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U.S. Q3 2014 REFINING MARGINS SEE SLIGHT DECREASE

Special Topic: Can the St. Croix Refinery be Profitable Processing Light U.S. Crude Oil?

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Baker & O'Brien, Inc.'s 14Q3 release to *PRISM*¹ subscribers reflects a modest quarter-to-quarter decline in average U.S. refining margins. Q3 2014 market conditions were weaker, with narrower crude oil price differentials and lower refined product crack spreads.

With the exception of PADD 4, margins in all districts fell, with PADD 2 exhibiting the largest decline. The Chicago WTI 321 crack spread was lower by more than \$3/Bbl., while the U.S. Gulf Coast (USGC) LLS 321 crack spread declined by about \$2/Bbl.

PRISM Cash Margins vs. Previous Periods (\$/Bbl.)

	14Q3 vs. 14Q2	14Q3 vs. 13Q3
PADD 1	-0.33	2.71
PADD 2	-2.73	7.39
PADD 3	-1.17	3.72
PADD 4	1.96	6.36
PADD 5	-1.00	2.96
U.S. Overall	-1.24	4.49

Compared to 13Q3, however, recent period margins were still considerably better in all PADDs, consistent with recent quarterly earnings releases by U.S. refiners. Margin increases over last year were bolstered by lower domestic crude oil prices, as well as more favorable net product price realizations. Average WTI and LLS prices declined by \$8/Bbl. and \$9/Bbl., respectively.

Compared to 14Q2, the WTI-to-Brent discount narrowed by over \$2/Bbl., negatively impacting inland cracking refineries, and the relatively small increase in the LLS-Maya differential offered

Key Refining Margin Metrics, \$/Bbl.

	2014	2014	2014	2013	2012
	Oct.	Q3	Q2	Annual	Annual
WTI	84.59	97.48	103.05	97.93	94.16
LLS	87.75	100.95	105.55	107.31	111.72
Brent	87.56	101.85	109.63	108.62	111.58
LLS – Maya	9.42	10.05	9.77	9.94	12.14
USGC LLS 321*	8.14	14.66	16.64	10.63	9.81
USGC LLS 6321**	5.36	9.16	11.51	6.92	6.58
Chicago WTI 321***	18.38	19.41	22.51	22.83	29.24

*LLS deemed conversion to 67% conventional 87R gasoline and 33% ULSD

**LLS deemed conversion to 50% conventional 87R gasoline, 33% ULSD and 17% Fuel Oil

***WTI deemed conversion to 33% conventional 87R gasoline, 33% RB OB and 33% ULSD

little improvement to margins for USGC coking refineries. Refinery margins continue to adjust to the recent drop in crude oil prices in October and November. For the month of October, the USGC LLS 321 crack spread fell significantly, but the Chicago WTI 321 crack spread maintained a level similar to that of 14Q3. The longer term effect of the crude oil price declines will become clearer at the end of 14Q4.

¹ *PRISM*TM is Baker & O'Brien's refinery modeling and database system that includes operational and economic performance details for refineries in the U.S., Canada, Europe, and Asia.

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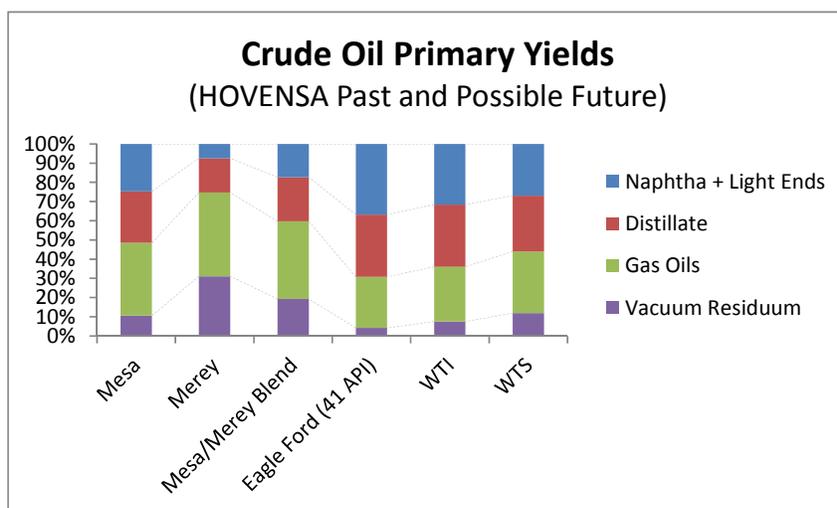
Special Topic: Can the St. Croix Refinery be Profitable Processing Light U.S. Crude Oil?

