 RR 1340: 6–20.

[202] 5 RR 1369:13-18.

[203] 5 RR 1360:23-1361:4.

[204] 5 RR 1341:7-13.

[205] 5 RR 1353:13-1354:2.

properties can come from lowered expectations of resale pricing or from the market not being willing to pay "full price" for the property because of the now known risk of future flooding.[206]

The severity of impact also includes the investment and the work that is required to get it back into a livable condition, which often is the biggest cost that the property owner would have before selling the property.[207] Dr. Bell noted that while the repairs do increase the value of the home, they are not the passive recovery that would normally be associated with a home because of the extensive cost and labor that goes into the repairs.[208] And there is the cost associated with being forced to evacuate the property under dangerous conditions and then not being able to live in or use the property in its damaged state.[209] This prevents a property owner from using it as they otherwise would have intended.[210] When asked to summarize his opinion about the severity of the impact on the Test Property Plaintiffs, Dr. Bell stated:

> In this preliminary case study analysis, the far right column, which I've shaded with kind of a light blue, is a percentage, and what I have in the back of my mind as I look down at a column of numbers like this, are those equity numbers we just discussed, the 10 percent or 20 percent.
>
> Routinely, you see the equity largely or entirely -- no pun intended -- under water. You know, as I said earlier, your equity can be gone. That tells me that this is, at least in my profession, it is a very severe situation.[211]

b. Mr. Matthew Deal.

Regarding the severity of the impact of Government-induced flooding on the subject properties, Plaintiffs also presented the testimony of Mr. Matthew Deal, a state-certified general real

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[206] 5 RR 1356:1-1357:1.

[207] 5 RR 1357:2-19.

[208] 5 RR 1364:4-18.

[209] 5 RR 1357:20-1358:18.

[210] 5 RR 1358:19-1359:25; *see also* 5 RR 138 :6-8 ("people were also displaced for months, and that was considered as well").

[211] 5 RR 1353:3-12.

estate appraiser and a member of the Counselors of Real Estate organization.[212] Based in Houston, Texas, through his real estate valuation and consulting firm, Deal Sikes, Mr. Deal has been appraising properties for 30 years.[213] In addition to his valuation work for private parties, Mr. Deal has been retained as an expert in large litigation assignments involving thousands of properties.[214] The Court qualified Mr. Deal as an expert in real estate market studies and real estate valuation.[215]

For his work in this matter, Mr. Deal conducted a market value study which analyzed the severity of interference and the diminution in price levels resulting from the inundation of the test properties. Amongst other factors, he considered supply, demand, and prices of upstream properties, with a focus on the properties of Plaintiffs Banker, Burnham, Giron, Stewart, Turney, and the West Houston Airport.[216] Mr. Deal described the research he undertook for his market study and testified that his opinions were informed by USPAP in reaching his opinions.[217] Mr. Deal inspected the residential properties and for each he identified nearby comparable sales—both before and after the Harvey pool flooding, and the condition of the property.[218] Mr. Deal also considered factors such as deed restrictions, income demographics, school districts, proximity to amenities, proximity to employment centers, and proximity to roadways, along with general market factors which affect a property's value.[219] Regarding each residential test property, as well as the terminal building at the West Houston Airport, Mr. Deal confirmed that each suffered "permanent damage" that would not be

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[212] 8 RR 2184:20-23; 2189:1-13. As Mr. Deal explained, the CRE designation is by invitation-only from the Society of Real Estate Counselors and consists of only about 1,000 members world-wide.

[213] 8 RR 2183:7-10; 8 RR 2184:12-19.

[214] 8 RR 2185:22-24.

[215] 8 RR 2209:7-9.

[216] 8 RR 2287:16-2188:10.

[217] 8 RR 2192:15-22; *see also* PX 2205, Expert Report of Matthew Deal at 1-2.

[218] 8 RR 2190:20-2191:2; PX 2205, Expert Report of Matthew Deal at 3–12.

[219] 8 RR 2189:1-13.

rectified without a "significant amount of investment and risk of capital" to get them back to their intended uses.[220] In his opinion, "the inundated properties suffered a significant diminution in price levels caused by this inundation."[221]

In sum, the expert testimony provided by Plaintiffs confirmed the severity of the interference with the property rights of each based on the interference with each Plaintiffs' right to use and enjoy their property, especially considering the destruction of each Test Plaintiff's real and personal property. *Ark. Game & Fish*, 736 F.3d at 1375). As ultimately explained by Dr. Bell: an analysis of the "severity of the impacts on properties, and the use and rights of their owners, developed and flooded behind the Addicks and Barker dams demonstrates that there is a severe impact to the properties and owners' rights and use."[222] For these Test Property Plaintiffs, the impact of the Government's flooding of their properties, "the numbers bear out what is self-evident; it's severe."[223]

3. Testimony and documentary evidence from each Test Plaintiff also confirmed that the storage of Harvey stormwaters on their real property, and the destruction of their personal property, sufficiently interfered with the use and enjoyment of that property to constitute a taking.

As this Court recognized in *Caquelin v. United States*, 140 Fed. Cl. 564, 573-77 (2018), there are numerous ways for the government to effect a physical taking of property. Here, each Test Plaintiff had real property invaded by the Government's actions to capture and store Harvey stormwaters on their property. Regardless of whether the flooding consisted of only a few inches of surface flooding

[220] 8 RR 2209:22-2210:10 ("They did suffer permanent damage, damage that wouldn't be healed by itself. It would require significant amount of investment and risk of capital in order to get them all the way back to be able to be habitable.").

[221] 8 RR 2210:23-2211:2.

[222] 5 RR 1344:18-23; PX 660, Expert Report of Dr. Randall Bell at 4.

[223] 5 RR 1361:16-1362:5; *see also* PX 526, Expert Report of Dr. Philip Bedient at 8 ("As compared to other flood events that I have reviewed and analyzed, the flooding of thousands of homes and thousands of acres of private property in each of the Addicks and Barker reservoirs was particularly severe and destructive.").

precluding use of (or ingress and egress to) a Plaintiff's property for an extended period of time, or whether it rose to several feet in a Plaintiff's home and destroyed furniture, fixtures, and other personal property, the substantial denial of a Plaintiff's use of their property is substantial and severe enough in nature and magnitude to constitute a taking.

The testimony and evidence in this record shows that each Test Plaintiff's property was invaded by government-induced flooding which restricted access to and from their property, causing their eviction from their properties for a period long after the water receded due to necessary repairs, or the significantly limited use of that property. The disruption of their lives, the devaluation of their properties, the destruction of their real and personal property, and their displacement from their homes and businesses for an extended period demonstrate Plaintiffs have suffered one or more of the following: (1) temporary categorical physical takings for the period each Test Plaintiff was deprived of the use of their property for its intended purpose, (2) permanent categorical physical takings for the destruction of Plaintiffs' personal property (and certain fixtures and improvements), and (3) permanent non-categorical physical takings for the flowage easements that *de facto* exist across each test Plaintiff's property for which a taking claim has now accrued. *Stueve Bros. Farms, LLC v. United States*, 737 F.3d 750 (Fed. Cir. 2013).

a. Todd Banker.

As to Test Property Plaintiff **Todd Banker**, the parties stipulated to the following facts: (a) at the time of Tropical Storm Harvey, Todd and Christina Banker had a property interest in a residential subject Test Property located at 4614 Kelliwood Manor Lane, Katy, Texas (the "Banker property"); the Banker property is Lot 36, in Block 1, of the Kelliwood Park subdivision; (c) the Bakers purchased the Banker property on July 27, 2007 and have owned the property since that time; (d) Joint Exhibit 82 is a true and correct copy of the deed by which the Banker property was conveyed to Christina and Todd Banker; and (e) based on the surveys conducted by the parties' retained surveyors in 2018, the

elevation of the finished first floor of the house located on the Banker property is 100.7 feet, NAVD88/2001 Adjustment.[224]

In addition, the United States admitted the following facts with regard to the Banker property: (a) the elevation of the finished floor for the Banker property at 4614 Kelliwood Manor Lane, Katy, Texas is lower than the elevation of water behind Barker Dam during Tropical Storm Harvey; (b) some portions of the Banker property at 4614 Kelliwood Manor Lane, Katy, Texas are lower than the elevation of water behind Barker Dam during Tropical Storm Harvey; and (c) that the Upstream Test Property owned by Todd and Christina Banker was affected by runoff from Tropical Storm Harvey.[225] Further, Mr. Banker testified that the property was in fact his primary residence and that the deed was the true and correct deed.[226] The Bankers have a protectable property right in the real estate, the home and fixtures, and the personal property that was taken by the Government's actions.

The Bankers' experience demonstrates the severity of the Government's taking of that property, The Bankers were not home when the flooding made it into their home because they had evacuated on the morning of the 28th.[227] However, while they were at home early Monday morning the water had already reached past their tree line.[228] After evacuating on a kayak and leaving town and spending time at his parents' home Mr. Banker returned to his home, without his wife and child, on

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[224] Dkt. No. 211, Stipulations of Fact for Trial Nos. 4-9. As used throughout the parties' stipulations on file as Dkt. 211, the phrase "elevation of the finished first floor" means the elevation in feet of the first floor of any structure on the subject property.

[225] Dkt. 219-3, USA's Response to Upstream Plaintiffs' Second Set of Interrogatories and First Set of Requests for Admissions Tab 11, Nos. 74, 88 (hereafter "Dkt. 219-3, USACE Admissions Tab 11"); Dkt. 219-4, United States' Amended Objections and Response to Upstream Plaintiffs' Second Request for Interrogatories and Admissions, and Seventh Requests for Production Tab 24, No. 132 (hereafter "Dkt. 219-4, USACE Admissions Tab 24").

[226] 6 RR 1700:10-25.

[227] 6 RR 1710:1-21.

[228] 6 RR 1710:21-24.

September 4th to find his home severely damaged by the flooding.[229] There was still water up to the sidewalk.[230] However, returning to see the damage was only the first portion of the time and duration that the Bankers were without use of their home. It took another seven months of costly repairs before the Bankers were able to move back into their home.[231]

Mr. Banker testified that he had no idea that his home was in the reservoir and that they had intentionally dropped their flood insurance because after nine years they did not believe that they needed it.[232] They didn't feel like they needed it because their home had never flooded before.[233] In the decade that the Bankers had lived at the property the only time Mr. Banker had ever seen water rise above the curb was during the 2016 Tax Day Flood.[234]

The Bankers had reasonable investment-backed expectations of a safe home when they purchased their home. Had they known that it was inside the reservoir they would not have purchased this home.[235] They bought a new home in a new subdivision that was deed restricted, which helps to stabilize and raise the value of the property.[236] Like many people, the Bankers chose their home based on the quality of the neighborhood around them, the schools, and proximity to family and friends.[237] Had they known that it was inside the reservoir they would not have purchased this home.[238] When

[229] 6 RR 1730:7-18.

[230] 6 RR 1712:16 -1713:7

[231] 6 RR 1717:12-18.

[232] 6 RR 1705:11-17:06:20.

[233] 6 RR 1704:20-25.

[234] 6 RR 1705:4-10.

[235] 6 RR 1720:5-8.

[236] 6 RR 1702:1-2.

[237] 6 RR 1703:5-23.

[238] 6 RR 1720:5-8.

they purchased their home in 2007 they had the expectation of the property value increasing and viewed the home as part of their retirement.[239]

Mr. Banker also provided examples of his family's personal property that was destroyed, including a scrapbook from his daughter's first year: "Well, the -- the scrapbook was a time when my daughter was in the hospital after she was born. So it covered this year-long time when she was in the hospital when she was first born. So that was kind of an important -- I didn't know where it was. And it happened to be flooded out when we got back."[240] When asked what was taken from them by the flooding Mr. Banker responded:

> Well, I mean, people say peace of mind, but that -- that is truly also what was taken from us, and the uncertainty of the future.
>
> More importantly for us is my daughter's future, who has special needs, and will never be able to take care of herself. So -- and so my wife and I had been planning for her care after we're gone for a long time and estimated how much we would need when we're gone. And figure this probably cost us 10 or 11 years of care for my daughter, at least, which, you know, took me 18 or 19 years to accumulate. So it's hard to get that back.
>
> But that's the most important aspect of what we've lost. And so we kind of -- that's what we -- hard to deal with on a day-to-day basis, I know.[241]

The severity of the flooding of the Bankers' property cannot be overstated. The core of what most people consider to be their home was destroyed including appliances, beds, tables, chairs, cabinets, the walls, and the floor.[242] Mr. Banker went over pictures of the destruction that the flood

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[239] 6 RR 1704:12-19.

[240] 6 RR 1717:24-1719:7; 1713:8-1716:25; *see also* Banker Exhibits 18 and 24.

[241] 6 RR 1719:14-1720:3.

[242] 6 RR 1717:24-1719:7.

waters caused in his home.[243] The Bankers would go months without being able to use their home in their customary manner.[244]

And as the testimony and reports of both hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the maximum flooding suffered by the Bankers was caused by the Barker reservoir pool; and indeed, the reservoir pool of Harvey stormwater stored behind the Barker dam was the **sole** cause of the flooding of this Test Property.[245]

b. Elizabeth Burnham.

Regarding Plaintiff **Elizabeth Burnham**, the parties stipulated to the following facts: (a) the property that is the subject of Plaintiff Elizabeth Burnham's claim is a residential property located at 15626 Four Season Drive, Houston, Texas, 77084 (the "Burnham property"); (b) the Burnham property is located in the Bear Creek Village Section 12 subdivision in Harris County, Texas; (c) Burnham and her mother, Josena Arquieta, purchased the Burnham property on December 31, 2014; (d) Joint Exhibit 121 is true and correct copy of the deed by which the property was conveyed to Burnham and Arquieta; and (e) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Burnham property is 105.4 to 105.5 feet, NAVD88/2001 Adjustment.[246]

In addition, the Government has admitted that (a) the elevation of the finished floor for the Burnham property is lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; (b) some portions of the Burnham are lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; and (c) the Upstream Test Property owned by Elizabeth Burnham was

[243] 6 RR 1713:8-1716:25; 6 RR 1707:12-1708:23.

[244] 6 RR 1719:8-11.

[245] *See* Sections III(B)(1)-(2).

[246] Dkt. No. 211, Stipulations of Fact for Trial Nos. 10-18.

affected by runoff from Tropical Storm Harvey.[247] Further, Ms. Burnham stated that the property was her home and verified that Joint Exhibit 120 was her home contract.[248]

Ms. Burnham not only made the property a home for her and her family, but she actively designed and decorated the home to be a part of the Weird Homes tour.[249] The work she had done on the home to have it be accepted as part of the tour was something of which she was very proud.[250] As shown herein, Ms. Burnham had a protectable property right in *inter alia* her real estate, her home and fixtures, and her personal property that was taken by the Government's actions.

According to a real estate disclosure, the Burnham Property had flooded once in a "freak storm" before Ms. Burnham purchased the property, and once again during the 2016 Tax Day flood,[251] but that flooding had not forced the family from their home.[252] As Dr. Bell predicted, the fact that the home had flooded during the Tax Day flood made the flood insurance too expensive for Ms. Burnham to get full coverage for her home and made the process take much longer.[253]

By August 30, 2017, Ms. Burnham's home was inundated with several feet of contaminated black water.[254] The Government-induced flooding didn't just damage the physical property, it destroyed the culture and social atmosphere of the neighborhood. Ms. Burnham described how before Harvey the neighborhood was extremely safe but afterwards it was "like a zombie apocalypse. And

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[247] Dkt. 219-3, USACE Admissions Tab 11, Nos. 71, 85; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[248] 6 RR 1757:5-19.

[249] 6 RR 1770:2-13.

[250] 6 RR 1770:2-13.

[251] *See* PX 20, Not for Public Release (USACE 207223) (internal Corps' document admitting that one cause of upstream flooding during Tax Day was restricted drainage from neighborhood storm management systems caused Addicks' elevated pool level).

