

Corrected

In the United States Court of Federal Claims

Sub-Master Docket No. 17-9001L

(Filed: October 28, 2022)

*****)	Taking via government-induced flooding
IN RE UPSTREAM ADDICKS AND)	of private property; post-trial decision on
BARKER (TEXAS) FLOOD-)	just compensation for six bellwether
CONTROL RESERVOIRS)	plaintiffs; text of flowage easement to be
*****)	filed in pertinent title records of affected
*****)	properties
THIS DOCUMENT APPLIES TO:)	
)	
ALL UPSTREAM CASES)	
)	
*****)	

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OPINION AND ORDER

LETTOW, Senior Judge.

At issue are the financial consequences of flooding of private property located “upstream of the federally designed, built, and maintained Addicks and Barker Dams” and “within the Addicks and Barker Reservoirs;” that occurred when Tropical Storm Harvey (“Harvey”) “doused Houston with an average of 33.7 inches of rain over a four-day period” in August 2017. *In re Upstream Addicks & Barker (Texas) Flood-Control Reservoirs*, 146 Fed. Cl. 219, 227 (2019). After Harvey, “hundreds of owners of ‘upstream’ properties,” including the bellwether plaintiffs here, brought suit against the United States, claiming that its operation of the Addicks and Barker Dams resulted in “the government-controlled inundation of their properties” by Harvey

floodwater and constituted an uncompensated taking. *Id.* at 227-28. The Harvey flooding cases were initially consolidated into a single Master Docket for plaintiffs both upstream and downstream of the Addicks and Barker Dams. The Master Docket was subsequently divided into separate sub-master dockets for upstream and downstream properties. *Id.* at 228. The upstream cases were further bifurcated into liability and damages phases, and discovery on liability proceeded with a focus on thirteen bellwether plaintiffs. *Id.* Following disposition of motions, the case proceeded to a 10-day trial in May 2019 in Houston on the issue of liability. *Id.*

Thereafter, “the court found the United States liable to thirteen bellwether property owners under the Fifth Amendment of the United States Constitution for the taking of a non-categorical, permanent flowage easement on their properties as a result of government-induced flooding during Tropical Storm Harvey, produced by the government’s construction, maintenance, and operation of the Addicks and Barker Dams.” *In re Upstream Addicks & Barker*, 148 Fed. Cl. 274, 275 (2020) (citing *In re Upstream Addicks & Barker*, 146 Fed. Cl. 219).

With that decision in hand, the cases moved to discovery on just compensation. Of the thirteen test property plaintiffs at issue in the liability trial, the properties of six test plaintiffs were chosen for the just compensation phase. *In re Upstream Addicks & Barker*, 148 Fed. Cl. at 275. The covid pandemic delayed trial preparations, but the necessary work was nonetheless completed and trial was held in Houston, Texas from May 31 to June 10, 2022. Post-trial briefing was undertaken, and a closing hearing was held on September 29, 2022. This decision follows.

FACTS¹

A. Tropical Storm Harvey, Flooding, and the Liability Trial

Factual circumstances were critical to the court’s liability determination. First, in response to a series of serious storms in the first half of the twentieth century, the United States Army Corps of Engineers (“the Corps”) designed and built the Addicks and Barker Dams. The dams’ purpose is to impound rainwater upstream to prevent flooding to downstream property in and around downtown Houston. *See In re Upstream Addicks & Barker*, 146 Fed. Cl. at 228-33. In constructing the dams, the Corps acquired land upstream of the dams to create reservoirs to hold impounded water but chose not to purchase enough property to accommodate the storage capacity of the dams’ design. *Id.* The reservoirs are ordinarily dry but impound water during and after rain events. After the Corps constructed the dams, it decided to install gates at the dams in the 1940s and 1960s to control the release of impounded water from the reservoirs. *Id.* at 233-34; *see also* Tr. 1297:1-11 (Vail). Then, in the late 1970s the privately-held grazing pastures and rice fields on land upstream were replaced with housing developments. *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 234. Subsequently, the Corps conducted a study of

¹ This recitation of facts constitutes the court’s principal findings of fact in accord with Rule 52(a) of the Rules of the Court of Federal Claims (“RCFC”). Other findings of fact and rulings on questions of mixed fact and law are set out in the analysis.

the Addicks and Barker dams and reservoirs, which disclosed “a dramatic increase to the maximum design spillway . . . and . . . a higher probable maximum precipitation value.” *Id.* at 234-35. The Corps responded by strengthening and modifying the dams to reduce seepage and enhance stability, but it did not expand the government-owned reservoirs. *Id.* at 235-36. The Corps continued to conduct studies into the twenty-first century, recognizing “[t]he possibility of flooding lands in the reservoirs beyond the government-owned land,” *id.* at 234, but “the Corps decided to take no action” to mitigate that upstream risk. *Id.* at 236-37.

When Hurricane Harvey arrived on August 25, 2017, and “stalled over the Houston metropolitan area for four more days,” the Corps operated the Addicks and Barker Dams according to the design criteria, impounding water in the upstream reservoirs. *See In re Upstream Addicks & Barker*, 146 Fed. Cl. at 240-41. The Corps’ official operating procedures for the dams provided that the dam gates be operated in a controlled manner to prevent flooding downstream, even when such operation would flood upstream private property beyond the government-owned land. *Id.* Accordingly, during Hurricane Harvey, “[t]he flood pools in the reservoirs crested at a record pool elevation of 101.6 feet in Barker and 109.1 feet in Addicks on August 30, 2017,” flooding private property. *Id.* at 241.

This flooding damaged the houses and property of bellwether test plaintiffs Todd and Cristina Banker, Elizabeth Burnham, Scott Holland, Christina Micu, Catherine Popovici, and Kulwant Sidhu. The Bankers’ home—located at 4614 Kelliwood Manor Lane, Katy, Texas—experienced 1.1 feet of flooding that remained in the home for four days. *See In re Upstream Addicks & Barker*, 146 Fed. Cl. at 241. Ms. Burnham’s home—located at 15626 Four Season Drive, Houston, Texas—experienced approximately four to five feet of flooding, which persisted at least seven days. *Id.* at 241-42. Mr. Holland’s home—located at 1923 Wingleaf Drive, Houston, Texas—experienced 1.5 feet of flooding that lasted three and a half days. *Id.* at 242. Ms. Micu’s home—located at 6411 Canyon Park Drive, Katy, Texas—had approximately two feet of flooding, which “was present in the home for about ten days.” *Id.* Ms. Popovici’s home—located at 19927 Parsons Green Court, Katy, Texas—experienced no flooding inside the residence, but water came “within a couple inches of entering” the home, damaged the garage, Tr. 799:17-23 (Popovici), and was on the property “between four and six days.” *See In re Upstream Addicks & Barker*, 146 Fed. Cl. at 243.² Mr. Sidhu had two test properties at issue in the liability and just compensation trials, both condominiums located at 16111 Aspenglenn Drive, Houston, Texas. *Id.* One unit was located on the ground level and experienced 2.4 feet of flooding for around four and one-half days, while an upstairs unit did not suffer any flooding. *Id.*

Following the court’s liability opinion, the parties asked the court to clarify the date and physical scope of the government’s taking, which the court did on April 30, 2020. *See In re Upstream Addicks & Barker*, 148 Fed. Cl. at 275-78. That opinion specified that until Harvey, impounded water at the Addicks and Barker Reservoirs had only slightly exceeded government-owned land and minimally flooded private property, so the government’s “physical invasion of plaintiffs’ properties began on August 28, 2017[,] and ‘crested at a record pool

² Citations to the trial transcript are cited as “Tr. _____ (Witness).” Citations to joint exhibits are shown as “JX _____,” plaintiff’s exhibits are identified as “PX-JC _____,” or “PX-JC _____ (name)” specific test property exhibits include plaintiff’s name and are marked as “name-JC,” and defendant’s exhibits are denoted as “DX _____.”

elevation of 101.6 feet in Barker and 109.1 feet in Addicks on August 30, 2017.” *Id.* at 276-77 (quoting *In re Upstream Addicks & Barker*, 148 Fed. Cl. at 241). The court therefore determined that the government’s taking occurred on August 30, 2017. *Id.* at 277. It further concluded that because “no taking occurs until water enters the property,” the extent of the government’s easement corresponded to the peak flooding on August 30, 2017, not the dams’ highest design pool level. *Id.* at 278.

B. The Just Compensation Trial

After the court resolved a series of discovery and procedural disputes, *see, e.g., In re Upstream Addicks & Barker*, 152 Fed. Cl. 114 (2021) (addressing a discovery dispute), and 157 Fed. Cl. 189 (2021) (denying class certification), the just-compensation trial took place in Houston, Texas, from May 31 through June 10, 2022. At issue were the flowage easement’s scope based on Corps policies and meteorological circumstances, the test properties’ values, plaintiffs’ personal property losses, an appropriate interest award, and whether the just compensation award should be reduced to reflect federal benefits plaintiffs received.

1. Scope of the easement.

The purpose and design of the Addicks and Barker Dams make the court-ordered easement necessary. Colonel Timothy Vail, the commander and district engineer for the Corps’ Galveston district, testified that the dams’ purpose is to impound water upstream before it flows downstream and floods downtown Houston. Tr. 1311:13-22 (Vail). Because the dams’ storage capacity exceeds government-owned land, operating the dams as planned under certain meteorological conditions entails a risk to upstream private property, human health and safety, and public infrastructure. Tr. 1317:16 to 1318:8 (Vail). As the dams currently exist, the government can account for this risk to upstream properties from peak reservoir pool elevations only by acquiring an interest in the properties. *See* PX-JC773 at 8.

(a) Corps’ policies regarding easements.

At trial, Paula Johnson-Muic and Timothy Nelson testified about the Corps’ policies regarding easements, both in general and as applied to the court-ordered easement in this case. Ms. Johnson-Muic, the Corps’ highest civilian authority on real estate issues across the United States, focused on the Corps’ Real Estate Handbook and policies. *See* Tr. 136:10-13, (Johnson-Muic); JX1007. The Real Estate Handbook, published in 1985 and periodically updated thereafter, is a reference manual the agency uses when making real estate decisions, such as managing flowage easements. *See* Tr. 139:8-13 (Johnson-Muic). Mr. Nelson, the chief of the Corps’ Real Estate Division within the Galveston District, related means of enforcing government property rights to land, including the land subject to the court-ordered permanent flowage easement in this case. Tr. 310:9-18, 364:12-16 (Nelson).

Under Corps’ policy, as confirmed by Ms. Johnson-Muic’s testimony, “[w]henever a plaintiff successfully prosecutes litigation which establishes that an interest in real property has been taken, the interest so taken should be confirmed in the form of a grant, wherever possible,” and such “instrument should be recorded in the public land records and permanently retained in the real estate files as evidence of the interest taken.” JX1007 at 5-71, ¶ 5-22; Tr. 143:8-24,

145:19-24, 147:24 to 148:6 (Johnson-Muic). By recording the instrument, the Corps notifies the public of the property interest acquired. Tr. 153:10-13 (Johnson-Muic). Nonetheless, she testified that the Corps sometimes does not record an instrument to memorialize such conveyances. Tr. 149:2-18, 157:3-13 (Johnson-Muic); *but see* Tr. 264:12-14 (Johnson-Muic) (“Q: The Corps policy calls for the recordation, correct? A: Yes.”); JX1007 at 5-74, ¶ 5-24(e) (outlining the Corps’ policy to record the judgment conveying a property interest in event that court does not issue a deed confirming the conveyance). The Corps retains the discretion to enforce its property rights. *See* Tr. 227:2-5, 232:13 to 233:1 (Johnson-Muic); *but see* PX-JC352 at 3, ¶ 6 (Corps Memorandum of May 10, 2019) (“Encroachments and trespasses of government real property shall be identified and resolved in a timely manner.”).³

The easement here permits the Corps to store water during occasional flooding by the operation of the Addicks and Baker Dams and allows plaintiffs to continue lawful use of the property subject to the risk of occasional flooding. *See In re Upstream Addicks & Barker*, 148 Fed. Cl. at 278. Accordingly, the Corps understands the flowage easement here to be a non-standard or atypical easement because the fee owners of the burdened properties “retain the right to lawful use of their property” according to state and local laws, which includes human habitation and maintaining existing structures on the properties. Tr. 204:13-25, 296:7 to 297:9 (Johnson-Muic).

The Corps’ understanding of “occasional flooding” as used to describe the easement here encompasses anything less than permanently inundating the burdened property. Tr. 166:18 to 167:7, 169:17-21 (Johnson-Muic). On this understanding, the court-ordered easement permits the Corps to flood burdened properties whenever operation of the Addicks and Barker Dams so requires, *i.e.*, when meteorological events threaten downstream properties and cause impounded waters to exceed the capacity of the government-owned property making up much of the reservoir. Tr. 174:9 to 175:2, 175:22 to 176:11, 184:11-25, 188:20 to 189:25 (Johnson-Muic).

The Corps may enforce its easement against any residual fee owner of burdened property who interferes with the government’s rights as the dominant estate holder. Tr. 164:23 to 165:3 (Johnson-Muic). Specifically, Mr. Nelson testified that efforts to exclude floodwaters from upstream properties subject to the permanent flowage easement would be contrary to the Buffalo Bayou and Tributaries project’s purpose and would encroach on the government’s easement. *See* Tr. 361:14-25, 367:6 to 368:8 (Nelson). For example, the Corps could and would prevent a burdened property’s owner from using fill or building a berm to reduce the risk of flooding. *See* Tr. 176:12-24 (assuming a standard easement), 194:18-21, 197:4-11, 200:24 to 201:7, 201:21 to 202:13 (Johnson-Muic) (indicating attempts to circumvent the easements’ restrictions “may”

³ Specifically, the Corps may protect its rights through litigation. Tr. 233:22 to 234:1, (Johnson-Muic); *see also* Tr. 305:11 to 306:25 (Johnson-Muic) (stating that litigation about the relationship between the Corps and the fee owner under an easement is “a real possibility”). The exercise of that discretion would turn on the Corps’ technical and legal analysis of the potential encroachment and whether it would “substantially interfere” with the government’s property rights under the easement. Tr. 279:14 to 280:8, 284:4-22, 290:2-17 (Johnson-Muic); *see also* Tr. 396:18 to 397:12 (Nelson) (describing Corps procedures governing engineering assessments of whether a potential encroachment impairs the project); JX1010 at 4, ¶ 1.6.3 (defining encroachment for Corps policy purposes).

constitute encroachment); JX1010 at 3, ¶ 1.5 (“It is the intention of the Corps to protect project authorized purposes . . . by preventing new encroachments.”); JX1007 at 8-12, ¶ 8-24(b) (explaining that using landfill to alter an easement’s contours “would be considered an encroachment”) (citing *United States v. Fisher-Otis Co., Inc.*, 496 F.2d 1146 (10th Cir. 1974)); *but see* Tr. 212:13-25, 213:23 to 214:1, 215:6-17 (Johnson-Muic) (explaining that JX1007 at 8-12, ¶ 8-24(b) predates the atypical easement in this case and could be interpreted to apply only to standard easements).

(b) Meteorological factors.

The plaintiffs’ primary expert on meteorological developments and the likelihood of flooding was Dr. Philip Bedient, an engineering professor at Rice University who researches hydrology, disaster management, and flood modeling and prediction systems. *See* PX-JC873 at 4. Dr. Bedient estimated “the frequency or chance of occurrence of flood stages within Addicks and Barker Reservoirs between . . . [g]overnment-[o]wned [l]and . . . and the maximum pool level reached during the Harvey 2017 storm event, and then used that information to provide estimates of the frequency and duration of various pool levels at each of the . . . [t]est [p]roperties.” *Id.* at 2. Using stage level data provided by the Corps, Dr. Bedient estimated that the maximum flood pool stage observed during Harvey “approximates between a 35-year and a 100-year recurrence event, while the . . . pool stage [on government-owned land] approximates a 10-20 year recurrence event.” PX-JC873 at 2-3; *see also* Tr. 1241:10-21, 1247:17 to 1248:1 (Bedient).

