TEXAS WINDSTORM INSURANCE ASSOCIATION
RESIDENTIAL PROPERTY RATE LEVEL REVIEW
July 2, 2021

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INTRODUCTION

The Texas Windstorm Insurance Association (TWIA) has completed studies sufficient to support rate level indications for its residential coverages. This report documents the procedures, methods, assumptions, data and results of this analysis.

DISTRIBUTION AND USE

This report was prepared for internal use by the management of TWIA and for the Board of Directors of TWIA. A complete copy of the report may be submitted to the Texas Department of Insurance (TDI or Department) for use in the approval of a rate change. Use of this report for other than the stated purpose may not be proper and must be preceded by written authorization.

RELIANCE UPON DATA

The following data and information used in this analysis were prepared by TWIA and are the responsibility of TWIA's management:

- TWIA losses and loss adjustment expenses
- TWIA written and earned premiums
- History of rate changes impacting TWIA residential premium
- TWIA's statutory annual statements and insurance expense exhibits.

At the time of this analysis, some of the data was unaudited. The data was reviewed for reasonableness and consistency, and the TWIA written premium and paid loss data provided for this analysis were reconciled to TWIA's annual statements

In addition to TWIA's own data, we utilized insurance industry premium and loss data supplied by the TDI.

We also used the results of two different hurricane simulation models -- one model developed by Applied Insurance Research (AIR) and the other model developed by Risk Management Solutions (RMS). Both models utilized TWIA exposure data as of 11/30/2020. TWIA has not directly verified the accuracy of these simulation models, but has relied on documentation provided directly by the modeling firms and submission documentation provided to the Florida Commission on Hurricane Loss Projection Methodology to comply with Actuarial Standard of Practice #38, "Using Models Outside the Actuary's Area of Expertise."

LIMITATIONS

The indicated rate level change as shown in this report represents a reasonable estimate of the rate level necessary to cover the TWIA's expected costs of providing residential wind/hail coverage. The actual costs of providing residential property coverage for a specific year may differ substantially from the indicated rate level range shown in this report. The possibility of this variability arises from the fact that the events covered by TWIA are inherently unpredictable from year to year. The indicated rate level is, however, our best estimate of the expected average annual cost of providing residential wind/hail coverage.

This actuarial report provides professional insights and guidance to TWIA regarding TWIA's current rate levels; however, the final decision regarding implementation and actual rate level change is a Board decision subject to the approval requirements of the Texas Department of Insurance.

The attached exhibits should be considered an integral part of this report.

EXECUTIVE SUMMARY

This section provides a brief summary of the key findings contained in our study.

1. We have estimated the indicated total rate level change using a combination of two different methodologies for projecting the expected average annual hurricane loss portion of the indicated rate level. The indicated total rate level changes are shown in Exhibit 1 and the following table:

Indicated Rate Change: Long Term Hurricane Methodologies

Hurricane Projection Methodology	Indicated Rate Change
Actual Experience and Models Combined	+39%
Actual Industry Experience	+32%
AIR Hurricane Simulation Models	+54%
RMS Hurricane Simulation Models	+38%

The indicated rate change shown is based on a combination of actual industry experience and hurricane simulation models. The indications based on each of these methodologies alone are also shown for reference. All methodologies rely on a long-term view of event frequency to develop the hurricane portion of the indicated rate level.

The hurricane simulation models utilized are widely used for catastrophe risk management and insurance ratemaking by the insurance industry. Versions of these simulation models have undergone verification and been approved by the Florida Commission on Hurricane Loss Projection Methodology.

2. The differences in indicated rate level changes reflect different hurricane loss projection methodologies. The different methods were used because the actuarial methods used to project hurricane losses in rate indications are still evolving. Traditionally, actuarial methods had been based on insurance industry hurricane loss experience. This traditional method is well recognized as having its limits. For instance, historical results are not representative of future events in many areas, given that exposures change over time (i.e. property values, population movement, building codes and construction techniques, topography, etc.). Furthermore, on-leveling historical hurricane losses and premiums is very challenging due to a lack of robust historical data. In recent decades after Hurricane Andrew, actuarial methods have incorporated the results of hurricane simulation models to minimize the weaknesses of the traditional approaches.

   The method relying on actual industry hurricane experience is a more traditional approach. Specifically, hurricane severity is calculated from 55 years of actual insurance industry premium and loss data, and hurricane frequency is based on 169 years of actual hurricane experience along Texas coastal lines. Severe hurricanes are so relatively infrequent that this limited number of years of actual industry experience may not represent the scope of potential occurrences. Also, the distribution of insured properties has changed dramatically over time with increased population and building values along the Gulf Coast. The alternative method incorporates the results of hurricane simulation models and has the advantage of minimizing many of the theoretical weaknesses of the traditional actuarial methodologies. The overall indication assigns equal weight to both traditional hurricane projection methodology and simulation model-based hurricane projection methodology.

3. The current rate indication is 5% less than the corresponding indication from the prior TWIA residential rate study. Changes in industry hurricane loss ratios, reduced Class I public security repayment provisions and reduced net reinsurance costs are the primary reasons for the decrease.

   Details on the key differences between the current and prior rate indications are described in the Analysis section of this report.

4. The indicated rate changes presented in this report reflect a separate provision for contributions to funding and uncertainties in pricing hurricanes. The total funding and contingency provision is assumed to be equal to 5% of TWIA premium.

   The provision for debt service of 18.6% represents the projected cost of debt service on the Series 2014 Class 1 Pre-Event Bonds. As of June 30, 2018, the available proceeds of the Series 2014 Pre-event Class 1 securities were used to pay claims associated with Hurricanes Harvey.

   The provision for reinsurance expense is 18.6% of TWIA premium. The provision for reinsurance expense reflects the estimated actual net cost of purchasing catastrophe reinsurance (reinsurance premiums paid net of the expected reduction in TWIA retained losses). Catastrophe reinsurance provides TWIA with annually renewable protection against large storm losses.

ACTUARIAL ANALYSIS

Overview of Analysis

The goal of the rate level adequacy review is to compare the current rate level to TWIA's expected costs for providing residential property insurance coverage. This comparison is achieved by estimating the projected loss, loss adjustment expense (LAE), and fixed expense ratio for a prospective accident year and then comparing this ratio to the "permissible" loss, LAE, and fixed expense ratio. The permissible ratio is the portion of premium remaining to pay loss, LAE, and fixed expenses after payment of TWIA variable expenses. If the projected ratio is higher than the permissible ratio, then a rate increase is indicated. If the projected ratio is lower than the permissible, then a rate decrease is indicated.

The steps employed to estimate the projected loss, LAE, and fixed expense ratio are as follows:

1. Adjust historical premium to the current rate level (to facilitate calculation of historical loss ratios at current rates).
2. Determine LAE factors to add projected LAE to projected loss.
3. Estimate the projected non-hurricane loss and LAE ratio.
4. Estimate the projected hurricane loss and LAE ratio.
5. Estimate the projected fixed expense ratio.
6. Sum the projected non-hurricane and hurricane loss ratios and the projected fixed expense ratio to obtain the projected total loss, LAE, and fixed expense ratio.

The steps employed to determine the permissible loss and LAE ratio are as follows:

(a) Analyze historical variable expense to premium ratios to estimate the projected total variable expense ratio.
(b) Subtract the projected total variable expense ratio from 1.00 to derive the permissible loss, LAE and fixed expense ratio.

Steps 1-5 and (a)-(b) are described in more detail in the remainder of this report.

Earned Premium at Current Rates

Historical industry earned premium and TWIA earned premium are adjusted to TWIA's current rate level. Earned premium at current rates for prior years permits the calculation of historical loss ratios at the current rate level.

Exhibit 10 shows the calculation of earned premium at current TWIA rates. Industry earned premium is provided by TDI/TICO. Historical TWIA written premium is adjusted to the current rate level and adjusted to an earned basis based on a uniform monthly earning assumption.

Loss Adjustment Expense Factors

In Exhibit 4, the historical ratio of LAE to loss is analyzed to develop LAE factors. Separate LAE factors are developed for hurricane and non-hurricane losses. The hurricane LAE factors are developed based on the LAE to loss ratio for years with hurricanes. The non-hurricane LAE factors are developed based on the ratio for years without hurricanes. TWIA statutory annual statement incurred loss and LAE data is utilized to derive these ratios.

The indicated LAE to loss ratios are shown in Exhibit 4, Sheet 1. For hurricane losses, the indicated LAE ratio of 0.154 is equal to the weighted average of the 10 hurricane years included in the analysis. For non-hurricane losses, the indicated ratio of 0.278 is equal to the weighted average of the most recent 10 non-hurricane years included in the analysis.

The development of these LAE factors is necessary to add LAE to the projected hurricane and non-hurricane loss ratios. The development of these loss ratios is described in the following two sections.

Projected Non-Hurricane Loss and LAE Ratio

Exhibit 2 shows the development of the projected non-hurricane loss and LAE ratio. The loss portion of this ratio is estimated by comparing the indicated ultimate TWIA non-hurricane loss for accident years 2011 - 2020 to the earned premium at current TWIA rates for the same years. The indicated ultimate non-hurricane loss for each year is based on actual TWIA paid loss as of 12/31/2020, and the paid loss development method. LAE is then added to each year's ultimate loss through the non-hurricane LAE factor developed in Exhibit 4.

Paid loss development factors are selected based on the average of all available years and prior selections. Given the positive skewness of the observed age-to-age development factors, a

straight average is more appropriate than an average that excludes the highest and lowest observation to avoid understating the expected development.

Each year's estimated ultimate loss and LAE is compared to the earned premium at present rates.

The resulting loss and LAE ratios are then trended forward based on the expected prospective inflation level. The net trend factor is equal to a loss trend offset by a premium trend. The loss trend is calculated using industry-wide construction cost and consumer price indices. The premium trend is derived from historical changes in average written premium at present rates. Both premiums and losses are trended to current levels by applying the actual historical changes in the appropriate data. Future premium and loss trends are selected based on all available and relevant data. The selected trends are estimates of the future trend between the current and prospective earned and accident dates, and they are not used to trend historical experience to current premium and loss levels.

The indicated loss and LAE ratio for each territory, is the premium-weighted average loss ratio from the 2011 - 2020 accident period. Given the great variability among individual accident years, a premium weighted average across the most recent 10 years has been selected to achieve both high stability and credibility.

The all-territory indicated loss and LAE ratio is then calculated as the weighted average of the individual territory loss and LAE ratios. TWIA 2020 written premium is used in the weighted average calculation.

Projected Hurricane Loss and LAE Ratio

Two different methods are used to develop the projected hurricane loss and LAE ratios. The first method is based on insurance industry experience from the recent 55 years and meteorological hurricane experience from the recent 170 years. The other method is based on hurricane simulation models. The "55/170-year" method is utilized because the Texas Insurance Code requires the consideration of a 30-year minimum experience period. The simulation method is utilized because it minimizes many of the weaknesses of the traditional method. These weaknesses include:

- A 55-year period is insufficient to measure long-term hurricane severity.
- A 55-year period of insurance industry experience includes years where land use, population

densities, construction techniques and materials, engineering techniques and building codes were different than today. These differences diminish the relevance of insurance data from several decades ago in evaluating today's residential property rates.

Differences between the two methods are the result of expected variances in the frequency and severity of hurricanes, and fundamental differences between the historical industry exposures and current TWIA exposures. Because of the readily identifiable nature of hurricanes, there should be no double-counting or understatement of expected future losses resulting from the use of either method.

For each of the two methods mentioned above, the projected hurricane loss ratio is estimated first. LAE is added to loss ratio using the hurricane LAE factor developed in Exhibit 4. Development of the projected hurricane loss ratio for the two methods is described as follows:

Actual 55/170-Year Industry Hurricane Experience

In Exhibit 6, the reported Texas insurance industry seacoast dwelling extended coverage premium and loss experience for the period 1966 through 2020 is used in the development of a projected hurricane loss ratio. Insurance industry loss ratios at current rates are calculated using information provided by the TDI. For the years where sufficient detail is available (1983 - 2020), these loss ratios are adjusted to TWIA's rate level.

A projected hurricane loss ratio is developed from these 55 years of loss ratios by separating the 55 years into the 14 hurricane years and 41 non-hurricane years. The 41 non-hurricane years are used to develop an estimated non-hurricane loss ratio.

Hurricane loss ratios are then estimated by subtracting the non-hurricane loss ratio from the total loss ratio in each of the fourteen hurricane years. An average per hurricane loss ratio for hurricane years is calculated as the average of the 14 hurricane loss ratios: 91.4%.

The 55-year period that underlies the selected hurricane loss ratio has experienced significantly fewer hurricanes than the long-term average. As shown in Exhibit 9, the annual hurricane frequency during this 55-year period is 0.327, while the annual frequency during the most recent 170-year period is 0.394. The 55-year period represents all years for which TWIA has been provided industry data by TDI. Because the expected frequency of hurricanes is unrelated to the availability of insurance industry data, there is no reason to use only the most recent 55-year

period to estimate the expected frequency of hurricane activity. Given the relatively infrequent occurrence of hurricanes, the longest experience period should be considered in order to obtain the most credible result. The selected hurricane frequency is therefore set equal to the 170-year historical hurricane frequency. As shown in Exhibit 6, Sheet 1, multiplying the selected loss ratio for hurricane years by the selected hurricane frequency yields a projected hurricane loss ratio of 36%.