[252] 7 RR 1814:14-1815:9.

[253] 6 RR 1765:9-19; Burnham 54g (September 8, 2017, photo of storm drain).

[254] Burnham 54b (August 30, 2017, photo of Burnham's home).

my house was broken into, and when I saw that, I came outside, and I was just so frustrated about everything that had happened that I could scream bloody murder in the streets and nobody would come see you because nobody was there. And the stench. And it was just horrific."[255] Because of this change Ms. Burnham didn't feel safe in her home and felt like she had to leave.[256]

Ms. Burnham had reasonable investment-backed expectations when she purchased her home. She stated that she chose the property because as a single mother of two children she wanted something that was secluded, safe, and had good schools.[257] She paid $164,900 for what she believed would be her "forever home," and thought it was a good investment because the community was deed restricted, which would ensure that the "neighborhood would stay nicer."[258] Unfortunately, Ms. Burnham was forced to sell her home that she was so proud of for $80,000 because of Government had determined in 2009, years before she purchased her home, that her property was one of the homes it would submerge through Project operations; however, when she purchased the home she had no idea it could be submerged from the Addicks pool.[259]

The severity of the flooding of the Burnham property cannot be overstated. The flood water came up to Ms. Burnham's chest height.[260] Mold covered her furniture; appliances were destroyed.[261] At its maximum there were approximately five feet of water standing in the house.[262] The flooding

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[255] 6 RR 1779:2-22.

[256] 6 RR 1780:5-17.

[257] 6 RR 1754:11-21.

[258] 6 RR 1754:11-1755:10; JX 120, One to Four Family Residential Contract (December 8, 2014).

[259] 6 RR 1760:8-1761:1.

[260] 6 RR 1775:12-17; Burnham 54b (August 30, 2017, photo of Burnham's home).

[261] Burnham 54h (September 8, 2017 photo of refrigerator); Burnham 54i (September 10, 2017, photo of Burnham's sofa covered with mold).

[262] 6 RR 1773:11-24.

clearly prevented Ms. Burnham and her family from using their home in the customary way a family uses a home.[263] When asked to describe what the flooding took from her, Ms. Burnham responded:

> My home. My sense of security. My ability to pay my mother back. My daughter being able to graduate with her friends. Living in a nice house. My new house is not nearly as nice as this one. It makes me sick. My mother has COPD, and she -- by the time I'm able to pay her back, it won't matter.[264]

Ms. Burnham is one of the three Test Plaintiffs as to whom the Government does not concede causation entirely; the Government does concede that the maximum inundation was caused by the reservoir pool.[265] Dr. Nairn opined that his model "predicted" that overflows from Langham creek would cause structural flooding at the Burnham property beginning on August 27th,[266] however Dr. Nairn conceded that his model over-predicted the flood stages in the Langham Creek area in the Addicks reservoir.[267] Further, his conclusions are contrary to the photographic and testimonial evidence at trial flows on Langham Creek during Harvey were, at most, 9,000 cfs, which the USGS characterized as consistent with a 20-year storm.[268] The USGS' characterization is consistent with Harris County Flood Control District high water marks, which indicate that Lanham Creek's flows

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[263] 6 RR 1781:25-1782:4.

[264] 6 RR 1782:10-15.

[265] 9 RR 2777:1-6 (Nairn); DX 608, Expert Report of Dr. Robert Nairn at 94 ("Peak flood elevations at all the upstream Test Properties are attributed to backwater due to high pool elevations in Addicks or Barker Reservoirs."); *see also* 7 RR 1947:9-14 ("Q. And what did you understand, based on Dr. Nairn's work, does his model show as being the maximum level of flooding throughout all of the 13 test properties in terms of the reason for it? [Bedient] A. His finding in his analysis was that, indeed, all of the test properties, the maximum flooding there was from the pool.").

[266] 9 RR 2763:3-14 (stating flooding at Burnham property "peaked" at midnight on August 28).

[267] 9 RR 2841:2-23. .

[268] *See* PX 138, Characterization of Peak Streamflows and Flood Inundation Resulting from Harvey at 9 (July 2018 USGS 0073463); 9 RR 2742:15 – 2742: 19 (Dr. Nairn conceded that gauge data is more accurate than predicted model data); JX 126, Harris County Flood Control District Press Room Notice, (April 21, 2016) (highlighted map including Four Seasons Drive and Red Willow Drive).

and elevations were nearly two feet higher during Tax Day than during Harvey.[269] Yet the fact that his model's "predictions" did not comport with what actually happened did not trouble Dr. Nairn because, as he explained, models can be "absolutely correct" in terms of the "prediction" they provide based on the data input, and also not be "absolutely right" and consistent with what actually occurred.[270]

In contrast, in his expert testimony and report Dr. Bedient relied on the FEMA FIRM profile and demonstrated that, at Burnham's location, along that profile the flows along Langham Creek would not have come out of banks to flood the structure of her home. Dr. Bedient combined this information with his review of the intensity of rainfall to confirm that neither Langham Creek, nor local drainage issues, would have resulted in the Burnham house flooding.[271]

Plaintiffs urge that the conjectural testimony of Dr. Nairn with regard to the Burnham causation issue be rejected, and that the testimony and report of Dr. Bedient—that none of the Test Properties would have flooded but for the impoundment of rainfall runoff waters behind Addicks and Barker Dams, and that the impoundment of stormwater runoff behind the Project was the sole cause of the flooding suffered by the Test Property Plaintiffs—be credited and causation found as to each Plaintiff, including Ms. Burnham.[272]

c. Juan Giron.

Regarding Plaintiff **Juan Giron**, the parties stipulated to the following facts: (a) the property that is the subject of Plaintiff Juan Giron's claim is a residential property located at 4310 Cassidy Park

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[269] JX 200, Summary Sheet – HCFCD High Water Marks at 36 (September 19, 2017 USACEII 00727234) (indicating the elevations for Langham Creek at West Little York).

[270] 9 RR 10-14.

[271] PX 526, Expert Report of Dr. Philip Bedient at 7-8 (finding that the storage of stormwater runoff by the Government's flood control project was the sole cause of the flooding suffered by the Test Property Plaintiffs); PX 2296, Expert Report of Dr. Philip Bedient at Appx. D-1, Table 15-1.

[272] PX 526, Expert Report of Dr. Philip Bedient at 7-8.

Lane, Katy, Texas (the "Giron property"); (b) the Giron property is located in the Cinco at Willow Fork subdivision in Fort Bend County, Texas; (c) Plaintiff Juan Giron and his wife, Anna Giron, purchased the Giron property on October 31, 2005 and have owned the property since that time; (d) Joint Exhibit 79 is a true and correct copy of the deed by which the property was conveyed to Juan Giron and Anna Giron; and (e) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Giron property is 101.5 feet, NAVD88/2001 Adjustment.[273]

In addition, the Government has admitted that (a) the elevation of the finished floor for the Giron property is lower than the elevation of water behind Barker Dam during Harvey; (b) some portions of the Giron property are lower than the elevation of water behind Barker Dam during Tropical Storm Harvey; and (c) the Upstream Test Property owned by the Girons was affected by runoff from Tropical Storm Harvey.[274] Further, Mr. Giron testified that the home had been their primary residence since 2005.[275] The family moved into this home, when they had the option to live anywhere they wanted, because they wanted their children to go to a good high school, specifically Cinco Ranch High School.[276] As shown herein, the Giron family had a protectable property right in, *inter alia*, the real estate, the home and fixtures, and their personal property that was taken by the Government's actions.

Mr. Giron left for Austin before the storm hit and returned to their home on September 3rd, his birthday, and there was still about five inches of water in the home.[277] Giron Exhibit 19 shows the

[273] Dkt. No. 211, Stipulations of Fact for Trial Nos. 19-23.

[274] Dkt. 219-3, USACE Admissions Tab 11, Nos. 75, 89; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[275] 6 RR 1647:14-1648:3.

[276] 6 RR 1649:5-1650:7.

[277] 6 RR 1663:19-1664:2.

property on August 28th at 9:47 A.M. with no water in the house.[278] Giron Exhibit 20 then shows the water at the threshold of the back door at 12:41 P.M. the next day.[279]

The character of the land is defined both by the relationship of the people to the land and the land to the method of taking. The home had never flooded and during the 2015 Memorial Day storm the water had only made it onto the driveway.[280] Mr. Giron also testified that he had never heard anyone say that the water came out of the nearby upper Buffalo Bayou during Tax Day or Harvey.[281]

The Girons had reasonable investment-backed expectations when they purchased their home. They did not receive any sort of discount because of the government's intent to use their property for floodwater storage; in fact, the Giron property was the most expensive home they looked at prior to purchasing.[282] The house had not flooded before and was not in the 100-year floodplain.[283] The Girons did not have insurance because they "got the mortgage with a very well-known bank. And, you know, if you need flood insurance, they will request flood insurance if that's a must. And it wasn't a must."[284] The Girons also talked to other people, including their relator who had spent 30 years in the area, who told them that the area would never flood.[285] Mr. Giron also testified he had never seen the "controlled inundation" plat language prior to this litigation, that his closing binder did not include any such language but said his home was not in a flood zone, and had no idea his home is located in the Barker

[278] 6 RR 1671:6-20.

[279] 6 RR 1672:4-19.

[280] 6 RR 1693:17-22.

[281] 6 RR 1683:7-13.

[282] 6 RR 1658:6-12.

[283] 6 RR 1659:12-1660:16.

[284] 6 RR 1654:8-18.

[285] 6 RR 1654:8-18; 6 RR 1651:8-14.

reservoir, as underscored by a demonstrative exhibit showing there is no signage or any indication that the Barker reservoir pool could extend beyond Government land.[286]

Beyond the physical damage to the property Mr. Giron testified that "Well, we're not the same. The house is gone. All the memories — I'm sorry. I'm just getting emotional. Thank you. But, I mean, the house is gone. Our marriage is not where it needs to be. We separated because of all these things going on."[287] Mr. Giron testified that he had no idea that the government had come by his home to determine the elevation and likelihood of his home flooding.[288]

The severity of the flooding of the Giron property cannot be overstated. At the time of the trial Mr. Giron was living alone in a trailer that was parked in his driveway.[289] He had been living there since January of 2019, but at the time of trial was concerned that he would lose the trailer soon because he could not afford it.[290] The highwater marks in the home were approximately one foot up the wall, but the damage spread well beyond the first foot of the home.[291] The wood floors were ripped out, the sheetrock torn down, and the personal belongings were thrown away.[292] None of the downstairs furniture or clothing could be salvaged.[293]

And while Mr. Giron is one of the three Test Plaintiffs as to whom the Government does not concede causation, the record establishes the requisite causation for his property as well. First, the

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[286] 6 RR 1660:8-1661:24; 6 RR 1666:5-1667:21; PDX 40 Giron (Google Earth photograph of South Mason Road south of Barker Dam's Auxiliary Spillways).

[287]6 RR 1683:14-22.

[288] 6 RR 1662:1-17.

[289] 6 RR 1646:20-21.

[290] 6 RR 1682:9-23.

[291] 6 RR 1674:23-1682:15; Giron Exhibit 26.

[292] 6 RR 1678:11-22.

[293] 6 RR 1680:3-5

Government admits that the Giron property was affected by runoff from Tropical Storm Harvey;[294] indeed, its expert, Dr. Nairn, conceded that the maximum flooding suffered by Mr. Giron was caused by the Barker reservoir pool.[295] In addition, while Dr. Nairn opined that his model "predicts" structural flooding of the Giron property beginning around noon on August 27th,[296] here again Dr. Nairn conceded that his model over-predicted the data regarding the Barker reservoir by more than a foot.[297] Further, his conclusions are again contrary to the photographic and testimonial evidence at trial; indeed, time-stamped photographs proved that stormwater had not entered the Giron home as of 9:47 a.m. on August 28, 2017—the day after Dr. Nairn's model predicts flooding of the Giron property.[298] And again, that his model's predictions did not comport with reality was of no concern to Dr. Nairn since models can be "absolutely correct" in terms of the "prediction" they provide based on the data input, and also not be consistent with what occurred.[299]

In contrast, in his expert testimony and report, Dr. Bedient relied on the FEMA FIRM profiles showing that, at the profile intersection Giron's location, upper Buffalo Bayou stream flows would not have come out of banks to flood the Giron home. Dr. Bedient combined this information with his

[294] Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[295] 9 RR 2777:1-6 (Nairn); DX 608, Expert Report of Dr. Robert Nairn at 94 ("Peak flood elevations at all the upstream Test Properties are attributed to backwater due to high pool elevations in Addicks or Barker Reservoirs."); *see also* 7 RR 1947:9-14 ("Q. And what did you understand, based on Dr. Nairn's work, does his model show as being the maximum level of flooding throughout all of the 13 test properties in terms of the reason for it? [Bedient] A. His finding in his analysis was that, indeed, all of the test properties, the maximum flooding there was from the pool.").

[296] DX 608, Expert Report of Dr. Robert Nairn at Fig. 5-31.

[297] 9 RR 2681:24-2682:1; 9 RR 2682:22-2683:2; 9 RR 2683:19-2684:1.

[298] *See* Giron Exhibit 31.

[299] 9 RR 10-14.

review of the intensity of rainfall to confirm that neither upper Buffalo Bayou, nor local drainage issues, would have resulted in the Giron house flooding.[300]

Plaintiffs request that the testimony of Dr. Nairn with regard to the Giron causation issue be rejected, and that the testimony and report of Dr. Bedient—that none of the Test Properties would have flooded but for the impoundment of rainfall runoff waters behind Barker Dam, and that the Barker reservoir pool was the sole cause of the flooding suffered by the Test Property Plaintiffs—be credited and causation found as to each Plaintiff, including Mr. Giron.[301]

d. Scott Holland.

Regarding Plaintiff **Scott Holland**, the parties stipulated to the following facts: (a) the property that is the subject of Plaintiff Scott Holland's claim is a residential property located at 1923 Wingleaf Drive, Houston, Texas (the "Holland property"); and (b) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Holland property is 107.8 to 107.9 feet, NAVD88/2001 Adjustment.[302]

In addition, the Government has admitted that (a) the elevation of the finished floor for the Holland property is lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; (b) some portions of the Holland property are lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; and (c) the Holland property was affected by runoff from Tropical Storm Harvey.[303] Further, Mr. Holland testified that he had been renting the home for

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[300] PX 526, Expert Report of Dr. Philip Bedient at 7-8 (finding that the storage of stormwater runoff by the Government's flood control project was the sole cause of the flooding suffered by the Test Property Plaintiffs); PX 2296, Expert Report of Dr. Philip Bedient at Appx. D-1, Table 15-1.

[301] PX 526, Expert Report of Dr. Philip Bedient at 7-8.

[302] Dkt. No. 211, Stipulations of Fact for Trial Nos. 24-26.

[303] Dkt. 219-3, USACE Admissions Tab 11, Nos. 68, 82; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

15 years prior to Harvey and identified his lease agreement with the owner.[304] Mr. Holland has a protectable property right in his leasehold and his personal property that was taken by the Government's actions.

Mr. Holland noted that there was water on his property on August 28th and then showed a video a few days after the water began to recede from the three feet of water down to about 10 inches.[305] On August 28th at 5:24 a.m. the water was over the curb and about three-quarters of the way up the yard.[306] Mr. Holland and his wife and dogs were mandatorily evacuated later on August 28th by boat.[307] The experience "wasn't fun" because Mr. Holland had just had surgery to remove a kidney due to cancer, and was at risk of opening his sutures.[308] Moreover, Mr. Holland could not afford to repair the home and has had to leave Houston.[309] Now he is living in a 210 square foot RV in Cleveland Texas, which Mr. Holland describes as feeling "like a tuna can."[310]

Mr. Holland did not have flood insurance because "[n]othing stated that it would ever flood" and did not know that the property was located in a FEMA flood zone until after Harvey.[311] In the time that Mr. Holland lived at the property the water had never before gone over the curb.[312]

Mr. Holland had reasonable investment-backed expectations when he leased his home that it would be safe. He selected the home because it was a safe neighborhood and did not receive any sort

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[304] 7 RR 1830:8-24.