Mario Beddingfield, a hydraulic engineer for the Corps, testified that flooding beyond government-owned land would occur more frequently than the government had previously thought. Tr. 903:1-7 (Beddingfield). Mr. Beddingfield spoke to stage frequency analyses, the preparation of which he oversaw when the Corps created a provisional 2019 Water Control Manual. Tr. 905:22 to 906:3 (Beddingfield). The pool elevation levels in the prior version of the Manual from 2012 were based on an approximately 30-year period of record back to the early 1980s, a period in which the highest precipitation event was a 1992 storm that peaked at a level of 93.6 inches of water behind the Addicks and Barker Reservoirs. Tr. 908:2-6, 933:5 to 934:20 (Beddingfield). Since that time, Mr. Beddingfield testified that changed conditions—*i.e.*, a boom in urbanization and increasingly frequent and severe storms—have caused more water to accumulate at times in the Addicks and Barker Reservoirs. Tr. 942:6 to 951:20 (Beddingfield); *see also* Tr. 1303:10-18 (Colonel Timothy Vail) (confirming that the Corps has received information from the National Oceanic and Atmospheric Administration indicating increased “frequency and intensity of rainfall events”). The 2019 Manual does not account for these changed conditions. Tr. 952:3-19 (Beddingfield). According to Mr. Beddingfield, accounting for these developments leads to higher storm and runoff levels and an overall higher frequency curve than those presented in the 2019 Manual. Tr. 969:1 to 980:25 (Beddingfield); *see also* JX1021A and JX1021B (demonstrative exhibits representing a higher frequency curve that includes the top ten storms, including Harvey). Mr. Beddingfield testified that this adjusted curve would “approximately” place the Harvey event between a 20- and 50-year event. Tr. 987:5-11 (Beddingfield). Mr. Beddingfield also testified that each test property is within the 20- to 50-year flood event frequency, except for Ms. Micu’s home which is within a 10-20-year flood event frequency. Tr. 990:2 to 992:21 (Beddingfield).

The government called Dr. John England, a lead civil engineer in the Corps' Risk Management Center and expert in flood hydrology, to rebut Dr. Bedient's analysis. *See* Tr. 2490:3 to 2491:1 (England). Dr. England's rebuttal consisted of two main criticisms. First, Dr. England opined that Dr. Bedient's report did not follow industry best practices. Tr. 2531:18 to 2534:16 (England). Second, Dr. England opined that Dr. Bedient used a small data set to produce an estimate of flood frequency. Tr. 2528:3 to 2532:24 (England). Dr. England also testified that Dr. Bedient's report looked only at elevation data but ignored storage capacity data specific to the Addicks and Barker Reservoirs. Tr. 2518:18 to 2519:21 (England). In Dr. England's opinion, these errors caused Dr. Bedient to reach a flood frequency estimate five times more frequent than his own estimate. Tr. 2529:16-19, 2533:25 to 2534:2 (England).

Dr. Barry Keim, a professor at Louisiana State University specializing in precipitation frequency analysis, challenged Dr. Bedient's conclusions concerning rainfall frequency. Tr. 2577:13 to 2580:1 (Keim). Dr. Keim criticized Dr. Bedient's data set and methods, opining that Dr. Bedient's estimated frequency of a Harvey-like flood event over the Addicks and Barker reservoirs was too frequent to be the result of proper analysis. *See* Tr. 2610:9-19 (Keim). For example, Dr. Bedient's analysis considered the total rainfall from several storm events, rather than only the rainfall from each of those storms that fell specifically on the reservoirs. Tr. 2596:17 to 2601:18 (Keim). Moreover Dr. Bedient's data set did not include storms before the 1970s. Tr. 2606:18 to 2607:5 (Keim). A longer period of record, according to Dr. Keim, would produce more accurate results that are closer to the government estimates of the frequency of Harvey-like flood events. Tr. 2607:8-19; 2612:5-15 (Keim).

Mark Glaudemans, branch chief over the Water Resources Services Branch of the National Weather Service, likewise defended the government's current precipitation frequency estimates. Tr. 2029:12 to 2031:9 (Glaudemans). Specifically, he testified that the National Oceanic and Atmospheric Administration ("NOAA") estimates that the frequency of a 33-inch rainfall over the Addicks and Barker Reservoirs is 1-in-1000 years. Tr. 2045:3-10 (Glaudemans).⁴ NOAA's estimate includes Harvey data as well as data from sources that, in some instances, date back 150 years and correlate records gathered from hundreds of recording stations over 120 years. Tr. 2031:6-9, 2035:22 to 2037:24 (Glaudemans); DX1339 at 15. Nonetheless, the data NOAA used were not adjusted to reflect the upward trend in rainfall observed over the last two decades as distinct from the broader 150-year period. Tr. 2048:25 to 2051:3 (Glaudemans). Mr. Glaudemans also acknowledged that at least two storm events within two years of each other have exceeded NOAA's estimate for 1,000-year events, *i.e.*, both Hurricane Harvey in 2017 and Tropical Storm Imelda in 2019 produced over 40 inches of rainfall. Tr. 2060:11 to 2064:17 (Glaudemans).

⁴ These estimates are contained in NOAA Atlas 14, which estimates the precipitation frequencies of various locations. Tr. 2035:6-21 (Glaudemans).

2. *Appraisal of test properties.*

Real estate appraisers determine a subject property's value by determining its best use and analyzing its characteristics and aspects of the relevant market. *See* PX-JC156 (Interagency Land Acquisition Conference, *Uniform Appraisal Standards for Federal Land Acquisitions* ("Yellow Book") at 8, § 1.1 (2016). The Yellow Book outlines the standards for developing "an opinion of market value that can be used to determine just compensation under federal law." *Id.* at 3, § 0.1. Here both parties have adopted appraisal approaches outlined in the Yellow Book.

The Yellow Book requires appraisers to apply the before and after rule to determine just compensation. This approach measures the difference between the parcel's before-taking value and its after-taking value. Yellow Book at 17, § 1.2.7.3.4. The Yellow Book identifies three approaches to valuing land: (1) the sales comparison approach, (2) the cost approach, and (3) the income approach. *Id.* at 26-35, §§ 1.5.2-1.5.4.

The sales comparison approach is "normally the preferred method of valuation." Yellow Book at 26, § 1.5.2. Appraisers applying this approach identify "sales of properties with the same highest and best use as the subject property that are as close in proximity" and as close to the time of the taking as possible. *Id.* Each sale is then adjusted to account for differences between the comparable and subject properties. *Id.* Next, the resulting "sales data is [*sic*] reconciled to a final opinion of market value." *Id.* The sales comparison approach requires that comparable sales be between "willing and reasonably knowledgeable buyers and sellers." *Id.* at 95, § 4.2.1.3 (emphasis omitted). To qualify, buyers and sellers need not be "all-knowing." *Id.*

Under the cost approach, the land's market value, separate from the value of any improvements and typically determined according to the sales comparison approach, is added to the depreciated cost of reproducing or replacing improvements on the property. Yellow Book at 33, § 1.5.3. Replacement costs are estimated based on current, local market labor and material costs. *Id.* It is reduced to account for "depreciation from all causes." *Id.* at 34, § 1.5.3.1.2.

Finally, the income approach applies to income-generating properties. Yellow Book at 35, § 1.5.4. For rental properties, the income approach calculates the market rent by analyzing comparable leases and deducting operating expenses to determine the net operating income. *Id.* at 35-36 §§ 1.5.4.1-1.5.4.3.

Here, the parties disagree on both the before and after valuations. Regarding the before-taking values, the parties' primary disagreement concerns the selection of comparable properties and whether to make quantitative or qualitative adjustments to account for any differences from the subject properties. *See* Def.'s Post-Trial Mem. at 17-19, ECF No. 570. Their disagreements on the after-takings valuation are more fundamental. The parties debate whether the market is aware of the flowage easement, and, as a result, whether a direct sales comparison methodology can be applied at all. They also disagree on how to account for subsequent repairs and renovations and whether just compensation should be limited to the flooding actually caused by the Addicks and Barker Dams, as distinct from flooding that would have occurred if the dams were never built. *See* Pls.' Post-Trial Resp. at 72-73, ECF No. 571.

(a) *Plaintiffs' valuations.*

Two experts estimated the before-taking and after-taking values of the test properties for the plaintiffs, and a third estimated the diminution percentage.

Timothy Archibald and Matthew Deal estimated the test properties' before-taking values using the sales comparison approach. Both determined that the Sidhu properties were best used as condominium projects and that the other properties were best used as single-family residences. *See generally* PX-JC877, 878, 880-884 (Archibald appraisals); PX-JC886-891 (Deal appraisals). For the Sidhu condominium units, Mr. Archibald and Mr. Deal each provided estimates under the income approach as well. *See* PX-JC883 at 25-28, PX-JC884 at 24-27 (Archibald); PX-JC890 at 42-43, PX-JC891 at 42-43 (Deal).

The plaintiffs contend that the market is unaware of the flowage easement and, accordingly, that no direct comparison of sales can be used to determine the bellwether properties' after-taking value. *See* Pls.' Pre-Trial Mem. at 16, ECF No. 466. Plaintiffs stress the distinction between market awareness of a flood risk and market awareness of a flowage easement because an easement grants dominant estate rights, including the right to prevent mitigation efforts and the right to store water inside structures. *See* PX-JC1025 at 7 (identifying eleven significant differences between flowage easements and flood risks); *see also* Pls.' Post-Trial Br. at 14, n.49, ECF No. 568 (arguing that the easement "prohibit[s] the property owner from interfering with the government's use of the easement").

As evidence that the market is unaware of the flowage easement, plaintiffs rely on the lack of activity in the title insurance industry, the dearth of public-facing Flood Insurance Rate Maps ("FIRMs") demarcating the Harvey flood pool, and property sellers' general failure to disclose the existence of an unrecorded easement in state-required disclosure forms.

Mr. Robert Philo, a real estate attorney who has worked in the title insurance industry for more than 40 years, Tr. 434:23 to 435:9 (Philo), testified that the title insurance industry is unaware of the court-ordered easement. Tr. 462:3-19 (Philo). He averred that if the industry were aware, there would be several observable responses. For instance, some buyers would opt out of sales after learning of the easement, Tr. 469:3-7 (Philo), and title insurance companies would likely take exception to the easement—meaning they would not cover financial losses the easement inflicts, Tr. 470:23-471:5—causing lenders to stop issuing mortgages, increase interest rates, Tr. 481:22-482:19, or demand a higher down payment for encumbered properties. Tr. 487:20 to 488:6. Mr. Philo testified that none of these downstream effects has occurred, so the title industry is unaware of the easement. *See* Tr. 462:15 to 463:4 (Philo).

Moreover, FEMA (Federal Emergency Management Agency) and Harris County officials, who collaborate on FIRMs that demarcate flood pools, *see* Tr. 740:18 to 742:10 (Wanhanen), averred that the FIRM maps showing the Harvey flood pool had not been made public. *See* Tr. 726:6 to 727:11 (Wanhanen); Tr. 530:16-21 (Hahn). Corps employees indicated that "multiple sources" had asked the Corps to include reservoir inundation limits on public-facing FIRMs. JX1078; *see also* Tr. 560:6-15 (T. Ward). These sources also reminded the Corps that FIRMs are "the main source residents use for flood risk information for their property." PX-JC371. But FEMA's public-facing maps nonetheless do not show the Harvey flood pool. Tr. 530:16-21 (Hahn).

Additionally, one of plaintiffs' appraisal experts, Dr. Randall Bell, testified that an unrecorded easement was disclosed on only three of 1,288 seller's disclosure forms for properties sold within the Harvey flood area between September 1, 2019 and October 31, 2021. *See* PX-JC1025 at 22-23; Tr. 2790:22 to 2793:13 (Bell). Nine sellers related the property was in a flood way, 68 that the property was in a reservoir, and 71 that the property was in a flood pool. *See* PX-JC1025 at 22-23; Tr. 2793:15 to 2796:14 (Bell). According to Dr. Bell, these seller's disclosures are a place to go to determine market awareness "[i]f you had an authentic interest in understanding the level of market knowledge," and these low reporting numbers indicate the market is largely unaware of the easement. Tr. 2797:1 to 2799:2 (Bell).

Plaintiffs' after-market appraisals also accounted for repair costs. Matison Construction Estimating and DeFacto Consulting Group provided estimates for plaintiffs. DeFacto estimated repair costs for the Banker, Burnham, Micu, and Sidhu unit 603 test properties. *See generally* PX-JC1113 (Banker); PX-JC1114 (Burnham); PX-JC1115 (Micu); and PX-JC1116 (Sidhu 603). DeFacto's estimate relied on the government experts' scope of work, dimensional information, and quantity of materials. Tr. 1782:2 to 1783:16 (Lozos); *but see* Tr. 2444:9-16 (McReynolds) (indicating these scopes of work were general, and plaintiffs' experts had to fill in the details). These figures were accepted during the liability phase.⁵ DeFacto then used the "published cost data for the area immediately after . . . Harvey" to determine material costs. Tr. 1782:2-9; *see also* Tr. 1786:3-16 (Lozos) (describing the Xactimate tool that gathers and publishes costs by zip code on a monthly basis). Matison followed a similar approach but arrived at somewhat different estimates.⁶

Aside from specific cost estimates for restoring the test properties, the Internal Revenue Service (IRS) published Revenue Procedure 2018-09 to help individuals calculate the financial loss Hurricane Harvey inflicted upon personal-use residential property. Rev. Proc. 2018-09, 2018-02 IRB 290. When one's property is damaged, a taxpayer can reduce his or her taxable income by the amount of damages. *See* 26 U.S.C. §§ 165(a), (h). IRS procedure 2018-09 provides tables taxpayers can use to calculate a safe harbor number by which they can reduce their taxable income. Rev. Proc. 2018-09, 2018-02 IRB 293. These tables allow a taxpayer to calculate their deduction without obtaining appraisals or contractor estimates of the property damage they suffered. Tr. 886:18 to 887:8 (Ward).⁷

⁵ Plaintiffs called Mr. Timothy Lozos as an expert to testify regarding the cost of repairing the plaintiffs' flooded real property structures. He calculated the costs of remediating the Banker structures to be \$166,740.29, PX-JC1113 at 40, the Burnham structures to be \$106,777.59, PX-JC1114 at 21, the Micu structures to be \$121,908.83, PX-JC1115 at 32, and Sidhu unit 603 to be \$49,101.09, PX-JC1116 at 19.

⁶ The plaintiffs' did not call a witness to testify to the truth of the Matison expert reports, so they were excluded. Tr. 1708:21 to 1710:13. The court did, however, permit Mr. Deal to rely upon those estimates. Tr. 1710:8-13 (court).

⁷ Donald Ward, a lead appraiser with the IRS, was called by plaintiffs to testify regarding the development of the Cost Index Per Square Foot tables published in Revenue Procedure 2018-09 and, more specifically, the data used to develop the values in the "Texas" columns in that procedure and a Memorandum captioned Hurricane Harvey & Irma Disaster Area—Casualty

Mr. Sidhu provided evidence of the actual costs associated with repairing the condominium units following Harvey. *See* JX1172; Sidhu-JC83 at 964-967. Repairs and lost income amounted to \$29,504.11 for the downstairs unit and \$1,194.99 for the upstairs unit. JX1172.