Hurricane Simulation Models

The projected hurricane loss ratio is determined by averaging two different hurricane simulation models. The model versions utilized are AIR Touchstone v8 and RMS RiskLink v18.1. Both models were run using exposure data provided by TWIA as of 11/30/2020. This exposure data included location-level detail, with physical characteristics of each risk, and all relevant coverages. Both models were run using historical (long-term) event rates and both results include loss amplification (demand surge) and exclude storm surge and loss adjustment expenses. The AIR and RMS models generated 4,749 and 9,774 unique events, respectively, with the following distribution of intensity ratings:

Saffir-Simpson Category	AIR	RMS
Category 0	12.8%	45.2%
Category 1	36.3%	17.0%
Category 2	22.9%	13.1%
Category 3	19.0%	13.9%
Category 4	8.3%	9.9%
Category 5	0.8%	0.8%

Events shown as Category 0 include events with no U.S. landfall, Category 0 events making landfall or bypass in TX, and events making landfall or bypass in neighboring states or Mexico.

As shown in Exhibits 7 and 8, these models yield projected hurricane loss ratios of 50.7% and 40.6%. The average of these loss ratios is 45.7%.

Fixed Expenses and Variable Permissible Loss and LAE Ratio

Exhibit 11 shows the expense assumptions used to develop the projected fixed expense ratio and the variable permissible loss and LAE ratio. Fixed expenses include general expenses, Class 1 public security interest and principal repayment and the net cost of reinsurance (after modeled recoveries). The sum of these projected expenses provides for a 45.3% fixed expense ratio. Variable expenses include commission, taxes, and projected contributions to the Catastrophe Reserve Trust Fund (CRTF). Subtracting these expenses from 100% yields a permissible loss and LAE ratio of 77.1%.

As stated above, the expenses include a provision for an annual contribution to the CRTF, repayment of Class 1 public securities, and the projected net cost of TWIA's purchasing of reinsurance. The 18.6% provision for reinsurance expense reflects the estimated net actual cost of purchasing reinsurance (reinsurance premiums net of the expected reduction in TWIA retained losses). TWIA's purchasing of reinsurance provides additional current year protection to TWIA, coastal policyholders and TWIA insurance members. Furthermore, TWIA's purchasing of reinsurance helps TWIA fulfills its statutory funding obligations.

Indicated Rate Change

Exhibit 1 summarizes the indicated rate change using a combination of the two hurricane loss ratio projection methods. The individual indications resulting from the use of each methodology are also shown for reference. The indicated rate change for each method is calculated by dividing the total projected loss, LAE, and fixed expense ratio by the variable permissible loss and LAE ratio. This method of calculating the indicated rate change assumes that TWIA's variable expenses vary proportionally with premium while the fixed expenses do not.

Data Issues

Reconciliation of Data to TWIA's Annual Statements

Exhibit 12 shows a reconciliation of the premium data provided by TWIA to TWIA's annual statement data. This reconciliation shows the differences between the two data sources. Differences of less than 1% exist for all recent years except 2010.

Key Differences Versus Prior Indications

The indicated rate change shown in this report is 5% less than the comparable indication based on the prior (July 2020) study. The reasons for lower indications are summarized in the following table.

Reconciliation of Current vs. Prior Indications

Rate Indication/Reason for Change	Impact of Change	Rate Indication
Previous Rate Indication (Combined Method)		**+44%**
Change in modeled loss ratio	-2%	
Change in Reinsurance Provision	-1%	
Change in class I bond repayment	-1%	
Change due to all other factors	-1%	
Current Rate Indication (Combined Method)		**+39%**

These reasons are discussed below:

Change in modeled loss ratio

The decrease of 2.4% in modeled hurricane loss ratios reflects both hurricane model version changes and TWIA exposure changes observed in the coastal area.

Changes in outstanding bond repayment provision, reinsurance provision and general expense provision

The outstanding class 1 public securities were issued in 2014 and had been depleted from paying for claims associated with Hurricane Harvey. Due to a recent bond redemption in 2020, TWIA's revised annual principal and interest payment is about $69 million, resulting in a provision of 18.6%. Meanwhile, reinsurance provision decreased to 18.6% from 19.5% applied in the prior analysis and general expense provision decreased to 8.1% from 8.5%. Collectively those three provisions add up to a fixed expense provision of 45.3%, which is 2.4% less compared to 2020 rate analysis.

SUMMARY OF EXHIBITS

Exhibit Number	Exhibit Title or Purpose
1	Summary of Indicated Rate Change
2	Projected Ultimate Non-Hurricane Loss & LAE Ratio
3	Paid Loss Development Factors and Premium and Loss Trend Analysis
4	Development of LAE Factor
5	Summary of Indicated Hurricane Loss & LAE Ratios
6	Development of Hurricane Loss Ratio – 55/170-Year Method
7	Hurricane Loss Ratio – AIR Model
8	Hurricane Loss Ratio – RMS Model
9	Texas Hurricanes 1850 – 2020
10	Earned Premium at Present Rates
11	Fixed Expenses and Variable Permissible Loss & LAE Ratios
12	Reconciliation of Premium Data to Annual Statement

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
2021 Rate Level Review

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Residential Property - Wind & Hail
Rate Level Review

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Residential Property - Wind & Hail
Rate Level Review
Summary of Indicated Rate Change
By Method for Projecting Hurricane Loss & LAE

Exhibit 1

	Indicated Loss & LAE Ratio					Indicated	Proposed
Hurricane Projection Method	Hurricane	Non-Hurricane	Fixed Expenses	Total	Permissible LLAE Ratio	Rate Change	Rate Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Using Experience and Models	46.8%	14.9%	45.3%	107.1%	77.1%	39.0%	
Using Actual Industry Experience	41.5%	14.9%	45.3%	101.7%	77.1%	+32%	
Using AIR Models	58.3%	14.9%	45.3%	118.5%	77.1%	+54%	
Using RMS Models	46.0%	14.9%	45.3%	106.2%	77.1%	+38%	
Average of AIR and RMS Models	52.2%	14.9%	45.3%	112.4%	77.1%	46%	

Notes:
(2) Exhibit 5
(3) Exhibit 2, Sheet 1
(4) Exhibit 11, Sheet 1
(5) = (2) + (3) + (4)
(6) Exhibit 11, Sheet 1
(7) = (5) / (6) - 1
(8) Selected

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss & LAE Ratio
All Territory Weighted Average

	2020 Written Premium		Indicated Non-Hurricane
Territory	Amount	Share	Loss & LAE Ratio
(1)	(2)	(3)	(4)
Tier 1 - Territory 8	110,461,812	35.5%	12.1%
Tier 1 - Territory 9	56,782,746	18.2%	15.3%
Tier 1 - Territory 10	139,598,381	44.8%	17.0%
Tier 2	4,478,381	1.4%	16.3%
Total / Average	311,321,320	100.0%	14.9%

Notes:
(2) TWIA data
(3) = (2) / (2) Total
(4) Exhibit 2, Sheet 2a - Sheet 2d

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience
Tier 1 -- Territory 8 (Galveston County)

Accident Year Ending 9/30/xx	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current TWIA Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2011	1,277,401	0.278	1.122	1,831,686	126,684,509	1.4%
2012	10,634,874	0.278	1.100	14,950,506	128,914,788	11.6%
2013	54,064,828	0.278	1.092	75,451,576	131,926,783	57.2%
2014	520,624	0.278	1.070	711,932	134,663,386	0.5%
2015	17,450,030	0.278	1.057	23,572,303	136,975,647	17.2%
2016	11,024,805	0.278	1.061	14,949,173	133,431,908	11.2%
2017	2,726,914	0.278	1.042	3,631,366	126,682,785	2.9%
2018	2,579,888	0.278	1.012	3,336,662	115,596,430	2.9%
2019	4,957,914	0.278	0.999	6,329,878	109,182,096	5.8%
2020	4,916,077	0.278	1.010	6,345,574	108,043,628	5.9%
Total	110,153,355			151,110,656	1,252,101,960	12.1%

Notes:

(2) Exhibit 2, Sheet 3a
(3) Exhibit 4, Sheet 1
(4) Exhibit 2 Sheet 5
(5) = (2) * [1 + (3)] * (4)
(6) Exhibit 10, Sheet 1a
(7) = (5) / (6)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience
Tier 1 -- Territory 9 (Nueces County)

Accident Year Ending 9/30/xx	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current TWIA Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2011	19,201,295	0.278	1.122	27,533,044	69,387,124	39.7%
2012	20,630,853	0.278	1.100	29,002,853	70,391,274	41.2%
2013	6,175,709	0.278	1.092	8,618,671	71,513,690	12.1%
2014	1,618,066	0.278	1.070	2,212,641	74,528,934	3.0%
2015	9,470,740	0.278	1.057	12,793,511	77,646,885	16.5%
2016	9,569,319	0.278	1.061	12,975,595	76,688,491	16.9%
2017	7,740,629	0.278	1.042	10,308,010	72,582,595	14.2%
2018	1,174,440	0.278	1.012	1,518,946	65,531,943	2.3%
2019	893,361	0.278	0.999	1,140,574	59,870,593	1.9%
2020	455,628	0.278	1.010	588,116	57,494,711	1.0%
Total	76,930,040			106,691,961	695,636,240	15.3%

Notes:
(2) Exhibit 2, Sheet 3b
(3) Exhibit 4, Sheet 1
(4) Exhibit 2 Sheet 5
(5) = (2) * [1 + (3)] * (4)
(6) Exhibit 10, Sheet 1b
(7) = (5) / (6)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience
Tier 1 -- Territory 10 (Other Tier 1)

Accident Year Ending 9/30/xx	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current TWIA Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2011	56,124,736	0.278	1.122	80,478,157	193,033,699	41.7%
2012	18,946,421	0.278	1.100	26,634,879	209,220,809	12.7%
2013	4,828,270	0.278	1.092	6,738,218	215,695,773	3.1%
2014	2,844,673	0.278	1.070	3,889,977	222,006,785	1.8%
2015	86,493,247	0.278	1.057	116,839,057	226,666,349	51.5%
2016	12,216,562	0.278	1.061	16,565,145	216,365,340	7.7%
2017	22,074,500	0.278	1.042	29,396,082	197,982,407	14.8%
2018	6,969,592	0.278	1.012	9,014,024	171,091,403	5.3%
2019	10,714,984	0.278	0.999	13,680,056	151,980,115	9.0%
2020	21,508,366	0.278	1.010	27,762,569	141,633,299	19.6%
Total	242,721,351			330,998,164	1,945,675,979	17.0%

Notes:
(2) Exhibit 2, Sheet 3c
(3) Exhibit 4, Sheet 1
(4) Exhibit 2 Sheet 5
(5) = (2) * [1 + (3)] * (4)
(6) Exhibit 10, Sheet 1c
(7) = (5) / (6)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss & LAE Ratio based on TWIA experience
Tier 2 -- (Territories 1)

Accident Year Ending 9/30/xx	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current TWIA Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2011	54,382	0.278	1.122	77,979	3,878,435	2.0%
2012	259,290	0.278	1.100	364,510	4,306,581	8.5%
2013	502,759	0.278	1.092	701,638	4,573,701	15.3%
2014	30,748	0.278	1.070	42,047	4,650,368	0.9%
2015	339,691	0.278	1.057	458,870	4,748,938	9.7%
2016	448,235	0.278	1.061	607,788	4,776,381	12.7%
2017	487,376	0.278	1.042	649,027	4,657,598	13.9%
2018	291,225	0.278	1.012	376,652	4,410,916	8.5%
2019	2,766,639	0.278	0.999	3,532,229	4,296,061	82.2%
2020	354,799	0.278	1.010	457,967	4,367,811	10.5%
Total	5,535,144			7,268,707	44,666,790	16.3%

Notes:
(2) Exhibit 2, Sheet 3d
(3) Exhibit 4, Sheet 1
(4) Exhibit 2 Sheet 5
(5) = (2) * [1 + (3)] * (4)
(6) Exhibit 10, Sheet 1d
(7) = (5) / (6)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss
Tier 1 -- Territory 8 (Galveston County)

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2011	1,277,401	1.000	1,277,401
2012	10,634,874	1.000	10,634,874
2013	54,064,828	1.000	54,064,828
2014	520,624	1.000	520,624
2015	17,432,597	1.001	17,450,030
2016	10,980,881	1.004	11,024,805
2017	2,691,919	1.013	2,726,914
2018	2,499,891	1.032	2,579,888
2019	4,565,298	1.086	4,957,914
2020	3,883,157	1.266	4,916,077
Total	108,551,470		110,153,355

Notes:
(2) Exhibit 2, Sheet 4a, as of 12/31/20
(3) Exhibit 3, Sheet 1
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss
Tier 1 -- Territory 9 (Nueces County)

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2011	19,201,295	1.000	19,201,295
2012	20,630,853	1.000	20,630,853
2013	6,175,709	1.000	6,175,709
2014	1,618,066	1.000	1,618,066
2015	9,461,279	1.001	9,470,740
2016	9,531,194	1.004	9,569,319
2017	7,641,292	1.013	7,740,629
2018	1,138,023	1.032	1,174,440
2019	822,616	1.086	893,361
2020	359,896	1.266	455,628
Total	76,580,223		76,930,040

Notes:

(2) Exhibit 2, Sheet 4b, as of 12/31/20
(3) Exhibit 3, Sheet 1
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss
Tier 1 -- Territory 10 (Other Tier 1)