[305] 7 RR 1838:20-1839:3; 7 RR 1845:12-1846:24.

[306] 7 RR 1836:20-1837:8.

[307] 7 RR 1837:19-22.

[308] 7 RR 1838:6-8; 1839:7.

[309] 7 RR 1844:25-1845:11.

[310] 7 RR 1844:25-1845:11. Mr. Holland's losses were not limited to the property that was destroyed; he had two dogs die of pneumonia within a few weeks after the storm.

[311] 7 RR 1834:17-19; 7 RR 1834:14-16.

[312] 7 RR 1834:3-13.

of discount because of the risk of flooding.[313] While watching a video of his flooded home Mr. Holland stated: "Oh, well. Nothing like being old and starting over."[314] When asked what was taken from him he stated:

> A. Everything. You plan your life out, and you set yourself to where, okay, if I'm going to stay in this place forever or if maybe one day I -- you know, if I decide to sell it or whatever. But you sink all your money and efforts into everything. And then it's just taken away. And you have no knowledge that it's possible because everything that you know, you have nothing to be worried about.
>
> Q. If you knew back in 2002 what you know today, would you still have decided to make your home on Wingleaf Drive?
>
> A. No.
>
> Q. Why not?
>
> A. I wouldn't put money into something that could be destroyed.[315]

The severity of the flooding on Mr. Holland's property interest cannot be overstated. Mr. Holland was not able to salvage any furniture.[316] The flood water destroyed all of his appliances.[317] When asked what kind of property was destroyed he listed freezers, tools, appliances and the possessions acquired over years.[318] Everything was completely ruined by the water and it was not habitable.[319] He has been completely unable to recover from the loss of the property that was destroyed because he had already spent his savings to pay for his wife's cancer treatment.[320]

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[313] 7 RR 1833:15-23.

[314] 7 RR 1845:12-1846:24.

[315] 7 RR 1845:12-1846:24.

[316] 7 RR 1842:20-1844:14.

[317] 7 RR 1842:20-1844:14.

[318] 7 RR 1842:20-1844:14.

[319] 7 RR 1844:15-24.

[320] 7 RR 1842:20-1844:14.

And as the testimony and reports of both hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the maximum flooding suffered by Mr. Holland was caused by the Addicks reservoir pool; and indeed, the reservoir pool of Harvey stormwater stored behind the Addicks dam was the **sole** cause of the flooding of this Test Property.[321]

e. Lakes on Eldridge Community Association.

Regarding the **Lakes on Eldridge Community Association**, the parties stipulated to the following facts: (a) Lakes on Eldridge Community Association ("LOE") is a homeowners association and acquired its real property from a developer or builder of the subdivision; (b) LOE is the owner of multiple parcels within the gated community; (c) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the Lakes on Eldridge subject property (the "LOE property") is 108.9 feet, NAVD88/2001 Adjustment.[322] In addition, the Government admitted (a) that the elevation of the finished floor for the LOE property is lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; (b) some portions of the LOE property are lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; and (c) the Upstream Test Property owned by Lakes on Eldridge Community Association was affected by runoff from Tropical Storm Harvey.[323] Sue Strebel confirmed that she both lives in the LOE community and is a board member of the LOE Homeowners Association, and identified Joint Exhibit 291 as the deed held by LOE for the LOE test property.[324] LOE has a protectable property right in its real estate, its buildings and fixtures (including a swimming pool, tennis court,

[321] *See* Sections III(B)(1)-(2).

[322] Dkt. No. 211, Stipulations of Fact for Trial Nos. 27-30.

[323] Dkt. 219-3, USACE Admissions Tab 11, Nos. 69, 83; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[324] 5 RR 1383:6-12; 5 RR 1386:18-1387:2.

volleyball court, clubhouse, and playground), and its personal property that was taken by the Government's actions.

LOE property is comprised of the clubhouse complex, which includes the tennis courts, pools, playgrounds, volleyball court, and the club house itself.[325] The amenities that make up the test property make the location more attractive for people who are considering moving to the area and they bring together people who are living in the subdivision.[326] The clubhouse complex was damaged during Harvey and it took approximately eight months to repair the property and affected 749 homes who had access to the area.[327] LOE had never flooded before.[328] In the days leading up to Harvey the board members were not concerned about flooding "[b]ecause it never flooded before. It's built up really high. We had no reason to believe that waters would come in."[329]

LOE had reasonable investment-backed expectations when it purchased the property. The amenities that make up the test property make the location more beautiful and attractive for people who are considering moving to the area and brings together people who are living in the area.[330]

Through a set of photographs Ms. Strebel testified to seeing the backup of reservoir pool waters into the subdivision; water was actually moving upstream instead of downstream as it always had.[331] "Well, Harvey had come and gone, and the water was bad, and it had rose, but it had gone

[325] 5 5 RR 1385:1-5.

[326] 5 RR 1389:1-11.

[327] 5 RR 1389:21-1390:18.

[328] 5 RR 1406:8-10.

[329] 5 RR 1406:20-1407:2.

[330] 5 RR 1389:1-11.

[331] 5 RR 1400:25-1401:20.

down. And now it's coming back, and we didn't understand why it was coming back or where it was coming from."[332]

> That's on the footbridge over Turkey Creek at the south side of the Lakes on Eldridge property. That shows -- I wish I had taken a video, but I didn't, but it shows the water coming upstream. We sat and looked at it, and all of a sudden it just looked weird. Water is supposed to go downstream, and it was coming upstream.[333]

The severity of the flooding of the LOE property was evident. The tennis courts could not be pressure washed because the surface is different and had to be cleaned.[334] The sand volleyball court had to be cleaned because there was lots of debris left in it.[335] The furniture in the community hall had to be repaired or replaced.[336] The kitchen had the cabinets torn out, the appliances were removed, and some of the granite countertops were broken when they were being removed.[337] The fitness center had to replace all of the machines and replace the rubberized floor which was holding water.[338]

Beyond the physical damage to the property the flooding has made it take longer to sell a home and chased away potential lessees.[339] It also meant that the residents "had lost not just peace of mind, but things in your lives and a way of life."[340]

> I think it really drove everything home that, you know, we have a serious problem, because our property values are forever lost because, you know, we're in a floodplain. We didn't use our property for -- you know, for most us, it was just months, but the peace of mind is gone forever.[341]

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[332] 5 RR 1401:11-14.

[333] 5 RR 1400:1-23.

[334] 5 RR 1390:19-1391:3.

[335] 5 RR 1391:4-8.

[336] 5 RR 1391:9-15.

[337] 5 RR 1391:16-1392:3.

[338] 5 RR 1392:4-15.

[339] 5 RR 1393:4-1394:1.

[340] 5 RR 1403:10-1404:2.

[341] 5 RR 1413:15-1414:5.

And as the testimony and reports of both hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the maximum flooding suffered by the Lakes on Eldridge Community Association was caused by the Addicks reservoir pool; indeed, the reservoir pool of impounded Harvey stormwater runoff was the **sole** cause of the flooding of this Test Property.[342]

f. Christina Micu.

Regarding Plaintiff **Christina Micu**, the parties stipulated to the following facts: (a) the property that is the subject of Christina Micu's claim is a residential property located at 6411 Canyon Park Drive, Katy, Fort Bend County, Texas 77450 (the "Micu property"); (b) Christina Micu and her husband, Oscar Quintero, purchased the Micu property on February 2, 2012, and have owned the property since that time; (c) Joint Exhibit 107 is a true and correct copy of the deed by which the property was conveyed to Christina Micu and Oscar Quintero; and (d) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Micu property is 99.8 feet, NAVD88 (2001 Adjustment).[343]

In addition, the Government admitted that (a) the elevation of the finished floor for the Micu property is lower than the elevation of water behind Barker Dam during Harvey; and (b) the Upstream Test Property owned by Christina Micu was affected by runoff from Tropical Storm Harvey.[344] Further, Ms. Micu testified that the property was her primary residence, her homestead, and that the deed was a true and correct copy of the deed.[345] Ms. Micu has a protectable property right in her real estate, home and fixtures, and personal property that was taken by the Government's actions.

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[342] *See* Sections III(B)(1)-(2).

[343] Dkt. No. 211, Stipulations of Fact for Trial Nos. 31-36.

[344] Dkt. 219-3, USACE Admissions Tab 11, No. 64; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[345] 5 RR 1288:2-13.

The home had never flooded before and the Micus did not have flood insurance before Harvey, but they do now because "now I know that they can store storm water on it, and we could flood whenever, whenever it happens, yeah."[346] If she would have known what she knows now before the home was purchased she never would have purchased the property.[347] "The neighborhood was built in a reservoir overflow. How freaking crazy is that."[348]

As with the other test properties, contemporaneous photos and videos show that the source of the Micu family's flooding was the Barker reservoir pool. An August 27th photograph taken at 10:00 pm CDT shows street flooding, and eyewitness testimony confirmed there was no structure flooding at that time.[349] An August 28th picture taken by Christian Micu shortly before he evacuated shows the flood waters on the sidewalk of the Micu property, but not in the house.[350] On August 30th a NOAA picture shows Ms. Micu's neighborhood was submerged.[351] Ms. Micu's husband first returned home on September 1st or 2nd in a kayak, but Ms. Micu did not return until September 5th. The storm water was inside the home for about 10 days.[352] Ms. Micu testified:

> So, I opened the door, and the first thing that I -- that hits me is the smell. It smells like sewage and mold and mildew, and it was so humid.
>
> And I looked, and on the floor, you could already see the wood floors warping, mud on the floors, all the furniture moved around, soaked with water. And toys everywhere. You could see the water line. You could see mold growing up the walls.[353]

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[346] 5 RR 1293:13-23.

[347] 5 RR 1308:16-22.

[348] 5 RR 1327:2-1328:6.

[349] 10 RR 2959:24 – 2962:4; Micu Exhibit 60 (August 27th photo of Ms. Micu's front yard).

[350] 10 RR 2959:24 – 2962:4; 5 RR 1297:10-20; Micu Exhibit 32 (August 28, 2017 photo of Ms. Micu's front yard); Micu Exhibit 59 (August 28th video of Ms. Micu's front yard).

[351] 5 RR 1290:15-24.

[352] 5 RR 1300:24-1301:1.

[353] 5 RR 1299:25-1300:10.

After the flood waters subsided the Micu family removed the flooring, took out the sheetrock and insulation, ran dehumidifiers 24/7 for five or six months, sprayed the home with chemicals twice a day for six weeks, ran HEPA filters for a week before the mold inspection, and hired an AC inspection company to clean the mold out of their air ducts and service the AC.[354] It took almost a year to repair the home.[355]

Ms. Micu had a reasonable investment backed expectation in a safe home when she purchased her home. Ms. Micu stated that she chose this home because there was a good school system, a safe neighborhood, a good place to raise her family, and because she thought it would be a good investment that would appreciate.[356] It is in a deed restricted neighborhood for single family homes.[357] The house had never flooded and was not in the 100 year floodplain.[358] The Micus did not receive a discounted price because of the risk of the Government flooding their home.[359] Before Harvey, Ms. Micu had no idea that her home was in the reservoir and never saw any language on the plat that would have advised her that her home could be flooded by the government because it was not included in her closing documents.[360] She further answered:

> Q. Did you know that the government took a first-floor elevation survey of your home in 2003 or 2004?
>
> A. No, I didn't know that they did that to my home.
>
> Q. Did you know that they took that photograph during that elevation survey?
>
> A. No, I had no idea they took that picture of my home.

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[354] 5 RR 1322:4-1323:7.

[355] 5 RR 1305:1-9.

[356] 5 RR 1291:20-1293:12.

[357] 5 RR 1289:23-1290:1.

[358] 5 RR 1291:20-1293:12.

[359] 5 RR 1294:22-25.

[360] 5 RR 1295:1-1296:7.

> Q. Did you know that the government actually had a detailed map showing that your house was one of the thousands that they had planned to occupy with inundated floodwater?
>
> A. No, I had no idea they made that map. I wish that we would have known.[361]

The severity of the flooding of the Micu property cannot be overstated. "They took my home. They took a lot of our personal belongings. They took a bunch of memories/mementos. They took my security and peace of mind."[362] Ms. Micu moved out of the property because she didn't feel safe staying there. She was constantly concerned that each rain would end up flooding her home again.[363] All of the appliances and much of the personal property was destroyed, including pictures, family heirlooms, an autobiography, and more.[364] On September 7th Ms. Micu posted on Facebook saying:

> Everybody is asking what do I need to have to prepare to clean my house. They're saying masks, gloves, disinfectant, et cetera, et cetera, but nobody nothing talks about how to mentally prepare yourself to throw away all your stuff. Everybody says, oh, it's just stuff. Then you see your favorite jacket that always kept you warm. You see all your kids toys, their favorite toys. You see that one shirt that you like to wear on sunny days. And they're all downstairs either next to a wall that has mold growing on it or wet from being in nasty floodwaters for several days.[365]

And like Mr. Giron, Ms. Micu is one of the three Test Plaintiffs as to whom the Government does not concede causation entirely; the Government does concede that the maximum inundation for the Micu property was caused by the reservoir pool.[366] Yet for her too, the record establishes the sole

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[361] 5 RR 1289:2-15.

[362] 5 RR 1308:6-11.

[363] 5 RR 1307:6-24.

[364] 5 RR 1303:18-1304:20.

[365] 5 RR 1326:7-23; Micu Exhibit 10 at 38.

[366] 9 RR 2777:1-6 (Nairn); DX 608, Expert Report of Dr. Robert Nairn at 94 ("Peak flood elevations at all the upstream Test Properties are attributed to backwater due to high pool elevations in Addicks or Barker Reservoirs."); *see also* 7 RR 1947:9-14 ("Q. And what did you understand, based on Dr. Nairn's work, does his model show as being the maximum level of flooding throughout all of the 13 test properties in terms of the reason for it? [Bedient] A. His finding in his analysis was that, indeed, all of the test properties, the maximum flooding there was from the pool.").

causation for her property was the Government's Project. First, the Government admits that the Micu property was affected by runoff from Tropical Storm Harvey.[367] In addition, while Dr. Nairn opined that his model "predicts" structural flooding at the Micu property beginning on August 27,[368] but as the evidence showed, Buffalo Bayou was modeled too high in Nairn's model by more than a foot,[369] and his conclusion regarding Micu is (again) contrary to the photographic and testimonial evidence at trial which proved that stormwater did not enter the Micu home until after the morning of August 28th.[370] And as noted before, Dr. Nairn acknowledged that his opinion was based on the predictions of his model, and he was not troubled if those predictions did not equate with reality.[371]

In contrast, in his expert testimony and report, Dr. Bedient relied on the FEMA FIRM profile and demonstrated that, at Micu's location, along that profile, the flows along Willow Fork Diversion Channel would not have come out of banks to flood the structure of her home. Dr. Bedient combined this information with his review of the intensity of rainfall to confirm that neither Willow Fork Diversion Channel, nor local drainage issues, would have resulted in the Micu house flooding.[372]

Plaintiffs request that the testimony of Dr. Nairn with regard to the Micu causation issue be rejected, and that the testimony and report of Dr. Bedient—that none of the Test Properties would

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[367] Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[368] 9 RR 2765:10-15 (stating flooding at Micu property "peaked" at midnight on August 28).

[369] 9 RR 2681:24-2682:1; 9 RR 2682:22-2683:2; 9 RR 2683:19-2684:1.