In the after-taking analysis, both Mr. Archibald and Mr. Deal concluded that the best use of the Banker, Burnham, Micu, and Popovici properties, and the Sidhu upstairs condominium, was residential. Tr. 1533:17 to 1534:5 (Deal); Tr. 1992:16 to 1993:15 (Archibald). Mr. Archibald also deemed the best use of the Sidhu downstairs condominium to be residential, Tr. 1992:16 to 1993:15 (Archibald), while Mr. Deal deemed its best use to be speculative because the estimated repair costs exceeded his appraisal of its before-taking value, Tr. 1534:6-24 (Deal).

As a result of positing that the market remains unaware of the easement, plaintiffs' after-taking appraisals were not based on a direct sales comparison. *See, e.g.*, PX-JC877 at 30 (Archibald) (indicating no comparable sales could be located because "the market has no notice of the government's right to 'occasionally' inundate the properties"); PX-JC886 at 23 (Deal) ("We performed an exhaustive search and were unable to confirm transactions of comparable single-family residential properties similarly encumbered."); PX-JC897 at 105 (Bell) ("[T]here is a lack of general awareness regarding the flowage easement.").

Mr. Archibald instead referenced data and studies on how flooding and flowage easements affect property value. *See, e.g.*, PX-JC881 at 33. Mr. Archibald consulted a chart devised by Donald Sherwood to determine the diminution in value attributable to the flowage easement itself. *Id.* at 33-34. He then considered the repair cost estimates submitted by DeFacto and Matison to assess the total diminution to property value in the after-taking, uncured condition. *Id.* at 35-36. He concluded that the government's taking caused a diminution in the fair market value between 85-95% in the single-family home properties that experienced structural flooding—the Banker, Burnham, and Micu residences. *Id.*; *see also* Pls.' Pre-Trial Mem. at 24. He concluded that the Sidhu downstairs unit's entire value had been taken and applied a 99% diminution factor. PX-JC883 at 33. Even though the upstairs unit was not flooded, he applied a 51% diminution factor because the flowage easement burdened common areas of the condominium complex. PX-JC884 at 36. Because there was no structural flooding on Ms. Popovici's property and only 55.9% of her property was subject to the flowage easement, Mr. Archibald applied a diminution factor of 51%. Pls.' Pre-Trial Mem. at 24, PX-JC882 at 28-34.

For the Sidhu condominiums, Mr. Archibald also applied this diminution factor to his before-taking figures under the income approach. PX-JC884 at 36.

Loss Determination and a spreadsheet titled Hurricane Safe Harbor Calculations 09/2017.xlsx. *See* DX1990 at 2. Safe Harbor provisions allow taxpayers to calculate tax deductions using a standardized formula. Tr. 887:2-8 (Ward). This cost index table helps individuals calculate the Harvey-related losses that the taxpayer can deduct from his or her taxable income.

Mr. Archibald calculated Mr. Holland's leasehold interest to be \$3,300 by multiplying Mr. Holland's leasehold advantage⁸ by six—the number of months remaining on his lease. Pls.' Pre-Trial Mem. at 25.

Mr. Deal also did not base his after-taking appraisals on a direct sales comparison. Instead, he first determined the maximum value remaining after the taking based on various market studies, a literature review, and research in reservoir databases. *See, e.g.*, PX-JC888 at 17; PX-JC889 at 17-18; PX-JC890 at 15-16. He then determined the immediate compensable damage to improvements on the test properties under a modified sales-comparison approach and a cost-comparison approach. Under the modified sales-comparison approach, Mr. Deal analyzed diminution in value suffered by comparable properties that were sold in an un-remediated state. *See, e.g.*, PX-JC886 at 83-84 (Banker); PX-JC887 at 84-86 (Burnham); PX-JC888 at 79-82 (Micu); PX-JC889 at 77-79 (Popovici); PX-JC890 at 79-81 (Sidhu 603); PX-JC891 at 80-82 (Sidhu 604). In the cost-comparison approach Mr. Deal considered the construction cost estimates submitted by Matison Construction Estimating and DeFacto Consulting Group, and, as a third alternative, generated safe harbor numbers using Revenue Procedure 2018-09. *See, e.g.* PX-JC886 at 85-86 (Banker); PX-JC887 at 86-88 (Burnham); PX-JC888 at 83-85 (Micu); PX-JC889 at 79 (Popovici);⁹ PX-JC890 at 81-83 (Sidhu 603).¹⁰

Mr. Deal then selected a figure within the cost range established by these measures and subtracted it from the maximum market value remaining after the taking to determine the diminution value. *See, e.g.*, PX-JC886 at 86-87 (Banker); PX-JC887 at 87-88 (Burnham); PX-JC888 at 84-85 (Micu); PX-JC889 at 79-80 (Popovici); PX-890 at 83 (Sidhu 603); PX-891 at 82 (Sidhu 604). Mr. Deal testified that the Banker home diminished by 66%, PX-JC886 at 87, the Burnham property by 91%, PX-JC887 at 88, and the Micu home by 77%, PX-JC888 at 85. *See also* Pls.' Pre-Trial Mem. at 23. Mr. Deal's market research led him to conclude that the Corps' easement diminished the Popovici property's value by 17%. PX-JC889 at 80. Mr. Deal found diminutions in value of 94% and 17% for Sidhu units 603 and 604, respectively. PX-JC890 at 83; PX-JC891 at 83.

Dr. Randall Bell, a licensed real estate appraiser, computed a diminution percentage. Tr. 1821:15 to 1822:18. Dr. Bell determined that "market resistance" to purchasing a property with

⁸ Mr. Archibald used Mr. Holland's leasehold advantage, \$550, because he determined that Mr. Holland's monthly rental payment, \$1,200, was under-market, which Mr. Archibald determined to be \$1,750. Tr. 1948:6 to 1949:14 (Archibald).

⁹ For the Popovici structures Mr. Deal considered only the estimate submitted by Matison.

¹⁰ Because the cost estimate for repairs to the Sidhu downstairs unit "far exceed[ed] the Maximum Remaining Market Value of the property," Mr. Deal found the taking resulted in a complete economic loss of the improvements and determined the after-taking value by applying Mr. Sidhu's and his sister-in-law's 0.9% undivided interest appurtenant in 603 to the land's value after the taking. *See* PX-JC890 at 81-83.

a flowage easement caused between 85% to 100% diminution in value. Tr. 1847:6-11 (Bell).¹¹ To reach this value, he conducted a literature review, market surveys, and a case study analysis, reviewed the Corps' valuation of the flowage easement, and consulted a chart prepared by the International Right of Way Association that determines an easement's effect on property value. PX-JC897 at 8-9; Pls.' Pre-Trial Mem. at 20-21; Tr. 1833:12 to 1834:9 (Bell). Dr. Bell testified that this rate applied equally to the Sidhu condominiums and regardless of whether the property was partially or fully flooded. PX-JC897 at 140. Plaintiffs then applied this diminution to Deal and Archibald's before values. Pls.' Pre-Trial Mem. at 21.¹²

Below is a table summarizing plaintiffs' valuations. Because Dr. Bell did not provide an after-taking estimate, the upper end of the ranges for Bell were determined by applying his diminution to the higher of Mr. Archibald and Mr. Deal's before-taking estimates.

Banker			
	Before	Diminution	After
Archibald	\$560,000	85-95%	\$28,000-84,000
Deal	\$530,000	66%	\$181,000
Bell	NA	85-100%	\$0-84,000
Burnham			
	Before	Diminution	After
Archibald	\$180,000	85-95%	\$9,000-27,000
Deal	\$180,000	91%	\$17,000
Bell	NA	85-100%	\$0-27,000
Micu			
	Before	Diminution	After

¹¹ Dr. Bell used a range because at the time of his report "the specific language of the flowage easement [wa]s unknown." PX-JC897 at 9.

¹² Colonel Timothy Vail testified about statements he made during public presentations regarding the Corps' studies of the Addicks and Barker dams and proposed solutions to eliminate the threat of flooding upstream properties. Tr. 1330:21 to 1331:4 (Vail). Slides displayed during one of these public presentations on October 15, 2020 depicted the probable maximum flood area upstream from the Addicks and Barker dams and the extent to which that area went beyond land owned by the government. See PX-JC773. Ms. Popovici testified that during the October 15, 2020 presentation "a gentleman in uniform" stated that the "impact of a flowage easement on the value of your property . . . [is] about 90 percent of the local land cost." Tr. 810:20 to 811:14 (Popovici). Colonel Vail testified that he spoke during this presentation, Tr. 1390:6-9 (Vail), but did not recall whether he averred that the value of a flowage easement was equal to 90 percent of the property value. Tr. 1391:14-22 (Vail).

Archibald	\$270,000	85-95%	\$13,500-40,500
Deal	\$290,000	77%	\$68,000
Bell	NA	85-100%	\$0-43,500
Popovici			
	Before	Diminution	After
Archibald	\$655,000	51%	\$321,000
Deal	\$625,000	15%	\$516,250
Bell	NA	85-100%	\$0-344,000 ¹³
Sidhu 603 Downstairs			
	Before	Diminution	After
Archibald	\$53,000-54,000	99%	\$530-540
Deal	\$50,500	94%	\$3,156
Bell	NA	85-100%	\$0-8,100
Sidhu 604 Upstairs			
	Before	Diminution	After
Archibald	\$53,000-54,000	51%	\$26,000-26,500
Deal	\$50,500	17%	\$41,900
Bell	NA	85-100%	\$0-8,100

(b) *The government's valuation.*

The primary difference between plaintiffs' and defendant's valuations arises from defendant's decision to conduct a direct sales comparison to determine after-taking property values based on its view that the market's awareness of the flood risk is sufficient notice of the flowage easement to render post-Harvey sales comparable. DX1001 at 11775-76, ¶¶ 39-40.

In evaluating the test properties' before-taking values, Mr. Frank Lucco compared each to comparable single-family properties in the same or relevantly similar subdivisions or neighborhoods with a similar area of above-grade, finished living space and a similar lot size that sold between August 31, 2016 and August 30, 2017. *See* DX1002 at 11215-16 (Banker), DX1003 at 11321-22 (Burnham), DX1004 at 0011443-44 (Micu), and DX1005 at 11552-53 (Popovici). For the Sidhu condominiums, Mr. Lucco searched for sales between August 31, 2014 and August 30, 2017 and included two comparable sales from before this period "[d]ue to the limited number of condominium sales in the subject[s'] market" and other similarities with

¹³ Plaintiffs reached this figure by applying Mr. Bell's diminution (85%) only to the portion of the Popovici property burdened by the flowage easement (55.9%), *i.e.*, after value = before value – (before value x 0.85 x 0.559). *See* Pls.' Post-Trial Br. at 35, n.135. While plaintiffs only apply the revised version of Mr. Bell's formula to the before values from Mr. Deal, the court believes this is in error and applies it to Mr. Archibald's before value to obtain the range in the table.

the Sidhu properties. DX1006 at 11623-37 (Sidhu Unit 603); DX1007 at 11708-22 (Sidhu Unit 604).

To ensure the comparisons were precise, Mr. Lucco then adjusted his valuation where appropriate to reflect differences in the comparable sales he selected or, alternatively, explained why no adjustment was necessary. *See, e.g.*, DX1005 at 11555-57 (Popovici) (considering, for example, adjustments reflecting differences in the room count, area of above-grade, finished living space that was air-conditioned, car storage, exterior amenities, and construction quality).

Defendant contends that the market is aware of “the conditions of the easement” because it knew of the flooding caused by Harvey and “the easement is based on the extent of actual flooding behind the dams during the Harvey event.” *See* Def.’s Pre-Trial Mem. at 4-5, ECF No. 507. The government relies on publicly available maps of the Harvey flood pool, seller’s disclosures, and social and news media coverage of the flooding. *See id.* at 19.

Mr. Lucco concluded the market was aware of the easement’s conditions after surveying various sources “such as media reports, USACE reports and meetings, public meetings, litigation outreach, online resources, flood-related closures, professional knowledge, [p]laintiffs’ [u]pstream takings claims, flood insurance, Multiple Listing Service (MLS) listings, and seller’s disclosures.” DX1001 at 11790-91, ¶ 66.

While plaintiffs focused on whether sellers checked the box on the disclosure form indicating the existence of an unrecorded easement, the government focused on whether sellers disclosed prior structural or property flooding, flooding caused by the failure or breach of a reservoir, or flooding caused by natural events elsewhere on the form. *See* Tr. 2820:10 to 2821:10 (Bell); *see generally* JX1127 (cataloguing local MLS listings). Indeed, many sellers of properties subject to the court’s easement did indicate the property had flooded during Harvey without disclosing an unrecorded easement. *See, e.g.*, DX1676 at 49000; PX-JC1201 at 2-3 (disclosing previous structural and property flooding and that the unit flooded completely “from Addicks Reservoir overflow during Hurricane Harvey”); PX-JC1189 at 2-3 (disclosing flooding “due to hurricane Harvey aftermath” and “release [*sic*] of water from Barker Dam”). Defendant also produced MLS real estate listings containing information about flood history and risk. *See, e.g.*, DX1021 at 12800 (*E.g.*, “[t]his house was flooded during Hurricane Harvey.”); *id.* at 12804 (“[H]ome did flood in Harvey due to reservoir and owner has mold remediation certificate.”).

Moreover, public-facing maps of the Harvey flood pool were available on the Harris County Flood Control District website during and after Harvey. Tr. 556:22 to 557:14 (T. Ward). The maps illustrated which areas would be flooded depending on the water elevation in the Addicks and Barker Reservoirs. DX1356; DX1357; Tr. 632:11-24 (T. Ward). Maps depicting the flood pool were also published in the Texas Tribune less than two months after Harvey. *See* DX1080 at row 1500; Neena Satija and Kiah Collier, *Houston officials let developers build homes inside reservoirs. But no one warned buyers.*, The Texas Tribune (Oct. 12, 2017), <https://apps.texastribune.org/harvey-reservoirs/>.

Defendant also accounted for repair costs necessary to restore the test properties. Mr. John McReynolds estimated the repair costs under the government’s estimated level of flooding that would have occurred even without the Addicks and Barker dams. He generated two sets of

figures, one that accounted for upgrades and depreciation and one that did not. *See* DX1097 at 12156-58.

In formulating his opinions, Mr. McReynolds first determined each property's condition "immediately prior to the loss" and the reasonable repairs necessary to restore the property to that condition. Tr. 2415:13-22 (McReynolds). Mr. McReynolds entered this scope of work into Xactimate to estimate the price of materials at the time the work would be performed. Tr. 2416:16-25 (McReynolds). Finally, before writing his report, Mr. McReynolds applied his professional judgment to adjust the resulting estimate to match unique features of the properties in question and account for economies of scale impacting the work to be performed. Tr. 2418:3-18 (McReynolds).

Defendant's after-taking valuation was also based on the direct sales comparison approach. Mr. Lucco provided an after-taking valuation for each property in its damaged condition. For the properties that suffered structural flooding—Banker, Burnham, Micu, and Sidhu—Mr. Lucco also estimated the after-taking value according to their repaired condition.¹⁴ He used the same search parameters to select comparable properties but focused on sales occurring after August 30, 2017. *See* DX1002 at 11215, 11250 (Banker), DX1003 at 11321, 11375 (Burnham), DX1004 at 11443, 11487 (Micu), and DX1006 at 11623, 11649 (Sidhu 603).¹⁵

Except for the downstairs Sidhu unit discussed *infra*, Mr. Lucco determined the after-taking value for the properties in their damaged state by searching for comparable properties that had suffered similar flooding. *See* DX1002 at 11231 (Banker); DX1003 at 11345 (Burnham); DX1004 at 11462 (Micu); DX1005 at 11571 (Popovici);¹⁶ DX1007 at 11734 (Sidhu 604). Each

¹⁴ Mr. Lucco did not calculate the after-taking repaired values of the Popovici and Sidhu upstairs properties because "there was no interior structural flooding of these properties requiring repairs." Def.'s Pre-Trial Mem. at 22. The government contends that the after-taking value should be assessed based on the properties in their damaged condition if structural repairs are deemed non-consequential and should be assessed based on the repaired condition if repairs are deemed consequential damages, which it urges must not be included in a just compensation award. Def.'s Post-Trial Mem. at 26, n.40.

