Whiting NHT
April RCM Follow up

10-July- 2017

Whiting cannot deliver WRMP rates and comply with 10ppm gasoline without investment in gasoline desulfurization

- No indication of US Government intervention to eliminate 10ppm regulation
- Investment in a 85kbpd NHT is the best option available for Whiting to meet 10ppm gasoline requirement
  - Guarantees compliance through ability to desulfurize wide range of gasoline blend components during both steady state and non-steady state operations
  - Provides ability to run full complement of advantaged crude up to WRMP design limits while maximizing transportation fuels production
  - Provides surplus credits to be generated to support Whiting TARs, non-steady state operations, Fuels NA compliance at Toledo and lowers the cost of IST blending operations
- MARPOL regulation in Jan 2020 will significantly increase the value of complex refiners ability to run advantaged crude and therefore, the value of the NHT investment
- NHT project continues to meet all project benchmarks for a well managed project
  - Delaying project is not recommended as it will increase project delivery cost, reduce projects ability to execute to BP and external benchmarks and targets
  - CAPEX bridge funding: $20m for Aug to Sept (CAPEX NTE to $107m end Sep)

Redacted - First Amendment

Delay or cancellation of NHT compromises Whiting ability to deliver WRMP rates & reduces unique 2020+ MARPOL margin opportunity

It is not recommended that we tie the profitability of Whiting to the future markets for credits with the level uncertainty involved

Investment case provides upside benefit not available with credit compliance strategy and protects from unavailability.
(96% Refinery availability in base case)

MARPOL price environment favors fully upgraded heavy refiners like Whiting

- Delaying project may eliminate most profitable year of operation
- Enables 10kbpd incremental heavy crude and 40kbpd transportation fuels production
- MARPOL heavy diff estimate at $22/bbl
- Full Tier 3 and MARPOL compliance occur on the same date 1-Jan-2020 creating a unique opportunity
- Refiners like Whiting will have ability to monetize credit length and operating flexibility during volatile transition period

Gross Margin Impact	**$(271)m/yr**
Light Ends Management	(49)
Reduce Crude rate and % Heavy	(195)
Gasoil Hydrotreater TAR	(27)
Revex Benefits	$43m/yr
Operating Expense	36
Carbon tax credit	7
Net Operating Penalty	$(228)m/yr
Lost MARPOL Uplift	(77)
2020 Operating Penalty	**$(305)m/yr**

NOTE: MARPOL uplift based on increased heavy diff and refining crack using May 2017 MARPOL price set with NHT in operation compared to NHT Project LP runs compared to Central GIAPP case

Delaying or cancelling NHT project limits Whiting's ability to deliver WRMP rates without significant increase in revex

Operating without the NHT in 2020 could negatively impact revex $100m if credits are available and over $300m if no credits are available – there is no way to deliver plan without a credit or margin penalty

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total
Low Credit Price	-3	-3	-3	-5	-5	-5	-5	-5	-5	-3	-3	-3	-45
Expected Credit Price	-8	-8	-8	-12	-12	-12	-12	-12	-12	-8	-8	-8	-108
High Credit Price	-12	-12	-12	-17	-17	-17	-17	-17	-17	-12	-12	-12	-161
Base Case	-20	-18	-20	-24	-25	-24	-25	-25	-24	-20	-19	-20	-245
MARPOL add	-5	-4	-5	-9	-9	-9	-9	-9	-9	-5	-5	-5	-77
2020 Total	-25	-22	-25	-33	-33	-33	-34	-34	-33	-25	-24	-25	-322

NHT Project delay will increase project cost by at least 15% reducing project efficiency and creating additional execution risks

Option	Key Activities	Risks	2016 Spend ($m)	2017 Spend ($m)	Spend to Complete ($m)	Total Capital ($m)	Full Beneficial Operation
Current Plan **Recommended Option**	• Complete Major Equip (2017) • Complete Engineering, Bulk Procurement, Lump Sum Bid RFP's (2018) • Civil Construction (2017/18) • Mechanical Construction (2018/19)	• Base Case (Simultaneous Operations, Schedule Risk)	27	101 (planned)	182	310	Jan 2020
Defer 6 Months Restart January 2018	• Complete Major Equip (2017) • Complete Engineering (2018) • Lump Sum Bid RFP's (2018) • Civil construction (2018) • Complete Procurement (2019) • Mechanical Construction (2019/2020)	• Completion and storage of major equipment • Continuity of BP/KBR resources • Increased duration of major activities: engineering, procurement, construction • Margin risk (lost 2020 margin $200+m/yr and need for credits in 2020) and inability to build credit balance for future outages	27	55 (at hold)	253	335 $25m incremental capex	4Q 2020
Defer 12 Months Restart July 2018	• Complete Major Equip (2017) • Receive/store Equip (2018) • Complete Engineering (2019) • Complete Procurement (2019) • Lump Sum Bid RFP's (2019) • Civil construction (2019) • Mechanical Construction (2019/20)	• Completion and storage of major equipment • Loss of key BP and external resources • Increased duration of major activities: engineering, procurement, construction • Margin risk (lost 2020 margin $200+m/yr and need for credits in 2020/21) and inability to build credit balance for future outages	27	55 (at hold)	273	355 $45m incremental capex	2Q 2021