[370] *See* Micu Exhibit 60 (photograph showing no water in Micu home at 10 p.m., August 27); 10 RR 2960:2-21 (testimony confirming accuracy, date, and time of Micu Exhibit 60); Micu Exhibit 59 (video showing water about to enter Micu home at 9:55 a.m., August 28); 10 RR 2961:6-22 (testimony confirming accuracy, date, and time of Micu Exhibit 59). Further, in his "No Project" scenario, Dr. Nairn blocked or cut off the Willow Fork diversion channel with a fictitious wall, creating a false reality where water coming down the channel could pool into the neighborhood.

[371] 9 RR 10-14.

[372] PX 526, Expert Report of Dr. Philip Bedient at 7-8 (finding that the storage of stormwater runoff by the Government's flood control project was the sole cause of the flooding suffered by the Test Property Plaintiffs, including Ms. Micu).

have flooded but for the impoundment of rainfall runoff waters behind Addicks and Barker Dams, be credited instead.

g. Catherine Popovici.

Regarding Plaintiff **Catherine Popovici**, the parties stipulated to the following facts: (a) the property that is the subject of Plaintiff Catherine Popovici's claim is a residential property located at 19927 Parsons Green Court, Katy, Harris County, Texas, 77450 (the "Popovici property"); (b) the Popovici property is located in the Kelliwood Estates subdivision in Harris County, Texas; (c) Plaintiff Catherine Popovici and her husband, Alexander Popovici, purchased the Popovici property on June 13, 2003 and have owned the property since that time; (d) Joint Exhibit 262 is a true and correct copy of the deed by which the property was conveyed to Catherine and Alexander Popovici; and (e) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Popovici property is 102.2 feet, NAVD88/2001 Adjustment.[373] In addition, the Government admitted that some portions of the Popovici property are lower than the elevation of water behind Barker Dam during Tropical Storm Harvey; and (b) the Upstream Test Property owned by Catherine Popovici was affected by runoff from Tropical Storm Harvey.[374]

Ms. Popovici stated that she has been living in her home for almost 16 years and verified that the deed was correct.[375] Ms. Popovici has a protectable property right in her real estate, her home and fixtures, taken by the Government's actions.

During the Harvey event, Ms. Popovici did not have water insider her home, but had water up to her foundation, approximately a couple inches from coming inside her home.[376] Ms. Popovici

[373] Dkt. No. 211, Stipulations of Fact for Trial Nos. 37-42.

[374] Dkt. 219-3, USACE Admissions Tab 11, No. 79; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[375] 5 RR 1222:1-9.

[376] 5 RR 1239:1-5.

testified that there was street flooding in front of her property on August 27th.[377] On the 28th at 7:00 PM the water had receded to the curb.[378] On August 29th the water was inching up towards the bottom of the foundation.[379] At 4:26 that afternoon the water had raised up to 3.5 inches up the foundation of the home.[380] At this point the drinking water had been turned back on by the city, but they were required to boil any water that was used.[381]

Like all other Test Properties, the flooding on Ms. Popovici's land reached maximum flooding on August 30th. A picture taken at 7:58 AM on September 1st shows that about a third of the yard is still covered in water and the Popovicis were not able to drive out yet.[382] Ms. Popovici described that her family and their house guest were "trapped" in the home for approximately 4 to 5 days.[383]

Prior to Harvey flood waters had never gone above the curb at Ms. Popovici's home.[384] Nor did she realize that the Government actually knew that hers would be one of the upstream properties that would be cut-off by floodwaters in the event of significant stormwater runoff storage behind the Addicks dam.

> Q. Did you know that the government did a first-floor elevation survey of your home in 2003 or '4?
>
> A. No.
>
> Q. Are you aware that the government actually had a detailed map showing that your house was one of thousands that the government planned to occupy with impounded floodwaters?

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[377] 5 RR 1234:9-1236:24.

[378] 5 RR 1233:4-1234:1; 1234:17-18.

[379] 5 RR 1235:22-1236:24.

[380] 5 RR 1237:13-1239:11.

[381] 5 RR 1237:13-1239:11.

[382] 5 RR 1241:12-1242:1.

[383] 5 RR 1218:8.

[384] 5 RR 1225:18-1226:14.

A. No.[385]

Indeed, Ms. Popovici testified that she never understood she lived in a Government flood control reservoir:

> Q. You've seen the signs for Addicks and Barker in and around the actual government-owned land property lines; correct?
>
> A. Right. So there is a sign that indicates Barker Reservoir. It's probably five to six miles away from my house, and it's close to the dam.
>
> Q. And when you're looking at that sign and seeing the green space in front of you, what was your impression of what that sign depicted?
>
> A. So, again, because that sign is close to the dam, as you enter Westheimer Parkway, and then you see an area of land which is part of Barker Park but there's nothing there. There are no soccer fields or a gun range or anything like that; it's just the trees. So my assumption is that was what the reservoir was. As you drive further down Westheimer Parkway and closer and closer to Katy, to my home, you have the dog park, the gun range, all the soccer fields, and then after that, you go into the residential area, and neighborhood, after neighborhood, after neighborhood.
>
> Q. And where did you think the reservoir ended based on that topography and layout?
>
> A. Frankly, before Harvey, I never gave any thought to where the reservoir ended. I assume it ended, you know, where the -- probably where the gun range starts, because that's the first set of -- kind of structures or public area where people can be. Now, today, I know that actually the entire park and all the residential neighborhoods behind it are part of the reservoir.[386]

Ms. Popovici had reasonable investment-backed expectations for a safe home when she purchased it. She paid approximately $440,800 for the home and used it as her primary residence.[387] She selected the home because the area was beautiful, the home fit their needs, it was close to her husband's job, and she expected the value of the property to increase because of the schools and

[385] 5 RR 1230:14-21.

[386] 5 RR 1228:1-1229:25.

[387] 5 RR 1218:21-25.

because the value of the property had increased in the past.[388] There are deed restrictions in the neighborhood to make sure that everything looks nice.[389]

There were no discounts on the price of the home because of the risk of the government flooding the property.[390] Ms. Popovici did not think there was any flood risk because the property was not in the 100 or 500-year floodplain and the appraisal did not report any risk.[391] The Popovicis moved into the home after living in California and were wholly unaware of the proximity of the reservoir.[392] Had they known of the risk of flooding they would not have purchased the home.[393]

The severity of the flooding of the Popovici property cannot be overstated. Even though there was no structural flooding of Ms. Popovici's home, she was denied the use and enjoyment of her property when she was trapped by the "Class 3" contaminated water that completely prevented ingress and egress for a significant period of time, and to this day impacted her landscaping and her ability to use her property for a garden.[394] Testimony at trial showed that reservoir pool flooding is qualitatively different and more severe—in part because it is longer lasting.[395] Further, when the Popovicis sell the

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[388] 5 RR 1223:8-1224:11.

[389] 5 RR 1219:14-21.

[390] 5 RR 1230:10-13.

[391] 5 RR 1225:2-17.

[392] 5 RR 1227:1-25.

[393] 5 RR 1227:1-25.

[394] *See* 5 RR 1244:11-14 ("we could not get on and off the property without a boat or special clothing"); 1244:3-10 ("Well, it took from me my peace of mind, the safety of my property. Again, I don't think my, you know, granddaughters are going to run around in the yard the way that my kids had been able to. I love to garden. I have to take special precautions in the yard. You know, I think that's what they took from me."); *see also* 8 R.R. 2454:12-17 (Fitzgerald: reservoir pool flooding is of a different nature because of the extended length of time that the inundation occurs).

[395] 8 RR 2454:12-17 (Fitzgerald).

home they will be required to state that the property has flooded in the past.[396] Dr. Bell's expert opinion also establishes that these Popovici flood damages were severe.

And as the testimony and reports of both hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the maximum flooding suffered by Ms. Popovici was caused by the Barker reservoir pool; and indeed, the reservoir pool of Harvey stormwater stored behind the Barker dam was the **sole** cause of the flooding of this Test Property.[397]

h. Kulwant Sidhu.

Regarding Plaintiff **Kulwant Sidhu**, the parties stipulated to the following facts: (a) Sidhu is a joint owner of 29 condominium units located within Harris County in the Aspen Club Condominiums located at 16111 Aspenglenn Drive, Houston, Texas 77084 (the "Sidhu property"); (b) the units are used as residential rental properties; (c) only two units are considered Test Properties, one upstairs (Unit 603) and one downstairs (Unit 604); (d) Joint Exhibit 72 is a true and correct copy of the deed covering the Test Property; (e) no flood waters reached the upstairs condominium (Unit 604); and (f) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the top of the finished first floor of the Sidhu condominium building in which Unit 603 and Unit 604 are located is 107.0 to 107.1 feet, NAVD88/2001 Adjustment.[398]

In addition, the Government admitted that (a) the elevation of the finished floor for the Sidhu property is lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; (b) some portions of the Sidhu property are lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; and (c) the Upstream Test Property owned by Kulwant Sidhu was affected

[396] 5 RR 1246:4-12.

[397] *See* Sections III(B)(1)-(2).

[398] Dkt. No. 211, Stipulations of Fact for Trial Nos. 43-49.

by runoff from Tropical Storm Harvey.[399] Further Mr. Sidhu testified that he purchased the properties in 2005 and that Joint Exhibit 72 is the Sidhu property deed.[400] Mr. Sidhu has a protectable property right in the real estate, the fixtures, and the rental income that was taken by the Government's actions.

Mr. Sidhu had a reasonable investment-backed expectation when he purchased the properties that they would be safe. The properties were purchased as investment properties and intended to help with his retirement.[401] There was no discount on the price of the property because of the risk of government flooding.[402] In addition to the seller's disclosures a portion of the property was appraised when the properties were purchased, neither of which noted any risk of flooding.[403]

The severity of the flooding of the Sidhu property cannot be overstated. Contractors completely gutted the lower unit (No. 603), removing and replacing all sheetrock, insulation, cabinets, and doors.[404] Mr. Sidhu testified that the tenant in that unit cancelled their lease for the property and it was almost a year before he could rent it again.[405]

And as the testimony and reports of both hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the maximum flooding suffered by Mr. Sidhu was caused by the Addicks reservoir pool; and indeed, the reservoir pool of Harvey stormwater stored behind the Addicks dam was the **sole** cause of the flooding of this Test Property.[406]

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[399] Dkt. 219-3, USACE Admissions Tab 11, No. 67, 81; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[400] 6 RR 1733:16-1734:18.

[401] 6 RR 1736:9-12.

[402] 6 RR 1738:21-24.

[403] 6 RR 1737:3-20.

[404] 6 RR 1741:25-1742:3.

[405] 6 RR 1742:20-25.

[406] *See* Sections III(B)(1)-(2).

i. Elisio Soares.

Regarding Plaintiff **Elisio Soares**, the parties have stipulated to the following facts: (a) the property that is the subject of Plaintiff Elisio M. Soares' claim is a residential property located at 20526 Indian Grove Lane, Katy, Harris County, Texas 77450 (the "Soares property"); (b) the Soares property is located in the Cinco Ranch Equestrian Village Section 3 residential subdivision located in both Fort Bend County and Harris County, Texas; (c) Plaintiff Elisio M. Soares and his wife, Ana L. Soares, purchased the Soares property in 2001 and have owned the property since that time; (d) Joint Exhibit 263 is a true and correct copy of the deed by which the property was conveyed to Elisio M. and Ana L. Soares; and (e) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Soares property is 101.1 feet, NAVD88/2001 Adjustment.[407] In addition, the Government admitted that (a) the elevation of the finished floor for the Soares property at 20526 Indian Grove Lane, Katy Texas is lower than the elevation of water behind Barker Dam during Tropical Storm Harvey; (b) some portions of the Soares property are lower than the elevation of water behind Barker Dam during Tropical Storm Harvey; and (c) the Upstream Test Property owned by Elisio Soares was affected by runoff from Tropical Storm Harvey.[408] Further, Mr. Soares testified that the property was his primary residence, that he had owned it since 2001, and that Joint Exhibit 263 was his deed for the Test Property.[409] Mr. Soares has a protectable property right in his real estate, their home and fixtures, and the personal property that was taken by the Government's actions.

[407] Dkt. No. 211, Stipulations of Fact for Trial Nos 50-55.

[408] Dkt. 219-3, USACE Admissions Tab 11, No. 66, 80; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[409] 4 RR 1067:20-23; 1068:1-11.

Mr. Soares was out of town when Harvey arrived and first came back to evaluate his home by riding a boat to it on August 31st.[410] There was water in the home for about four days.[411] He was unable to fully use the home for months and personal property was taken permanently.[412] It wasn't until May of 2018 that the home had been put back to its pre-Harvey condition.[413]

> Q. Where did you stay when you returned to Houston on August 31st?
>
> A. We stayed with friends in a downstream area of the reservoir. We stayed for two weeks.
>
> Q. And what did you do after those two weeks?
>
> A. We moved into the second story of the home. We improvised there a living area with a camping style kitchen.
>
> Q. Who lived with you on the second floor of your home?
>
> A. My wife and my two children.
>
> Q. What was that experience like?
>
> A. It was difficult. We couldn't cook properly, so we gave up on cooking and started to buy pizza. We ate a lot of pizza. Everything is expensive, you know. We have a family of four, and you start eating out a lot, so it was difficult. A lot of people in a small area, it was stressful.

Mr. Soares had no idea that the home was in the reservoir and would not have bought it if he had.[414] They intentionally let the flood insurance drop because they didn't think they would flood, but purchased flood insurance after Harvey since "[n]ow I know that it can flood again, yes."[415]

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[410] 4 RR 1081:6-10.

[411] 4 RR 1086:4-24.

[412] 4 RR 1094:24-1095:6.

[413] 4 RR 1093:11-23.

[414] 4 RR 1095:7-13.

[415] 4 RR 1076:3-18.

The Soares had reasonable investment-backed expectations when they purchased their home that it would be safe. Because of the flooding the home was uninhabitable and they live in a constant state of fear that they will be flooded again.[416] They decided to buy the home because the schools were very good, the neighborhood was nice, the home was a new build on a cul-de-sac, and they expected the property value to rise over time.[417] The property is in a deed restricted community.[418] Mr. Soares testified that he thought that they were living near a park, not a reservoir.[419] Because of the flooding, they now live in a constant state of fear that they will be flooded again.[420]

The property was not in a FEMA flood zone and had never flooded in the 17 years that they had lived there.[421] There was no reduction in the price because of the risk of the government induced flooding.[422] The first time he saw the plat with language about flooding was during his deposition and he did not receive the plat as part of his closing documents.[423] He went on to describe how he believed that the plat language was inaccurate because his home is not "adjacent" to the reservoir, his home is actually inside of the reservoir.[424]

The severity of the flooding of the Soares property cannot be overstated. When Mr. Soares returned to his home on the 31st everything was soaked in "sewage water" and there was mold beginning to grow from the water that was approximately one foot high in the home.[425] All of their

[416] 4 RR 1093:24-1094:10.

[417] 4 RR 1074:11-1075:5.

[418] 4 RR 1069:2-5.

[419] 4 RR 1076:22-1078:3.

[420] 4 RR 1093:24-1094:10.

[421] 4 RR 1075:12-24.

[422] 4 RR 1078:10-12.

[423] 4 RR 1078:13-23; 1079:4-6.

[424] 4 RR 1079:21-1080:11.

[425] 4 RR 1086:4-24.

furniture that was touched by the water was thrown away because FEMA had warned that there could be flesh-eating bacteria in the water.[426] Additionally, the water destroyed the appliances and many pictures, mementos, fishing gear, and much more that was destroyed forever.[427]

And as the testimony and reports of both hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the maximum flooding suffered by the Soares was caused by the Barker reservoir pool; and indeed, the reservoir pool of Harvey stormwater stored behind the Barker dam was the **sole** cause of the flooding of this Test Property.[428]

j. Mitchell Stewart.