¹⁵ For both Sidhu units, Mr. Lucco also conducted an income approach analysis to assess the after-taking value of the properties as renovated. DX1006 at 11664 (Sidhu 603), DX1007 at 11749 (Sidhu 604). For the downstairs unit, the income approach yielded a range of \$52,706-58,667, DX1006 at 11665, and for the upstairs unit, \$48,094-53,533. DX1007 at 11750. While Mr. Lucco took the income approach estimates into consideration, he gave most weight "to the [s]ales [c]omparison [a]pproach as it best represents the actions of buyers and sellers in the marketplace." DX1006 at 11666, DX1007 at 11751.

¹⁶ Because the Popovici property suffered site but not structural flooding except for the garage, Mr. Lucco looked for comparable sales for property that had "site flooding . . . as opposed to structure flooding." Tr. 2287:20 to 2288:3 (Lucco). Mr. Lucco testified, however, that he based this information on GIS mapping and aerial imagery and not on information from the listing agents for those comparable property sales. Tr. 2308:5 to 2310:8 (Lucco).

of these comparable properties for the Banker, Burnham, and Micu properties had also suffered structural flooding, and Mr. Lucco applied a seven dollar per square foot downward adjustment to the first floor living spaces to reflect the fact that comparable “sales of damaged properties reflect[ed] some work completed after flood waters receded, e.g., removal of wet materials, such as sheet rock, insulation, flooring.” See, e.g., DX1002 at 11235 (Banker); DX1003 at 11351 (Burnham), and DX1004 at 11467 (Micu). For the Sidhu upstairs unit, Mr. Lucco made a deduction to account for a special assessment that condominium owners had to pay to cover damage to the common areas. Tr. 2290:16-23 (Lucco).¹⁷ In appraising the Popovici property, Mr. Lucco considered “a small amount of repairs associated with the garage.” Tr. 2285:15 to 2287:5 (Lucco).

Regarding the Sidhu downstairs unit’s after-taking damaged value, in his view there were insufficient sales of comparable condominium units. DX1006 at 11669 (Sidhu 603). Accordingly, Mr. Lucco appraised the unit’s value by deducting the estimated renovation costs from the after-taking renovated value. *Id.* at 11670. He estimated the property’s renovation costs to be \$40,000 by multiplying the costs Mr. Sidhu submitted by a factor between 1.5 and 2 times the repair costs to reflect the risk an investor would associate with a renovation project. *Id.*; see also Tr. 2292:21 to 2294:10 (Lucco) (describing how he calculated the after-renovated value).

The below table summarizes Mr. Lucco’s appraisal conclusions:

	Before Value	Diminution From After-Damage Scenario	After-Taking Damaged Value	Diminution From After-Repaired Scenario	After-Taking Repaired Value
Banker	\$510,000	48%	\$265,000	13%	\$445,000
Burnham	\$175,000	60%	\$70,000	none	\$185,000
Micu	\$260,000	40%	\$155,000	6%	\$245,000
Popovici	\$605,000	1%	\$600,000	n/a	n/a

¹⁷ Plaintiffs also claim a \$1,079.98 assessment for the special assessment the homeowners association (HOA) charged Mr. Sidhu for the downstairs unit, JX1172, but Mr. Sidhu testified that he received a \$1,200 reimbursement from the HOA that was related to the special assessment. Sidhu-JC62; Tr. 1736:1-5 (Sidhu).

Sidhu Upstairs	\$50,000	2%	\$48,900	n/a	n/a
Sidhu Downstairs	\$50,000	52%	\$23,900	none	\$63,900

3. *Personal property and fixtures valuation.*

Plaintiffs also request compensation for personal property damaged when the government took the permanent flowage easement. In general, plaintiffs calculate this amount by multiplying each item’s replacement cost by a depreciation rate that accounts for how age affects the item’s value over time. *See* PX-JC867 at 3. Plaintiffs each catalogued their personal property,¹⁸ and their expert, Mr. Lozos, calculated and applied a depreciation rate. *See id.* at 2-4; Tr. 1773:20 to 1774:2 (Lozos). Mr. Lozos arrived at the depreciation value by referring to four different depreciation guides, including as his primary reference the Joint Military Industry Depreciation Guide. PX-JC867 at 4-7; 1774:11-19 (Lozos). He determined the actual cash value of the Banker personal property to be \$90,592.34, Burnham to be \$21,088.63, Micu to be \$43,984.85, Popovici to be \$7,193.41, and Holland to be \$79,087.52.¹⁹ PX-JC867 at 6; *see generally id.* App. II (itemizing personal property values and applying depreciation to determine award amount). Mr. Sidhu provides receipts for replacement appliances in the downstairs unit totaling \$1,900.40. Sidhu-JC52; Sidhu-JC89.

Aside from arguing that plaintiffs’ personal property losses are non-compensable consequential damages, the government contests plaintiffs’ personal property valuation on various grounds. In general, the government argues that plaintiffs have failed to meet their burden of establishing losses and corresponding values for all the personal property claimed. Def.’s Post-Trial Mem. at 79. In particular, the government challenges plaintiffs’ inclusion of various costs as personal property costs; plaintiffs’ assertion that certain property was damaged by Harvey; and plaintiffs’ valuation of expensive items. After adjusting for these costs, defendant contends the Bankers suffered \$16,527.41 in personal property losses; Holland, \$37,957.52; Micu, \$42,184.85; and Popovici and Sidhu no compensable losses. *See id.* at 90. The government offers no adjustment to Ms. Burnham’s total claimed personal property loss of \$21,088.63. *See id.*

The parties contest whether landscaping constitutes personal property separate from real property. The Bankers claim \$8,500 in yard landscaping and sod. PX-JC867 App. II at Banker

¹⁸ Tr. 91:17-18 (Burnham) (“All of these items right here were owned by me.”); Tr. 115:14-20 (Micu) (indicating all the personal property lost was shared with her husband).

¹⁹ Elsewhere plaintiffs claim Mr. Holland suffered \$91,837.52 in personal property loss, adding \$12,750 for damage to his vehicles, Ms. Popovici \$8,283.69, and Mr. Sidhu \$4,195.31. *See* Pls.’ Post-Trial Br. at 40.

1.²⁰ Ms. Popovici likewise provides two invoices, bearing 2020 dates, for landscaping services totaling \$11,559.74. JX1170; JX1171.

The parties further disagree on whether the plaintiffs have proven that personal items were damaged by the taking, including above-flood-level property and the Popovics' car, and whether Ms. Micu had an obligation to redeem rather than dispose of up to \$1,800 in mutilated currency. Specifically, the Bankers claim \$162.50 for a microwave located above the flood level, as well as a refrigerator valued at \$285 that the Bankers did not have before Harvey. PX-JC867 App. II at Banker 1-2; Tr. 775:15 to 776:14 (Banker).

Ms. Popovici submits evidence that repairs to her garage door frame cost \$806.11, JX1165, and repairs to the garage door's torque, part of the mechanism that opens the garage door, for \$595.38, JX1167; Popovici Resp. to Req. for Admis. No. 14, ECF No. 534-36 Tab 40 at 5. Ms. Popovici further claims \$2,390.97 for cleaning services performed on her home's heating, ventilation, and air conditioning system in November 2018. JX1168; *see also* 2019 Liability Trial Tr. 822:2-23 (Popovici) (testifying that the units themselves were not damaged by flooding).²¹ In addition, Ms. Popovici seeks to recover \$1,239.11 in repair costs associated with flushing brake fluid and replacing the starter in her Toyota Sequoia. JX1169; Tr. 824:25 to 825:18 (Popovici) (excluding from her claim \$25.50 incurred for a state inspection). She testified that these repairs were made necessary because her husband drove the car off the property through flooded streets during Harvey. Tr. 824:13-24 (Popovici).

Ms. Micu's claims for damaged currency involve \$1,000 in cash and a piggybank containing an unknown amount of additional money, which Mr. Lozos depreciated to \$800. *See* PX-JC867 App. II at Micu 7, 9. In addition to lost cash, Ms. Micu also claims losses for "piles" of personal property that Ms. Micu disposed of without confirming whether the items were damaged during Harvey or salvageable. Tr. 112:17 to 113:12 (Micu).

The parties also contest whether plaintiffs have established the depreciated value of certain high-value items, namely antiques, heirlooms, and specialty items claimed by Mr. Holland and cars owned by the Bankers. Mr. Lozos testified that antiques "need more documentation than just what's claimed" but did not receive any supporting documentation for plaintiffs' antique claims. Tr. 1798:5-18 (Lozos). As a result, Mr. Lozos was unable to form an opinion on the antique status or depreciation applicable to plaintiffs' antiques. Tr. 1799:9-21 (Lozos); PX-JC867 at 5 ("[T]he determination of what is or isn't 'antique' is beyond the scope of this assignment.").

Mr. Holland claims damage to antiques, such as a dining hutch that he valued at \$3,000, a dining room table and chairs valued at \$5,000, a sterling silver set valued at \$500, and a sewing machine valued at \$1,500. PX-JC867 App. II at Holland 4, 6-7, 11. He also claims to have lost various specialty items including a Kiss Guitar signed by Paul Stanley valued at \$1,000, a World Wrestling Entertainment championship belt valued at \$450, and an original 1970's Star Wars

²⁰ The page numbering in PX-JC867 Appendix II starts over for each plaintiff. "Banker 1" refers to the first page in the section of Appendix II devoted to the Bankers' personal property claims.

²¹ "2019 Tr." refers to the transcript of the 2019 liability trial in this case.

collection valued at \$15,000. *Id.* He further claims \$1,430 in items described as “Hobby” and “Art, Hobbies & Collectibles,” and “Collections.” Holland-JC28 at 155-56.

Mr. Holland seeks another \$11,950 for a 2016 Kia Soul and \$800 in repairs to his 1999 Ford F-150. Holland-JC28 Resp. to Written Dep. 59. These figures reflect the cars’ ages and mileage. *Id.* Mr. Archibald determined the Kia Soul’s retrospective value by speaking with an automobile broker, who in turn gathered price information from a dealership. Tr. 2003:12 to 2004:10 (Archibald). For his truck, Mr. Holland claims \$300 for necessary supplies and \$500 for ten hours of his own labor. Holland-JC28 Resp. to Written Dep. 59.

Mr. Lozos likewise did not apply a depreciation adjustment to the amounts the Bankers’ claimed for each of their two cars, which were the cars’ purchase prices. PX-JC867, App. II at Banker 1. The Bankers seek \$38,117.43 for a Cadillac acquired in 2012 and \$27,000.00 for a Murano acquired in 2010. *Id.*

4. *Displacement costs.*

The government’s taking of a permanent flowage easement also displaced plaintiffs Banker, Burnham, Micu, and Holland from their homes. These plaintiffs lost the ability to occupy their homes and incurred costs associated with securing alternate housing. As part of their real property appraisals, Mr. Deal and Mr. Archibald estimated the test properties’ monthly rental value. Both experts determined the test properties’ monthly rental rate by comparing each to comparable rental transactions. Plaintiffs Burnham and Micu also provided lease agreements to establish the alternative housing costs they incurred.

After flooding caused the Bankers to evacuate their home, they lived with Mr. Banker’s parents until they could safely return in the “last week of April or first of May.” Tr. 763:2-10 (T. Banker). Mr. Deal estimated the monthly rental value of the Bankers’ home to be \$3,000, and Mr. Archibald estimated it to be \$3,300. Pls.’ Post-Trial Br. at 38.

Ms. Burnham evacuated her home on August 25, 2017 and never lived there again. Tr. 46:25 to 47:6 (Burnham). Ms. Burnham stayed with her now mother-in-law and in a hotel paid for by FEMA until she leased a new apartment on October 28, 2017. Burnham-JC38 at 133. She paid \$161.29 to rent the unit for the remaining days in October, then \$1,266.50²² per month thereafter. *Id.* at 140. Ms. Burnham determined that she did not have the money to repair her home, so she sold it for \$80,000 on February 5, 2018. *See* Burnham-JC94; Tr. 59:19-23 (Burnham). She moved out of the apartment she was renting and into her new home on April 14, 2018. *See* Tr. 58:25 to 59:2, 63:4-12 (Burnham). Mr. Deal estimated the monthly rental value of Ms. Burnham’s property subject to the easement to be \$1,500, and Mr. Archibald estimated it to be \$1,700. Pls.’ Post-Trial Br. at 38.

During Harvey, Ms. Micu sought refuge in a hotel in Dallas. Tr. 102:16-20 (Micu). When she returned to her home one to two weeks after Harvey, she realized she and her family could not move back in until the property was repaired. Tr. 102:21 to 103:15 (Micu). Ms. Micu relocated to a rental apartment from September 6, 2017 to August 31, 2018, when she and her

²² This figure represents \$1,250 per month in rent plus \$15.00 in pet rent and a \$1.50 monthly pest fee.

family returned to their home. Tr. 106:16 to 107:6, 123:5-8 (Micu). She paid \$2,332.50 for the remainder of September 2017 and \$2,799 for each month thereafter. Micu-JC19 at 4950. Mr. Deal estimated the monthly rental value of Ms. Micu's home to be \$1,875 and Mr. Archibald estimated it to be \$1,900. Pls.' Post-Trial Br. at 38.

Mr. Sidhu seeks to recover costs associated with re-leasing the condominium units and lost rent after Harvey displaced his tenants. For the upstairs unit, 604, Mr. Sidhu claims \$127 in lost rent because Harvey displaced the tenant for a few days. JX1172.

Mr. Sidhu's claims for the downstairs unit, 603, are higher. Due to flooding caused by Harvey and subsequent renovations, the downstairs unit was unoccupied between September 1, 2017 and July 27, 2018. *See* Sidhu-JC62. He accordingly accounted for \$7,183 (eleven months at \$653 per month) in lost rent when calculating his damages. From this lost rent, Mr. Sidhu subtracts an HOA reimbursement of \$1,200 and \$129 for an "other adjustment." *Id.* To this ultimate net rental loss of \$5,854, Mr. Sidhu adds \$313.43 he paid in electric utilities that accrued while the unit was vacant, JX1172; Tr. 1738:11-21 (Sidhu), and \$200 in fees he paid an agent to show the apartment to obtain a new tenant, Tr. 1739:3-7 (Sidhu). Finally, Mr. Sidhu claims \$3,001.53 in travel, hotel, and food costs, \$1,774.30 of which he incurred in traveling from his home in California to testify at the liability trial and the remaining \$1,227.23 in traveling to Houston to oversee repairs to the unit. Tr. 1739:19 to 1740:22 (Sidhu).

