

# Harvey Refinery Casualties Could Increase

## Eleven more plants vulnerable to prolonged disruption.

**Morningstar Commodities Research**  
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**Data Sources for This Publication**  
Energy Information Administration  
Texas Railroad Commission  
To discover more about the data sources used, [click here](#).

### Crude Supply Concern

Hurricane Harvey has already shuttered seven Texas refineries and Motiva is contemplating closing their 603 thousand barrel/day, or mb/d, plant in Port Arthur, Texas. These closures are already impacting markets with crude prices lower on a perceived drop in demand and gasoline prices spiking in response to lower supply. Although refineries in Corpus Christi, Texas were shut ahead of the storm in anticipation of damage, the bigger concern now is crude supply and product distribution for plants further east in Houston. This note discusses current and potential outages caused by the worst storm in Texas' history.

### Shuttered Today

Existing refinery capacity shuttered as of Monday Aug. 28, 2017 is summarized in Exhibit 1. Seven refineries are currently out of action with U.S. Energy Information Administration reported nameplate capacity of just under 2 million barrels/day or mmb/d. There are also two smaller condensate splitters in Corpus Christi with a capacity of 90 mb/d for a total offline capacity of about 2.1 mmb/d. Based on recent throughput data from the Texas Railroad Commission, or TRRC, we estimate typical throughput at all these plants to be 1.87 mmb/d.

**Exhibit 1** Texas Gulf Coast Refinery Closures

Owner	Location	Typical Crude Throughput	EIA Capacity (mb/cd)
Citgo	Corpus	168	158
Valero	Three Rivers	77	89
ExxonMobil	Baytown	515	561
Flint Hills Resources	Corpus	262	296
Phillips 66	Sweeny	264	247
Shell	Deer Park	293	326
Valero	Corpus	291	293
Magellan (splitter)	Corpus	N/A	43
Buckeye (splitter)	Corpus	46	46
<b>Total</b>		<b>1,870</b>	<b>2,059</b>

Source: TRRC, Morningstar

Apart from infrastructure and flood damage, the recovery of all these plants will be delayed by the impact of crude oil supply and product distribution issues.

### **Corpus Christi Closures**

A mixture of crude imports and, increasingly, Eagle Ford shale supplies feeds the shuttered Corpus Christi plants. If, as reported, Eagle Ford production is being shut-in due to flooding or other damage, recovery for these refineries will be slower. Any imports will have to wait for reopening of the Port of Corpus Christi and the arrival of vessels carrying crude. We estimate the Citgo Corpus Christi refinery typically has 13 days' crude supply on site and Valero Corpus has 10 days' worth, based on typical run rates and month-end storage levels. The Flint Hills Resources Corpus refinery typically has six days' supply. The two condensate splitters in Corpus are supplied from the Eagle Ford and Permian Basin, but these are smaller plants and their output is largely for export, so their closure has less impact on the regional market.

### **Houston Shut-Ins**

Those Houston area refineries currently shut down (ExxonMobil Baytown, Shell Deer Park and Phillips 66 Sweeny) between them process about 1.1 mmb/d of crude. Much of that supply comes from imports, although the Sweeny plant processes up to 100 mb/d of Eagle Ford crude. We estimate the ExxonMobil plant typically has seven days of crude supplies onsite and Shell Deer Park has 10 days' supply. The Phillips 66 Sweeny plant typically has four days of crude supply in on-site storage. These three refineries do have access to significant Houston area crude storage capacity, if pipeline access is not interrupted.

Incoming crude supplies to Houston are hampered by the closure of the Magellan Longhorn and BridgeTex pipelines from the West Texas Permian Basin—a joint capacity of about 600mb/d. The 300 mb/d Kinder Morgan Crude and Condensate pipeline into Houston from the Eagle Ford is also believed to be out of commission. Enterprise has said that the 850 mb/d Seaway twin pipeline is operating and this could help resupply Houston refineries from Cushing. Most domestic Gulf of Mexico production comes ashore in Louisiana but disruption to that output due to Harvey (currently estimated at 331 mb/d offline as of Monday according to the Department of the Interior's Bureau of Safety and Environmental Enforcement) will have some knock on-effect in Houston. A much greater impediment to supplying Houston area refineries with crude is the closure of the Ports of Houston, Texas City, and Freeport that cuts off the supply of imports.

### **Vulnerable to Closure**

Should the flood disruption caused by Harvey continue to plague Houston and the close-by Beaumont/Port Arthur refining hub to the east, we estimate 11 more refineries with combined capacity of 1.3 mmb/d are at risk of closure. These plants are listed together with capacity and estimated days of crude storage in Exhibit 2. The largest of these plants and one apparently under consideration for shutdown (according to Reuters) is the 603 mb/d Aramco/Motiva plant at Port Arthur which is the largest refinery in the U.S. We estimate this refinery has a limited three days' crude supply on site and so it is likely vulnerable the longer that port access for imports is threatened. Of the remaining plants in

our "vulnerable" list, the Kinder Morgan condensate splitter at Galena Park, Houston is likely to shut down or reduce throughput if the Kinder Morgan Eagle Ford crude pipeline is not up and running to provide supply. The absence of Permian crude supplies via the Magellan pipelines will increase the chances of these refineries shutting down or reducing throughput. Continued port closures preventing imports will further increase the risk.

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**Exhibit 2** Vulnerable Texas Gulf Coast Refineries

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<b>Owner</b>	<b>Location</b>	<b>Typical Throughput</b>	<b>EIA Capacity (mb/cd)</b>	<b>Days Crude Storage</b>
ExxonMobil	Beaumont	348	362	4
LyondellBasell	Houston	270	264	3
Kinder Morgan (splitter)	Galena Park	77	84	5
Marathon	Galveston	494	459	3
Marathon	Texas City	87	86	7
Motiva	Port Arthur	605	603	3
Pasadena (Petrobras)	Houston	96	112	12
Valero	Port Arthur	327	335	4
Valero	Texas City	221	225	6
Valero	Houston	186	191	5
Petromax (splitter)	Houston	25	25	n/a
	<b>Total</b>	<b>2736</b>	<b>2746</b>	

Source: TRRC, Morningstar

### **Need to Send Out Products**

All Texas Gulf Coast refineries are also vulnerable to shut down if they are unable to distribute refined products, because they will run out of storage space for output they cannot send out. For Gulf Coast refiners that increasingly means port access to ship exports to Mexico and other Latin American destinations as well as pipelines for domestic delivery. Indications on Monday that operations on the Colonial pipeline (the largest conduit from Houston to East Coast markets) are being impacted by Houston flooding, could slow refinery recovery further.

### **Outside Texas**

This analysis has concentrated on Texas refineries. Significant refining capacity further east in Louisiana is of course also vulnerable to Hurricane Harvey if it moves in that direction.

Aside from spiking gasoline prices already seen in the markets, the longer-term impact of the refining disruption from Harvey will be felt particularly on the East Coast. That is because Gulf Coast regional refineries supply an average of about 2 mmb/d of gasoline to the Atlantic Coast (including Florida) by pipeline and by barge. Reduced supply from Texas will be bullish for gasoline prices on the East Coast

because the alternative source is imports—typically from Europe. The cost of gasoline imports is likely to be bid higher by competition between East Coast buyers and Latin American buyers no longer receiving exports from Texas refineries. ■■

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