Regarding Plaintiff **Mitchell Stewart**, the parties stipulated to the following facts: (a) the property that is the subject of Mitchell Stewart's claim is a residential property located 4719 Eagle Trail Road, Houston, Texas (the "Stewart property"); (b) the Stewart property is located in the Bear Creek Village, Section 9 subdivision in Harris County, Texas; (c) Mitchell and Donna Stewart purchased the Stewart property on June 24, 1983 and have owned the property since that time; (d) Joint Exhibit 29 is a true and correct copy of the deed by which the property was conveyed to Mitchell and Donna Stewart; and (e) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Stewart property is 108.9 to 109.0 feet, NAVD88/2001 Adjustment.[429] In addition, the Government admitted that (a) the elevation of the finished floor for the Stewart property at 4719 Eagle Trail Drive, Houston, Texas is lower than the elevation of water behind Barker Dam during Tropical Storm Harvey; (b) some portions of the Stewart property are lower than the elevation of water behind Addicks Dam during Tropical Storm

[426] 4 RR 1090:1-7.

[427] 4 RR 1091:6-1092:6.

[428] *See* Sections III(B)(1)-(2).

[429] Dkt. No. 211, Stipulations of Fact for Trial Nos. 56-61.

Harvey; and (c) the Upstream Test Property owned by Mitchell and Donna Stewart was affected by runoff from Tropical Storm Harvey.[430] Mr. Stewart verified that he has been living in the home for 36 years.[431] As shown herein, the Stewarts had a protectable property right in, *inter alia*, the real estate, the home and fixtures, and their personal property that was taken by the Government's actions.

Mitch and Donna Stewart were home when Harvey made landfall, and remained home until impounded stormwaters forced them to evacuate via boat during the afternoon of August 29, 2017.[432] On the morning of the 29th the water was a few feet away from the garage, and the impounded stormwaters had not yet entered the Stewart home[433] There were several time-stamped videos and pictures introduced in evidence which display the amount of flooding.[434] Mr. Stewart also testified that the neighborhood used to be nice but after Harvey there are empty homes that have not been repaired at all or have not finished repairs.[435] The neighbors have also changed from long-time residents to renters.[436]

The Stewarts had reasonable investment-backed expectations when they purchased their home. The Stewarts moved in to the neighborhood because it was well kept, near work, the right size home, and would be nice to live in.[437] They had never had water over the curb and do not live in a

[430] Dkt. 219-3, USACE Admissions Tab 11, No. 72, 86; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[431] 6 RR 1582:12-16; 1582:19-25.

[432] 6 RR 1591:12 – 1596:11.

[433] 6 RR 1590:9-1591:10.

[434] *See* Stewart Exhibit 25, Stewart Exhibit 26, Stewart Exhibit 7, Stewart Exhibit 9, Stewart Exhibit 27, Stewart Exhibit 29, Stewart Exhibit 30, and Stewart Exhibit 32.

[435] 6 RR 1600:1-15.

[436] 6 RR 1600:1-15.

[437] 6 RR 1599:10-22.

flood zone.[438] The Stewart's home is not located in any FEMA-designated flood zone, and had never flooded prior to being inundated with impounded stormwater runoff.[439] The Stewarts have flood insurance now "because it's become more and more apparent that, not only could it happen again, but it probably will happen again. And we could never come close to affording the loss that we took this time."[440] In his 36 years of living in the area Mr. Stewart had never seen water over his curbs, much less anything close to what happened during Harvey.[441] Mr. Stewart testified he had no idea the Government would use his home as part of its flood-control Project during a storm, was similarly never notified by the Government that it had the names and addresses of homes in the reservoir pools, and did not know his home was located in a reservoir pool.[442] Mr. Stewart also testified about his personal knowledge regarding the death of Andrew Pasek, which occurred only 150 yards south of Mr. Stewart's home on Eagle Trail Drive.[443]

The severity of the flooding of the Stewart property cannot be overstated. There were between five and nine inches of water in the house.[444] The Stewarts had to remove the first four feet of sheetrock in order to prevent mold from spreading up in the sheet rock.[445] The water also destroyed their appliances, countless pictures and mementos that will never be replaced, the HVAC system,

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[438] 6 RR 1584:11-18.

[439] 6 RR 1584:11-1586:25; PX 461 (FIRM dated June 18, 2007); PX 2188 (FIRM dated July 29, 2015).

[440] 6 RR 1609:10-16.

[441] 6 RR 1594:19-23.

[442] 6 RR 1608:15 – 1609:6.

[443] 6 RR 1593:14-1594:7; *see also* 2 RR 352:5-354:7 (Robert Thomas trial testimony regarding the overall risk to human life, including the death of Andrew Pasek, due to the presence of impounded stormwater runoff).

[444] 6 RR 1600:1-15.

[445] 6 RR 1601:7-1602:14.

doors, and "everything under 4 feet that was inside the house was pretty much ruined."[446] In May of 2018 the Stewarts were close to fixing up their home, but it is still not back to the condition of the property before Harvey.[447] They were unable to live in the home for approximately five months.[448] The Stewarts were forced to sell a second home, located in Kingsland, Texas on Lake LBJ because they had used up all of their savings and were unprepared for any other type of emergency.[449] In sum, when asked what the Government had taken from them by using their property to store Harvey stormwater runoff, Mr. Stewart testified:

> A. Well, for 34 years, we had a house that had never flooded. And then, after Harvey, we had a flooded house. We had 4 feet of -- everything under 4 feet that was inside the house was pretty much ruined.
>
> All of our interior doors, you can see a bunch of them stacked up against one of the trees there in the front yard. A lot of our clothes, most of our appliances, my lawn mower, a bunch of stuff that was in the garage. You know, I could probably sit here for an hour thinking of things that were taken from us permanently.
>
> Q. And you say "permanently." Why do you say that?
>
> A. Because it was things that couldn't be replaced. We had boxes of photographs. We had a lot of, you know, personal mementos, things that couldn't -- could never be replaced.[450]

And as the testimony and reports of <u>both</u> hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the inundation suffered by Mr. Stewart was caused by the Addicks reservoir pool; and indeed, the reservoir pool of impounded Harvey stormwater runoff behind the Addicks dam was the **<u>sole</u>** cause of the flooding of this Test Property.[451]

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[446] 6 RR 1603:21-1605:8.

[447] 6 RR 1610:5-17.

[448] 6 RR 1609:17-20.

[449] 6 RR 1605:22-1606:12.

[450] 6 RR 1603:25-1604:17; *see also* Stewart Exhibit 30.

[451] *See* Sections III(B)(1)-(2).

k. Robert Turney.

Regarding Plaintiff **Robert Turney**, the parties stipulated to the following facts: (a) the property that is the subject of Plaintiff Robert Turney's claim is a residential property located at 15910 Red Willow Drive, Houston, Texas (the "Turney property"); (b) the Turney property is located in the Bear Creek Village Section 1 subdivision in Harris County, Texas; (c) Robert and Beverly Turney purchased the Turney property on November 11, 1975; (d) Joint Exhibit 20 is a true and correct copy of the deed by which the property was conveyed to Robert and Beverly Turney is marked as Joint Exhibit 20; (e) Joint Exhibit 70 is a true and correct copy of the Special Warranty Deed by which the Turney property was conveyed to Robert Turney as part of divorce proceedings, on December 15, 2004; (f) between January 2 and January 5, 2018, Robert and Onoria Turney conveyed the Turney property to Maryelyn Ramirez; (g) Joint Exhibit 210 is a true and correct copy of the deed by which Robert and Onoria Turney conveyed the Turney property to Maryelyn Ramirez; and (h) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Turney property is 104.5 to 104.7 feet, NAVD88/2001 Adjustment.[452] In addition, the Government admitted that (a) the elevation of the finished floor for the Turney property at 15910 Red Willow Drive, Houston, Texas is lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; (b) some portions of the Turney property at 15910 Red Willow Drive, Houston, Texas are lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; and (c) the Upstream Test Property owned by Robert Turney was affected by runoff from Tropical Storm Harvey.[453] Mr. Turney also confirmed that he has owned the home since 1975.[454] As

[452] Dkt. No. 211, Stipulations of Fact for Trial Nos. 62-69.

[453] Dkt. 219-3, USACE Admissions Tab 11, No. 73, 87; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[454] 7 RR 2127:18-23.

shown herein, the Turney family had a protectable property right in, *inter alia*, the real estate, the home and fixtures, and their personal property that was taken by the Government's actions.

The occupants of the Turney property evacuated before the home started flooding.[455] They were not allowed to return to their home for several days:

> Q. Now, when y'all first came in the house, can you remember about what that date was? I mean --
>
> A. Well, it was -- law enforcement would not let us get back in the neighborhood. They didn't want anybody to get electrically shocked. And then, when the water began to go down, I think they -- you know, they eventually opened it up for homeowners to return. I can't tell you what exact date that was.[456]

The Turneys had no idea that their home was in a reservoir before Harvey hit.[457] After the damage was done the Turneys, along with friends and family, did all of the repairs to their home.[458] The home had flooded in the Tax Day floods, but only up to about two feet instead of the six feet that occurred during Harvey.[459]

The Turneys had reasonable investment-backed expectations when they purchased their home. The Turneys bought the home because it was near his wife's job and it was a brand-new neighborhood that was surrounded by golf courses, baseball fields, and wooded areas.[460] The Turney's home is not located in any FEMA-designated flood zone, and had never flooded prior to being

[455] 7 RR 2130:16-2131:10.

[456] 7 RR 2132:23-2133:5.

[457] 7 RR 2151:16-20.

[458] 7 RR 2132:8-22.

[459] 7 RR 2142:1-12.

[460] 7 RR 2128:14-2130:3.

inundated with impounded stormwater runoff.[461] It is, however, in an area that is "impacted by backwater from Addicks Reservoir."[462]

The severity of the flooding of the Turney property cannot be overstated. The highwater mark from the impounded stormwater runoff in the home was approximately six feet and necessitated mucking out and gutting the entire interior of the structures located on the Turney property.[463] At trial, Mr. Turney testified to the conditions at his home.

> Q. What did the ground look like inside the home there on Red Willow?
>
> A. I can tell you all about that.
>
> Q. Okay.
>
> A. If you make up that guacamole and don't eat it all and you put it in the icebox and it begins to turn brown, that's what it looked like, just about 3 inches of guacamole dip that we had to walk through to get into that house. And it didn't smell like guacamole; it smelled real bad.
>
> Q. And guacamole is avocados and some other ingredients?
>
> A. Yeah, and a little pico de gallo.[464]

And as the testimony and reports of both hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the inundation of the Turney property was solely caused by the Addicks reservoir pool; and indeed, the reservoir pool of impounded Harvey stormwater runoff stored behind the Addicks dam was the **sole** cause of the flooding of this Test Property.[465]

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[461] 6 RR 1584:11-1586:25; PX 461 (FIRM dated June 18, 2007); PX 2188 (FIRM dated July 29, 2015).

[462] JX 126, Harris County Flood Control District Press Room Notice (April 21, 2016) (highlighted map including Four Seasons Drive and Red Willow Drive)

[463] 7 RR 2134:13-23.

[464] 7 RR 2133:8-20.

[465] *See* Sections III(B)(1)-(2).

l. Kurt and Jean Wind.

Regarding Plaintiffs **Kurt and Jean Wind**, the parties stipulated to the following facts: (a) the property that is the subject of Plaintiff Kurt and Jean Wind's claim is a residential property located at 5306 Sunbright Court, Houston, Texas 77041 (the "Wind property."); (b) the Wind property is located in the Twin Lakes residential subdivision in Harris County, Texas; (c) Plaintiff Kurt Wind and his wife, Jean Wind, purchased the Wind property on August 17, 1990, and have owned the property since that time; (d) Joint Exhibit 41 is a true and correct copy of the deed by which the property was conveyed to Kurt and Jean Wind; and (e) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the house located on the Wind property is 109.2 to 109.3 feet, NAVD88/2001 Adjustment.[466]

In addition, the Government admitted that (a) some portions of the Wind property at 5306 Sunbright Ct., Houston, Texas are lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; and (b) the Upstream Test Property owned by Kurt and Jean Wind was affected by runoff from Tropical Storm Harvey.[467] Mr. Wind confirmed that the Winds bought their home in 1990 and that Joint Exhibit 41 is his true and correct deed.[468] The Winds have a protectable property right in their real estate, their home and fixtures, and their personal property that was taken by the Government's actions.

The Winds were initially home during Harvey but evacuated around 7:00 PM on the 28th and at that time there was no street flooding in the community.[469] The flood waters were in the home for

[466] Dkt. No. 211, Stipulations of Fact for Trial Nos. 70-75.

[467] Dkt. 219-3, USACE Admissions Tab 11, No. 78; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[468] 6 RR 1620:5-12.

[469] 6 RR 1629:8-1631:12.

two or three days.[470] The Winds returned on the 30th, but could not drive their car to the house and had to walk through the dirty waters until they were picked up by good Samaritans in a boat.[471] Mr. Wind stated that he has never seen water accumulate in the streets in his 29 years in this community, including the 2015 Memorial Day, 2016 Tax Day, and 2001 Allison storms.[472]

The Winds had reasonable investment-backed expectations when they purchased their home that it would be safe. The Winds bought the home because it was a new subdivision, designed by a well-known builder, they liked the location of the home in the subdivision, and it was quiet and safe enough for the children to play (including their legally blind daughter).[473] Another benefit of the neighborhood is that there are "four retention ponds that were built in that subdivision initially, and they did a very good job of keeping the streets dry."[474] The home that they live in is controlled by deed restrictions.[475] The home was also not in a 100 or 500-year floodplain.[476]

After they purchased the property they made several investments in the home including adding a pool, a makeover in 2008, and remodeling in 2012 which included adding the "mother-in-law suite."[477] The Winds expected the value of their home to increase when they bought the home and when they made those investments. There was no price reduction on their home because of its location

[470] 6 RR 1635:8-12.

[471] 6 RR 1629:8-1631:12.

[472] 6 RR 1624:1-24.

[473] 6 RR 1622:18-1623:8.

[474] 6 RR 1624:25-1625:5.

[475] 6 RR 1621:23-25.

[476] 6 RR 1624:1-24.

[477] 6 RR 1623:9-25.

in the reservoir.[478] Had Mr. Wind known that the home was in a reservoir and the potential for catastrophic damage to his home, he would not have bought this home:

> And what do you do with your investment when you can't sell it? You would feel horrible selling your home, if you could find somebody to buy it, to somebody else and have to put them through that. So it's -- it's a very emotional experience.[479]

The severity of the flooding of the Wind property cannot be overstated. All of the floors were removed, the walls and cabinets were torn down up to five feet in the home, many of the appliances were destroyed, their cars were totaled, and lots of personal belongings were ruined.[480] It took 11 months before everything was repaired so that the Winds could move back in. During those 11 months the Winds paid for a small garage apartment for 10 months.[481]

On September 9th Mr. Wind took a video of the damage around his neighborhood and stated: "And, over the course of the next coming weeks, the trash got so high you literally could not see the front doors of the houses when you drove down the street, people's personal belongings and furniture and flooring, sheetrock, insulation, just nasty stuff."[482] When asked what he lost Mr. Wind stated:

> What did the government take from me? They took away personal possessions. They took away use of my home. They took away time that I had to take away from my business to spend remediating and -- and rebuilding my house. They took away the potential equity and/or the appreciation that we had hoped to achieve in the nice development that we invested all that money in.[483]

And as the testimony and reports of <u>both</u> hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the maximum flooding suffered by the Winds was caused by

[478] 6 RR 1627:11-13.

[479] 6 RR 1641:4-22.

[480] 6 RR 1635:8-1638:17.

[481] 6 RR 1635:8-1638:17.

[482] 6 RR 1639:14-1641:3.

[483] 6 RR1638:13-17.

the Addicks reservoir pool; and indeed, the reservoir pool of Harvey stormwater stored behind the Addicks dam was the **sole** cause of the flooding of this Test Property.[484]

m. West Houston Airport Corporation.