Project Deferral Backup

Hold Project 6 Months – Restart January 2018

Risks

- Continuity of team
  - Loss of some BP team
  - Loss of KBR team
- Execute Engineering
  - 3 months to fully mobilize
  - 8 months to complete engineering (add 2 months to current schedule)
  - Add premiums on material costs to support 3Q/4Q2018 construction
- Changes in design or business priorities
- Construction
  - Work Stoppage in January 2019
  - Overlaps with GOHT TAR
  - Poor access to Operations resources in 2019
  - Project becomes schedule driven to beat credit market uncertainties

Opportunities

- Peak construction moves away from Fall 2018 Mega-TARS
- Integrate selected lump sum contractor into early construction planning
- Better clarity on future credit market

Likely Full Beneficial Operation

- 4Q2020

Hold Project 12Months – Restart June 2018

Risks
- Loss of BP Project and Operations team
- Loss of KBR team
- Changes in design or business priorities
- Difficult to remobilize Execute Engineering
  - 3 month to fully mobilize and restart KBR
  - 12 months to complete engineering/procurement
  - Rebid bulk materials and instrument
- Construction
  - Overlaps with GOHT TAR
  - Poor access to Operations resources in 2019
  - Project becomes schedule driven to beat credit market uncertainties

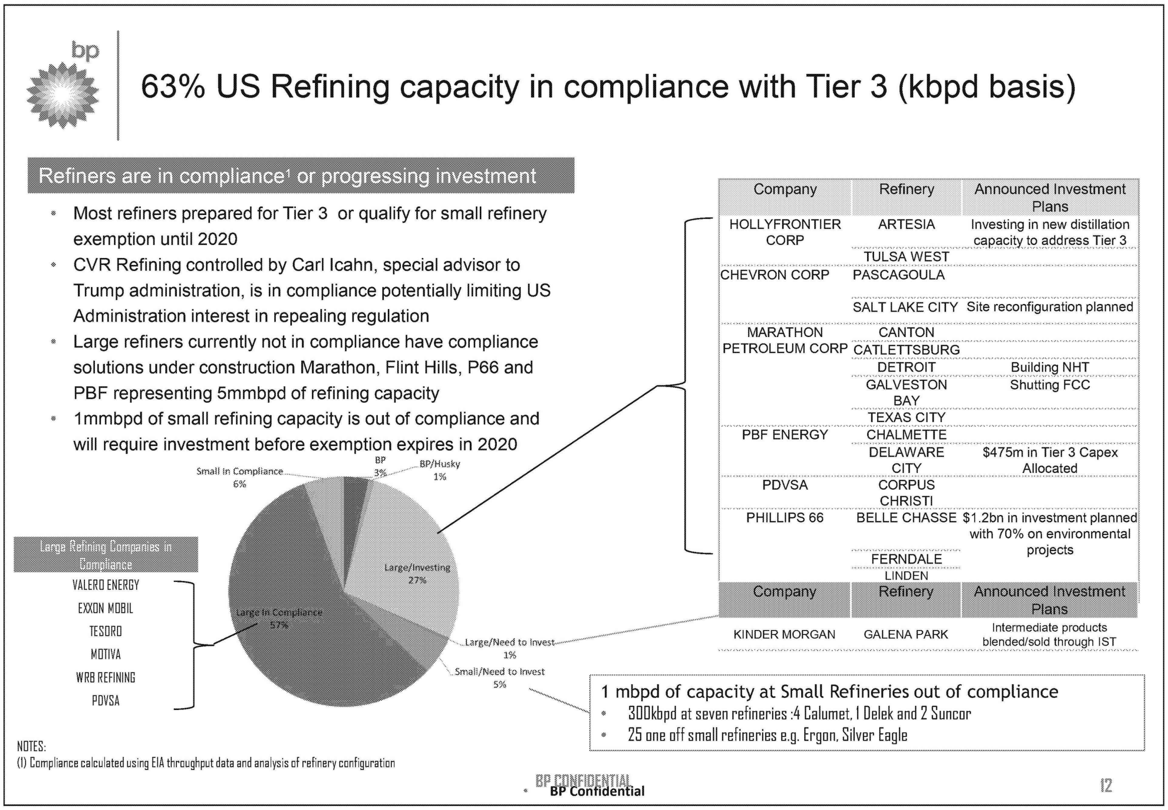
Opportunities
- Peak construction moves away from Fall 2018 Mega-TARS
- Integrate selected lump sum contractor into construction planning
- Likely no impact from any 2019 Work Stoppage (construction start after work stoppage)
- Better access to Operations Resources (2020)
- Better clarity on future credit market and WRMP margin uptake