5. *Plaintiffs' FEMA benefits.*

The federal government administers relief programs that help those affected by federally declared disasters. FEMA pays hotels to house individuals who are displaced, *see* Tr. 2694:12-21 (Glasschroeder), and issues direct payments to individuals for home repairs, critical needs (*i.e.*, life-sustaining items including food, first aid, and hygiene items),²³ and personal property assistance for repairs or replacement. *See, e.g.*, DX1288; DX1977. FEMA assistance is available when the President declares that a major disaster has occurred and federal assistance is needed to supplement efforts by state and local governments. *See* 42 U.S.C. § 5122. Individuals within the disaster zone are eligible if they are a U.S. citizen, noncitizen national, or a qualified alien, they register within the application period, and FEMA verifies their request for disaster-related damages. Tr. 2704:12 to 2705:19 (Glasschroeder). FEMA requires those within a special flood hazard area, as designated by FEMA, to obtain and maintain flood insurance on their property. *See* Tr. 2693:18 to 2694:7 (Glasschroeder). FEMA pays for the first three years of flood insurance. *Id.*

President Trump issued a disaster declaration (No. 4332) for the State of Texas on August 25, 2017. Plaintiffs Burnham, Micu, Banker, and Holland each received FEMA benefits. Ms. Burnham and her then fiancé received \$27,957.65 in direct payments comprised of \$4,618 in rental assistance, \$19,060.06 for home repairs, and \$4,279.59 for personal property repair and replacement. DX1288. FEMA also paid \$7,897.50 directly to a hotel to provide Ms. Burnham transitional shelter. *Id.* Ms. Micu and her husband received \$30,656.46 in direct payments: \$500 for critical needs, \$12,366 in rental assistance, \$17,540.47 for home repairs, and \$249.99 for a dehumidifier. DX1980. FEMA also directly paid a hotel \$155.60 to shelter Ms. Micu. *Id.* The

²³ FEMA, *Individual Assistance Program and Policy Guide* 148 (January 19, 2019).

Bankers received \$23,992.89 in direct FEMA payments: \$21,256.89 for home repairs and \$2,666 for two months of rental assistance. DX1287. Mr. Holland received \$9,959.67 in direct payments: \$500 for critical needs, \$3,546 in rental assistance, and \$5,913.67 to repair or replace personal property. DX1977. FEMA also paid \$4,887.09 directly to a hotel to house Mr. Holland. *Id.*

Dan Leistra-Jones, the government's expert in economic and financial analysis, testified regarding "whether the plaintiffs received payments or benefits from the United States that relate directly to the losses they are claiming in this matter." Tr. 2718:25 to 2719:5 (Leistra-Jones). Mr. Leistra-Jones classified home repair assistance and miscellaneous assistance awards as offsets to plaintiffs' home repair costs; personal property assistance and critical needs assistance awards as offsets to plaintiffs' personal property losses; and rental assistance payments as offsets to their claimed displacement expenses. Tr. 2728:11-21 (Leistra-Jones).

C. Post-trial Procedures

At the conclusion of the just compensation trial, the court established a schedule for post-trial briefing and closing arguments, and the parties filed their post-trial briefs accordingly. The parties presented closing arguments on September 29, 2022 in Washington, D.C.

STANDARDS FOR DECISION

The Takings Clause of the Fifth Amendment provides that "private property [shall not] be taken for public use, without just compensation." U.S. Const. amend. V. A just compensation award must be "'just' both to an owner whose property is taken and to the public that must pay the bill[.]" *United States v. Commodities Trading Corp.*, 339 U.S. 121, 123 (1950). The proper measure of just compensation enforces this balance: the property owner "is entitled to be put in as good a position pecuniarily as if his property had not been taken. He must be made whole but is not entitled to more." *Olson v. United States*, 292 U.S. 246, 255 (1934). This measure "derives as much content from the basic equitable principles of fairness as it does from technical concepts of property law." *United States v. Fuller*, 409 U.S. 488, 490 (1973) (citations omitted). Just compensation is an "objective standard that disregards subjective values" ascribed by the owner. *United States v. 50 Acres of Land*, 469 U.S. 24, 35 (1984). The just compensation award includes interest that accrues from the date of the government's acquisition until the date of compensation. *See Tech. Coll. of the Low Country v. United States*, 147 Fed. Cl. 364, 367 (2020).

Just compensation is determined according to a before-and-after approach that gauges "the difference in the market value of the property taken before and after the taking." *Potts v. United States*, 130 Ct. Cl. 88, 91 (1954). In cases involving a partial taking, just compensation "may [also] include the diminished value to the remaining portion of land." *Ideker Farms, Inc. v. United States*, 151 Fed. Cl. 560, 607 (2020). The plaintiff must show the quantum of damages claimed "to a reasonable approximation." *Arkansas Game & Fish Comm'n v. United States*, 736 F.3d 1364, 1379 (Fed. Cir. 2013). Put differently, although damages must be shown "to a reasonable certainty," the plaintiff "need not prove the precise amount of damages." *Id.* Additionally, plaintiffs' damage calculation can be approximate if the defendant's "wrong... preclude[s] exact ascertainment of the amount of damages," but this approximation still must be

more than speculative. *Kestenbaum v. Falstaff Brewing Corp.*, 514 F.2d 690, 698 (5th Cir., 1975). A court “confronted with conflicting evidence and relatively extreme valuations’ from the plaintiff and the Government” may form a just compensation award independent from the parties’ formulations. *Gadsden Indus. Park, LLC v. United States*, 956 F.3d 1362, 1372 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 2795 (2021) (quoting *Otay Mesa Prop., L.P. v. United States*, 779 F.3d 1315, 1326 (Fed. Cir. 2015)).

“[N]ot all losses suffered by the [property] owner are compensable under the Fifth Amendment.” *United States ex rel. Tennessee Valley Auth. v. Powelson*, 319 U.S. 266, 281 (1943). Specifically, no compensation is due for damage or destruction that is the “unintended incident of the taking of land.” *Mitchell v. United States*, 267 U.S. 341, 345 (1925). Whether the loss is compensable turns on whether the loss is an “incidental or indirect consequence[] of a taking of other property” or a “direct product[] of the actual invasion or taking of the property involved.” *R.J. Widen Co. v. United States*, 174 Ct. Cl. 1020, 1028 (1966). Accordingly, so long as the owner is deprived of a piece of property’s use “not by a negligent act, but as the natural consequence of the deliberate, intended exercise of an asserted power,” it makes “no difference” whether the property is personal or real property. *Causby v. United States*, 109 Ct. Cl. 768, 772 (1948). So too if a business or its assets are taken as a natural consequence of government action. See *Kimball Laundry Co. v. United States*, 338 U.S. 1, 14-15 (1949) (holding just compensation includes a business’s “demonstrable loss of going-concern value,” the value contributed by non-physical assets like management or client development skills); *Todd v. United States*, 155 Ct. Cl. 87, 98 (1961) (awarding plaintiffs the depreciated value of fishing equipment used in a fishing business conducted on property taken by the government).

Notably, a plaintiff injured by a taking is not entitled to double recovery. See *Innovair Aviation, Ltd. v. United States*, 83 Fed. Cl. 498, 502 (2008) (adopting one approach to valuing an asset because the other would “give Plaintiff a double award”); *Adams v. United States*, 230 Ct. Cl. 628, 631-32 (1982) (considering compensation the state government paid for easements on the same land that the federal government took “to avoid double recovery by plaintiffs”). “As the finding of any such offset results in the reduction of a just compensation award, the government bears the burden of proving the applicability of any alleged offsetting benefit and its amount.” *In re Upstream Addicks & Barker*, 159 Fed. Cl. 512, 526 (2022). The government fails to carry this burden, for instance, if it provides only “a listing of the public benefits that flow from nearly all flood control projects.” See *City of Van Buren v. United States*, 697 F.2d 1058, 1062 (Fed. Cir. 1983). The government must establish that the benefit arose “directly and proximately to the remaining land as a result of the public work on the part taken, due to the particular relation of the land in question to the public work.” *Hendler v. United States*, 175 F.3d 1374, 1380 (Fed. Cir. 1999).

ANALYSIS

The court has held that the government’s taking encompassed both “a permanent flowage easement” and “plaintiffs’ personal property, fixtures, and improvements damaged or destroyed by [flooding attributable to Harvey].” *In re Upstream Addicks & Barker*, 148 Fed. Cl. at 278. Accordingly, the court’s just compensation award accounts for three categories of loss caused by the government’s easement: (1) diminution in real property value including damage to attendant structures, (2) damage or destruction of personal property, and (3) dislocation costs. The first

two categories constitute just compensation for the taking itself, the last for dislocation that was the direct and natural result of the government's physical taking.

In the foregoing analysis, the court first determines the extent to which the government's easement diminished the value of plaintiffs' real property. This valuation is a factor of the easement's scope, the likelihood of future flooding under the easement, and the cost of repairing damage to structures taken by the government. Next, the court calculates the just compensation award for the government's taking of plaintiffs' personal property. The court identifies and applies deductions reflecting plaintiffs' failure to prove certain items' value and that items were taken. Then, the court concludes that housing and dislocation costs that plaintiffs incurred while the properties were uninhabitable are compensable because they were the direct and natural result of the government's takings. To prevent duplicative recovery, the court then reduces the above awards to account for compensation plaintiffs have already received from FEMA to repair their homes, replace personal property, and obtain substitute housing until their homes were repaired. Finally, the court determines the interest necessary to make plaintiffs whole for the delay between payment and the government's taking.

A. Just Compensation

1. Real property.

The government has a "categorical duty to compensate the former owner" for property it physically takes. *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302, 322 (2002) (citing *United States v. Pewee Coal Co.*, 341 U.S. 114, 115 (1951)). The flowage easement taken here constitutes a physical, permanent partial taking. *See United States v. Cress*, 243 U.S. 316, 328-29 (1917). Accordingly, the government must pay just compensation for the property interest it has taken and the "depreciation which results to the remainder in its use and value." *United States v. Grizzard*, 219 U.S. 180, 185 (1911). While the Yellow Book binds only the government's appraiser,²⁴ the parties agree that the Yellow Book's before and after approach to valuation is proper. Under the before and after approach, the just compensation award is the difference between the property's market value without the easement and the property's market value with the easement plus any diminution to the remainder property's value. Yellow Book at 37, § 1.7.1.

Market value is the amount for which the property would have sold on the effective date from a "willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer." Yellow Book at 95, § 4.2.1 (emphasis omitted). A reasonably knowledgeable buyer or seller is not "all-knowing," but rather has the knowledge possessed by the "typical" willing buyer or seller. *Fla. Rock Indus., Inc. v. United States*, 18 F.3d 1560, 1566 (Fed. Cir. 1994). Regarding easements specifically, market participants can be reasonably informed for the purposes of a direct sales comparison appraisal even if the easement's exact language has not been recorded. *See Vaizburd v. United States*, 384 F.3d 1278, 1283-85 & n.5 (Fed. Cir. 2004)

²⁴ "The Yellow Book applies only to appraisers hired by the federal government for condemnation purposes; it is not mandatory with respect to appraisers not hired by the government." *Hardy v. United States*, 141 Fed. Cl. 1, 32 (2018).

(upholding an appraisal notwithstanding the absence of easement language due to the court finding an easement and determining just compensation simultaneously).

While the parties agree that the before and after approach is proper, they disagree on how to resolve two issues that arise when applying the approach to determine the test properties' after-taking value. First, the parties debate the scope of their rights under the easement, which bears on how extensively the easement diminishes property value. Second, they contest whether the market is aware that the easement exists, which determines whether a direct comparison of actual post-Harvey sales in the flood pool accurately captures the properties' after-taking value. These disagreements explain the parties' divergent after-taking valuations.

Concerning the easement's scope, the court's prior rulings specify that the easement "leave[s] plaintiffs a fee simple interest in their properties which allows them to continue their lawful use subject to the risk of occasional flooding caused by the operation of the Addicks and Barker Dams." *In re Upstream Addicks & Barker*, 148 Fed. Cl. at 278. This leaves at issue only the parties' rights and obligations "in the event of potential future floods." *See id.*

Plaintiffs' primary contention is that the government and property owners' rights are uncertain because the easement has not been "reduced to express language and recorded." Pls.' Pre-Trial Mem. at 7. Plaintiffs argue that Texas law will determine the parties' rights under the easement, and that under Texas law the government has an "unrestricted right" to use the easement and "prohibit[] the property owner from interfering with the government's use of the easement." *Id.* at 4-5. Plaintiffs further contend that the Corps will enforce its policies to the maximum extent permissible, and that the Corps' promises to the contrary are inapposite. *Id.* at 7; Closing Arg. Tr. 123:8 to 124:3. In plaintiffs' view, the government must compensate plaintiffs for the expansive rights it obtained via this partial taking. Pls.' Pre-Trial Mem. at 5.

The government responds that the easement's scope will be determined by the court's orders, not Texas law. Def.'s Post-Trial Mem. at 43-45. Based on the court's previous rulings, the government argues there is no uncertainty in the easement's scope. Plaintiffs and their successors "retain all development rights and can continue to make all lawful use of these properties," and plaintiffs have not identified state laws that would restrict plaintiffs' use of their properties. *Id.* at 45. The government maintains that just compensation for the easement should therefore reflect these allowances for the property owners and not the expansive view of the government's rights that plaintiffs advance. *Id.* at 43-45.²⁵

Next, regarding market awareness of the easement, plaintiffs claim that "without a written, recorded, final easement, no comparable [after-taking] sales exist or could be found," so post-Harvey sales in the flood pool do not provide reliable evidence of the test properties' after-taking value. Pls.' Pre-Trial Mem. at 16. As evidence of the lack of market awareness the

²⁵ To resolve and define the easement, the court asked the parties to brief the text of the easement, and the parties have done so. *See, e.g.,* Upstream Pls.' Br. on Easement Language, ECF No. 577; Def.'s Submission of Proposed Easement Language, ECF No. 578; Upstream Pls.' Resp., ECF No. 579; Def.'s Reply, ECF No. 580. The court has taken the parties' proposals into account, along with the trial testimony in the case, in crafting the text of the comment, which text is set out in the Appendix, *infra*.

plaintiffs point to the absence of public-facing FEMA flood insurance rate maps, *see* Tr. 726:6 to 727:11 (Wanhanen), the lack of any response from the title insurance industry, *see* Tr. 462:15 to 463:4 (Philo), and recent sellers' general failure to disclose the existence of an unrecorded easement, *see* PX-JC1025 at 22-23. Therefore, in plaintiffs' view, literature reviews, case studies, sales data for properties outside the flood pool, and other indirect information provide the only reliable basis for calculating the properties' after-taking value. *See* Pls.' Pre-Trial Mem. at 18-19. Plaintiffs also claim the government's after-taking comparable sales analysis is invalid because the market was ignorant of the easement, so none of those sales transferred the same property interest as the subject properties: fee simple ownership subject to the court-ordered flowage easement. *Id.* at 15-17.

The government counters that the market is aware of the flood risk, and this awareness supports its direct sales-comparison analysis. Def.'s Post-Trial Mem. at 33-40. According to the government, "market participants' awareness of the conditions that the [c]ourt found to constitute a taking was enough to use actual sales to determine market value even though there is no recorded easement." *Id.* at 31-32. Put differently, to know the extent of Harvey flooding is to know of the easement. The market's awareness of the flood risk comes from individuals' "personal, direct experience" with upstream flooding during Harvey, local and national news and social media coverage, public meetings and outreach, and school and road closures. *Id.* at 33, 36.

The government criticizes plaintiffs for defining market awareness too narrowly and ignoring relevant evidence of market awareness. Specifically, it argues that plaintiffs put form over substance by distinguishing knowledge of the easement from knowledge of the flood risk. *See* Def.'s Post-Trial Mem. at 42. Additionally, the government claims that plaintiffs' focus on the lack of a recorded easement and sellers' general failure to check the disclosure form box for unrecorded easements is too narrow. It contends that, in addition to the aforementioned sources beyond disclosure forms, other fields on the disclosure forms where sellers disclosed flooding due to Harvey and the Addicks and Barker Reservoirs, adequately informed the market of the easement's conditions. *Id.* at 34-37, 60-61.