Regarding Plaintiff **West Houston Airport Corporation**, the parties stipulated to the following facts: (a) the West Houston Airport is located at 18000 Groeschke Road, Houston, Texas 77084; (b) the property that is the subject of West Houston Airport Corporation's claim at trial is an improved parcel of land that serves as the West Houston Airport's terminal facility, parking lot, and various equipment (the "WHAC property"); and (c) based on the surveys conducted by the parties' retained surveyors in 2018, the elevation of the finished first floor of the terminal building located on the WHAC property is 108.6 feet, NAVD88/2001 Adjustment. In addition, the Government admitted that (a) the elevation of the finished floor for the property at 18000 Groeschke Road, Houston, Texas is lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; (b) some portions of the WHAC property at 18000 Groeschke Road, Houston, Texas are lower than the elevation of water behind Addicks Dam during Tropical Storm Harvey; and (c) the Upstream Test Property owned by West Houston Airport Corp. was affected by runoff from Tropical Storm Harvey.[485] Woody Lesikar, WHAC's airport manager and an officer of the company, stated that he has been affiliated with WHAC, including its predecessors, since 1968; and a 1980 general warranty deed proved WHAC's ownership of the terminal property.[486] The entire terminal building was built in 1984, and had recently been remodeled in 2012.[487] Mr. Lesikar confirmed at trial that the WHAC property

[484] *See* Sections III(B)(1)-(2).

[485] Dkt. 219-3, USACE Admissions Tab 11, No. 70, 84; Dkt. 219-4, USACE Admissions Tab 24, No. 132.

[486] 7 RR 2109:1-12; WHAC Exhibit 47 (General Warranty Deed).

[487] 7 RR 1870:17-1871:1.

had never flooded in over 50 years.[488] FEMA flood insurance rate maps demonstrate the WHAC terminal property is not located in any FEMA-designated flood zone.[489] As shown herein, WHAC had a protectable property right in the various property that was taken by the Government's actions..

WHAC had reasonable investment-backed expectations when they purchased the property. Mr. Lesikar wrote in a newspaper article that "I had no idea that this could happen. It had never happened before, and the airport is outside the 100-year floodplain. When I drove into the airport and through the foot of deep water, I knew this was going to make history and result in misery to many of my neighbors and customers."[490] The airport was covered by flood insurance for 33 years, but in an attempt to save money the flood insurance was intentionally dropped.[491] Just after the rains eased up, Mr. Lesikar sent a letter to his clients stating that no flooding had occurred—but then the reservoir pool waters rose to a level that did flood the airport building and terminal:

> A. "As the rains subsided, I mailed our patrons that all was well and no flooding, but I would soon be proven wrong. The 40 inches that I had just received caused no problems for our high-and-dry airport."
>
> Q. So when you said you'd soon be proven wrong, what did you mean by that?
>
> A. Well, I meant we flooded.
>
> Q. Right.
>
> A. But not from the rain.[492]

Mr. Lesikar also testified regarding his interaction with Richard Long and the Corps, which included discussions regarding WHAC's lease of Government land and WHAC's efforts to expand its runway on to Government land.[493] Mr. Lesikar testified that the Corps never disclosed that the WHAC

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[488] 7 RR 2109:1-2110:17.

[489] 6 RR 1584:11-1586:25; PX 461 (FIRM dated June 18, 2007); PX 2188 (FIRM dated July 29, 2015).

[490] 7 RR 2118:6-2119:5.

[491] 7 RR 2123:16-24.

[492] 7 RR 2117:2-12.

[493] 7 RR 2119:6 -2121:5.

property was in an area that could be and would be occupied by the Government's impoundment of stormwater, and that he had no idea this was even possible until it happened.[494]

Mrs. Stacy Lesikar-Martin was at the airport throughout Tax Day and Harvey.[495] She reported that there was no flooding during Tax Day, and through her testimony, photographs, and videos also proved that the Bear Creek diversion channel (immediately north of the WHAC airport property) never came out of it banks during either Tax Day or Harvey.[496] Mrs. Lesikar-Martin's time-stamped photographs also demonstrate that the flood waters reached the terminal on Tuesday August 29th, and that there was at least 7 ¾" of contaminated water in the terminal by 8:32 am CDT on Wednesday August 30th.[497] It was not until September 5th that the runway was free of water, and it was not until September 7th that the impounded stormwaters had receded.[498] The airport was shut down or not working at full capacity for seven to ten days and it took about a year to repair things back to their pre-Harvey condition.[499]

The severity of the flooding of the WHAC property cannot be overstated. The airport had about half a dozen airplanes that were totaled and suffered from a substantial loss of business.[500]

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[494] *Id.* Mr. Lesikar's experiences here are buttressed by common sense inasmuch as the WHAC property's first floor slab elevation is higher than the natural ground adjacent to the end of the Addicks dam's north auxiliary spillway.

[495] 7 RR 1862:19-24; Lesikar Exhibit 1-A (August 28, 2017, 8:43 am time-stamped photo of Bear Creek diversion channel); Lesikar Exhibit 1-J (August 28, 2017, 7:03 pm CDT time-stamped photo of Bear Creek diversion channel); Lesikar Exhibit 3 (time-stamped video named IMG_0780 showing that the Bear Creek diversion channel was in its banks on August 28, 2017, at 7:46 pm CDT).

[496] 7 RR 1854:17-1855:25.

[497] 7 RR 1885:17-23; WHAC Exhibit 16-J; JX 143, USGS 08073000 Addicks Reservoir at 11 (Addicks reservoir pool elevation of 108.51 feet as of August 29, 2017, at 11:45 am CDT; Addicks reservoir pool elevation of 109.07 feet as of August 30, 2017, at 8:30 am CDT).

[498] 7 RR 1886:7-1888:10.

[499] 7 RR 2121:6-2123:8.

[500] 7 RR 2124:10-14.

"There are still airplanes -there's probably 50 airplanes out there that are sitting there that still have not flown since Harvey because the owners can't afford to fix them up or don't have insurance on them. And so when they're inoperative like that, they don't buy fuel, they don't do maintenance. So that's a problem."[501] The terminal parcel suffered substantial damage, including to its furnishings, equipment, and aircraft.[502] Inside the terminal there was between 5-8 inches of contaminated stormwater.[503] That water included a snake among other things.[504] As Ms. Lesikar-Martin testified in response to the Court's inquiry, the water in the terminal building "was nasty. We had animals. Ants. Ants were unbelievable. The water — the sewer, the -- the flowage. It was -- we had a little bit of fuel from the residue of the ramps and that kind of stuff all over. And turned off the power to the terminal the day before so we wouldn't have any electrocution. But -- the water was over my rubber boots. We were all walking around sloshing in it, and it was just gross. It was gross."[505]

And as the testimony and reports of <u>both</u> hydrology experts at trial—Dr. Bedient for Plaintiffs **and** Dr. Nairn for the Government—the inundation of the WHAC property was solely caused by the Addicks reservoir pool; and indeed, the reservoir pool of impounded Harvey stormwater runoff stored behind the Addicks dam was the **<u>sole</u>** cause of the flooding of this Test Property.[506]

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[501] 7 RR 2124:20-2125:2.

[502] 7 RR 1868:11-1874:25; 7 RR 2121:11-2123:8; WHAC Exhibit 16K; WHAC Exhibit 16-M; WHAC Exhibit N; WHAC Exhibit 16-O; WHAC Exhibit 16-T.

[503] 7 RR 1862:1-11; WHAC Exhibit 16-J (August 30, 2017 high water mark photo).

[504] 7 RR 1863:8-14.

[505] 7 RR 1867:24-1868:8.

[506] *See* Sections III(B)(1)-(2).

IV. The Government's Actions Constituted a Taking under the Multi-Factor Analysis of *Arkansas Game & Fish Commission v. United States*.

Plaintiffs believe that the *Ridge Line* inquiry of whether the flooding Plaintiffs experienced was the "predictable result of the government's action, and whether the government's actions were sufficiently substantial to justify a takings remedy" are demonstrated on a *per se* basis without the necessity of demonstrating a taking based on the multi-factor analysis set forth in *Arkansas Game*. Even so, and in light of this Court's recent decision in *Caquelin v. United States*, 140 Fed. Cl. 564, 571-72 (2018) (a rails to trails taking case), record evidence also establishes that Plaintiffs suffered a compensable taking of real and personal property based on the multi-factor "tort/taking" analysis set forth by the Supreme Court in *Arkansas Game & Fish Comm'n v. United States*, 568 U.S. 23 (2012).

As noted by this Court in *Caquelin*, the Supreme Court's decision in *Arkansas Game & Fish* has brought into question what application (if any) does a multi-factored analysis have in a physical takings case. Plaintiffs note that in *Arkansas Game*, the Court reaffirmed two key points of takings jurisprudence: (a) that when the government physically takes possession of an interest in property for some public purpose, "it has a categorical duty to compensate the former owner;" and (b) that no magic formula enables a court to judge, in every case, whether a given government interference with property is a taking. *Arkansas Game & Fish*, 568 U.S. at 31 (citations omitted).

In *Caquelin*, this Court analyzed the six "interrelated" factors set forth in the Supreme Court's *Arkansas Game & Fish* opinion: (a) the time and duration of the taking; (b) the degree to which the invasion was intended; (c) the foreseeable result of the authorized Government action; (d) the character of the land at issue; (e) the property owner's reasonable investment-backed expectations regarding the land's use; and (f) the "severity of the interference." *Caquelin*, 140 Fed. Cl. at 576, 579. Even though Plaintiffs do not believe this analysis is applicable in a physical takings case (especially the "reasonable investment-backed expectations" factor), each factor supports finding a taking here for each of the 13 Test Properties.

A. The Time and Duration of the Taking.

In *Caquelin*, this Court recognized that temporary categorical takings, which deny a landowner all rights to the use of private property, are not different in kind from permanent takings, for which the Constitution clearly requires compensation. *Caquelin*, 140 Fed. Cl. at 576 (citing *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, 482 U.S. 304, 318 (1987)). "When a physical taking is categorical, courts look to the temporal element to determine the measure of just compensation under the Fifth Amendment, not whether a claim arose at all. 140 Fed. Cl. at 573 (citing *Ladd v. United States*, 630 F.3d 1015, 1025 (Fed Cir. 2010), *Yuba Nat. Res., Inc. v. United States*, 821 F.2d 638, 641-42 (1987)); *see also id.* at 574 ("Whether the government exercises permanent or temporary control is only relevant for the calculation of compensation, not whether a taking occurred.") (citing *United States v. General Motors Corp.*, 323 U.S. 373, 378 (1945)). Against this backdrop, the *Arkansas Game & Fish* multi-factor analysis becomes less applicable where the taking of Plaintiffs' properties was categorical and physical.

As the record demonstrates, the Government effected a categorical, physical taking of Plaintiffs' real and personal property. Each Plaintiff testified to the significant period of time they lost the complete use and enjoyment of their real property, that each was denied the categorical right to exclude another (here the Government's impounded stormwater) from the use and occupation of their property. Moreover, all but Ms. Popovici suffered the complete loss of countless personal possessions.[507]

And the time and duration of the Government's taking was not merely the period that floodwaters occupied Plaintiffs' homes, businesses, and properties—although that metric alone would justify a taking remedy because these are citizens' homes and businesses. After the waters receded,

[507] *See, e.g.*, Section III(B).

Plaintiffs were still deprived of the customary use and enjoyment of their properties as they faced the daunting, months-long task of repairing and rebuilding, leaving most Plaintiffs displaced for an extended period, and some, permanently.[508] The physical occupation by the Government of Plaintiffs' properties with Harvey stormwater stored behind its flood control dams "mandates compensation … even though that use [was] temporary." *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302, 322 (2002).[509] The first factor supports a taking.

B. The Degree to Which the Invasion was Intended.

Demonstrating that Plaintiffs' injuries were "the direct, natural, or probable result of the authorized government action," rather than merely an incidental or consequential injury, establishes the Government's intent to take private property. *Cary v. United States*, 552 F.3d 1373, 1377 (Fed. Cir. 2009) (citing *Ridge Line*, 346 F.3d at1356). The plaintiffs' injury need only be the likely result of the Government's act. *See Moden v. United States*, 404 F.3d 1335, 1343 (Fed. Cir. 2005). Here, Plaintiffs' proof far exceeds this "likely result" standard.

As set forth above, the Addicks and Barker dams were designed, constructed, modified, used, and operated with the full intent and purpose of holding back and controlling stormwater runoff

[508] *See, e.g.*, 6 RR 1780:15-1781:18 (Plaintiff Elizabeth Burnham testimony that she had to sell her property); 7 RR 1844:5-1845:11 (Plaintiff Scott Holland testifying as to his losses and financial circumstances which have forced to live in RV).

[509] Although a "regulatory" takings case, *Tahoe* recognized that the "longstanding distinction between acquisitions of property for public use, on the one hand, and regulations prohibiting private uses, on the other, makes it inappropriate to treat cases involving physical takings as controlling precedents for the evaluation of a claim that there has been a "regulatory taking." 535 U.S. at 323. The Court explained that the distinction was grounded in the text of the Fifth Amendment itself, which "provides a basis for drawing a distinction between physical takings and regulatory takings. Its plain language requires the payment of compensation whenever the government acquires private property for a public purpose, whether the acquisition is the result of a condemnation proceeding or a physical appropriation." 535 U.S. at 321. The physical appropriation (and destruction) of Plaintiffs' real and personal property here puts each Plaintiffs' claim squarely within those physical takings that are "as old as the Republic and, for the most part, involves the straightforward application of *per se* rules." 535 U.S. at 322.

from nearly 400 square miles of watersheds in a known geographic area: two defined reservoirs which, as a necessary consequence of their design and operation, include thousands of acres of private property.[510] Witnesses testified that the dams are permanent and immobile structures that, as a matter of hydrology, impound stormwater runoff from the upper Buffalo Bayou watershed.[511] During and after Harvey, the Project operated and functioned exactly as expected and intended.[512] Everything the Government did during Harvey was mandated by the approved Water Control Manual, and was done to effectuate the Project's public purpose of protecting downstream.[513]

And the flood pools that resulted from the prescribed use and operation of the federal flood control Project was well within its design parameters, not only from the perspective of rainfall amounts, but also from the perspective of pool elevations.[514] As explained by Mr. Thomas, the probable maximum precipitation is the worst rainfall that engineers believe could be generated by the weather in the region.[515] The PMP for this federal project is 43 or 44 inches.[516] And as Mr. Thomas admitted, the Harvey rainfall was about 35 inches, which is less than the PMP.[517] The same analysis

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[510] *See* Sections II(D), III(A).

[511] 1 RR 90:17-20; 7 RR 1936:1-19.

[512] 1 RR 169:1-3; see also PX 25 ("The embankment, outlet structures, and emergency spillways functioned as intended…Overall conclusion is that the project was preforming as expected with no significant problems during this pool of record event.").

[513] *See* 1 RR 175:1-14 (Thomas: flooding of homes upstream during Harvey was no accident, was mandated by dictates of Water Control Manual); 1 RR 176:12-177:1 (Thomas: upstream homes flooded by runoff held back by federal project); 6 RR 1448:18-21 (Long: during Harvey the Government did not depart from the dictates of the Water Control Manual); 6 RR 1449:5-8 (Long: everything the Corps did during the Harvey event was covered by the Water Control Manual). As Richard Long testified, in his 41 years at the Corp, he is unaware of a single instance when the Water Control Manual had ever been disregarded. 6 RR 1446:16-24.

[514] 1 RR 151:8-15,; 1 RR 152:2-3; 4 RR 995:10-24.

[515] 1 RR 175:15-22.

[516] 1 RR 176:4-5.