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2011	56,124,736	1.000	56,124,736
2012	18,946,421	1.000	18,946,421
2013	4,828,270	1.000	4,828,270
2014	2,844,673	1.000	2,844,673
2015	86,406,840	1.001	86,493,247
2016	12,167,890	1.004	12,216,562
2017	21,791,214	1.013	22,074,500
2018	6,753,481	1.032	6,969,592
2019	9,866,468	1.086	10,714,984
2020	16,989,231	1.266	21,508,366
Total	236,719,224		242,721,351

Notes:
(2) Exhibit 2, Sheet 4c, as of 12/31/20
(3) Exhibit 3, Sheet 1
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss
Tier 2 -- (Territories 1)

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2011	54,382	1.000	54,382
2012	259,290	1.000	259,290
2013	502,759	1.000	502,759
2014	30,748	1.000	30,748
2015	339,352	1.001	339,691
2016	446,449	1.004	448,235
2017	481,121	1.013	487,376
2018	282,195	1.032	291,225
2019	2,547,550	1.086	2,766,639
2020	280,252	1.266	354,799
Total	5,224,098		5,535,144

Notes:
(2) Exhibit 2, Sheet 4d, as of 12/31/20
(3) Exhibit 3, Sheet 1
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Summary of TWIA Historical Paid Loss as of 12/31/20
Tier 1 -- Territory 8 (Galveston County)

Accident Year	Paid Loss Excluding Expense Non-Hurricane	Hurricane	Total
(1)	(2)	(3)	(4)
2011	1,277,401	0	1,277,401
2012	10,634,874	0	10,634,874
2013	54,064,828	0	54,064,828
2014	520,624	0	520,624
2015	17,432,597	0	17,432,597
2016	10,980,881	0	10,980,881
2017	2,691,919	34,578,896	37,270,815
2018	2,499,891	0	2,499,891
2019	4,565,298	0	4,565,298
2020	3,883,157	24,705	3,907,862
Total	108,551,470	34,603,601	143,155,071

Notes:
(2),(3) Provided by TDI. Accident years ending 9/30/xx
(4) = (2) + (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Summary of TWIA Historical Paid Loss as of 12/31/20
Tier 1 -- Territory 9 (Nueces County)

Accident Year	Paid Loss Excluding Expense: Non-Hurricane	Hurricane	Total
(1)	(2)	(3)	(4)
2011	19,201,295	0	19,201,295
2012	20,630,853	0	20,630,853
2013	6,175,709	0	6,175,709
2014	1,618,066	0	1,618,066
2015	9,461,279	0	9,461,279
2016	9,531,194	0	9,531,194
2017	7,641,292	247,337,056	254,978,348
2018	1,138,023	0	1,138,023
2019	822,616	0	822,616
2020	359,896	1,228,141	1,588,037
Total	76,580,223	248,565,197	325,145,420

Notes:
(2),(3) Provided by TDI. Accident years ending 9/30/xx
(4) = (2) + (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Summary of TWIA Historical Paid Loss as of 12/31/20
Tier 1 -- Territory 10 (Other Tier 1)

Accident Year	Paid Loss Excluding Expense Non-Hurricane	Hurricane	Total
(1)	(2)	(3)	(4)
2011	56,124,736	0	56,124,736
2012	18,946,421	0	18,946,421
2013	4,828,270	0	4,828,270
2014	2,844,673	0	2,844,673
2015	86,406,840	0	86,406,840
2016	12,167,890	0	12,167,890
2017	21,791,214	619,717,457	641,508,671
2018	6,753,481	0	6,753,481
2019	9,866,468	0	9,866,468
2020	16,989,231	5,323,059	22,312,290
Total	236,719,224	625,040,516	861,759,740

Notes:
(2) (3) Provided by TDI. Accident years ending 9/30/xx
(4) = (2) + (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Summary of TWIA Historical Paid Loss as of 12/31/20
Tier 2 -- (Territories 1)

Accident Year	Paid Loss Excluding Expense Non-Hurricane	Hurricane	Total
(1)	(2)	(3)	(4)
2011	54,382	0	54,382
2012	259,290	0	259,290
2013	502,759	0	502,759
2014	30,748	0	30,748
2015	339,352	0	339,352
2016	446,449	0	446,449
2017	481,121	3,363,572	3,844,693
2018	282,195	0	282,195
2019	2,547,550	0	2,547,550
2020	280,252	6,672	286,924
Total	5,224,098	3,370,244	8,594,342

Notes:
(2) (3) Provided by TDI. Accident years ending 9/30/xx
(4) = (2) + (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Calculation of Net Trend Factors

Year / Quarter	Average Writen premium Per house year At present rates
(1)	(2)
2012 / 3	1,600.24
2013 / 3	1,631.23
2014 / 3	1,649.95
2015 / 3	1,664.45
2016 / 3	1,667.78
2017 / 3	1,656.10
2018 / 3	1,660.23
2019 / 3	1,686.68
2020 / 3	1,700.13

(3)	Current Average Earned Date	7/1/2020
(4)	Current Average Accident Date	7/1/2020
(5)	Prospective Average Earned / Accident Date	1/1/2023
(6)	Premium Trend Length	2.500
(7)	Loss Trend Length	2.500
(8)	Selected Premium Trend	1.5%
(9)	Selected Loss Trend	1.9%

Accident Year	Current Premium Trend	Current Loss Trend	Prospective Premium Trend	Prospective Loss Trend	Net Trend Factor
(10)	(11)	(12)	(13)	(14)	(15)
2011	1.062	1.180	1.037	1.048	1.122
2012	1.062	1.157	1.037	1.048	1.100
2013	1.042	1.126	1.037	1.048	1.092
2014	1.030	1.091	1.037	1.048	1.070
2015	1.021	1.068	1.037	1.048	1.057
2016	1.019	1.070	1.037	1.048	1.061
2017	1.027	1.059	1.037	1.048	1.042
2018	1.024	1.026	1.037	1.048	1.012
2019	1.008	0.997	1.037	1.048	0.999
2020	1.000	1.000	1.037	1.048	1.010

Notes:

(2) Exhibit 3, Sheet 2 (6)
(3) Latest Year / Quarter Ending Date - 6 Months
(4) Latest Accident Year Ending Date - 6 Months
(5) Rate Effective Date + 12 Months
(6) = (5) - (3)
(7) = (5) - (4)
(8) Exhibit 3, Sheet 2
(9) Exhibit 3, Sheet 3a
(11) = (2) Indexed to 2020 / 3
(12) Exhibit 3, Sheet 3a
(13) = [1 + (8)] ^ (6)
(14) = [1 + (9)] ^ (7)
(15) = [(12) * (14)] / [(11) * (13)]

Texas Windstorm Insurance Association Exhibit 3
Residential Property - Wind & Hail Sheet 1
Rate Level Review
Paid Loss Development Factors
Statewide Industry Extended Coverage Dwelling Paid Loss

Months of Development

Accident Year	15	27	39	51	63	75	87	99	111
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2011	137,269	154,006	156,583	157,456	157,929	157,995	158,032	158,046	158,071
2012	162,844	196,788	232,373	242,523	245,227	246,785	247,419	247,577	247,574
2013	124,050	143,359	151,995	154,466	156,218	156,541	156,580	156,628	
2014	151,510	178,253	187,490	191,068	191,825	192,297	192,389		
2015	173,851	200,069	206,343	208,327	209,063	209,156			
2016	486,124	553,332	561,570	563,809	564,583				
2017	634,033	775,472	803,501	815,757					
2018	181,011	217,042	220,050						
2019	276,104	316,560							
2020	322,634								

Development Factors

Accident Year	15 - 27	27 - 39	39 - 51	51 - 63	63 - 75	75 - 87	87 - 99	99 - 111	111 - Ult
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2011	1.122	1.017	1.006	1.003	1.000	1.000	1.000	1.000	
2012	1.208	1.181	1.044	1.011	1.006	1.003	1.001	1.000	
2013	1.156	1.060	1.016	1.011	1.002	1.000	1.000		
2014	1.177	1.052	1.019	1.004	1.002	1.000			
2015	1.151	1.031	1.010	1.004	1.000				
2016	1.138	1.015	1.004	1.001					
2017	1.223	1.036	1.015						
2018	1.199	1.014							
2019	1.147								
Average	1.169	1.051	1.016	1.006	1.002	1.001	1.000	1.000	
Avg 5 Year	1.172	1.030	1.013	1.006	1.002	1.001	1.000	1.000	
Prior	1.163	1.053	1.021	1.012	1.004	1.001	1.000	1.000	1.000
Selected	1.166	1.052	1.018	1.009	1.003	1.001	1.000	1.000	1.000
Selected Cumulative	1.266	1.086	1.032	1.013	1.004	1.001	1.000	1.000	1.000

Notes:
Provided by TICO. Accident years ending 9/30/xx

Texas Windstorm Insurance Association Exhibit 3
Residential Property - Wind & Hail Sheet 1
Rate Level Review
Incurred Loss Development Factors
Statewide Industry Extended Coverage Dwelling Incurred Loss

Months of Development

Accident Year	15	27	39	51	63	75	87	99	111
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2011	143,685	155,082	157,261	157,739	158,014	157,995	158,050	158,046	158,071
2012	170,023	203,480	240,439	246,180	247,027	247,422	247,520	247,594	247,574
2013	127,453	147,009	154,930	155,922	156,569	156,577	156,580	156,628	
2014	157,426	183,366	190,278	191,866	192,056	192,342	192,403		
2015	183,266	204,239	208,541	209,008	209,335	209,189			
2016	498,092	556,120	562,298	564,014	564,747				
2017	665,247	791,814	816,792	822,501					
2018	186,500	218,189	220,721						
2019	283,698	318,858							
2020	338,256								

Development Factors

Accident Year	15 - 27	27 - 39	39 - 51	51 - 63	63 - 75	75 - 87	87 - 99	99 - 111	111 - Ult
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2011	1.079	1.014	1.003	1.002	1.000	1.000	1.000	1.000	1.000
2012	1.197	1.182	1.024	1.003	1.002	1.000	1.000	1.000	
2013	1.153	1.054	1.006	1.004	1.000	1.000	1.000		
2014	1.165	1.038	1.008	1.001	1.001	1.000			
2015	1.114	1.021	1.002	1.002	0.999				
2016	1.117	1.011	1.003	1.001					
2017	1.190	1.032	1.007						
2018	1.170	1.012							
2019	1.124								
Average	1.145	1.045	1.008	1.002	1.000	1.000	1.000	1.000	1.000
Avg 5 Year	1.143	1.023	1.005	1.002	1.000	1.000	1.000	1.000	
Prior	1.152	1.049	1.015	1.007	1.002	1.000	1.000	1.000	1.000
Selected	1.149	1.047	1.011	1.005	1.001	1.000	1.000	1.000	1.000
Selected Cumulative	1.223	1.065	1.017	1.006	1.001	1.000	1.000	1.000	1.000

Notes:
Provided by TICO. Accident years ending 9/30/xx

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Premium Trend Analysis
TWIA Residential Earned Premium at Present Rates

Year / Quarter	Exposure Written	Written Premium	On-Level Factors	Written Premium at Present Rates	Average Written Premium at Present Rates Quarterly	Average Written Premium at Present Rates Four Quarter Ending	Exponential Fitted Trends All-Year	5-Year	4-Year	3-Year
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2011 / 2	75,601	90,742,856	1.340	121,604,106	1,608					
2011 / 3	82,435	99,110,457	1.340	132,817,491	1,611					
2011 / 4	54,497	66,729,933	1.340	89,424,492	1,641					
2012 / 1	54,769	68,658,174	1.276	87,627,162	1,600	1,614	1610.4			
2012 / 2	77,155	96,214,511	1.276	122,796,806	1,592	1,609	1612.3			
2012 / 3	89,431	112,131,482	1.276	143,111,343	1,600	1,606	1614.2			
2012 / 4	54,952	70,018,382	1.276	89,363,170	1,626	1,603	1616.2			
2013 / 1	54,742	71,740,155	1.216	87,200,607	1,593	1,602	1618.1			
2013 / 2	82,182	108,632,729	1.216	132,043,761	1,607	1,606	1620.0			
2013 / 3	83,114	111,540,208	1.216	135,577,820	1,631	1,615	1622.0			
2013 / 4	60,544	81,734,680	1.216	99,349,014	1,641	1,619	1623.9			
2014 / 1	55,592	77,867,785	1.158	90,141,695	1,621	1,624	1625.9			
2014 / 2	79,155	111,616,003	1.158	129,209,475	1,632	1,632	1627.8			
2014 / 3	89,874	128,096,479	1.158	148,287,687	1,650	1,638	1629.7			
2014 / 4	60,646	86,711,448	1.158	100,379,340	1,655	1,641	1631.7			
2015 / 1	57,651	85,327,979	1.103	94,074,097	1,632	1,643	1633.6			
2015 / 2	82,158	122,581,230	1.103	135,145,806	1,645	1,646	1635.6			
2015 / 3	84,402	127,421,809	1.103	140,482,544	1,664	1,650	1637.6			
2015 / 4	57,308	87,342,988	1.103	96,295,644	1,680	1,655	1639.5			
2016 / 1	54,113	84,557,230	1.050	88,785,092	1,641	1,657	1641.5	1648.9		
2016 / 2	79,991	125,845,764	1.050	132,138,052	1,652	1,659	1643.4	1650.0		
2016 / 3	77,932	123,784,247	1.050	129,973,459	1,668	1,660	1645.4	1651.2		
2016 / 4	51,030	81,959,449	1.050	86,057,421	1,686	1,661	1647.4	1652.4		
2017 / 1	50,991	79,037,984	1.050	82,989,883	1,628	1,659	1649.4	1653.6	1643.6	
2017 / 2	73,614	114,547,681	1.050	120,275,065	1,634	1,654	1651.3	1654.8	1645.8	
2017 / 3	68,864	108,614,623	1.050	114,045,354	1,656	1,650	1653.3	1656.0	1648.0	
2017 / 4	45,960	73,697,340	1.050	77,382,207	1,684	1,648	1655.3	1657.2	1650.2	
2018 / 1	44,101	71,679,332	1.000	71,679,332	1,625	1,649	1657.3	1658.3	1652.5	1642.4
2018 / 2	63,851	104,163,394	1.000	104,163,394	1,631	1,649	1659.3	1659.5	1654.7	1646.1
2018 / 3	61,408	101,951,681	1.000	101,951,681	1,660	1,650	1661.2	1660.7	1656.9	1649.8
2018 / 4	40,418	68,300,637	1.000	68,300,637	1,690	1,650	1663.2	1661.9	1659.2	1653.5
2019 / 1	39,758	65,036,872	1.000	65,036,872	1,636	1,652	1665.2	1663.1	1661.4	1657.3
2019 / 2	60,805	99,948,528	1.000	99,948,528	1,644	1,656	1667.2	1664.3	1663.7	1661.0
2019 / 3	57,547	97,063,357	1.000	97,063,357	1,687	1,664	1669.2	1665.5	1665.9	1664.7
2019 / 4	38,375	65,697,652	1.000	65,697,652	1,712	1,668	1671.2	1666.7	1668.2	1668.5
2020 / 1	38,302	63,498,682	1.000	63,498,682	1,658	1,673	1673.2	1667.9	1670.4	1672.2
2020 / 2	59,374	98,472,763	1.000	98,472,763	1,659	1,677	1675.2	1669.1	1672.7	1676.0
2020 / 3	57,963	98,544,861	1.000	98,544,861	1,700	1,681	1677.2	1670.3	1674.9	1679.7
2020 / 4	37,911	65,820,531	1.000	65,820,531	1,736	1,686	1679.2	1671.5	1677.2	1683.5
(14) Average Annual Change							0.5%	0.3%	0.5%	0.9%
(15) Correlation Coefficient							80.9%	37.9%	68.7%	94.5%
(16) Selected Premium Trend										1.5%