The court's just compensation award for plaintiffs' real property is informed by the atypical nature of the easement and the fact that the market knows of the flood risk even if the precise terms of the easement have not been identified until now. *See* Appendix, *infra*. The court's past rulings are explicit that this flowage easement is an atypical one. Unlike standard flowage easements that generally prohibit human habitation and structures, *see* JX1007 at 8-12 to 8-14, plaintiffs are allowed "to continue their lawful use subject to the risk of occasional flooding caused by the operation of the Addicks and Barker Dams." *In re Upstream Addicks & Barker*, 148 Fed. Cl. at 278. Importantly, because this taking involves "a permanent right to inundate the property with impounded flood waters," it has a greater impact on property value than a temporary taking would. *See In re Addicks & Barker*, 146 Fed. Cl. at 250. This permanence also means that plaintiffs cannot recover from the government for any damage caused by future flooding up to the elevation of the government's easement. *See id.* at 253.

Plaintiffs' expansive conception of an easement's scope overlooks the fact that the government's rights under this atypical flowage easement are narrower and more qualified than they would be under a standard flowage easement. Plaintiffs identify rights that a standard flowage easement imparts to the dominant estate. But the extent to which the easement

diminishes plaintiffs' property value largely turns on the atypical scope of the government's rights and how frequently these rights are likely to be invoked, namely how frequently meteorological conditions would cause flooding above government-owned land under the Corps' operating procedures.

In short, this easement's effect on property value is tied to the frequency and extent of flooding, *i.e.*, how frequently the government will resort to the easement. *See In re Upstream Addicks & Barker*, 159 Fed. Cl. at 522. Plaintiffs contend that the easement has a greater impact on property value than flooding because it gives the government the right to flood homes at any time for any reason,²⁶ and the pool behind the dams is deliberately engineered to flood and could cause flooding that is not limited to natural disasters. PX-JC1025 at 7. The court-ordered easement, however, does not confer the right to flood homes "at any time for any reason," *id.*, but only the right to flood "by the operation of the Addicks and Barker Dams," *i.e.*, when meteorological conditions and the Corps' purpose for the dams so require. *In re Upstream Addicks & Barker*, 148 Fed. Cl. at 278. Admittedly, the Corps' operating procedures do little to limit the frequency of flooding because "the 2012 Water Control Manual, which the Corps followed during Harvey, instructs the Corps to operate the dams in a manner consistent with their original purpose: to protect downstream property by impounding water in upstream reservoirs." *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 259. The probability that the meteorological conditions necessary for the reservoir pools to exceed government-owned land will occur, however, provides a more meaningful limitation on how frequently the government will use its easement.

Neither the parties nor the court can predict for certain how frequently the government will use its easement, but the evidence suggests that the frequency of a Harvey-level flooding event will be somewhere between the parties' estimates. Plaintiffs' experts testified that flooding above government land is between a 10- and 20-year recurrence event and flooding to the Harvey pool level is between a 35- and 100-year recurrence event. PX-JC873 at 2-3; *see also* Tr. 987:5-11 (Beddingfield) (agreeing Harvey is approximately a 20- to 50-year recurrence event). But these estimates fail to account for storage capacity information about the reservoirs, Tr. 2518:18 to 2519:21 (England), and posit recurrence of rain that fell on the reservoirs during the observed storms, Tr. 2596:17 to 2597:20 (Keim). In comparison, defendant's expert characterizes Harvey as a 1000-year recurrence event. *See* Tr. 2045:3-10 (Glaudemans). But recent trends suggest that storms and hurricanes on par with Harvey are becoming increasingly frequent, and the government fails adequately to account for this increase. *See* Tr. 2062:16-19 (Glaudemans) (testifying that two greater-than-thousand-year events occurred within two years); JX1013 at II01926565 (stating the need to reduce flood risks within the Buffalo Bayou and surrounding areas is driven in part by the "increased frequency of large-scale flooding events"). In short, the government understates the frequency of a Harvey-level storm. Similarly large storms will likely occur in the future, but it remains uncertain when or how frequently. Notwithstanding this uncertainty, the evidence does show that the government will use its easement only in the event of a natural disaster. That the President actually declared Harvey and Imelda to be major disasters supports this conclusion.

²⁶ Plaintiffs list separately the right to store water inside a house, *see* PX-JC1025 at 7, but this right is encompassed by the right to flood homes at any time circumstances warrant.

Plaintiffs further contend that the easement grants the Corps the rights to prevent new construction and to control the plaintiffs' flood mitigation efforts. PX-JC1025 at 7. But these rights are more qualified and narrower than plaintiffs suggest. For one, the court-ordered easement preserves the property owners' rights to continue all lawful uses. *In re Upstream Addicks & Barker*, 148 Fed. Cl. at 278. The Corps understands this to mean property owners can inhabit and maintain existing structures on the property. *See* Tr. 296:7 to 297:9 (Johnson-Muic). Moreover, apart from storms, the Corps officials testified that the easement would only be enforced if the owners' actions reduced the storage capacity of the land in question. *See* Tr. 164:23 to 165:3 (Johnson-Muic); JX1010 at 3, ¶ 1.5; JX1007 at 8-12, ¶ 8-24. The Corps further suggested that the easement's atypical nature might require it to tolerate even some property modifications that would reduce the reservoirs' storage capacity. *See* Tr. 211:22 to 214:10 (Johnson-Muic).

Plaintiffs also include certain dominant estate rights that they have not shown the Corps will exercise. These rights include the Corps' freedom to post signs and enter plaintiffs' property. PX-JC1025 at 7. Plaintiffs presented no evidence that the Corps would post signs or that, if the Corps did, posting signs would impact property value. *See* Tr. 2840:21 to 2841:13 (Bell). Plaintiffs also have not presented evidence on the likelihood that, absent storms, the Corps would access properties, how frequently, or how this access would affect property values. *See* Tr. 2839:23 to 2840:18 (Bell). Accordingly, the easement's scope is narrower than plaintiffs contend, and narrower than the scope plaintiffs' experts used in appraising the test properties' after-taking value. The after-taking value must reflect only those rights that the government actually acquired and only to the extent those rights affect the value of plaintiffs' property.

Turning to market awareness, the typical buyer and seller in the market are reasonably aware of the flood risk but not the easement. Knowledge of a flood risk is not the same as knowledge of an easement. While an easement can impress its full effect on property's value without being recorded, a market participant who is reasonably knowledgeable of a flood risk will likely behave differently than one who is reasonably knowledgeable of an easement. Indeed, the title industry treats easements and flood risks differently. For instance, a title insurance company would likely except from its policy any financial loss attributable to an easement, which in turn would cause the loan provider either to increase either the mortgage rate, the down payment or both, or deny the loan altogether. Tr. 482:1-19, 487:20 to 488:6 (Philo). This would price some buyers out of the market unless the owner lowered the sale price. *See* Tr. 469:3-7 (Philo). Because title insurance companies will issue policies to properties within 100- and 500-year floodplains and lenders will issue mortgages for such properties, an easement's existence negatively affects value independent from and in addition to the property's flood risk. *See* Tr. 501:12-22 (Philo).

The market is unaware of the easement but has begun to experience some of the effects on property value that will occur once the market learns of the easement. To date, no easement has been recorded, title insurers have continued to issue policies for properties sold in the Harvey flood pool, *see* Tr. 462:15 to 463:4 (Philo), and less than one-half percent of people who sold homes within the Harvey flood pool after Harvey disclosed the existence of an unrecorded easement. PX-JC1025 at 22-23. Although the court has previously indicated that its own prior rulings "are sufficient to inform the scope of the easement" even absent the recording of "exact easement language," *In re Upstream Addicks & Barker*, 159 Fed. Cl. at 524, there is evidence

that price trends for flood-pool properties did not specifically change after the court's liability ruling, *see* DX1001 at 11896-11900.²⁷ Taken together this evidence shows the market remains unaware of the easement's terms.

Nevertheless, the market's knowledge of the test properties' flood risk indicates that post-Harvey sales data informs to some extent the test-properties' after-taking value. Social and news media covered and continues to cover Harvey-related flooding and more general flood risks in the Houston area. *See generally* DX1001 at 11790-11878 (cataloguing the effect recent weather events and Harvey specifically had on the market's awareness of flood risk). Moreover, although property owners often use FIRMs to gauge flood risk and none shows the Harvey flood pool, other sources have provided public-facing maps of the Harvey flood pool, including the Harris County Flood Control District's website and the Texas Tribune. *See* Tr. 556:22 to 557:14 (T. Ward); DX 1080 at row 1500; Neena Satija and Kiah Collier, *Houston officials let developers build homes inside reservoirs. But no one warned buyers.*, The Texas Tribune (Oct. 12, 2017), <https://apps.texastribune.org/harvey-reservoirs/>. Market participants could also access even more site-specific information. Beside the box for disclosing an unrecorded easement, sellers used various fields on disclosure forms to notify buyers of the flood risk associated with particular properties. For instance, sellers disclosed previous structural and site flooding and even specifically mentioned Harvey and the Addicks and Barker Reservoirs. *See* DX1676 at 49000; PX-JC1201 at 2-3; PX-JC1189 at 2-3. Similar information was displayed on MLS real estate listings. *See, e.g.*, DX1021 at 12800, 12804.

The court's real property just compensation award reflects the properties' value in their damaged state, subject to the easement. *See In re Upstream Addicks & Barker*, 148 Fed. Cl. at 278. The court's award takes into consideration the facts that the government's easement is atypical and "a similarly large storm, producing comparable rainfall, remains likely to occur again." *See In re Upstream Addicks & Barker*, 146 Fed. Cl. at 251-52. The court rejects the government's valuation for the properties in their after-taking repaired state because just compensation is measured "at time of the taking." *United States v. 564.54 Acres of Land*, 441 U.S. 506, 511 (1979). Accordingly, the government cannot credit repairs that plaintiffs made after the government damaged their property by impounding Category 3 black water on plaintiffs' land and in their homes. *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 252 (2019). The awards account for repairs only to the Banker, Burnham, Micu and Sidhu 603 homes and the Popovici's garage, and for only those costs the plaintiffs incurred to restore their property to their pre-taking state. The numbers exclude costs associated with upgrades, remodeling, or other improvements going beyond the repairs that the government's taking necessitated.²⁸

²⁷ The government contends this is evidence that knowledge of the easement "had no negative effect on prices." Def.'s Post-Trial Mem. at 28. But this lack of a market response could just as well indicate the court's liability ruling did not alert the market of the easement.

²⁸ The award for the government's taking of plaintiffs' real property and improvements is reduced by 50% for plaintiffs Burnham, Micu, Popovici, and Sidhu to reflect these plaintiffs' proportional ownership interest. Tr. 41:12-18 (Burnham); Tr. 101:18 to 102:7 (Micu); Tr. 789:11-20 (Popovici); Tr. 1713:11-22 (Sidhu).

The award for structurally flooded properties reflects both the fact that the easement grants the government the permanent right to impound water within the homes on the properties, and the structural damage the government caused by taking the easement. The government flooded Ms. Burnham's home with four to five feet of water for at least seven days. *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 242. The damage was so extensive that Ms. Burnham had to sell a home that she described as her forever home which she had renovated and decorated with her own original artwork. *See* Tr. 43:12-44:19 (Burnham). The Bankers' property was flooded with roughly one foot of water for four days. *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 241. The flooding distributed mucky sludge throughout the first floor of their home, requiring a eight-month-long restoration. Tr. 762:14 to 763:25 (Banker); Pls.' Post-Trial Br. at 38. Ms. Micu's property was flooded with approximately two feet of water for ten days. *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 242-43. The home had to be mucked out and remediated to eliminate mold growth and portions of the home's walls and foundation had to be restored, a process that took roughly one year. Tr. 121:10-11 (Micu).

Damage to Mr. Sidhu's downstairs unit was even more extensive. The flooding required Mr. Sidhu to gut and renovate his property over the course of nearly one year. *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 243. Plaintiffs' experts opined that the cost of repairing the unit far exceeded its market value, PX-JC890 at 83, and that "all value of the unit ha[d] been taken," PX-JC883 at 33. The government's expert estimated the flooding and necessary repairs diminished the property's value by \$40,000. DX1006 at 11670.

The government did not flood homes on the Popovici and Sidhu 604 properties and the Popovici's garage suffered only limited damage, so the just compensation award for them is lower. Tr. 1730:7-9 (Sidhu) (testifying that the upstairs unit did not need repairs because it was not flooded); Tr. 791:19-21, 799:17-23 (Popovici) (describing damage to the wooden garage door).

Mr. Holland's real property interest generates different issues from the fee simple plaintiffs. The government argues that his favorable leasehold is a non-compensable consequential loss because Mr. Holland's interest is a contract right, and the government has not appropriated his contract right. Def.'s Post-Trial Mem. at 77. This argument fails. Leaseholds are compensable property interests under the Fifth Amendment. *United States v. Petty Motor Co.*, 327 U.S. 372, 378 (1946). The government executes a taking by interfering with a contract right in a way that affects an underlying property right. *See Palmyra Pac. Seafoods, L.L.C. v. United States*, 561 F.3d 1361, 1369 (Fed. Cir. 2009). For this reason, although residential leases involve contractual rights, "[i]t has long been established that the holder of an unexpired leasehold interest in land is entitled, under the Fifth Amendment, to just compensation for the value of that interest." *Alamo Land & Cattle Co. v. Arizona*, 424 U.S. 295, 303 (1976).

Just compensation for a leasehold interest is the value of the government's use and occupancy for the remainder of the lease as determined either by the amount specified in the lease or the fair rental value plus the value of the tenant's renewal right. *Alamo Land & Cattle Co.*, 424 U.S. at 304. Mr. Holland had a leasehold interest in the property that would have extended for six months after Harvey. But Mr. Holland's landlord indicated he did not intend to restore the property, and because Mr. Holland could not afford to both restore the property and pay his rent, the landlord terminated the lease. *See* Holland-JC28 Resp. to Written Dep. 48-50.

By flooding the property such that Mr. Holland could not safely return, the government effectively terminated Mr. Holland’s leasehold. Because he paid for no repairs to his leased property, he is entitled to compensation only for his leasehold advantage. *Id.*

Based on these considerations, plaintiffs are entitled to just compensation for their real property in the following amounts:

Plaintiff(s)	Gross Just Compensation Award²⁹
Mr. and Ms. Banker	\$200,279.34
Ms. Burnham	\$57,237.81
Mr. Holland	\$3,300
Ms. Micu	\$64,988.90
Ms. Popovici	\$1,401.49
Mr. Sidhu, for unit 603	\$25,000
Mr. Sidhu, for unit 604	\$534.00

2. *Personal property.*

Plaintiffs are entitled to compensation for “personal property, fixtures, and improvements damaged or destroyed by the flood” that attended the government’s taking of the flowage easement. *In re Upstream Addicks & Barker*, 148 Fed. Cl. at 278. This prior ruling comports with precedent that establishes plaintiffs whose personal property the government appropriates are entitled to just compensation. *Horne v. Dep’t of Agric.*, 576 U.S. 350, 359-361 (2015). The plaintiffs nonetheless must take reasonable steps to mitigate damages. *See Heydt v. United States*, 38 Fed. Cl. 286, 310 (1997).