[517] 1 RR 176:6-11.

holds if the Spillway Design Flood is used, because the SDF is 43.5 inches, which corresponds to the maximum design pool elevation.[518] For a Spillway Design Flood, which is the probable maximum flood, the Government knows that the amount of private land that would be occupied by impounded runoff would exceed 15,000 acres.[519] Further, because there are no embankments on the back end of the reservoirs, there is no barrier to keep the reservoir pool on government owned land.[520] The Government has long studied and known what pool elevations will exceed Government land.[521]

The evidence supporting the intent prong could not be stronger in this case, and it is buttressed by evidence of the Government's repeated contemplations to buy the very land it knew its Project will necessarily occupy.[522] As long as the dams are in place, and given enough rainfall runoff in the upper Buffalo Bayou watersheds, then impounded stormwater runoff will back up onto upstream private

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[518] 2 RR 341:14-20; 2 RR 344:1-4 (Corps recalculated the SDF but it is similar to the one used from 1984); 2 RR 361:3-13; 364:17-22 (explaining the probable maximum flood corresponds to the SDF).

[519] 1 RR 149:10-15; 2 RR 364:17-22.

[520] 1 RR 86: 9-14.

[521] *E.g.*, 1 RR 120:25-121:6; 1 RR 123:2-5.

[522] Notably, on August 30, 2017, at the height of the Harvey pool, Thomas was engaged in an email exchange with Col. Zetterstrom of the Galveston District, and in a discussion of future funding Thomas expressed the need for "federal funding to buy all of the property in the AB reservoirs and in the surcharge corridor." PX 1644, Email: Robert Thomas to Col. Lars Zetterstrom at 1 (August 30, 2017, USACE 803879). As far back as when the 1977 Hydrology Report was issued there was discussion about additional acquisition of upstream areas. 1 RR 258:2-6. The Corps also considered acquiring additional upstream real estate in the 1980s but decided not to do so. 1 RR 289:21. As part of the 1995 *Reconnaissance Report*, the Corps again considered acquiring real estate or a flowage easement but chose the "no action" alternative instead. JX 52, Buffalo Bayou and Tributaries, Texas, Reconnaissance Report: *Section 216 Study, Addick and Barker Reservoirs, Houston, Texas* at 19 (October 1995, USACE 015148); 2 RR 377:6. Repeatedly, the Corps has evaluated, but never asked for, funds to acquire additional upstream land despite knowing that thousands of people live within the flood pools of the reservoirs. 4 RR 852:19-853:6.

The fact that, for nearly 40 years, the Government has explicitly considered using its condemnation power to acquire upstream private land is indisputable evidence that the property would be inundated by the Government's Project.

property not owned by the Government—which is precisely what happened during Harvey.[523] The testimony at trial only confirmed what the Government has always known: that the reservoir "storage area includes not only government lands but also private property by design and intent."[524] For all these reasons, Plaintiffs have readily shown their flooding was the "direct, natural, or probable result" of the intended use and operation of the Buffalo Bayou and Tributaries, Texas Project for its authorized public purpose. The second factor supports a taking.

C. The Foreseeable Result of the Authorized Government Action.

Noting it is a "related vein," *Caquelin* next examined whether the effects the plaintiffs experienced were "the predictable result of authorized government action." *Caquelin*, 140 Fed. Cl. at 580 (quoting *Ridge Line*, 346 F.3d at 1355-56). The question presented by this factor is whether the invasion of Plaintiffs' property was the foreseeable result of Government action. *Banks v. United States*, 138 Fed. Cl. 141, 150 (2018). As noted earlier, a taking is "foreseeable" if it is the direct, natural or probable result of the alleged Government authorized actions for a public purpose and not a mere eventual or consequential injury inflicted by those actions. *Cary*, 552 F.3d at 1377; *Moden*, 404 F.3d at 1342; *see also Hansen v United States*, 65 Fed. Cl. 76, 97 (2005) ("the *Ridge Line* court adopted the traditional objective tort-causation approach to takings as an alternative means for establishing a takings claim," which "is largely based on causation-in-fact and allows a takings claim to lie so long as the harm is proximately related to the causative action").

And as with the intent prong, the evidence of foreseeability is overwhelming. Not only was the flooding of Plaintiffs' homes and properties foreseeable, it was actually foreseen. The Corps' internal "Reservoir Structure" maps depict the elevations of upstream structures located within

[523] 7 RR 1936:14-19; 1 RR 66:6-10; 1 RR 67:23-68:6.

[524] 6 RR 1454:16-19; *see also* 6 RR 1471:15-20 (Long: admitting that one of the residential subdivisions is in the storage area behind Barker Dam "by design").

Addicks and Barker's respective pools and are clear evidence of foreseeability.[525] Notably, even these internal maps depict the "Project Boundaries" to be coequal with Government land, despite the fact that the same maps graphically illustrate how many privately-owned homes and businesses would be submerged at reservoir pool elevations well below their corresponding "full pool" elevations.

Moreover, in 2009, for example the Corps prepared a PowerPoint presentation for local authorities (but not the general public) with the following slide: "Fact: Addicks & Barker Reservoirs are capable of putting development above the reservoir under water…storms have occurred near our area that would have caused flooding off government owned land in Addicks & Barker Reservoirs."[526] And with a concluding slide: "Addicks & Barker Reservoirs has never flooded off government-owned land. After seeing the potential for flooding from the two storms presented [Tropical Storm Claudette and Allison], we know *it can and probably will happen* at some point in time."[527]

Other evidence in this record further confirms the foreseeability of flooding Plaintiffs' properties. Around 2003-2004, the Corps hired a private contractor to collect first floor elevation surveys for over 10,000 structures in the upstream area subject to being submerged by the impounded runoff.[528] The Corps of Engineers wanted the information in order to know when the pool gets high enough to go beyond government owned land so that the Corps had "the addresses, the names, the elevations" of the homes which will be submerged.[529] When asked whether the flooding of upstream

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[525] PX 268, Addicks and Barker Reservoir Structures Maps (USACE USACE668672-75); PX 271, Addicks and Barker Inundation Maps (2002 USACE 668684-85) (depicting area that would be covered by an Addicks reservoir pool of 108 feet and 112 feet and area covered by a Barker reservoir pool of 104 feet).

[526] PX 1597 at 31 (Corps PowerPoint); 6 RR 1478:22-1479:10 (Long: confirming PowerPoint used for meeting with local officials).

[527] PX 1597 at 48 (emphasis added); 6 RR 1482:13-19.

[528] 1 RR 100:11-16.

[529] 1 RR 100:2-19.

homes during Harvey was a surprise, Mr. Thomas admitted that "we had data indicating the first level elevations of those homes and information about the pool level."[530] Likewise, Mr. Long admitted that "it was known that if a severe enough rain event occurred, that water impounded behind the [Addicks and] Barker Dam would exceed the government owned property limits."[531] Collecting such information demonstrates that the Government recognized its operations impose flooding on private property.

Notably, the Government had established a Taking Line for the project; a designation for establishing the limits of land acquisition for a reservoir project based on the project's hydrology.[532] As explained by Ms. Johnson-Muic and Mr. Thomas, people are not generally allowed to build homes within a government flood control reservoir.[533] For the Addicks and Barker reservoirs, the Taking Line that was established in the 1980s re-evaluation of the dams was set above the elevation of the Harvey flood pool.[534] The Taking Line also demonstrates the Government's expectation and foresight that one day it would impound stormwater up to that Taking Line elevation and submerge tens of thousands of upstream private properties to protect the City of Houston.

While plaintiffs in certain recent *downstream* temporary flooding cases may have struggled with issues of causation or foreseeability, *e.g.*, *Ideker Farms, Inc. v. United States*, 136 Fed. Cl. 654, 692 (2018), *reconsideration denied*, 142 Fed. Cl. 222 (2019) (stating the 2011 flood did not meet the foreseeability test); *St. Bernard Par. Gov't v. United States*, 887 F.3d 1354, 1362 (Fed. Cir. 2018) (declining to reach

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[530] 1 RR 273:3-7.

[531] 6 RR 1473:15-17; *see also* 6 RR 1475:20-24; PX 1747, Email from Richard Long to Jon Sweeten at 1 (September 5, 2017, USACEII 00655687) ("the fact that this could happen [upstream flooding] has always been known").

[532] 4 RR 855:21-856:1; 1 RR 294:1-14; 1 RR 295:2-10.

[533] 4 RR 860:10-17.

[534] 1 RR 294:1-14; 295:2-10; PX 46.

foreseeability because causation was not established), these *upstream* Plaintiffs who are literally "in the reservoir" have unequivocal evidence of both. The record evidence conclusively proves the inundation of Plaintiffs' properties was caused by the Project's control of stormwater runoff and was foreseeable. Indeed, it was an eventuality the Government recognized over the course of several decades, yet deliberately chose to accept the risk of litigation instead. To borrow again from *Caquelin*, no "preternatural clairvoyance is needed" to predict that the Government's use and operation of this Project would impose flooding on private lands within the resulting reservoir pools. 140 Fed. Cl. at 580. The third factor supports finding a taking.

D. The Character of the Land at Issue.

Regarding the fourth factor, the *Caquelin* opinion observed that *Arkansas Game & Fish* "points courts to determine whether a taking (as opposed to a tort) occurred by looking at the nature of the underlying land, *i.e.*, was it prone to repeated flooding or especially susceptible to flooding." *Caquelin*, 140 Fed. Cl. at 581. Here, the properties at issue are homes located within deed-restricted residential communities whose land use, as recognized by the Government's regulations prohibiting human habitation and permanent structures inside a flood control reservoir, is grossly inconsistent with storing contaminated black water for weeks or months on end.[535] And with regard to this specific area, the Corps affirmatively acted to aid the alteration of the "character of the land" from rice fields to residential subdivisions within the footprint of the reservoirs.

Originally, the Corps followed a policy to decline all requests for channel improvements.[536] But beginning in the late 1970s, when private developers approached the Corps to extend channel improvements onto Government-owned land in order to facilitate land development by reducing the regulatory floodplain, the Corps reversed course and took affirmative actions to grant easements on

[535] *See* 31 Fed. Reg. 9108 (July 2, 1966).

[536] 2 RR 382:19-383:5.

its property within the reservoirs so that such development could go forward.[537] As the Government's representative, Robert Thomas conceded the Government could have maintained its prior policy and simply said "no" to the developers.[538] As the Corps internally recognized, its change in policy and affirmative grant of easements for channel improvements on Government land would result in more development and a greater risk of flood damages to private property in those upstream areas.[539]

As homes and places of business, the Plaintiffs' properties are exceptionally vulnerable if a federal project puts them at risk of reservoir pool flooding. As in *Arkansas Game & Fish*, and *Caquelin*, the inundated areas at issue here have never been exposed to flooding comparable to the accumulations from Harvey reservoir pools "in any other time span either prior to or after the construction" of the Addicks and Barker Dams. *Caquelin*, 140 Fed. Cl. at 581. Testimony showed that reservoir pool flooding is of a different nature because of the extended length of time that the inundation occurs.[540] And testimony from the test property plaintiffs confirmed that the various properties had never experience flooding of the kind and severity as the inundation that occurred during and after Harvey. Given the character of the land, and the Corps' affirmative actions to facilitate the development of these places of residence or business, the fourth factor supports a taking.

[537] 2 RR 383:9-18.

[538] 2 RR 387:1-4.

[539] 2 RR 387:13-22; *see also* PDX 15 (upstream development timeline showing virtually all development in the so-called "fringe area" occurred after the Corp's policy change).

[540] 8 RR 2454:12-17 (Fitzgerald).

E. Plaintiffs' Reasonable Investment-Backed Expectations Regarding the Land's Use.

Though discussed in *Arkansas Game & Fish*, the concept of "reasonable investment-backed expectations" is applied in a regulatory takings case and "is designed to account for property owners' expectation that the regulatory regime in existence at the time of their acquisition will remain in place, and that new, more restrictive legislation or regulations will not be adopted." *Love Terminal Partners, L.P. v. United States*, 889 F.3d 1331, 1345 (Fed. Cir. 2018). Strictly speaking, the factor should not be applied here because this action involves an actual physical taking. *See Palm Beach Isles Assoc. v. United States*, 231 F.3d 1354, 1364 (Fed. Cir. 2000) (noting that when a categorical taking is found to have occurred, "the property owner is entitled to a recovery without regard to consideration of investment-backed expectations [because, i]n such a case, 'reasonable investment-backed expectations' are not a proper part of the analysis, just as they are not in physical takings cases"); *see also Preseault v. United States*, 100 F.3d 1525 (Fed. Cir. 1996) ("[D]ifferent situations call for quite different analyses. The Government's attempt to read the concept of 'reasonable expectations' as used in regulatory takings law into the analysis of a physical occupation case would undermine, if not eviscerate, long-recognized understandings regarding protection of property rights; it is rejected categorically. The trial court erred in accepting the Government's effort to inject into the analysis of this physical taking case the question of the owner's 'reasonable expectations.'"). Nevertheless, should the factor be deemed applicable to this physical taking case, the evidence showed that the Government's impoundment of storm water for days on end, destroying real and personal property, and denying access, is not something Plaintiffs expected, or reasonably could have expected.[541]

[541] That a "reasonable investment-backed expectations" analysis does not belong in a physical takings case is supported by U.S. Supreme Court decisions pre-dating *Arkansas Game & Fish*, as well as *Arkansas Game* itself. In *Tahoe*, 535 U.S. at 303, the high court explained that the "longstanding distinction between acquisitions of property for public use, on the one hand, and regulations prohibiting private uses, on the other, makes it inappropriate to treat cases involving physical takings as controlling precedents for the evaluation of a claim that there has been a regulatory taking, and vice

Each Plaintiff testified that they had no knowledge they were sited within a federal flood-control reservoir pool.[542] Moreover, the Plaintiffs' lack of knowledge about their location within a federal reservoir correlates with the other evidence at trial regarding the efforts of the Corps to downplay (or in some cases, conceal) this fact from the public. Quite simply, there was no evidence that the Corps ever undertook a widespread public information campaign about the full extent of the Addicks and Barker reservoirs so that such knowledge should have impacted Plaintiffs' expected use of their properties.[543] To the contrary, the evidence showed that citizens and landowners were kept in

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versa." In *Arkansas Game*, the court identified as "fundamental" the *Tahoe* court's pronouncement that "when the government physically takes possession of an interest in property for some public purpose, it has a categorical duty to compensate the former owner." 568 U.S. at 31 (citing *Tahoe*, 535 U.S. at 322). And while the facts underlying *Arkansas Game & Fish* involved a physical taking, the Court's holding that "government-induced flooding temporary in duration gains no automatic exception from takings Clause inspection" appeared to include both "regulation or temporary physical invasion," as the Court referenced both types of takings. Thus, when the Court elaborated on factors "relevant to the takings inquiry," it was not surprising that it included factors that are relevant to both regulation and physical invasion, *even if* the Court did not clarify that certain of those factors (such as reasonable investment-backed expectations) should only be applicable to the one type of taking. *See* 568 U.S at 38; *cf. Caquelin v. United States,* 697 Fed. Appx. 1016, 1019 (Fed. Cir. 2017) (recognizing that the government had "invoke[d] the general regulatory takings framework" and remanding for consideration under *Arkansas Game & Fish*'s multi-factor analysis). Also relevant is that the *Arkansas Game* Court only cited regulatory takings cases for the proposition that the investment-backed expectations inquiry might be applicable. 568 U.S. at 38 (citing *Lucas*, 505 U.S., at 1027–1029; *Phillips v. Washington Legal Foundation*, 524 U.S. 156, 164 (1998)). Likewise this Court in *Caquelin* relied only on regulatory taking cases when discussing this inquiry, *see generally* 140 Fed. Cl. at 582, because that inquiry only appears in regulation cases. As this Court noted in *Arkansas Game & Fish*, "superinduced flows of water would constitute a physical, not a regulatory, taking." *Ark. Game & Fish Comm'n v. United States*, 87 Fed. Cl. 594, 616 (2009), *aff'd*, 736 F.3d 1364 (Fed. Cir. 2013). And time and again, the Supreme Court has underscored the distinctness of these two lines of takings cases. *See, e.g., Horne v. Dep't of Agric.*, 135 S. Ct. 2419, 2427 (2015) ("Our cases have stressed the 'longstanding distinction' between government acquisitions of property and regulations."); *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 432 (1982) (stressing that "physical invasion cases are special" (emphasis omitted)).