Notes:
(2) Provided by TWIA
(3) Provided by TWIA
(4) Cumulative effect of annual rate changes
(5) = (3) * (4)
(6) = (5) / (2)
(7) annualized average written premium
(8) - (11) = (6) fitted to an exponential distribution
(14) Fitted average annual change
(15) Evaluates the predictability of the fitted curve
(16) Selected based on judgment

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Loss Trend Analysis
Summary of Indices and Calculation of Prospective Loss Costs

Calendar Year Ending 9/30/xx	Statewide Boeckh	Coastal Boeckh	Modified CPI	Weighted Average
(1)	(2)	(3)	(4)	(5)
2011	1.201	1.211	1.086	1.180
2012	1.175	1.188	1.062	1.157
2013	1.140	1.149	1.055	1.126
2014	1.105	1.106	1.045	1.091
2015	1.077	1.080	1.031	1.068
2016	1.084	1.088	1.016	1.070
2017	1.072	1.075	1.009	1.059
2018	1.033	1.034	1.002	1.026
2019	1.010	1.002	0.981	0.997
2020	1.000	1.000	1.000	1.000
Factors to Adjust For Prospective Loss Costs				
(6) Fitted Trend	2.2%	2.3%	0.7%	1.9%
(7) Cost Factor	1.062	1.065	1.019	1.053

Notes:
(2) = Exhibit 3, Sheet 3b trended forward to 9/30/2020
(3) = Exhibit 3, Sheet 3c trended forward to 9/30/2020
(4) = Exhibit 3, Sheet 3d
(5) = 25% CPI and 75% Boeckh (most appropriate available by year)
(6) = (2) - (5) fitted to an exponential curve using 5 years' data
(7) = [1 + (6)] ^ 2.75 (trended from 4/1/2020 to 1/1/2023)

Texas Windstorm Insurance Association Exhibit 3
Residential Property - Wind & Hail Sheet 3b
Rate Level Review
Loss Trend Analysis
Boeckh Residential Construction Index Trend (Statewide)

Calendar Year Ending	Texas Statewide Index	Fitted Trends All Years Linear	All Years Exponential	5 Years Linear	5 Years Exponential	4 Years Linear	4 Years Exponential	3 Years Linear	3 Years Exponential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
3/31/2011	2065.10	2068.00	2074.08						
6/30/2011	2070.21	2079.43	2084.50						
9/30/2011	2075.77	2090.86	2094.97						
12/31/2011	2083.16	2102.30	2105.50						
3/31/2012	2092.69	2113.73	2116.08						
6/30/2012	2103.68	2125.16	2126.71						
9/30/2012	2121.46	2136.59	2137.39						
12/31/2012	2139.97	2148.03	2148.13						
3/31/2013	2155.46	2159.46	2158.92						
6/30/2013	2172.56	2170.89	2169.76						
9/30/2013	2188.33	2182.32	2180.66						
12/31/2013	2202.66	2193.76	2191.62						
3/31/2014	2219.67	2205.19	2202.63						
6/30/2014	2239.01	2216.62	2213.69						
9/30/2014	2257.42	2228.05	2224.81						
12/31/2014	2275.56	2239.49	2235.99						
3/31/2015	2293.59	2250.92	2247.22						
6/30/2015	2307.55	2262.35	2258.51						
9/30/2015	2316.02	2273.78	2269.86						
12/31/2015	2319.90	2285.22	2281.26						
3/31/2016	2316.44	2296.65	2292.72	2274.68	2276.58				
6/30/2016	2308.41	2308.08	2304.24	2287.55	2288.83				
9/30/2016	2301.26	2319.51	2315.81	2300.41	2301.14				
12/31/2016	2296.54	2330.95	2327.45	2313.27	2313.52				
3/31/2017	2299.40	2342.38	2339.14	2326.13	2325.97	2310.75	2311.68		
6/30/2017	2309.77	2353.81	2350.89	2339.00	2338.49	2325.28	2325.67		
9/30/2017	2326.30	2365.24	2362.70	2351.86	2351.07	2339.80	2339.74		
12/31/2017	2343.81	2376.68	2374.57	2364.72	2363.72	2354.32	2353.90		
3/31/2018	2363.74	2388.11	2386.50	2377.59	2376.44	2368.85	2368.15	2388.83	2389.03
6/30/2018	2386.99	2399.54	2398.49	2390.45	2389.22	2383.37	2382.48	2400.49	2400.46
9/30/2018	2413.52	2410.97	2410.54	2403.31	2402.08	2397.90	2396.90	2412.15	2411.95
12/31/2018	2441.12	2422.41	2422.65	2416.17	2415.00	2412.42	2411.40	2423.82	2423.49
3/31/2019	2459.13	2433.84	2434.82	2429.04	2428.00	2426.95	2425.99	2435.48	2435.09
6/30/2019	2468.96	2445.27	2447.05	2441.90	2441.06	2441.47	2440.68	2447.14	2446.74
9/30/2019	2469.01	2456.70	2459.34	2454.76	2454.20	2455.99	2455.45	2458.80	2458.45
12/31/2019	2466.82	2468.14	2471.70	2467.62	2467.40	2470.52	2470.30	2470.47	2470.22
3/31/2020	2471.85	2479.57	2484.11	2480.49	2480.68	2485.04	2485.25	2482.13	2482.04
6/30/2020	2478.73	2491.00	2496.59	2493.35	2494.03	2499.57	2500.29	2493.79	2493.92
9/30/2020	2493.75	2502.43	2509.13	2506.21	2507.44	2514.09	2515.42	2505.45	2505.85
12/31/2020	2522.05	2513.87	2521.74	2519.07	2520.94	2528.62	2530.65	2517.11	2517.84
Annual Trend		1.8%	2.0%	2.0%	2.2%	2.3%	2.4%	1.9%	1.9%
R-Squared		0.968	0.966	0.930	0.929	0.937	0.934	0.876	0.872

Notes:
(2) = Average Index for Austin, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, Odessa, and San Antonio
(3) - (10) = (2) fitted to linear and exponential distributions

Texas Windstorm Insurance Association Exhibit 3
Residential Property - Wind & Hail Sheet 3c
Rate Level Review
Loss Trend Analysis
Boeckh Residential Construction Index Trend (Coastal)

Calendar Year Ending	Texas Coastal Index	Fitted Trends All Years Linear	All Years Exponential	5 Years Linear	5 Years Exponential	4 Years Linear	4 Years Exponential	3 Years Linear	3 Years Exponential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
3/31/2011	2073.42	2066.04	2073.04						
6/30/2011	2074.47	2078.30	2084.14						
9/30/2011	2078.09	2090.56	2095.30						
12/31/2011	2083.46	2102.82	2106.52						
3/31/2012	2089.96	2115.08	2117.80						
6/30/2012	2099.33	2127.33	2129.14						
9/30/2012	2118.82	2139.59	2140.54						
12/31/2012	2139.88	2151.85	2152.00						
3/31/2013	2157.74	2164.11	2163.52						
6/30/2013	2175.63	2176.37	2175.10						
9/30/2013	2189.62	2188.63	2186.75						
12/31/2013	2203.37	2200.88	2198.46						
3/31/2014	2227.71	2213.14	2210.23						
6/30/2014	2252.63	2225.40	2222.06						
9/30/2014	2275.00	2237.66	2233.96						
12/31/2014	2296.77	2249.92	2245.92						
3/31/2015	2310.58	2262.17	2257.94						
6/30/2015	2322.52	2274.43	2270.03						
9/30/2015	2330.38	2286.69	2282.19						
12/31/2015	2333.26	2298.95	2294.41						
3/31/2016	2328.65	2311.21	2306.69	2285.48	2287.57				
6/30/2016	2320.80	2323.46	2319.04	2299.48	2300.86				
9/30/2016	2313.59	2335.72	2331.46	2313.49	2314.24				
12/31/2016	2308.17	2347.98	2343.94	2327.49	2327.69				
3/31/2017	2311.24	2360.24	2356.49	2341.50	2341.22	2326.38	2327.25		
6/30/2017	2323.79	2372.50	2369.11	2355.50	2354.82	2342.02	2342.30		
9/30/2017	2340.80	2384.76	2381.79	2369.51	2368.51	2357.66	2357.44		
12/31/2017	2360.09	2397.01	2394.54	2383.51	2382.28	2373.31	2372.69		
3/31/2018	2380.33	2409.27	2407.37	2397.52	2396.12	2388.95	2388.03	2413.90	2413.86
6/30/2018	2404.16	2421.53	2420.25	2411.52	2410.05	2404.60	2403.47	2425.97	2425.73
9/30/2018	2433.32	2433.79	2433.21	2425.53	2424.06	2420.24	2419.01	2438.04	2437.65
12/31/2018	2467.60	2446.05	2446.24	2439.53	2438.15	2435.88	2434.66	2450.10	2449.62
3/31/2019	2494.19	2458.30	2459.34	2453.54	2452.32	2451.53	2450.40	2462.17	2461.66
6/30/2019	2508.16	2470.56	2472.51	2467.54	2466.57	2467.17	2466.24	2474.24	2473.76
9/30/2019	2510.44	2482.82	2485.74	2481.55	2480.91	2482.81	2482.19	2486.31	2485.91
12/31/2019	2504.07	2495.08	2499.05	2495.55	2495.33	2498.46	2498.24	2498.38	2498.13
3/31/2020	2502.47	2507.34	2512.43	2509.56	2509.83	2514.10	2514.40	2510.45	2510.41
6/30/2020	2502.92	2519.60	2525.89	2523.56	2524.42	2529.74	2530.66	2522.52	2522.74
9/30/2020	2516.54	2531.85	2539.41	2537.57	2539.09	2545.39	2547.02	2534.59	2535.14
12/31/2020	2539.13	2544.11	2553.01	2551.57	2553.85	2561.03	2563.49	2546.66	2547.60
Annual Trend		1.9%	2.2%	2.2%	2.3%	2.4%	2.6%	1.9%	2.0%
R-Squared		0.963	0.961	0.913	0.912	0.905	0.902	0.790	0.786

Notes:
(2) = Average Index for Corpus Christi and Houston
(3) - (10) = (2) fitted to linear and exponential distributions

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Loss Trend Analysis
Modified Consumer Price Index - External Trend