The government argues that plaintiffs’ personal property losses are non-compensable results of the taking, that such losses overlap with their real property claims, and that plaintiffs have failed to establish the value of their personal property and that Harvey caused loss or damage to various items. *See* Def.’s Post-Trial Mem. at 77-90. The government first argues that “[p]laintiffs’ claims relating to personal property are consequential damages, which are not compensable under the Fifth Amendment.” *Id.* at 78. More specifically, it asserts that these losses are non-compensable because in taking the flowage easement the government neither “appropriate[d] [p]laintiffs’ personal property for public use . . . nor . . . intend[ed] to damage any personal property.” *Id.* This argument ignores the court’s ruling that plaintiffs’ personal property was not merely damaged by the government’s taking of plaintiffs’ real property. Rather, the personal property itself was taken by the government. Just as when it takes real

²⁹ These amounts for award do not account for offsets discussed *infra*, section B.

property, the government must pay just compensation when it takes personal property. *Horne*, 576 U.S. at 359-61.

The government's argument also falters because, even had the court held the government only took real property, the personal property losses would nonetheless be compensable because they were directly and naturally caused by the government's real property taking. To be specific, whether a loss caused by a taking is compensable hinges not on whether it is a consequence of the government's taking but on whether it is an "incidental or indirect consequence[] of a taking." *R.J. Widen Co.*, 174 Ct. Cl. at 1028. Accordingly, a loss that is the "direct product[] of the actual invasion or taking of the property involved" is compensable. *Id.* This distinction, further defined by cases surveyed below, also explains that the plaintiffs' personal property losses are compensable even if the government did not intend to cause such damage and did not acquire the personal property for public use.

A loss is incidental and non-compensable when its connection to the taking is too attenuated. For example, an injury that results from the government's taking of another's property is not compensable under the Fifth Amendment. *Air Pegasus of DC, Inc. v. United States*, 424 F.3d 1206 (Fed. Cir. 2005); *United States ex rel. Tennessee Valley Authority v. Powelson*, 319 U.S. 266 (1943). In *Air Pegasus*, a plaintiff heliport business sought to recover its leasehold interest for a building when the government prohibited the operation of helicopters in the area where the heliport was located. 424 F.3d at 1209-10. The Federal Circuit noted that "Air Pegasus does not actually own or operate any helicopters," and that the injury was non-compensable because it resulted not from the government taking Air Pegasus's property but was "the more attenuated result of the government's purported taking of other people's property." *Id.* at 1215. Similarly, the plaintiff in *Tennessee Valley Authority* argued the value of land the government had taken should reflect the land's potential future use for a hydroelectric project. 319 U.S. at 274. But the plaintiff had not yet built the project and could not do so without combining the land in question with other tracts it had not yet acquired through eminent domain. *Id.* at 284. The Court held the plaintiff was not entitled to "compensation for the loss of a business opportunity based on the unexercised privilege to use the power of eminent domain," *id.*, because the opportunity was "too remote and speculative." *Id.* at 275-76 (quoting *McGovern v. New York*, 229 U.S. 363, 372 (1913)).

Similarly, the government need not compensate a party for a reduction in profit caused by factors outside the governments' control. *Yuba Nat. Res., Inc. v. United States*, 904 F.2d 1577 (Fed. Cir. 1990). The government temporarily took land that Yuba had agreed to lease to a third party in exchange for rent and a percentage of mineral royalties. *Id.* at 1578-81. The trial court awarded Yuba its minimum rent and royalty payments but declined, however, to award royalty losses that occurred because gold had a lower value after the temporary taking. *Id.* The Federal Circuit affirmed because "any attempt to determine how much gold would have been extracted during the taking period, and what its net sales price would have been, would involve the very kind of conjectural and speculative analysis the courts consistently reject as a basis for determining just compensation under the Fifth Amendment." *Id.* at 1582-83.

Property losses, including personal property losses, are compensable when they are directly caused by the government's taking. In *Causby v. United States*, the court held the government had taken an easement over plaintiffs' property by flying airplanes 83 feet above the

land. 109 Ct. Cl. at 769-70. At the time of the taking the *Causby* plaintiffs had used the land to raise chickens. 104 Ct. Cl. 342, 349 (1945), *rev'd*, 328 U.S. 256 (1946).³⁰ By using its easement, the government caused “as many as 6 to 10 chickens a day [to be] killed by flying into the walls from fright caused by the planes.” *Id.* The Claims Court ultimately awarded plaintiffs just compensation for the lost personal property. 109 Ct. Cl. at 772. It reasoned that there was “no difference in the destruction of personal property and real property” if the owner is deprived of its use “not by a negligent act, but as the natural consequence of the deliberate, intended exercise of an asserted power.” *Id.* Similarly in *Todd v. United States*, the court ordered the government to compensate plaintiffs for both real and personal property losses. 155 Ct. Cl. 87. In *Todd* the government took plaintiffs’ fishing rights under their state fishing licenses. *Id.* at 91. In addition to the value of the fishing licenses, the court held that plaintiffs were entitled to compensation for nets and poles rendered useless by the taking. *Id.* at 91, 98.

Here, unlike in *Yuba Natural Resources*, the personal property damage plaintiffs claim they suffered is neither speculative nor conjectural. This case does not include the sale of a commodity subject to rapid fluctuations in value. Instead, plaintiffs’ loss was directly caused by factors within the government’s control, namely the operation of the Addicks and Barker Dams. See *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 254 (“The damage to plaintiffs’ properties was the direct result of the government’s construction, modification, and operation of the Addicks and Barker Dams.”). Plaintiffs’ claims are also not attenuated as those were in *Powelson* and *Air Pegasus* because at the time of the taking plaintiffs actually owned the personal property for which they seek compensation. Moreover, the damage to this personal property was a direct result of the government’s taking the easement, like the losses suffered by plaintiffs in *Todd* and *Causby*. The flowage easement gives the government the right to impound water on plaintiffs’ property, and the personal property was damaged when the government did just that. The Corps was “well aware that storms capable of overflowing government-owned land were likely to occur.” *In re Upstream Addicks & Barker*, 146 Fed. Cl. at 260. It also knew that the at-risk land contained residences. See *id.* at 256 (describing Corps surveys of properties “in the reservoirs located beyond government land”). Accordingly, plaintiffs are entitled to the personal property lost when the government flooded their properties on August 30, 2017.

Also at issue is whether plaintiffs’ have met their burden of proof in establishing the value of personal property and that it was damaged or destroyed as a direct result of the taking. The government specifically contests the value plaintiffs ascribe to particular items and whether certain personal property damage was caused by Harvey. Def.’s Post-Trial Mem. at 78-80, 82-90.

The property owner “must show actual damages ‘with reasonable certainty,’ which requires ‘more than a guess, but less than absolute exactness.’” *Otay Mesa Prop., L.P.*, 779 F.3d at 1323 (quoting *Precision Pine & Timber Inc. v. United States*, 596 F.3d 817, 833 (Fed. Cir. 2010)). And, “all costs claimed must have supporting documentation.” *Chevron U.S.A., Inc. v. United States*, 116 Fed. Cl. 202, 227 (2014); *Tyger Const. Co. v. United States*, 31 Fed. Cl. 177,

³⁰ Upon appeal, the Supreme Court affirmed the Claims Court’s holding that there had been a taking and remanded for the Claims Court to determine the “precise nature of the easement taken.” *Causby*, 109 Ct. Cl. at 769. The description of the property damage is included in the Claims Court’s first opinion: *Causby*, 104 Ct. Cl. 342

260 (1994) (“Because [plaintiff] presented no documentary evidence, proof of damages is insufficient with respect to this claim.”). Absent documentary support, even a claim for damages that is supported by testimony from a plaintiff’s expert may fail for lack of proof. *See Transtechnology Corp., Space Ordnance Sys. Div. v. United States*, 22 Cl. Ct. 349, 384 (1990). Similarly, a plaintiff fails to carry its burden if its damages claims are so vague that the court “cannot ascertain whether they are viable.” *Bowman Constr. Co. v. United States*, 154 Fed. Cl. 127, 142 (2021).

Mr. Holland claims substantial dollar values for antiques and specialty items but provides no documentation to establish the items’ status or value as antiques or collectables. Instead, Mr. Holland provides only general descriptions such as “Dining hutch – antique” and “Dining room table and chairs – antique” to support his claimed losses. *See* PX-JC867 App. II at Holland 7. His valuation of collectors’ items also rests on sparse evidence. For instance, he requests compensation for “an [o]riginal 1970’s Star Wars Collection” and a “WWE championship belt.” *Id.* at 7, 11. Still other listed entries provide categorical descriptions without describing what particular items comprise the loss, namely his claim for \$1,430 in lost “Art Hobbies & Collectibles.” Holland-JC28 at 155-56. These descriptions are too vague for the court to determine their accuracy. Additionally, plaintiffs’ expert on personal property valuations admitted that he did not verify Mr. Holland’s claims for antiques and collectibles even though such items typically must have their value confirmed with supporting documentation. PX-JC867 at 5. In short, Mr. Holland has provided inadequate evidence of the value of the antique dining hutch, sterling silver set, and table and chairs as well as his signed Kiss Guitar, WWE championship belt, Star Wars action figures, and general losses to art hobbies and collectibles. Mr. Holland’s valuation of these items exceeds the value of non-antique or non-collectible items of the same kind to the point that the items’ value requires independent documentation. His just compensation award is reduced by \$13,940 to reflect this inadequacy. Aside from the above items, Mr. Holland has provided sufficient proof to support the loss of \$63,957.52 in personal property. Thus, Mr. Holland is awarded \$77,897.52 for his loss of personal property.

The Bankers similarly provide insufficient evidence of their cars’ value at the time of the taking and that certain personalty and fixtures were damaged by Harvey. The Bankers identified the amount they initially paid for the cars but did not provide evidence—such as vehicle repair histories, their mileage, or the extent to which they were damaged—to establish the value of the cars at the time of the taking. *See* Tr. 772:11-14 (Banker). The Bankers claim will also be reduced by \$285 attributable to a beverage refrigerator that they acquired after Harvey and \$162.50 for a microwave that they admitted “was probably not damaged” because it was above the flood line. PX-JC867 App. II at Banker 1-2; Tr. 775:173 to 776:4 (Banker). The Bankers also mischaracterize the cost of yard landscaping, sod, and refinishing their front door as personal property losses. PX-JC867 App. II at Banker 1. Plaintiffs have failed to establish that these costs are distinct from the amounts they claim for repairs to their real property. Compensation for these losses is addressed by the court’s award for repairs to the Bankers’ real property. Accordingly, the Bankers’ award is reduced by \$74,064.93 to account for their failure of proof with respect to damage to their two vehicles, microwave, refrigerator, and landscaping and door repair costs. The Bankers have submitted sufficient evidence to support their claim for \$16,527.41 in personal property losses. *See generally* Banker-JC6 (invoice listing appliances); PX-JC867 App. II at Banker 1-2 (personal property inventory); PX-JX1128; Tr. 771:5 to 773:11 (Banker) (describing personal property losses).

Ms. Popovici likewise claimed amounts for landscaping services and personalty and fixtures that allegedly were damaged by the government's taking. JX1170-71. Ms. Popovici failed to prove that landscape-related damages were proximately caused by the government's taking. The landscaping invoices are dated September 29 and October 2, 2020, more than two years after the government's taking. *Id.* Similar deficiencies undermine Ms. Popovici's claim for service and repair costs associated with her car and home HVAC system. The HVAC system was cleaned over a year after the government's taking once Ms. Popovici noticed "vents in the ceiling that were dirty." Tr. 796:24 to 797:12 (Popovici). The flood water did not enter the Popovici residence, Tr. 814:4-8 (Popovici), and the HVAC units themselves were not damaged by flooding, 2019 Tr. 1252:2-7 (Popovici). Ms. Popovici fails to show that these repairs were necessitated by the government's taking rather than routine servicing. Next, Ms. Popovici testified that her vehicle was damaged not when the government flooded her property, but when her husband drove the car off the flooded property. Tr. 824:13-24 (Popovici). Accordingly, Ms. Popovici has failed to establish that she suffered any personal property damage because of the government's easement. The \$1,401.49 Ms. Popovici claims in repairs to her garage is included in her just compensation award for real property. JX1165; JX1167.

Ms. Micu's claims for mutilated currency and the depreciated value of a piggy bank containing damaged currency falter as well. Ms. Micu was obligated to mitigate her damages. The Bureau of Engraving and Printing allows people to redeem mutilated currency for up to its face value. 31 C.F.R. § 100.5(a). Because Ms. Micu provides no evidence that she sought to mitigate these losses, her personal property award is reduced by \$1,800. Ms. Micu is entitled to recover \$42,184.85 for the government's taking of her personal property. *See generally* Micu-JC246 (personal property inventory); Micu-JC55 (photographs of damaged personal property); Micu-JC143 (photographs); Micu-JC192 (photographs).

Ms. Burnham carried her burden of proof for establishing her personal property damages claim for \$21,088.63. Ms. Burnham submitted numerous images depicting damage to personal property that supports the losses she claimed in her personal property inventory. *See generally* Burnham-JC92 (photographs); Burnham-JC96 (inventory).

Mr. Sidhu also seeks compensation for personal property, namely a range, range hood, refrigerator, and dishwasher to replace damaged appliances in the downstairs unit. Sidhu-JC52; Sidhu-JC89. These costs are not included in the court's just compensation award for damage to Mr. Sidhu's downstairs unit, so Mr. Sidhu is entitled to \$1,900.40 for these losses.

3. *Displacement.*

Plaintiffs also claim damages for their temporary displacement from their properties. Plaintiffs base their claim for dislocation on their properties' fair rental value. *See* Pls.' Post-Trial Br. at 37-38. The government argues that the plaintiffs are not entitled to any just compensation for the temporary displacement caused by the government's taking. *See* Def.'s Post-Trial Br. at 91. It contends that the just compensation for the taking of real property includes just compensation for temporary displacement because the after-taking valuation measures the value of the properties in their "unrepaired, flood damaged condition," and a reasonable buyer and seller would factor into the purchase price the time it takes to restore the property to a livable condition. *Id.*

The court agrees that using the monthly rental value of the properties would duplicate the court's real property just compensation award. *See* Yellow Book at 172, § 4.6.5.2. That award compensates plaintiffs for the cost of restoring the home to a livable condition including the cost of materials. The plaintiffs are nonetheless entitled to just compensation for the dislocation costs they incurred as a direct result of the government's taking.

A just compensation award may take into consideration displacement costs imposed on the plaintiff as a direct and natural result of the taking. *Cf. United States v. Gen. Motors Corp.*, 323 U.S. 373, 383 (1945); *see also Nat'l Lab'y & Supply Co. v. United States*, 275 F. 218, 220-21 (E.D. Pa. 1921) (indicating just compensation can include either the cost and expense of equipping the location taken by the government or the cost and expense of equipping the plaintiff's substitute location but not both and awarding the plaintiff the latter). For instance, in *General Motors* the Supreme Court explained that a plaintiff may be entitled to just compensation for "the reasonable cost of moving out the property stored and preparing the space for occupancy," including the cost of storing goods or returning them to the leased premises. 323 U.S. at 383. In that case the Court stated such costs could be considered along with the market rental value of the temporary occupancy taken but "not as independent items of damage." *Id.*

Accordingly, the court takes into consideration dislocation costs including the costs of securing substitute housing actually and necessarily incurred by plaintiffs here in determining the just compensation award. These displacements extended from the time the homes were rendered uninhabitable until the homes were repaired and safe to occupy once again. Ms. Burnham and Ms. Micu both established the length of time they were displaced from their homes and had to secure alternative housing. Ms. Burnham paid \$7,043 in rent for alternative housing,³¹ and Ms. Micu paid \$33,122.³² *See* Burnham-JC38 at 140; Micu-JC19 at 4950. These awards are reduced by half to reflect each plaintiff's co-tenancy.