[542] *E.g.*, 6 RR 1729:10-15 (Banker); 6 RR 1758:15-1760:3 (Burnham); 6 RR 1654:8-18, 6 RR 1651:8-17 (Giron); 7 RR 1834:14-16 (Holland); 5 RR 1413:15-1414:5 (Strebel, Lakes on Eldridge Community Association); 5 RR 1293:24-1294:15 (Micu); 5 RR 1225:2-17 (Popovici); 6 RR 1738:9-17 (Sidhu); 4 RR 1076:22-1078:3 (Soares); 6 RR 1607:19-22 (Stewart); 7 RR 2151:16-20 (Turney); 6 RR 1626:1-1627:7 (Wind); 7 RR 2120:20 - 2121:5 (Lesikar, West Houston Airport Corporation).

[543] While Mr. Michael Nakagaki gave testimony regarding which FEMA Flood Zone designation applied to each Test Property, he admitted that FEMA food insurance rate maps do not disclose any

the dark about how the Addicks and Barker dams and reservoirs truly operated. There simply is no evidentiary basis to find Plaintiffs have lesser property rights than other individuals, or that any of them ever expected that the Government would – without ever asking much less paying Just Compensation – use its Project to impose flooding on their homes or businesses.

As noted previously, as early as 1973 the Chief of the Galveston District's Engineering Division recognized that the Government project "will cause flooding of substantial amounts of private lands" and that since this fact "is expected to soon become a public issue," the Government needed to come up with a plausible story "for our operating concept of imposing flooding on private lands without benefit of flowage easement or other legal right."[544]

Indeed, even though the Corps knew that the general public did not understand the threat posed by the intended retention of stormwater that would submerge properties upstream of the dams, instead of admitting this fact to the public, it continually focused its public communications on issues concerning the dams to laud their safety. Government documents from the 1980s and 1990s show that the public was not informed of any problems associated with the Addicks and Barker dams, including the inadequacy of government-owned land to prevent flooding of upstream private property. For instance, in 1980 the Corps noted that following the completion of some repairs to the Addicks and Barker Dam embankments and outlet works, the general public "*now probably perceives the dams to be safe. These repairs, however, did not address the problem of* inadequate spillway capacity, possible flood hazard areas downstream from the structures, and *upstream areas subject to flooding outside existing government fee line*. These are three separate problems and are only very loosely interconnected. *The public*

risk of inundation by the Addicks or Barker reservoirs, or even whether any particular property is located inside a government reservoir. 8 RR 2378:8-2379:25.

[544] PX 37, Memo: Addicks and Barker Reservoirs – Encroachment on Private Lands at 1 (May 3, 1973, USACE 667927) (emphasis added).

has not been informed of any of these problems … ."[545] And while a draft Public Information Notice in October 1980 would have told the local citizens that "the impounded runoff from the SPF [Standard Project Flood] would flood areas outside the government owned property,"[546] that (potentially helpful) information in the notice was actually deleted by the Corps, and there is no evidence that even the revised notice was ever released to the general public.[547] Likewise, a news release from 1981 concerning "plans to insure the safety of the dams" did not mention the inadequate government owned land behind the reservoirs.[548]

Indicative (and revealing) of the Corps' conduct is a 1989 instance when it was contacted by a developer who had seen a USGS "quad map" which indicated "areas of controlled inundation" and asked that the Corps "investigate the legal limits of Barker Reservoir's allowable flood pools."[549] The internal Corps memo admits that "[t]he legal limits of Barker Reservoir allowable pools has never been addressed;" and it notes that Richard Long, the Corps Ranger at the Addicks project office, recognized that "storage of greater than the standard project flood (SPF) can potentially flood areas outside the USACE boundary and open them to lawsuits by those landowners."[550] However, the "fact sheet of

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[545] JX 26, Memo: Buffalo Bayou and Tributaries – Spillways for Addicks and Barker Dams at 1 (September 5, 1980, USACE 530470) (emphasis added); *see also* PX 1406, Memo: Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs: Special Report of Flooding at 2 (June 30, 1992, USACE 529848) ("Urbanization of the privately owned land that borders the Government Owned Land (GOL) has resulted in the erection of structures within the maximum pool zone. Homeowners are largely unaware of their situation.").

[546] PX 85, Public Information Notice: Buffalo Bayou and Tributaries, Texas – Addicks and Barker Dams at 2 (October 23, 1980, USACE 543330).

[547] PX 86, Memo: Buffalo Bayou and Tributaries – Spillways for Addicks and Barker Dams – Public Involvement at 1 (November 28, 1980, USACE 543321).

[548] *See* PX 446, News Release, Public Affairs Office, U.S. Army Corps of Engineers, *Dam Safety Plans Announced by Corps for Addicks and Barker Reservoirs* at 1-3 (November 19, 1981, FB 0017431-33); 1 RR 332:23-333:1.

[549] PX 2284, Memo: Barker Reservoir Pool Elevation; Kelliwood at 1 (August 24, 1989, FB 0000632).

[550] PX 2284, Memo: Barker Reservoir Pool Elevation; Kelliwood at 1 (August 24, 1989, FB 0000632).

information" Long put together in response to the inquiry does not acknowledge the potential for upstream flooding of private property by the Barker dam, but instead downplays the milquetoast comment on the USGS quad map, calling it "misleading," and assures the questioner that "The Reservoir has never stored more than ½ of its SPF capacity,"[551]

Similarly, when contacted in 1999 by the president of a homeowner association management company asking about "rumored plans to allow the area to flood,"[552] the Corps again gave no direct answer to the question.[553] Never does the Corp acknowledge that there were no "rumored plans to allow the area to flood;" nor that it was actually the Corps *current* plan to inundate land beyond that owned by the Government in the case of a significant storm. Instead, the Corps again provided a generic description of the Project, the operation of the dam gates, and touted that "During the 50-year life of the project, reservoir pools have never inundated private interests outside of government-owned land."[554] And once again, the Corps downplays the importance and reliability of the USGS quad maps by stating they "have not been updated to show current development" and that the limits of impoundment shown on them should only be used "as an approximation of what might be inundated."[555] Finally, the Corps makes it sound like inundation might pose a future threat to upstream

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[551] PX 2284, Memo: Barker Reservoir Pool Elevation; Kelliwood at 2 (August 24, 1989, FB 0000633). And specifically with regard to the USGS quad maps, no evidence was produced that any Plaintiff, or community at large, had ever consulted the maps. Instead, Mr. Hansmann testified that the USGS maps were only available online starting in 2010, and he could not confirm they provided any help or disclosure to a home buyer. *See* 8 RR 2303:23-25 (Hansmann); 8 RR 2307:4-13 (Hansmann: confirming "the homeowner would have to start putting together… the pieces of the puzzle" themselves). As the only Government witness on this issue admitted, Mr. Hansmann testified that he "didn't know" whether the USGS maps were effective in alerting a homebuyer of flood pool risk, and he was not testifying "to give [his] opinion" on that topic at all. 8 RR 2307:14-23 (Hansmann).

[552] *See* DX 933, Letter to Richard Long, USACE at 1 (May 7, 1999, USACE 464796).

[553] *See* DX 933, Response of Col. Nicholas Buechler, District Engineer at 1-2 (Undated, USACE 464797-98).

[554] *See* DX 933, Response of Col. Nicholas Buechler, District Engineer at 2 (Undated, USACE 464798).

[555] *See* DX 933, Response of Col. Nicholas Buechler, District Engineer at 2 (Undated, USACE 464798).

properties, but only "with the continued urbanization of upstream watersheds."[556] Again, an—at best—misleading Corps response to a direct public inquiry.[557]

Nor did the Corps' "Addicks and Barker Safety Program" in 2010 provide significant notice or information to the public of the danger of upstream flooding. As the Corps materials note, "The primary objective of the [two] meetings was to inform the public of the USACE National Dam Safety Program and its goal to maintain public safety by ensuring that the Addicks and Barker Dams are safe and risks to regional public are minimized."[558] A meeting notice summary report did not say anything about the floodwater that may go into the neighborhoods behind the dam.[559] Nowhere is the topic of

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[556] *See* DX 933, Response of Col. Nicholas Buechler, District Engineer at 2 (Undated, USACE 464798).

[557] Neither do the vague and misleading statements on some Fort Bend County plats provide salvation to the Government. As Mark Vogler, Chief Engineer for the Fort Bend County Drainage District, flatly testified, the language was unsuccessful in informing the public of the risks associated with being submerged by the Barker Reservoir pool. 3 RR 682:1-10 (Vogler). Vogler explained that his opinion was based on his interactions with the public, and that during those interactions "I was very surprised to know that the general public was not even aware they were in a reservoir." 3 RR 682:2-5, 11-13 (Vogler). Such testimony is consistent with the fact that homeowners do not typically see their plats when purchasing property. *E.g.*, 4 RR 1078:21-23 (Soares) (testifying that the first time he saw the plat was in his deposition). And according to Jeff Lindner of Harris County, most people in Harris County did not know the Addicks and Barker reservoirs existed and were unaware of the potential for water to leave government-owned land and flood homes upstream from the dams. 2 RR 589:19-590:8 (Lindner). Even in the remote chance that a home buyer did see plat language, even the testimony from the Government's own witnesses showed that the language was confusing, suggesting perhaps that the government owned land could be inundated, and not clearly stating that the subdivision themselves were subject to the Corps' inundation. *E.g.*, 6 RR 1577:1-1579:9. Yet it is this kind of misleading "notice"—much of which was not even provided to the public by the Corps—that the Government now wishes to rely on to manufacture a defense to its liability in this case. *See, e.g.*, DX 122, Review Form, Fort Bend County Engineering Department at 2 (July 30, 1992, FB0000611); 3 RR 719:8-22 (Vogler) (discussing same); *see also* JX 46, Plat of Kelliwood Courts, Section One at 1 (August 3, 1992, CIN5_0002064) (containing similar language). That tactics is simply not credible given the Corps own documentation which repeatedly acknowledges that "the land acquired will not accommodate maximum flood storage," and that "homeowners are largely unaware of their situation." PX 1406, Memo: Review of Report on Flooding, Buffalo Bayou and Tributaries (June 12, 1992, USACE 529848).

[558] JX 94, Addicks and Barker Upstream Meeting Summary Report at 1.0 (February 2010, USACE 594370).

[559] PX 4; 1 RR 87:1-4.

upstream flooding risk noted in the questions and issues addressed at either meeting.[560] In the Corps materials, the Government-owned land was called the project boundary on the map that was provided to the public, which Mr. Thomas conceded was not accurate to alert people as to where the water could be impounded.[561] Mr. Long admitted that he did not attend the meetings, and thus could not confirm that the exhibits were ever actually seen by anyone from the public.[562] Moreover, only 143 people in total attended the two meetings the Corps held, a minimal number possibly caused by the minimal effort the Corps expended in providing notice to the general public: a few newspaper notices, a total of 34 "yard signs" at various roadway intersections, and a one-paragraph mailer sent only to those persons whose property actually abutted the government-owned land in each reservoir—even though the Corps had the names and addresses of every person and property it expected to flood in the fringe areas beyond the Government-owned land.[563] Such numbers hardly lead to the type of community-wide awareness of reservoir pool flooding the Government has tried to lay at Plaintiffs' doorsteps. Likewise, the evidence of a couple meetings, in certain limited years, is hardly sufficient to establish "expectations" in a community of property owners that come and go with home sales, or moves, including people moving to the Houston area from out of town. In short, the fact that the Government may have communicated with 143 people in the year 2010 is grossly insufficient to meet this prong.

And the misinformation campaign from the Corps continued even in the aftermath of Harvey. Incredibly, on September 28, 2017, the Corps prepared talking points stating that "There are no homes

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[560] JX 94, Addicks and Barker Upstream Meeting Summary Report at 1.1-1.2 (February 2010, USACE 594371-72).

[561] 1 RR 86:1-3; 1 RER 86:19-22.

[562] 6 RR 1570:14-25.

[563] 6 RR 1573:21-1574:5; 1 RR 88:14-21; JX 94, Addicks and Barker Upstream Meeting Summary Report at Appendices A1, A2 (February 2010, USACE 594374-75, 594386-87, 594479-80).

built inside the reservoir. All private residences are outside of the Corps boundary and are governed by local land use regulations which we do not control."[564] But as Richard Long admitted, this is misleading at best based on how you define the term "reservoir."[565]

In sum, the Plaintiffs' "reasonable investment-backed expectations" should not be at issue in a physical takings case, and even if the factor were to be considered, the issue represents at most "one factor" that is not "talismanic" or "dispositive." *Palazzolo*, 533 U.S. at 634 (O'Connor, J., concurring); *see Ark. Game & Fish*, 568 U.S. at 39. The Government failed to any evidence that the Test Property Plaintiffs knew, or reasonably should have known, their properties were subject to reservoir pool flooding. The reality remains that most of the Plaintiffs invested their life savings into the Test Properties without knowledge or expectation of a flood risk that the Government over the years acted to conceal and/or minimize. However, Plaintiffs contend that any knowledge of the fact that their properties were located within a federal flood control reservoir is legally irrelevant in a physical takings case; and even if it is deemed relevant, on this record, the fifth factor supports a taking.

F. The Severity of the Interference.

As discussed previously, "it is the character of the invasion, not the amount of damage resulting from it, so long as the damage is substantial, that determines the question whether it is a taking." *United States v. Cress*, 243 U.S. 316, 328 (1917); *see also id.* ("There is no difference of kind, but only of degree, between a permanent condition of continual overflow by backwater and a permanent liability to intermittent but inevitably recurring overflows; and, on principle, the right to compensation must arise in the one case as in the other."); *United States v. Lynah*, 188 U. S. 445, 470 (1903) ("It is clear from these authorities that where the government by the construction of a dam or other public

[564] PX 1812, Draft Q&A's Addicks and Barker Reservoir at 2 (September 28, 2017, USACEII 00993348).

[565] 6 RR 1459:9-1460:20.

works so floods lands belonging to an individual as to substantially destroy their value, there is a taking within the scope of the 5th Amendment.").

As demonstrated in Section III(B) above, Plaintiffs meet the "severity" burden inasmuch as each of them proved, *inter alia*, that they suffered permanent damage, that they were preempted from exercising their property rights for months on end, and that the Government's impounded stormwater runoff so profoundly disrupted the corresponding areas that Plaintiffs could no longer use them for their intended purposes. Plaintiffs offered copious evidence at trial showing that the Government's use of its Project to hold back and control an extraordinary volume of stormwater runoff, which in turn caused widespread upstream destruction, preempted Plaintiffs from using and enjoying their properties as normal residences and businesses over an extended period of time—both during the inundation and for many months thereafter. Accordingly, the sixth factor supports a taking.

CONCLUSION

The thirteen Test Property Plaintiffs proved at trial that, from the 1940s through 2017, the Corps of Engineers designed, constructed, and operated the Addicks and Barker Dams with the intent to capture and store stormwater runoff from the upper Buffalo Bayou watersheds. Plaintiffs also proved that, during Tropical Storm Harvey in 2017, the Government impounded sufficient water to inundate Plaintiffs' private properties for the public benefit. Plaintiffs further showed that the inundation and destruction of their real and personal property severely interfered with the use and enjoyment of that private property. Plaintiffs therefore proved, by a preponderance of the evidence, that the Government effected a "taking" their property, and that now they are entitled to just compensation under the Fifth Amendment. Plaintiffs respectfully urge the Court to find in favor of each of the thirteen Test Property Plaintiffs.

Dated: June 26, 2019.

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned attorney hereby certifies that a true and correct copy of the foregoing instrument, together with all exhibits, was served on all counsel of record in this Sub-Master Cause via electronic mail on June 26, 2019.

/s/E. Lawrence Vincent
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