Exhibit 3
Sheet 3d

		Fitted Trends							
Calendar Year	Modified	All Years		5 Years		4 Years		3 Years	
Ending	CPI	Linear	Exponential	Linear	Exponential	Linear	Exponential	Linear	Exponential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
9/30/2010	178.59	179.59	179.74						
12/31/2010	178.72	180.10	180.22						
3/31/2011	178.97	180.60	180.70						
6/30/2011	179.61	181.11	181.18						
9/30/2011	180.52	181.61	181.66						
12/31/2011	181.55	182.12	182.15						
3/31/2012	182.78	182.62	182.64						
6/30/2012	183.87	183.13	183.12						
9/30/2012	184.57	183.63	183.61						
12/31/2012	185.03	184.14	184.10						
3/31/2013	185.38	184.64	184.59						
6/30/2013	185.51	185.15	185.09						
9/30/2013	185.82	185.65	185.58						
12/31/2013	186.03	186.16	186.08						
3/31/2014	186.43	186.66	186.57						
6/30/2014	186.87	187.16	187.07						
9/30/2014	187.59	187.67	187.57						
12/31/2014	188.62	188.17	188.07						
3/31/2015	189.46	188.68	188.58						
6/30/2015	189.59	189.18	189.08						
9/30/2015	190.03	189.69	189.58						
12/31/2015	190.50	190.19	190.09						
3/31/2016	190.95	190.70	190.60	192.23	192.24				
6/30/2016	192.03	191.20	191.11	192.59	192.59				
9/30/2016	192.82	191.71	191.62	192.94	192.94				
12/31/2016	193.56	192.21	192.13	193.29	193.28				
3/31/2017	193.86	192.72	192.64	193.64	193.63	194.17	194.18		
6/30/2017	194.07	193.22	193.16	193.99	193.98	194.47	194.47		
9/30/2017	194.20	193.73	193.67	194.34	194.33	194.76	194.76		
12/31/2017	194.18	194.23	194.19	194.70	194.68	195.06	195.05		
3/31/2018	194.71	194.74	194.71	195.05	195.03	195.35	195.34	196.16	196.15
6/30/2018	195.24	195.24	195.23	195.40	195.38	195.65	195.64	196.34	196.33
9/30/2018	195.63	195.75	195.75	195.75	195.73	195.94	195.93	196.52	196.51
12/31/2018	196.26	196.25	196.27	196.10	196.09	196.24	196.22	196.70	196.69
3/31/2019	197.08	196.75	196.80	196.45	196.44	196.53	196.52	196.88	196.87
6/30/2019	198.40	197.26	197.32	196.80	196.79	196.82	196.81	197.06	197.05
9/30/2019	199.83	197.76	197.85	197.16	197.15	197.12	197.11	197.24	197.23
12/31/2019	200.34	198.27	198.38	197.51	197.50	197.41	197.40	197.42	197.41
3/31/2020	199.75	198.77	198.91	197.86	197.86	197.71	197.70	197.60	197.59
6/30/2020	197.76	199.28	199.44	198.21	198.21	198.00	198.00	197.78	197.77
9/30/2020	195.97	199.78	199.97	198.56	198.57	198.30	198.29	197.96	197.95
12/31/2020	194.84	200.29	200.50	198.91	198.93	198.59	198.59	198.14	198.13
Annual Trend		1.0%	1.1%	0.7%	0.7%	0.6%	0.6%	0.4%	0.4%
R-Squared		0.953	0.952	0.632	0.636	0.399	0.401	0.102	0.102

Notes:

(2) = Weighted average of CPI for Lodging, Apparel, Furnishings, and Medical Care

(3) - (10) = (2) fitted to linear and exponential distributions

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Development of LAE factor Using TWIA Commercial + Residential Experience

Accident Year	Projected Ultimate Loss	Projected Ultimate LAE	Ultimate LAE to Loss Ratio	Hurricane Indicator
(1)	(2)	(3)	(4)	(5)
1980	12,911	1,318	0.102	H
1981	2,512	543	0.216	
1982	796	565	0.710	
1983	148,999	9,127	0.061	H
1984	999	324	0.324	
1985	512	297	0.580	
1986	881	505	0.573	H
1987	1,897	1,056	0.557	
1988	1,160	357	0.308	
1989	12,296	3,528	0.287	H
1990	335	225	0.672	
1991	1,217	729	0.599	
1992	489	554	1.133	
1993	3,375	1,375	0.407	
1994	679	507	0.747	
1995	2,977	903	0.303	
1996	1,166	582	0.499	
1997	2,964	1,343	0.453	
1998	22,401	4,732	0.211	
1999	8,773	2,388	0.272	H
2000	6,227	1,885	0.303	
2001	24,605	1,880	0.076	
2002	5,167	5,226	1.011	
2003	155,001	5,122	0.033	H
2004	5,167	1,471	0.285	
2005	154,981	20,235	0.131	H
2006	4,276	1,110	0.260	
2007	15,745	4,941	0.314	H
2008	2,583,017	346,615	0.134	H
2009	10,407	2,219	0.213	
2010	18,005	4,274	0.237	
2011	96,073	15,108	0.157	
2012	67,488	15,831	0.235	
2013	70,813	13,824	0.195	
2014	7,007	6,822	0.974	
2015	138,456	39,911	0.288	
2016	28,372	15,404	0.543	
2017	1,431,367	286,243	0.200	H
2018	11,949	6,729	0.563	
2019	17,428	9,193	0.527	
2020	85,005	31,704	0.373	H
All Years Total	5,163,895	866,705	0.168	
Hurricane Years Total	4,608,976	711,726	0.154	
Non-Hurricane Years				
Total	554,919	154,979	0.279	
10 Year	465,998	129,315	0.278	

Notes:
(2) Exhibit 4, Sheet 2
(3) Exhibit 4, Sheet 4
(4) = (3) / (2)
(5) "H" indicates hurricane year

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Ultimate Loss (TWIA All Lines)

Accident Year	Incurred Loss at 12/31/20	Development Factor	Indicated Ultimate Loss
(1)	(2)	(3)	(4)
1980			12,911
1981			2,512
1982			796
1983			148,999
1984			999
1985			512
1986			881
1987			1,897
1988			1,160
1989			12,296
1990			335
1991			1,217
1992			489
1993			3,375
1994			679
1995			2,977
1996			1,166
1997			2,964
1998			22,401
1999			8,773
2000			6,227
2001			24,605
2002			5,167
2003			155,001
2004			5,167
2005			154,981
2006			4,276
2007			15,745
2008			2,583,017
2009			10,407
2010			18,005
2011			96,073
2012	67,488	1.000	67,488
2013	70,813	1.000	70,813
2014	7,007	1.000	7,007
2015	138,733	0.998	138,456
2016	28,457	0.997	28,372
2017	1,447,150	0.989	1,431,367
2018	12,193	0.980	11,949
2019	17,949	0.971	17,428
2020	87,095	0.976	85,005

Notes:

(2) Exhibit 4, Sheet 3

(3) Exhibit 4, Sheet 3

(4) 2012 - 2020: (2) * (3); 1980 - 2011: from prior TWIA annual statements

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Incurred Loss Development Factors
TWIA Schedule P Incurred Loss (Including IBNR)

Months of Development

Accident Year	12	24	36	48	60	72	84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2011	94,870	96,967	97,503	96,828	96,263	95,964	96,073
2012	62,722	69,764	67,287	66,724	66,328	67,658	67,488
2013	77,204	75,204	72,860	71,823	71,286	71,068	70,813
2014	6,739	7,854	7,298	7,261	7,068	7,012	7,007
2015	147,927	139,955	140,459	139,777	138,801	138,733	
2016	31,292	29,612	28,908	28,523	28,457		
2017	1,278,467	1,373,877	1,445,588	1,447,150			
2018	13,197	12,326	12,193				
2019	18,155	17,949					
2020	87,095						

Development Factors

Accident Year	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - Ult
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2011	1.022	1.006	0.993	0.994	0.997	1.001	
2012	1.112	0.964	0.992	0.994	1.020	0.997	
2013	0.974	0.969	0.986	0.993	0.997	0.996	
2014	1.165	0.929	0.995	0.973	0.992	0.999	
2015	0.946	1.004	0.995	0.993	1.000		
2016	0.946	0.976	0.987	0.998			
2017	1.075	1.052	1.001				
2018	0.934	0.989					
2019	0.989						
Average	1.018	0.986	0.993	0.991	1.001	0.999	
Avg x hi / lo	1.009	0.985	0.992	0.993	0.998	0.998	
Avg 3 Year	0.999	1.006	0.994	0.988	0.996	0.998	
Avg 5 Year	0.978	0.990	0.993	0.990	1.001	0.999	
Prior	1.023	0.990	0.993	0.990	1.000	0.997	1.000
Selected	1.005	0.991	0.993	0.990	0.999	0.998	1.000
Cumulative	0.976	0.971	0.980	0.987	0.997	0.998	1.000

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Ultimate LAE (TWIA All Lines)

Accident Year	Incurred ALAE at 12/31/20	Development Factor	Indicated Ultimate ALAE	Incurred ULAE	Incurred LAE
(1)	(2)	(3)	(4)	(5)	(6)
1980					1,318
1981					543
1982					565
1983					9,127
1984					324
1985					297
1986			270	235	505
1987			652	404	1,056
1988			235	122	357
1989			2,727	801	3,528
1990			119	106	225
1991			403	326	729
1992			270	284	554
1993			806	569	1,375
1994			192	315	507
1995			698	205	903
1996			355	227	582
1997			892	451	1,343
1998			3,920	812	4,732
1999			1,757	631	2,388
2000			1,209	676	1,885
2001			1,207	673	1,880
2002			3,643	1,583	5,226
2003			3,239	1,883	5,122
2004			844	627	1,471
2005			15,229	5,006	20,235
2006			860	250	1,110
2007			2,489	2,452	4,941
2008	99,668	1.000	99,668	246,947	346,615
2009	223	1.000	223	1,996	2,219
2010	323	1.000	323	3,951	4,274
2011	725	1.000	725	14,383	15,108
2012	868	1.000	868	14,963	15,831
2013	901	1.000	901	12,923	13,824
2014	1,026	1.000	1,026	5,796	6,822
2015	2,838	0.977	2,773	37,138	39,911
2016	542	0.964	522	14,882	15,404
2017	21,700	0.969	21,027	265,216	286,243
2018	352	1.029	362	6,367	6,729
2019	471	1.222	576	8,617	9,193
2020	295	1.833	541	31,163	31,704

Notes:

(2) Exhibit 4, Sheet 5
(3) Exhibit 4, Sheet 5
(4) 2008 - 2020: (2) * (3); 1986 - 2007: from TWIA's annual statements
(5) From TWIA's annual statements
(6) 1986 - 2020: (4) + (5); prior years from prior TWIA annual statements

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Incurred ALAE Development Factors
TWIA Schedule P Incurred ALAE (Including IBNR)

Accident Year	Months of Development 12	24	36	48	60	72	84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2010	391	312	322	316	335	324	323
2011	515	592	609	682	629	745	725
2012	516	679	719	632	917	880	868
2013	802	806	715	1,089	991	971	901
2014	516	493	1,085	1,266	1,077	1,028	1,026
2015	973	1,818	2,355	2,749	2,944	2,838	
2016	412	678	746	571	542		
2017	891	16,490	21,865	21,700			
2018	301	361	352				
2019	48	471					
2020	295						

Accident Year	Development Factors 12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - Ult
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2010	0.798	1.032	0.981	1.060	0.967	0.997	
2011	1.150	1.029	1.120	0.922	1.184	0.973	
2012	1.316	1.059	0.879	1.451	0.960	0.986	
2013	1.005	0.887	1.523	0.910	0.980	0.928	
2014	0.955	2.201	1.167	0.851	0.955	0.998	
2015	1.868	1.295	1.167	1.071	0.964		
2016	1.646	1.100	0.765	0.949			
2017	18.507	1.326	0.992				
2018	1.199	0.975					
2019	9.813						
Average	3.83	1.21	1.07	1.03	1.00	0.98	
Avg x hi / lo	2.37	1.12	1.05	0.98	0.97	0.99	
Avg 3 Year	9.84	1.13	0.98	0.96	0.97	0.97	
Avg 5 Year	6.61	1.38	1.12	1.05	1.01	0.98	
Prior	1.20	1.10	1.08	1.01	0.99	0.97	1.00
Selected	1.50	1.19	1.06	1.01	0.99	0.98	1.00
Cumulative	1.83	1.22	1.03	0.97	0.96	0.98	1.00

Texas Windstorm Insurance Association Exhibit 5
Residential Property - Wind & Hail
Rate Level Review
Summary of Indicated Hurricane Loss & LAE Ratios

Basis for Hurricane Loss Ratio	Indicated Loss Ratio	LAE Factor	Indicated Loss & LAE Ratio
(1)	(2)	(3)	(4)
Industry Experience	36.0%	0.154	41.5%
Hurricane Models			
AIR Model	50.5%	0.154	58.3%
RMS Model	39.9%	0.154	46.0%
Average of Models	45.2%	0.154	52.2%

Notes:
(2) Exhibit 6 - Exhibit 8, Sheet 1
(3) Exhibit 4, Sheet 1
(4) = (2) * [1 + (3)]

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Industry Experience -- Residential Extended Coverage
1966 - 2020 -- Hurricane Years Only

Accident Year	Earned Premium at Current TWIA Rate Level	Number of Hurricanes During the Year	Hurricane Year Incurred Loss Ratio	Per Hurricane Loss Ratio
	(1)	(2)	(3)	(4)
1968	27,851,584	1	40.1%	29.7%
1970	28,411,573	1	73.2%	62.8%
1971	28,313,684	1	80.3%	69.9%
1980	48,089,878	1	74.8%	64.4%
1983	61,754,514	1	537.3%	526.9%
1986	78,674,586	1	11.2%	0.8%
1989	94,668,450	2	8.0%	0.0%
1999	175,094,688	1	8.8%	0.0%
2003	225,873,236	1	19.8%	9.4%
2005	248,665,748	1	110.5%	100.1%
2007	384,632,941	1	5.0%	0.0%
2008	477,636,241	2	424.2%	206.9%
2017	559,948,822	1	218.5%	208.1%
2020	502,850,592	3	14.1%	1.2%
Simple Average Loss Ratio for Hurricane Years			116.1%	91.4%