Mr. Sidhu also suffered costs when the government used its easement and displaced his tenants. Specifically, Mr. Sidhu claims \$5,854 in lost income and \$313.43 in utility payments he made while unit 603 was vacant. *See* JX1172. He further claims \$127 in lost rent for Unit 604 to reflect the discount he provided the tenant because they were displaced during Harvey. *Id.*; Tr. 1737:15-24 (Sidhu). Structural flooding caused by the government's easement rendered Unit 603 uninhabitable between September 1, 2017 and July 27, 2018. Sidhu-JC62. The government contends these losses are non-compensable as "normal business expenses incurred anytime a unit is vacant." Def.'s Post-Trial Br. at 75. But this argument ignores that Unit 603 was vacant because the government used its flowage easement and flooded the property. Lost profit and damage caused to business assets are compensable if they are the direct and natural consequence of the government's taking. *See Kimball Laundry Co.*, 338 U.S. at 16-19 (holding the government "must pay compensation" for a laundry business's trade routes and suggesting "the record of its past earnings" and expenditures building up the routes provide evidence of their value); *see also Causby*, 109 Ct. Cl. at 772 (awarding just compensation for destroyed business

³¹ This reflects \$161.29 for the month of October, \$6,332.5 for November-March, and \$548.82 prorated for April 1-13, 2018.

³² This reflects \$2,332.50 for September 2017, and \$2,799 per month from October 2017-August 2018.

assets). These figures are reduced by half to reflect Mr. Sidhu’s proportional ownership of the property.

Mr. Sidhu also claimed \$3,001.53 for costs, prorated for unit 603, incurred in traveling from his home in California to Texas to oversee the repair of his properties and testify during the liability trial. Tr. 1739:19 to 1740:22 (Sidhu). These expenses are incidental and therefore non-compensable. In *Georgia-Pacific Corp. v. United States*, the plaintiff also requested additional management costs, including travel costs, made necessary by the taking. 226 Ct. Cl. 95, 151-53 (1980). Unlike business assets that are taken, such costs represent how the taking may frustrate business operations, and “business frustrations and readjustments have been held noncompensable.” *Id.* at 153. Impounding floodwaters directly displaced Mr. Sidhu’s tenants, but travel costs he incurred because he lives in a different state and elected to travel to oversee the unit’s renovation have too attenuated a connection with the government’s taking.

B. Offsets

The government seeks to offset just compensation awards by the amount of money plaintiffs have already received in the form of direct payments from FEMA.³³ The rule against awarding a plaintiff duplicate recovery is attributable to just compensation’s guiding principle that the property owner “must be made whole but is not entitled to more.” *Olson*, 292 U.S. at 255; *Recovery*, *Black’s Law Dictionary* (11th ed. 2019); *see also Innovair Aviation, Ltd.*, 83 Fed. Cl. at 502; *Petro v. United States*, 47 Fed. Cl. 136, 151 (2000) (refusing to grant plaintiff lost profits for an asset that plaintiff retained, to prevent double recovery); *Adams v. United States*, 230 Ct. Cl. 628, 631-32 (1982) (considering compensation the state of Utah paid for easements on the same land that the federal government took to “avoid double recovery by plaintiffs”).

Plaintiffs contend that FEMA payments must not be offset. They rely on cases applying the relative-benefits doctrine. *See Ideker Farms Inc. v. United States*, 146 Fed. Cl. 413, 415 (2020). Under this doctrine, the court may offset only “direct and special benefits “which arise directly due to the particular relation of the land in question to the public work and proximately to the remaining land as a result of the public work on the part taken.” *Hendler*, 175 F.3d at 1380. Plaintiffs contend that FEMA payments do not qualify because they do not arise directly and proximately from the taking. Pls.’ Post-Trial Resp. at 31. Instead, the FEMA payments apply to “anyone who suffered from a declared disaster regardless of any connection to any taking or benefit . . . to the remainder property.” *Id.* at 33 (emphasis omitted).

The facts of this case do not fall neatly within the relative-benefit doctrine. Where that doctrine applies, the taking itself causes some benefit to the remainder property.³⁴ The relative-

³³ FEMA cannot claw back the funds it has disbursed because it can only do so within three years of awarding the funds, and each plaintiff who was granted FEMA relief was awarded relief more than three years ago. Tr. 2701:5-10 (Glasschroeder).

³⁴ *See, e.g., Hendler*, 175 F.3d at 1383 (affirming the lower court’s holding that the government’s taking of an easement to sink wells for the purpose of monitoring water migration conferred special benefits in the form of groundwater testing and remediation associated with installing the wells); *Laughlin v. United States*, 22 Cl. Ct. 85, 114 (1990) (applying the relative-benefits doctrine in holding that any increase in groundwater levels was offset by the special

benefit doctrine is a specific application of the general principle guiding the proper measure of just compensation: the person whose property is taken “must be made whole but is not entitled to more.” *Olson*, 292 U.S. at 255. Failing to deduct FEMA payments would constitute duplicate recovery. The government reimbursed for some losses of property once by issuing FEMA relief and should not be compelled to pay again for the damage to the property by the same flood pursuant to the court’s just compensation award. That the government made funds available to some others whose homes were flooded during Harvey but not because of a government taking is inapposite. *Cf. United States v. River Rouge Improvement Co.*, 269 U.S. 411, 415-16 (1926) (discussing authority establishing that a benefit can be special even if adjacent lands are “similarly benefited” by the government action). The government issued payments through FEMA to compensate plaintiffs for the very same property losses and damages that they seek to recover here. In sum, the government has established that the cash payments from FEMA were related to the same flood damage that the plaintiffs seek to recover. Def.’s Pre-Trial Mem. at 37. FEMA relief was provided as a direct result of the government’s taking an easement on plaintiffs’ land. Indeed, the plaintiffs were only eligible because FEMA verified their claims for Harvey-related damages. *See* Tr. 2705:10-19 (Glasschroeder).

Offsets also are relevant to plaintiffs’ costs for displacement, property loss, and repairs to structures flooded by Harvey. Plaintiffs Burnham, Micu, Banker, and Holland each received direct payments from FEMA, and if these amounts are not offset from the just compensation award these plaintiffs would receive an award greater than the loss they sustained. The Bankers received \$21,256.89 in home repair assistance and \$2,666 in direct rental assistance payments. DX1287. Ms. Burnham received \$4,618 in direct rental assistance payments, \$19,060.06 in home repair assistance, and \$4,279.59 in personal property assistance. DX1288. Mr. Holland received \$6,413.67 in critical needs assistance and personal property assistance and \$3,546 in direct rental assistance payments. DX1977. Ms. Micu and her husband received \$17,540.47 in home repair assistance, \$12,366 in direct rental assistance payments, and \$500 in critical needs assistance. DX1980. Accordingly, the Bankers’ total award will be reduced by \$21,256.89, Ms. Burnham’s by \$16,118.62,³⁵ Ms. Micu’s by \$15,203.24,³⁶ and Mr. Holland’s by \$6,413.67. These offset amounts exclude money paid directly to hotels that housed the plaintiffs.

benefit the government’s flood control system provided by making the property in question suitable for farming).

³⁵ Ms. Burnham’s offset is reduced by \$2,309, 50% of the total direct payments for rental assistance, because her fiancé is a co-applicant for FEMA relief and co-signed the lease agreement for the property she moved into after selling her home. DX1288; Burnham-JC38. It is further reduced by \$9,530.03, 50% of the total direct payments for real property repairs, because Ms. Burnham had only a 50% interest in the property and any increase in the sale value attributable to these repairs would be split with her mother. JX121. No reduction for personal property is made because Ms. Burnham indicates all the personal property in the home was hers. Tr. 91:17-18 (Burnham).

³⁶ Ms. Micu’s offset is reduced by 50% because Ms. Micu’s husband was listed as a co-applicant on the FEMA award. DX1980. Direct assistance in the form of a dehumidifier, valued at \$249.99, is also not deducted because it does not offset a loss Ms. Micu claimed.

	Banker	Burnham	Holland	Micu	Popovici	Sidhu
Gross just compensation award	\$216,806.75	\$81,847.94	\$81,197.52	\$102,642.33	\$1,401.49	\$29,631.42
FEMA offsets	\$21,256.89	\$16,118.62	\$6,413.67	\$15,203.24	\$0	\$0
Net just compensation	\$195,549.86	\$65,729.32	\$74,783.85	\$87,439.09	\$1,401.49	\$29,631.42

C. Interest

To make the landowner whole, the government may be required to pay interest for the delay between the date of the taking and the date of compensation. *Tech. Coll. of the Low Country*, 147 Fed. Cl. at 367. The court has held the taking occurred on August 30, 2017, and the parties disagree only on the appropriate rate and how frequently that interest should be compounded. Plaintiffs request an interest award of 3.62%, compounded quarterly, based on Moody’s Aaa Corporate Bond Index. Pls.’ Post-Trial Br. at 39-40. Defendants argue the rate awarded should be that set by the Declarations of Takings Act, compounded annually. Def.’s Post-Trial Mem. at 100.

Under the Prudent Investor Rule, the appropriate interest rate is based on “how ‘a reasonably prudent person’ would have invested the funds to ‘produce a reasonable return while maintaining safety of principal.’” *Tulare Lake Basin Water Storage Dist. v. United States*, 61 Fed. Cl. 624, 627 (2004) (quoting *United States v. 429.59 Acres of Land*, 612 F.2d 459, 464-65 (9th Cir.1980)). The Moody’s Aaa Corporate Bond Index rate has been held to satisfy the prudent investor rule without over-compensating the plaintiff. *Jackson v. United States*, 155 Fed. Cl. 689, 720 (2021), *appeal dismissed*, No. 2022-1276, 2022 WL 2163785 (Fed. Cir. Jan. 25, 2022); *Tech. Coll. of the Low Country*, 147 Fed. Cl. at 368-70; *Hardy v. United States*, 138 Fed. Cl. 344, 356 (2018); *Sears v. United States*, 124 Fed. Cl. 730, 733-37 (2016). It adequately protects plaintiffs’ principle against loss and provides a reasonable return for the liquidity risk borne by plaintiffs without over-compensating them. PX-JC872 at 8-9. The prudent investor rule also requires interest to be compounded. *Tech. Coll. of the Low Country*, 147 Fed. Cl. at 370.

Because it is the rate a reasonably prudent investor would seek, the court concludes that an interest rate of 3.62%, reflecting the Moody’s Aaa Corporate Bond Index, compounded semi-annually, comports with the prudent-investor rule in this case.

CONCLUSION

For the reasons stated, the plaintiffs are entitled to just compensation for the permanent flowage easement the government took through its construction, maintenance, and operation of the Addicks and Barker Dams. This award compensates plaintiffs for the taking of plaintiffs’ real property as well as the taking of their personal property, fixtures, and improvements as a result of the flowage easement. Thus, the government is liable to plaintiffs in the following

amounts, plus interest at the rate of 3.62% compounded semi-annually from August 30, 2017 until the date of payment:

To Mr. and Ms. Banker \$195,549.86

To Ms. Burnham \$65,729.32

To Mr. Holland \$74,783.85

To Ms. Micu \$87,439.09

To Ms. Popovici \$1,401.49

To Mr. Sidhu \$29,631.42

Pursuant to Rule 54(b), there being no just reason for delay, the Clerk is directed to enter final judgment for the test plaintiffs as specified.

Costs are deferred.

Additionally, the court delineates and defines the flowage easement taken by the government as set out in the Addendum to this opinion. The government is directed to file the flowage easement in the title records of the private properties affected by the flooding that occurred at the end of August 2017.

It is so **ORDERED**.

s/ Charles F. Lettow
Charles F. Lettow
Senior Judge

ADDENDUM

In the United States Court of Federal Claims

Sub-Master Docket No. 17-9001L

(Dated: October 28, 2022)

*****)
IN RE UPSTREAM ADDICKS AND)
BARKER (TEXAS) FLOOD-)
CONTROL RESERVOIRS)
)
*****)
THIS DOCUMENT APPLIES TO:)
)
ALL UPSTREAM CASES)
)
*****)

Flowage Easement

Pursuant to the court’s opinions and orders in the above-captioned case, which are incorporated by reference, IT IS ORDERED that the United States, through its construction, maintenance, and operation of the Addicks and Barker Dams, has taken a permanent flowage easement on the properties identified in Exhibit A.³⁷ This taking occurred on August 30, 2017.

This flowage easement grants the government the right to flood the properties identified in Exhibit A if meteorological conditions and the authorized operation and maintenance of the Addicks and Barker Dams so require. The easement’s geographic limits are derived from the Harvey flood pool elevations as of August 30, 2017: 101.6 feet (NAVD 1988, 2001 adjustment) behind Barker Reservoir and 109.1 feet (NAVD 1988, 2001 adjustment) behind Addicks Reservoir. Future flooding is not expected to occur regularly or frequently but is instead subject to particular meteorological conditions under which the operation of the dams may result in temporary flood pools that extend beyond government-owned land.

The owners of the properties subject to this flowage easement retain a fee simple interest in their properties. The fee simple owners and their successors in interest (the “owners”) retain (1) the right to continue their lawful residential uses of the properties; (2) all development rights, including the rights to build new, and maintain existing, structures, fixtures, and improvements; and (3) the right to make any other lawful use of their properties. Provided, however, that absent prior approval from any authority governing the operation or maintenance of the dams, the owners may not exercise these rights in a way that interferes with the government’s easement by

³⁷ The relevant prior opinions and orders are *In re Upstream Addicks & Barker (Texas) Flood-Control Reservoirs*, 146 Fed. Cl. 219, 250 (2019); *In re Upstream Addicks & Barker (Texas) Flood-Control Reservoirs*, 148 Fed. Cl. 274, 278 (2020); Order of June 11, 2021, ECF No. 381.

reducing the water storage capacity of the property, or portion of the property, that is subject to the easement.

This order does not alter any otherwise applicable local, state, or federal laws that may affect or restrict the present or future use of the properties.

Following the entry of a final, non-appealable judgment requiring the payment of just compensation for this flowage easement, this order shall be recorded by the United States in the Fort Bend County and Harris County land records for the properties identified in Exhibit A.

EXHIBIT A
Properties Subject to Permanent Flowage
Easement

Fort Bend County, Texas

Street Address	Fort Bend County Parcel Identification Number	Legal Description	Plat/Slide
4614 Kelliwood Manor Lane, Katy, Texas	R356720	Lot 36, Block 1, Kelliwood Park	Plat No.: 20060157
6411 Canyon Park Drive, Katy, Texas	R241191	Lot One (1), Block Two (2) of Canyon Gate Cinco Ranch, Section Seven (7)	Slide No.: 1953/A and 1953/B

Harris County, Texas

Street Address	Harris County Appraisal District Parcel Identification Number	Legal Description	Volume: Page
15626 Four Season Drive, Houston, Texas	1137260000060	Lot TR 60, Minus the Easterly Eleven (11) feet thereof, Block 31 in Bear Creek Village, Section 12	273:146
19927 Parsons Green Court, Katy, Texas	1168400040021	Lot 21 & West ½ of Lot 22 (Tract 22A), Block 4, of the Kelliwood Estates, Section 5	340:93
16111 Aspenglenn Drive, Unit 603, Houston, Texas	1150100060013	Unit 603, Building F, 0.90 Int Common Land & Ele, Aspen Club Condo Ph 2	117:125 Am in 123:48 Supp in 136:103
16111 Aspenglenn Drive, Unit 604, Houston, Texas	1150100060014	Unit 604, Building F, 0.89 Int Common Land & Ele, Aspen Club Condo Ph 2	117:125 Am in 123:48 Supp in 136:103