The U.S. shale boom has breathed new life into some refineries that were previously deemed uneconomic. Recent announcements indicate the St. Croix refinery, in the U.S. Virgin Islands, may be a candidate for re-activation after being shut down since January 2012 following a sustained period of financial losses. We understand that plans to restart the refinery may involve bringing price-advantaged light domestic crude oils into the plant, possibly in combination with some heavier Venezuelan grades. Some analysts have noted that a restart of such a large refinery could act as a potential “relief valve” for U.S. light crude oil production that might otherwise be constrained in the absence of a lifting of the ban on U.S. crude oil exports. But can the refinery be profitable in today’s marketplace?

Prior to its shutdown, the refinery—a joint venture between Hess Oil and PDVSA—processed about 350 MB/D of a mixture of Venezuela crude oils, as well as some light Atlantic Basin grades. Since the Virgin Islands remains exempt from the Jones Act—which requires U.S.-built, crewed, and flagged vessels be used for U.S. port-to-port shipments—U.S. crude oils could likely be delivered at a substantial discount to competing U.S. refineries in the Northeast. In addition, and also as result of the Jones Act exemption, products supplied to the Eastern Seaboard states would likely be cost-competitive with Colonial and Plantation pipeline movements from the USGC, as well as to markets in North and South America. Finally, the refinery’s relatively large size would provide economy-of-scale advantages over many of its competitors.

However, notwithstanding the foregoing, some difficulties still exist. First, unlike its land-based competitors that have access to low-cost natural gas, the St. Croix refinery relies on high-cost liquid fuels for its heat and power requirements. Second, in order to bring the plant into

environmental compliance the refinery had previously entered into a consent decree with the EPA which was expected to cost as much as \$700 million. Along with costs of refitting, inspection, and maintenance prior to any restart, it is widely expected that capital investment well in excess of \$1 billion may be needed. Finally, finding the optimum mix of crude oils, taking into account availability, pricing, yields,



and processing capability, may be more difficult than it seems. For example, the chart above compares the basic distillation yields for two Venezuelan crudes (Mesa and Merrey—which the refinery was known to process in the past) with light Eagle Ford crude, WTI, and WTS. The higher naphtha and light ends in the U.S. crudes may limit the plant’s throughput, and the lower gas oil and residuum fractions may create minimum “turndown” issues for the upgrading units.

So can a revitalized St. Croix refinery be profitable? Perhaps, but there are substantial hurdles to overcome. As has always been true, petroleum refining is never all “peaches and cream.”

About Baker & O'Brien

Baker & O'Brien is an independent professional consulting firm specializing in technology, economics, and management practice for the international oil, gas, chemical, and related industries. With offices in Dallas, Houston, and London, the firm focuses primarily on the downstream industry and assists clients with strategic studies, mergers and acquisitions, and technology evaluations. The firm also provides expert services to support insurance claims, investigate operating incidents, and support a wide range of commercial disputes in the energy industry.

About PRISM

Baker & O'Brien's *PRISM* software is used to perform detailed analysis of individual refineries and the refining value chain from crude oil load port to products truck rack. The system combines a large historical database with a robust refinery simulator to provide analytical support to competitive assessments, strategic planning, crude oil valuation, and delivered cost of supply. The *PRISM* database currently includes operational and economic performance details for all refineries in the U.S. and Canada, most refineries in Europe, and over 50 refineries in the Asia Pacific region. The *PRISM* system is available for license and is used in consulting assignments for Baker & O'Brien clients.

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