(5)	Selected Non-Hurricane Loss Ratio	10.4%	
(6) a	Average Hurricane Loss Ratio per Hurricane	91.4%	
(6) b	Selected Average Hurricane Loss Ratio Per Hurricane	91.4%	
(7)	Historical Hurricane Frequency		
	(a) 55-Year (1/1/1966 - 12/31/2020)	0.327	(1 Hurricane Every 3.1 years)
	(a) 170-Year (1/1/1851 - 12/31/2020)	0.394	(1 Hurricane Every 2.5 years)
	Selected Frequency	0.394	(1 Hurricane Every 2.5 years)
(8)	Indicated Hurricane Loss Ratio	36.0%	

Notes:
(1) Exhibit 6, Sheet 2. Accident years ending 9/30/xx
(3) Exhibit 6, Sheet 2. Accident years ending 9/30/xx
(4) = MAX((3)-(5),0)/(2)
(5) Exhibit 6, Sheet 2
(6) a= Average of (4)
(6) b = Selected
(7) Exhibit 9
(8) = (6) b * (7) Selected

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Industry Experience -- Residential Extended Coverage
1966 - 2020

Accident Year	Earned Premium	Earned Premium at CMR	Earned Premium at Current TWIA Rate Level	Incurred Losses	Incurred Loss Ratio	Hurricane Indicator
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1966		13,011,528	27,913,364	1,178,131	4.2%	
1967		13,130,860	28,169,364	663,024	2.4%	
1968		12,982,730	27,851,584	11,171,683	40.1%	H
1969		12,499,176	26,814,226	3,218,757	12.0%	
1970		13,243,763	28,411,573	20,786,468	73.2%	H
1971	10,640,335	13,198,133	28,313,684	22,731,206	80.3%	H
1972	12,302,040	13,902,740	29,825,263	2,242,093	7.5%	
1973	12,935,382	12,724,690	27,298,016	4,933,261	18.1%	
1974	12,794,652	11,637,700	24,966,119	2,293,219	9.2%	
1975	13,633,616	12,392,309	26,584,966	3,062,897	11.5%	
1976	17,088,846	13,884,831	29,786,843	1,522,489	5.1%	
1977	23,643,216	17,474,220	37,487,085	972,383	2.6%	
1978	28,157,329	19,320,941	41,448,818	1,449,823	3.5%	
1979	32,867,536	21,563,567	46,259,877	3,940,899	8.5%	
1980	32,179,994	22,416,603	48,089,878		74.8%	H
1981	30,817,037	29,693,419	63,700,682		3.2%	
1982	28,140,159	32,398,474	69,503,781		2.3%	
1983	28,786,234		61,754,514		537.3%	H
1984	20,078,668		43,074,354		14.6%	
1985	30,043,452		64,451,601		6.3%	
1986	36,673,352		78,674,586		11.2%	H
1987	41,598,709		89,240,856		2.9%	
1988	45,044,392		99,314,293		11.9%	
1989	41,745,774		94,668,450		8.0%	H
1990	40,384,195		90,182,909		20.2%	
1991	46,237,137		90,400,844		93.3%	
1992	44,512,572		107,296,089		6.8%	
1993	50,741,120		168,782,896		8.1%	
1994	57,584,585		169,445,141		4.3%	
1995	60,740,049		158,871,316		6.7%	
1996	71,865,572		169,174,051		3.8%	
1997	79,154,547		186,332,552		4.7%	
1998	80,238,260		188,694,953		21.3%	
1999	71,026,552		175,094,688		8.8%	H
2000	75,114,174		186,657,904		5.0%	
2001	74,726,401		163,169,890		6.8%	
2002	86,289,350		173,710,570		17.3%	
2003	112,200,741		225,873,236		19.8%	H
2004	123,050,217		236,207,042		1.7%	
2005	135,380,924		248,665,748		110.5%	H
2006	154,699,767		283,468,384		2.0%	
2007	219,914,305		384,632,941		5.0%	H
2008	289,558,186		477,636,241		424.2%	H
2009	327,305,758		490,534,995		1.9%	
2010	355,219,215		499,964,244		3.8%	
2011	370,875,863		509,107,482		18.2%	
2012	406,981,851		532,077,164		13.7%	
2013	440,952,159		549,111,155		17.6%	
2014	477,983,216		567,000,312		2.3%	
2015	517,579,765		584,847,630		24.1%	
2016	541,982,800		583,476,869		8.6%	
2017	533,284,592		559,948,822		218.5%	H
2018	516,732,311		529,931,693		3.6%	
2019	509,685,524		509,685,524		6.8%	
2020	502,850,592		502,850,592		14.1%	H
Total / Average	7,874,023,023	285,475,684	11,446,437,655		37.3%	
Average of Non-Hurricane Years					10.4%	
Selected					10.4%	

Notes: (2), (3) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2020
(4) 1983 - 2020: Sum of Exhibit 6, Sheet 4 - Sheet 7, (4); 1966 - 1982: (3) * 2.1
(5) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2010
(6) 1983 - 2020: Exhibit 6, Sheet 3; 1966 - 1982: (5) / (4)
(7) "H" indicates occurrence of hurricane(s) during the time period (years ending 9/30/xx)

Texas Windstorm Insurance Association Exhibit 6
Residential Property - Wind & Hail Sheet 3
Rate Level Review
Industry Experience -- Residential Extended Coverage

Loss Ratios by Territory / Tier

Accident Year	Territory 8	Territory 9	Territory 10	Tier 2	Weighted Loss Ratio	Wtd Devel'd Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	1283.6%	7.5%	173.8%	177.2%	537.3%	537.3%
1984	3.9%	7.1%	25.4%	40.4%	14.6%	14.6%
1985	2.0%	8.7%	8.5%	13.5%	6.3%	6.3%
1986	1.3%	3.0%	22.3%	14.8%	11.2%	11.2%
1987	0.7%	4.3%	3.9%	7.7%	2.9%	2.9%
1988	5.8%	7.2%	18.8%	7.6%	11.9%	11.9%
1989	6.3%	6.6%	9.5%	17.7%	8.0%	8.0%
1990	33.9%	12.2%	12.4%	25.0%	20.2%	20.2%
1991	78.2%	17.2%	138.5%	20.6%	93.3%	93.3%
1992	1.3%	12.4%	8.4%	19.0%	6.8%	6.8%
1993	9.8%	8.7%	6.3%	16.9%	8.1%	8.1%
1994	2.0%	5.1%	5.7%	6.7%	4.3%	4.3%
1995	2.8%	8.6%	8.6%	22.5%	6.7%	6.7%
1996	1.5%	5.3%	4.9%	10.0%	3.8%	3.8%
1997	1.9%	4.4%	6.9%	8.5%	4.7%	4.7%
1998	19.6%	11.1%	27.1%	10.4%	21.3%	21.3%
1999	2.1%	18.1%	10.3%	10.4%	8.8%	8.8%
2000	0.8%	2.3%	9.3%	10.5%	5.0%	5.0%
2001	5.0%	7.2%	7.3%	32.8%	6.8%	6.8%
2002	24.4%	5.8%	16.5%	10.6%	17.3%	17.3%
2003	5.1%	8.2%	36.5%	10.3%	19.8%	19.8%
2004	1.3%	1.9%	1.9%	3.9%	1.7%	1.7%
2005	51.1%	2.7%	203.6%	37.2%	110.5%	110.5%
2006	1.0%	1.7%	2.8%	4.9%	2.0%	2.0%
2007	2.7%	1.6%	8.3%	4.9%	5.0%	5.0%
2008	694.6%	2.2%	382.2%	418.4%	424.2%	424.2%
2009	2.9%	0.9%	1.3%	9.4%	1.9%	1.9%
2010	1.2%	5.6%	4.8%	10.9%	3.8%	3.8%
2011	1.0%	27.3%	28.4%	6.0%	18.2%	18.2%
2012	8.3%	28.9%	9.5%	85.0%	13.7%	13.7%
2013	40.7%	9.1%	2.8%	19.6%	17.6%	17.6%
2014	0.5%	2.5%	3.1%	17.7%	2.3%	2.3%
2015	12.7%	12.2%	37.5%	35.1%	24.1%	24.1%
2016	8.3%	12.7%	6.4%	35.9%	8.6%	8.6%
2017	31.2%	343.7%	317.9%	60.8%	217.2%	218.5%
2018	2.5%	2.2%	4.6%	10.5%	3.5%	3.6%
2019	5.3%	1.8%	8.4%	31.9%	6.4%	6.8%
2020	4.5%	3.5%	19.4%	36.6%	11.5%	14.1%
Average	62.2%	16.6%	42.2%	34.8%	44.5%	44.6%

TWIA 2020 Written Premium by Territory / Tier

		Territory 8	Territory 9	Territory 10	Tier 2	Total
(8)	Amount	110,461,812	56,782,746	139,598,381	4,478,381	311,321,320
(9)	% Share	35.5%	18.2%	44.8%	1.4%	100.0%

Notes:

(2) Exhibit 6, Sheet 4
(3) Exhibit 6, Sheet 5
(4) Exhibit 6, Sheet 6
(5) Exhibit 6, Sheet 7
(6) = Weighted average of (2) to (5), using (9)
(7) = (6) * loss development factors from Exhibit 3.1b
(8) Provided by TWIA
(9) = (8) / (8) Total

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Industry Experience -- Residential Extended Coverage
Tier 1 -- Territory 8 (Galveston County)

Accident Year	Earned Premium	Factor to TWIA Rate Level	Earned Premium at Current TWIA Rate Level	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)
1983	4,317,605	2.145	9,262,469	118,889,570	1283.6%
1984	3,512,853	2.145	7,536,051	292,543	3.9%
1985	6,066,870	2.145	13,015,132	265,705	2.0%
1986	6,846,710	2.145	14,688,106	187,218	1.3%
1987	7,738,740	2.145	16,601,760	111,242	0.7%
1988	8,043,378	2.205	17,734,115	1,026,666	5.8%
1989	8,149,957	2.268	18,481,961	1,163,813	6.3%
1990	7,816,199	2.233	17,454,540	5,908,943	33.9%
1991	8,645,208	1.955	16,902,736	13,225,287	78.2%
1992	5,826,467	2.410	14,044,506	180,484	1.3%
1993	5,825,916	3.326	19,379,055	1,900,088	9.8%
1994	6,996,874	2.943	20,588,605	420,038	2.0%
1995	8,737,576	2.616	22,853,953	644,169	2.8%
1996	11,652,672	2.354	27,430,795	406,004	1.5%
1997	12,573,252	2.354	29,597,872	573,343	1.9%
1998	13,838,930	2.352	32,544,777	6,371,206	19.6%
1999	14,103,814	2.465	34,768,730	742,130	2.1%
2000	15,784,218	2.485	39,223,609	324,948	0.8%
2001	17,776,666	2.184	38,816,490	1,947,817	5.0%
2002	20,514,469	2.013	41,298,029	10,059,284	24.4%
2003	25,868,450	2.013	52,076,220	2,672,918	5.1%
2004	30,357,860	1.920	58,274,910	731,759	1.3%
2005	36,780,457	1.837	67,557,818	34,527,644	51.1%
2006	43,562,211	1.832	79,822,419	813,430	1.0%
2007	59,282,257	1.749	103,685,428	2,757,645	2.7%
2008	73,789,694	1.650	121,718,652	845,466,768	694.6%
2009	81,999,709	1.499	122,893,429	3,581,024	2.9%
2010	89,665,314	1.407	126,202,213	1,451,547	1.2%
2011	93,230,854	1.373	127,979,548	1,329,886	1.0%
2012	99,629,727	1.307	130,253,235	10,756,644	8.3%
2013	107,104,250	1.245	133,375,327	54,322,555	40.7%
2014	114,784,032	1.186	136,160,810	691,708	0.5%
2015	122,782,019	1.130	138,739,529	17,655,480	12.7%
2016	127,007,324	1.077	136,730,973	11,304,270	8.3%
2017	126,002,753	1.050	132,302,891	41,316,273	31.2%
2018	122,707,170	1.026	125,841,595	3,199,518	2.5%
2019	121,980,686	1.000	121,980,686	6,499,306	5.3%
2020	121,816,746	1.000	121,816,746	5,435,871	4.5%
Total	1,793,119,887		2,489,635,720	1,209,154,744	48.6%

Notes:
(2) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2020
(3) 1987 and prior judgementally selected; 1988 - 2020 based on TWIA on-level factors
(4) = (2) * (3)
(5) Provided by TDI. Accidn't yrs ending 9/30/xx as of 12/31/2020; 2008 IKE incurred loss was adjusted down by $206,858,309 to incorporate the statutory limitations on litigation cost that House Bill 3 provides
(6) = (5) / (4)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Industry Experience -- Residential Extended Coverage
Tier 1 -- Territory 9 (Nueces County)