Likely Full Beneficial Operation
- 2Q 2021

Procurement Status - Summary

Item	Fabricator	Country	% Complete/Status	Delivery
HDS Reactor Heater	Bousted	China	50 in fabrication	17-Oct
Towers/Large Drums	Sunpower	China	30 in fabrication	17-Nov
Reactors	Doosan	Korea	60 in fabrication	17-Dec
Heat Exchangers	Hantech	Korea	40 in fabrication	17-Oct
Recycle Gas Compressor	Dresser	USA	60 in fabrication	Oct-17
Drums	Fabwell	USA	10 in engineering	18-Mar
Air Coolers	Hudson	USA	10 in engineering	18-Mar
RIE	EnGlobal	USA	10 in engineering	2Q18
PDC	Powell	USA	10 in engineering	2Q18
Analyzers	Siemens	USA	5 ordered	2Q18
Structural Steel	PAX	USA	ordered	as needed
Pipe Spools		USA	pending	not awarded yet
Engineering parts (instruments, valves, ..etc)			some orders	2018
Bulks			few orders	2018

May 2017 Update



Phillips 66 plans $1.2 billion of capital expenditures in Refining, with approximately 70 percent to be invested in reliability, safety and environmental projects, including compliance with the new Tier 3 gasoline specifications. (P66 Investor Update Oct 2015)
http://investor.phillips66.com/investors/news/news-release-details/2015/Phillips-66-Announces-2016-Capital-Budget-and-Increases-Share-Repurchase-Program/default.aspx

Marathon is planning to upgrade the refinery to produce low-sulfur gasoline in compliance with the EPA's Tier 3 standards, which take effect next year. – (BIC Magazine 5-Jan-2016) http://www.bicmagazine.com/expansions/downstream-subsection/marathon-on-track-for-detroit-refinery-expansion-permit/#sthash.5hjLBgh6.dpuf

Holly Frontier:
Compliance capex: environmental compliance spending focused on Tier 3 gasoline and MSAT 2 standards
Slide 19 - http://files.shareholder.com/downloads/FTO/2135536820x0x885301/EE61648A-043D-4D99-B6A3-5642A5A33E38/HFC.3.21.2016.pdf

PBF Energy (PBF.N) expects to have $475 million to $500 million in capital expenditures in 2016, with a significant portion aimed at Tier 3 requirements, according to regulatory filings
http://www.reuters.com/article/us-usa-refineries-regulations-idUSKCN0X217R

Flint Hills:
Flint Hills said it plans to install new technology, also costing about $150 million, to extract and process sulfur and nitrogen as it begins refining ultra-low-sulfur gasoline to meet stricter Tier 3 U.S. fuel standards in 2017
http://www.startribune.com/flint-hills-plans-300m-in-additional-upgrades-at-rosemount-refinery/250897141/

Shell:
Motiva to integrate Norco, Convent refineries in Louisiana http://www.ogj.com/articles/2015/03/motiva-to-integrate-norco-convent-refineries-in-louisiana.html

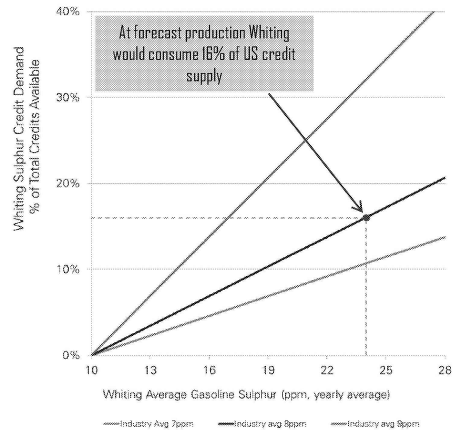
Chevron:

Chevron SLC refinery commits to Tier 3 conversion by end of 2019 - In an announcement from Mitra Kashanchi, manager of Chevron’s Salt Lake City refinery operations, the company said it will reconfigure the facility to produce low-sulfur, Tier 3 fuel by the end of 2019.
https://slenterprise.com/index.php/news/latest-news/770-chevron-slc-refinery-commits-to-tier-3-conversion-by-end-of-2019

Strategic recommendation to comply through investment

- IST forecasts industry to move from long to **short sulfur credits** per year[1] by 2021. As market can not be short credits, credit value will increase until crude selection/FCC rates balance credits.
- Current Tier 3 Standard[2] credit prices $1000/credit
  - Market consists of one trade and is not representative of future projections. **IST has been unable to buy credits forward.**
  - At $1000/credit Whiting's investment has 11% IRR
  - NHT NPV 0 at $590/mm-ppmm credit value
- Credit price expected to increase to incentivize high sulfur crude run cuts /FCC rate restrictions for refiners short credits. **Current estimate $2400/mm-ppm**
  - **17% IRR for investment**
  - **$129 mpy annual cost for credits at Whiting**
  - **NA Fuels/GOA short additional credits $25 mpy without Whiting NHT**
  - **Current view not enough credits will be available**
- Whiting's large credit demand skew risk to the downside if Whiting were to comply with credits
  - Confluence of regulations pressure sulfur removal: MARPOL enforcement and expiration of early generation credits both take effect Jan 2020

Whiting Credit Demand vs. Potential Credits



NOTES:
(1) One credit equals 1mmppm-gal based on industry average of 16ppm (IST Analytics)
(2) Standard credits are the only credits valid after Jan 2020
(3) Based on fixed G/D ratio across US refining industry, Whiting gasoline sulfur 24ppm, full US utilization and does not include credits required for imports

Whiting Margin Impact ($228/yr) for Operational compliance

Given credit uncertainty, operating changes used as project economic base case.

- Operating cost $228m/yr, some credits may be available. IRR 42%
- Credit cost $154m/yr estimate (NA total), availability expected to limit. IRR 19%

Actual results will oscillate between these extremes, captured in sensitivity analysis.

Investment case provides upside benefit not available with credit compliance strategy and protects from unavailability.
(96% Refinery availability in base case)

Do not recommend we tie the profitability of Whiting to the future markets for credits, with all of the uncertainty involved

Gross Margin Impact	$(271)m/yr
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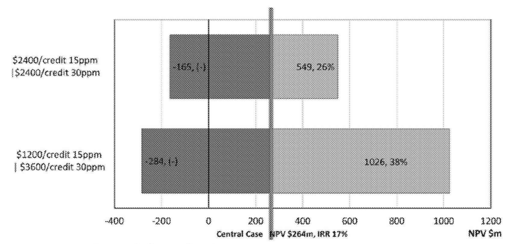

Central Case Basis:
$2400/mm-ppm gallon, 250kbpd gasoline at 24ppm sulfur

NHT Project –

NHT Project Commercial Growth IRR 7% to 10% ($278m to $450m NPV) 5% in EFM

MARPOL Upside: $16 to $81m NPV from credit sales 2020 to 2025

- Tier 3 10ppm gasoline regulation and IMO MARPOL 0.5% sulfur marine fuel regulations in effect January 2020
- BP forecasts MARPOL will increase heavy / high sulfur crude incentives
- Coastal refiners may sell LS gasoil into marine fuel and process high sulfur gasoil and rely on Tier 3 credits to meet gasoline sulfur requirements ($6m/yr at $500/credit to $30m/yr at $2500/credit from credit sales)

Margin capture during non-steady state operations: $10m of NPV based on one unplanned outage every 10yrs

- Margin protection for hydrotreating outages and/or limited hydrogen availability
- Reduce/eliminate impact of unanticipated high gasoil sulfur operational scenarios including GOHT catalyst underperformance, estimated at $24m/month for 600 ppm.
- Ability to decouple TARs and / manage through outages e.g. GOHT down / FCU's up

Additional blending margin for Fuels NA / IST at other locations: $40m NPV based on $450/credit

- Purchase high sulphur components in Toledo, Cherry Point, NYH and USGC blending operations
- 15,500 million-ppm-gal sulphur credits for use in Fuels NA or sale $7m/yr at $450/credit

Purchase high sulphur blendstocks and intermediates at Whiting

- Increase the pool sulfur to 10ppm (design projections ~7ppm)

NOTE: Future growth option incremental value range based on $12m/yr benefit ($66m NPV) and $23m/yr benefit ($132m NPV)