Accident Year	Earned Premium	Factor to TWIA Rate Level	Earned Premium at Current TWIA Rate Level	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)
1983	2,331,938	2.145	5,002,659	377,010	7.5%
1984	1,632,317	2.145	3,501,776	249,086	7.1%
1985	2,505,564	2.145	5,375,135	467,721	8.7%
1986	2,977,992	2.145	6,388,625	189,449	3.0%
1987	3,639,667	2.145	7,808,103	335,212	4.3%
1988	3,971,251	2.205	8,755,851	626,491	7.2%
1989	3,702,536	2.268	8,396,379	550,215	6.6%
1990	3,519,306	2.233	7,859,046	955,271	12.2%
1991	4,065,190	1.955	7,948,083	1,367,254	17.2%
1992	3,907,712	2.410	9,419,410	1,170,578	12.4%
1993	4,552,395	3.326	15,142,873	1,312,776	8.7%
1994	5,710,806	2.943	16,804,295	856,369	5.1%
1995	6,908,552	2.616	18,069,967	1,552,987	8.6%
1996	8,568,168	2.354	20,169,765	1,061,115	5.3%
1997	8,425,344	2.354	19,833,553	882,561	4.4%
1998	8,803,621	2.352	20,703,327	2,289,890	11.1%
1999	8,465,256	2.465	20,868,552	3,778,386	18.1%
2000	8,437,094	2.485	20,966,087	485,581	2.3%
2001	8,894,552	2.184	19,421,824	1,394,445	7.2%
2002	10,534,795	2.013	21,207,776	1,227,528	5.8%
2003	13,881,847	2.013	27,945,784	2,295,803	8.2%
2004	15,458,506	1.920	29,674,129	569,877	1.9%
2005	17,471,646	1.837	32,091,670	872,451	2.7%
2006	19,888,512	1.832	36,443,263	621,501	1.7%
2007	29,704,042	1.749	51,952,751	833,793	1.6%
2008	40,565,108	1.650	66,913,548	1,468,028	2.2%
2009	46,363,445	1.499	69,485,158	615,469	0.9%
2010	51,529,115	1.407	72,526,243	4,059,049	5.6%
2011	52,931,755	1.373	72,660,303	19,845,538	27.3%
2012	56,334,273	1.307	73,649,919	21,291,155	28.9%
2013	60,101,696	1.245	74,843,747	6,825,640	9.1%
2014	65,642,137	1.186	77,866,986	1,914,066	2.5%
2015	72,124,134	1.130	81,497,832	9,924,249	12.2%
2016	76,436,084	1.077	82,288,012	10,445,691	12.7%
2017	77,008,517	1.050	80,858,943	277,935,210	343.7%
2018	77,031,486	1.026	78,999,174	1,730,171	2.2%
2019	76,506,580	1.000	76,506,580	1,379,885	1.8%
2020	73,290,167	1.000	73,290,167	2,574,708	3.5%
Total	1,033,823,105		1,423,137,294	386,332,209	27.1%

Notes:

(2) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2020
(3) 1987 and prior judgementally selected; 1988 - 2020 based on TWIA on-level factors
(4) = (2) * (3)
(5) Provided by TDI. Accidn't yrs ending 9/30/xx as of 12/31/2020
(6) = (5) / (4)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Industry Experience -- Residential Extended Coverage
Tier 1 -- Territory 10 (Other Tier 1)

Accident Year	Earned Premium	Factor to TWIA Rate Level	Earned Premium at Current TWIA Rate Level	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)
1983	5,888,781	2.145	12,633,081	21,953,626	173.8%
1984	3,924,651	2.145	8,419,473	2,135,063	25.4%
1985	5,808,825	2.145	12,461,553	1,055,065	8.5%
1986	6,993,722	2.145	15,003,488	3,338,312	22.3%
1987	7,677,374	2.145	16,470,113	634,637	3.9%
1988	8,284,768	2.205	18,266,334	3,434,130	18.8%
1989	7,733,295	2.268	17,537,081	1,670,422	9.5%
1990	7,568,146	2.233	16,900,607	2,095,151	12.4%
1991	8,287,605	1.955	16,203,566	22,444,044	138.5%
1992	8,059,407	2.410	19,426,934	1,625,108	8.4%
1993	8,448,603	3.326	28,103,041	1,776,572	6.3%
1994	9,743,293	2.943	28,670,063	1,637,915	5.7%
1995	10,745,995	2.616	28,107,161	2,416,675	8.6%
1996	13,294,968	2.354	31,296,817	1,520,229	4.9%
1997	15,708,220	2.354	36,977,695	2,569,544	6.9%
1998	16,168,136	2.352	38,022,331	10,312,506	27.1%
1999	14,452,667	2.465	35,628,721	3,655,754	10.3%
2000	14,453,385	2.485	35,916,504	3,332,580	9.3%
2001	15,173,521	2.184	33,132,357	2,426,814	7.3%
2002	17,843,905	2.013	35,921,871	5,925,066	16.5%
2003	23,423,208	2.013	47,153,662	17,213,668	36.5%
2004	27,306,202	1.920	52,416,951	990,613	1.9%
2005	31,012,304	1.837	56,962,957	115,989,785	203.6%
2006	36,545,725	1.832	66,965,567	1,842,548	2.8%
2007	69,945,120	1.749	122,334,912	10,105,722	8.3%
2008	110,187,567	1.650	181,758,202	694,640,836	382.2%
2009	128,275,387	1.499	192,247,050	2,522,159	1.3%
2010	143,236,007	1.407	201,601,937	9,656,553	4.8%
2011	151,387,931	1.373	207,812,737	59,069,922	28.4%
2012	170,159,709	1.307	222,462,243	21,191,208	9.5%
2013	183,495,510	1.245	228,504,225	6,484,481	2.8%
2014	197,640,983	1.186	234,448,607	7,234,983	3.1%
2015	212,320,998	1.130	239,915,547	90,027,756	37.5%
2016	218,795,204	1.077	235,546,111	15,013,827	6.4%
2017	212,533,686	1.050	223,160,370	709,453,537	317.9%
2018	201,509,514	1.026	206,656,862	9,575,293	4.6%
2019	194,433,202	1.000	194,433,202	16,355,744	8.4%
2020	186,264,517	1.000	186,264,517	36,217,836	19.4%
Total	2,704,732,042		3,585,744,452	1,919,545,684	53.5%

Notes:
(2) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2020
(3) 1987 and prior judgementally selected; 1988 - 2020 based on TWIA on-level factors
(4) = (2) * (3)
(5) Provided by TDI. Accidn't yrs ending 9/30/xx as of 12/31/2020
(6) = (5) / (4)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Industry Experience -- Residential Extended Coverage
Tier 2 -- (Territories 1 and 11)

Accident Year	Earned Premium	Factor to TWIA Rate Level	Earned Premium at Current TWIA Rate Level	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)
1983	16,247,909	2.145	34,856,305	61,752,490	177.2%
1984	11,008,847	2.145	23,617,053	9,535,536	40.4%
1985	15,662,193	2.145	33,599,781	4,532,749	13.5%
1986	19,854,927	2.145	42,594,367	6,306,903	14.8%
1987	22,542,928	2.145	48,360,880	3,739,010	7.7%
1988	24,744,994	2.205	54,557,993	4,139,098	7.6%
1989	22,159,987	2.268	50,253,028	8,884,751	17.7%
1990	21,480,544	2.233	47,968,715	11,997,188	25.0%
1991	25,239,134	1.955	49,346,460	10,178,608	20.6%
1992	26,718,987	2.410	64,405,238	12,221,034	19.0%
1993	31,914,206	3.326	106,157,928	17,910,197	16.9%
1994	35,133,612	2.943	103,382,178	6,968,697	6.7%
1995	34,347,927	2.616	89,840,236	20,240,594	22.5%
1996	38,349,764	2.354	90,276,675	9,046,495	10.0%
1997	42,447,731	2.354	99,923,431	8,514,675	8.5%
1998	41,427,572	2.352	97,424,518	10,127,907	10.4%
1999	34,004,815	2.465	83,828,685	8,680,187	10.4%
2000	36,439,477	2.485	90,551,704	9,518,422	10.5%
2001	32,881,662	2.184	71,799,219	23,547,404	32.8%
2002	37,396,181	2.013	75,282,893	7,950,367	10.6%
2003	49,027,236	2.013	98,697,570	10,177,909	10.3%
2004	49,927,649	1.920	95,841,052	3,738,542	3.9%
2005	50,116,517	1.837	92,053,303	34,201,898	37.2%
2006	54,703,319	1.832	100,237,135	4,909,932	4.9%
2007	60,982,886	1.749	106,659,850	5,242,698	4.9%
2008	65,015,817	1.650	107,245,838	448,708,416	418.4%
2009	70,667,217	1.499	105,909,359	9,952,501	9.4%
2010	70,788,779	1.407	99,633,851	10,829,031	10.9%
2011	73,325,323	1.373	100,654,894	5,993,038	6.0%
2012	80,858,142	1.307	105,711,768	89,889,612	85.0%
2013	90,250,703	1.245	112,387,856	22,065,904	19.6%
2014	99,916,064	1.186	118,523,910	20,930,082	17.7%
2015	110,352,614	1.130	124,694,722	43,786,734	35.1%
2016	119,744,188	1.077	128,911,773	46,335,724	35.9%
2017	117,739,636	1.050	123,626,618	75,108,251	60.8%
2018	115,484,141	1.026	118,434,062	12,448,123	10.5%
2019	116,765,056	1.000	116,765,056	37,215,741	31.9%
2020	121,479,162	1.000	121,479,162	44,441,912	36.6%
Total	2,087,147,845		3,335,495,066	1,181,768,360	35.4%

Notes:
(2) Provided by TDI. Accident years ending 9/30/xx as of 12/31/2020
(3) 1987 and prior judgementally selected; 1988 - 2020 based on TWIA on-level factors
(4) = (2) * (3)
(5) Provided by TDI. Accidn't yrs ending 9/30/xx as of 12/31/2020
(6) = (5) / (4)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Hurricane Loss Ratio -- AIR Model

County	TWIA Insured Values (000s) as of 11/30/20	Modeled Loss Cost	Expected Annual Hurricane Loss
(1)	(2)	(3)	(4)
Aransas	1,641,086	2.529	4,150,306
Brazoria	9,184,245	1.760	16,164,271
Calhoun	928,096	3.055	2,835,333
Cameron	2,026,672	1.803	3,654,090
Chambers	1,413,194	1.617	2,285,135
Galveston	19,194,216	4.086	78,427,567
Harris	1,145,896	3.926	4,498,788
Jefferson	6,116,468	1.995	12,202,354
Kenedy	6,205	0.802	4,976
Kleberg	173,966	0.942	163,876
Matagorda	1,107,032	2.719	3,010,020
Nueces	10,012,218	2.597	26,001,730
Refugio	78,870	1.491	117,595
San Patricio	1,593,039	1.921	3,060,228
Willacy	79,020	2.073	163,808
Total	54,700,223	2.951	156,740,077
(5) Inforce-Premium as of 11/30/20 at Present Rates			310,647,523
(6) Indicated Hurricane Loss Ratio			50.5%

Notes:
(2) Provided by TWIA
(3) Exhibit 7, Sheet 2
(4) = (2) * (3)
(5) Provided by TWIA
(6) = (4) Total / (5)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
AIR Simulated Hurricane Results

County	TWIA Insured Values (000s) as of 11/30/20	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	1,641,086	4,150,548	2.529
Brazoria	9,184,245	16,162,522	1.760
Calhoun	928,096	2,835,323	3.055
Cameron	2,026,672	3,653,867	1.803
Chambers	1,413,194	2,285,500	1.617
Galveston	19,194,216	78,419,240	4.086
Harris	1,145,896	4,498,400	3.926
Jefferson	6,116,468	12,202,287	1.995
Kenedy	6,205	4,978	0.802
Kleberg	173,966	163,864	0.942
Matagorda	1,107,032	3,010,414	2.719
Nueces	10,012,218	26,000,396	2.597
Refugio	78,870	117,626	1.491
San Patricio	1,593,039	3,059,625	1.921
Willacy	79,020	163,797	2.073
Total	54,700,223	156,728,387	2.865

Notes:
(2) Provided by TWIA and Geo-coded by AIR
(3) Provided by AIR
(4) = (3) / (2)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Hurricane Loss Ratio -- RMS Model

County	TWIA Insured Values (000s) as of 11/30/20	Modeled Loss Cost	Expected Annual Hurricane Loss
(1)	(2)	(3)	(4)
Aransas	1,641,086	1.938	3,180,425
Brazoria	9,184,245	1.638	15,043,793
Calhoun	928,096	3.212	2,981,044
Cameron	2,026,672	2.114	4,284,385
Chambers	1,413,194	1.483	2,095,767
Galveston	19,194,216	2.967	56,949,239
Harris	1,145,896	2.732	3,130,588
Jefferson	6,116,468	1.819	11,125,855
Kenedy	6,205	1.355	8,408
Kleberg	173,966	1.411	245,466
Matagorda	1,107,032	2.662	2,946,919
Nueces	10,012,218	1.877	18,792,933
Refugio	78,870	1.800	141,966
San Patricio	1,593,039	1.680	2,676,306
Willacy	79,020	2.663	210,430
Total	54,700,223	2.263	123,813,524
(5) Inforce-Premium as of 11/30/20 at Present Rates			310,647,523
(6) Indicated Hurricane Loss Ratio			39.9%

Notes:
(2) Provided by TWIA
(3) Exhibit 8, Sheet 2
(4) = (2) * (3)
(5) Provided by TWIA
(6) = (4) Total / (5)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
RMS Simulated Hurricane Results

County	TWIA Insured Values (000s) as of 11/30/20	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	1,641,086	3,179,890	1.938
Brazoria	9,184,245	15,043,622	1.638
Calhoun	928,096	2,980,955	3.212
Cameron	2,026,672	4,284,175	2.114
Chambers	1,413,194	2,095,504	1.483
Galveston	19,194,216	56,954,328	2.967
Harris	1,145,896	3,130,621	2.732
Jefferson	6,116,468	11,125,002	1.819
Kenedy	6,205	8,407	1.355
Kleberg	173,966	245,462	1.411
Matagorda	1,107,032	2,947,075	2.662
Nueces	10,012,218	18,793,731	1.877
Refugio	78,870	141,934	1.800
San Patricio	1,593,039	2,676,706	1.680
Willacy	79,020	210,409	2.663
Total	54,700,223	123,817,821	2.264

Notes:
(2) Provided by TWIA and Geo-coded by RMS
(3) Provided by RMS
(4) = (3) / (2)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Texas Hurricanes 1850 - 2020

Exhibit 9

Landfall Year	Month	Name
	(1)	(2)
1851	Jun	
1854	Jun	
1854	Sep	“Matagorda”
1865	Sep	“Sabine River-Lake Calcasieu”
1866	Jul	
1867	Oct	“Galveston”
1869	Aug	“Lower Texas Coast"
1875	Sep	
1879	Aug	
1880	Aug	
1882	Sep	
1886	Jun	
1886	Aug	“Indianola”
1886	Sep	
1886	Oct	
1887	Sep	
1888	Jun	
1891	Jul	
1895	Aug	
1897	Sep	
1900	Sep	“Galveston”
1909	Jun	
1909	Jul	“Velasco”
1909	Aug	
1910	Sep	
1912	Oct	
1913	Jun	
1915	Aug	“Galveston”
1916	Aug	
1919	Sep	
1921	Jun	
1929	Jun	
1932	Aug	“Freeport”
1933	Aug	
1933	Sep	
1934	Jul	
1936	Jun	
1940	Aug	
1941	Sep	
1942	Aug	
1942	Aug	
1943	Jul	
1945	Aug	
1947	Aug	
1949	Oct	
1957	Jun	Audrey
1959	Jul	Debra
1961	Sep	Carla
1963	Sep	Cindy
1967	Sep	Beulah
1970	Aug	Celia
1971	Sep	Fern
1980	Aug	Allen
1983	Aug	Alicia
1986	Jun	Bonnie
1989	Aug	Chantal
1989	Oct	Jerry
1999	Aug	Bret
2003	Jul	Claudette
2005	Sep	Rita
2007	Sep	Humberto
2008	Jul	Dolly
2008	Sep	Ike
2017	Aug	Harvey
2020	Jul	Hanna
2020	Aug	Laura
2020	Oct	Delta

Frequency	Date Period	Hurricanes	Period	Annual Frequency
55-Year	1/1/1966 - 12/31/2020	18	55	0.327
170-Year	1/1/1851 - 12/31/2020	67	170	0.394

Notes:
(1), (2) from NOAA Technical Memorandum NWS-NHC-6, updated with actual experience through 2020

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Calculation of TWIA Earned Premium at Present Rate Level
Tier 1 -- Territory 8 (Galveston County)

Year	TWIA Earned Premium	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2011	92,287,441	1.373	126,684,509
2012	98,605,959	1.307	128,914,788
2013	105,941,027	1.245	131,926,783
2014	113,521,698	1.186	134,663,386
2015	121,221,015	1.130	136,975,647
2016	123,942,872	1.077	133,431,908
2017	120,650,271	1.050	126,682,785
2018	112,717,188	1.026	115,596,430
2019	109,182,096	1.000	109,182,096
2020	108,043,628	1.000	108,043,628
Total	1,106,113,195		1,252,101,960

Notes:
(2) Provided by TWIA
(3) Provided by TWIA
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Calculation of TWIA Earned Premium at Present Rate Level
Tier 1 -- Territory 9 (Nueces County)

Year	TWIA Earned Premium	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2011	50,547,302	1.373	69,387,124
2012	53,841,760	1.307	70,391,274
2013	57,427,564	1.245	71,513,690
2014	62,828,148	1.186	74,528,934
2015	68,716,114	1.130	77,646,885
2016	71,234,774	1.077	76,688,491
2017	69,126,281	1.050	72,582,595
2018	63,899,693	1.026	65,531,943
2019	59,870,593	1.000	59,870,593
2020	57,494,711	1.000	57,494,711
Total	614,986,940		695,636,240

Notes:
(2) Provided by TWIA
(3) Provided by TWIA
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Calculation of TWIA Earned Premium at Present Rate Level
Tier 1 -- Territory 10 (Other Tier 1)

Year	TWIA Earned Premium	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2011	140,621,661	1.373	193,033,699
2012	160,031,435	1.307	209,220,809
2013	173,209,952	1.245	215,695,773
2014	187,152,484	1.186	222,006,785
2015	200,595,693	1.130	226,666,349
2016	200,978,477	1.077	216,365,340
2017	188,554,673	1.050	197,982,407
2018	166,829,909	1.026	171,091,403
2019	151,980,115	1.000	151,980,115
2020	141,633,299	1.000	141,633,299
Total	1,711,587,698		1,945,675,979

Notes:
(2) Provided by TWIA
(3) Provided by TWIA
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Calculation of TWIA Earned Premium at Present Rate Level
Tier 2 -- (Territories 1 and 11)

Year	TWIA Earned Premium	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2011	2,825,372	1.373	3,878,435
2012	3,294,072	1.307	4,306,581
2013	3,672,814	1.245	4,573,701
2014	3,920,276	1.186	4,650,368
2015	4,202,726	1.130	4,748,938
2016	4,436,708	1.077	4,776,381
2017	4,435,808	1.050	4,657,598
2018	4,301,050	1.026	4,410,916
2019	4,296,061	1.000	4,296,061
2020	4,367,811	1.000	4,367,811
Total	39,752,698		44,666,790

Notes:
(2) Provided by TWIA
(3) Provided by TWIA
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Calculation of TWIA Earned Premium at Present Rate Level

Year	Earned Premium at Manual Rates	Factor to Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)
2008	219,412,771	1.650	361,928,954
2009	250,693,788	1.499	375,716,200
2010	273,154,916	1.407	384,460,314
2011	292,239,327	1.373	401,161,797
2012	323,323,869	1.307	422,704,960
2013	346,955,938	1.245	432,059,062
2014	372,022,089	1.186	441,305,539
2015	403,803,905	1.130	456,284,757
2016	405,934,590	1.077	437,012,842
2017	376,421,384	1.050	395,242,454
2018	341,468,875	1.026	350,191,338
2019	322,259,386	1.000	322,259,386
2020	311,420,426	1.000	311,420,426
Total	4,239,111,264		5,091,748,028

Notes:
(2) Provided by TWIA
(3) Based on historical rate changes
(4) = (2) * (3)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Fixed Expenses and Variable Permissible Loss & LAE Ratios

	Expense Category	2018	2019	2020	Selected
(1)	Direct Written Premium	$395,551,679	$372,016,601	$369,600,488	
(2)	Direct Earned Premium	$409,954,258	$381,571,182	$369,179,093	
(3)	Commission				
	$ Amount	$63,280,811	$59,474,929	$59,103,153	
	% of DWP	16.0%	16.0%	16.0%	16.0%
(4)	Other Acquisition				
	$ Amount	$0	$0	$0	
	% of DWP	0.0%	0.0%	0.0%	0.0%
(5)	General Expense				
	Unadjusted $ Amount	$30,687,177	$31,461,936	$31,624,678	
	Adjustments				
	Contribution to Statutory Fund	$0	$0	$0	
	Adjusted $ Amount	30,687,177	31,461,936	31,624,678	
	% of DWP	7.8%	8.5%	8.6%	8.1%
(6)	Taxes, Licenses & Fees				
	$ Amount	$7,590,295	$7,024,246	$6,904,349	
	% of DWP	1.9%	1.9%	1.9%	1.9%
(7)	Reinsurance Expense				18.6%
(8)	Outstanding Class 1 Public Security Repayment				18.6%
(9)	Total Fixed Expenses				45.3%
(10)	Total Variable Expenses				17.9%
(11)	CRTF Contribution & UW Contingency & Uncertainty				5.0%
(12)	Permissible Loss, LAE and Fixed Expense Ratio				77.1%

Notes:
(1) - (6) From TWIA's Statutory Annual Statements and Insurance Expense Exhibits
(7) Exhibit 11, Sheet 2
(8) Outstanding Class 1 Public Security issued in 2014, Security depleted due to Hurricane Harvey;
0.186= Annual principal and interest payment $68.9M/Prospective written premium at present rate$373.3M
$373.3M = TWIA 2020 written premium $369.6M*(1+0.5%)^2; 0.5% from Exhibit 11, sheet 2, (3)
(9) = (5) + (7) + (8)
(10) = (3) + (4) + (6)
(11) CRTF contribution selected judgmentally
(12) = 100% - (10) - (11)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Development of Reinsurer Expense
Using Average of AIR and RMS Hurricane Models

		Combined	Residential	Commercial
(1)	2021 - 2022 Reinsurance Premium	97,899,030	81,437,712	16,461,318
(2a)	Average Annual Loss by Reinsurance Layer (AIR)			
	100% of $1930M XS $2100M	31,044,471	25,927,581	5,116,890
	Total	31,044,471	25,927,581	5,116,890
(2b)	Average Annual Loss by Reinsurance Layer (RMS)			
	100% of $1930M XS $2100M	16,660,779	13,804,742	2,914,358
	Total	16,660,779	13,804,742	2,914,358
(2c)	Selected Total Average Annual Loss	23,852,625	19,866,162	4,015,624
(3)	Annual Exposure Growth	0.5%	0.5%	0.5%
(4)	Prospective Average Annual Loss	23,971,888	19,965,492	4,035,702
(5)	Net Cost of Reinsurance	70,331,359	58,477,396	11,820,261
(6)	TWIA 2020 Earned Premium at Present Rates	371,145,817	311,420,426	59,725,391
(7)	2021 - 2022 TWIA Prospective Earned Premium at Present Rates	373,778,124	313,629,138	60,148,986
(8)	Indicated Reinsurance Expense %	18.8%	18.6%	19.7%

Notes:
(1) From TWIA reinsurance contract effective 6/1/2021 through 5/31/2022
(2a) Provided by Guy Carpenter, based on AIR model using TWIA exposures as of 11/30/2020
(2b) Provided by Guy Carpenter, based on RMS model using TWIA exposures as of 11/30/2020
(2c) Selected equal to the average of the modeled average annual losses
(3) Selected based on projections communicated to reinsurers
(4) = (2c) * [(1+ (3)) ^ 1.000](projected exposure growth from 11/30/2020 to 12/1/2021)
(5) = (1) - (4)*1.15,1.15 is the loading for loss adjustment factor
(6) = Commercial Exhibit 10, Sheet 1 + Residential Exhibit 10, Sheet 2, calendar year ending 12/31/2020
(7) = (6) adjusted for exposure growth trend * [(1+ (3)) ^ 1.417] (projected exposure growth from 7/1/2020 to 12/1/2021)
(8) = (5) / (7)

Texas Windstorm Insurance Association
Residential Property - Wind & Hail
Rate Level Review
Reconciliation of Premium Data to Annual Statement

Exhibit 12

Calendar Year	TWIA Provided Written Premium Commercial	Residential	Total	Annual Statement Gross Written Premium	Difference
(1)	(2)	(3)	(4)	(5)	(6)
1994	10,672,677	15,758,330	26,431,007	26,510,501	(79,494)
1995	12,865,905	19,259,265	32,125,170	32,419,287	(294,117)
1996	15,640,660	24,504,127	40,144,787	40,358,575	(213,788)
1997	16,536,186	25,783,455	42,319,641	42,462,844	(143,203)
1998	16,558,977	27,833,800	44,392,777	44,410,914	(18,137)
1999	17,394,142	27,168,992	44,563,134	44,581,218	(18,084)
2000	17,332,561	29,762,296	47,094,857	48,012,426	(917,569)
2001	17,544,251	36,220,623	53,764,874	54,630,727	(865,853)
2002	24,013,525	48,856,422	72,869,947	72,967,831	(97,884)
2003	29,220,514	58,573,191	87,793,705	87,987,279	(193,574)
2004	31,009,323	71,292,702	102,302,025	102,384,351	(82,326)
2005	35,740,174	78,094,458	113,834,632	113,927,701	(93,069)
2006	76,847,840	119,658,576	196,506,416	196,833,235	(326,819)
2007	110,951,718	203,561,196	314,512,914	315,139,307	(626,393)
2008	98,036,118	232,925,990	330,962,108	331,057,645	(95,537)
2009	111,269,573	269,535,059	380,804,632	382,342,402	(1,537,770)
2010	102,174,680	278,116,922	380,291,602	385,549,582	(5,257,980)
2011	100,017,021	307,494,236	407,511,257	403,748,164	3,763,093
2012	110,524,397	335,795,725	446,320,122	443,479,701	2,840,421
2013	112,904,624	360,838,081	473,742,705	472,739,474	1,003,231
2014	104,642,688	389,333,918	493,976,606	494,036,010	(59,404)
2015	98,715,934	407,969,846	506,685,780	503,824,316	2,861,464
2016	88,278,690	399,074,847	487,353,537	487,353,537	-
2017	70,749,081	352,368,052	423,117,133	423,074,138	42,995
2018	65,696,833	331,676,957	397,373,790	395,551,679	1,822,111
2019	59,123,729	314,907,159	374,030,888	372,016,601	2,014,287
2020	60,327,052	310,312,753	370,639,805	369,600,488	1,039,317
Total	1,614,788,872	5,076,676,978	6,691,465,850	6,686,999,933	4,465,917

Notes:

(2), (3) Provided by TWIA, as of 12/31/2020
(4) = (2) + (3)
(5) Based on TWIA Annual Statements
(6) = (4) - (5)