Internal Investment Proposal

Summary Information

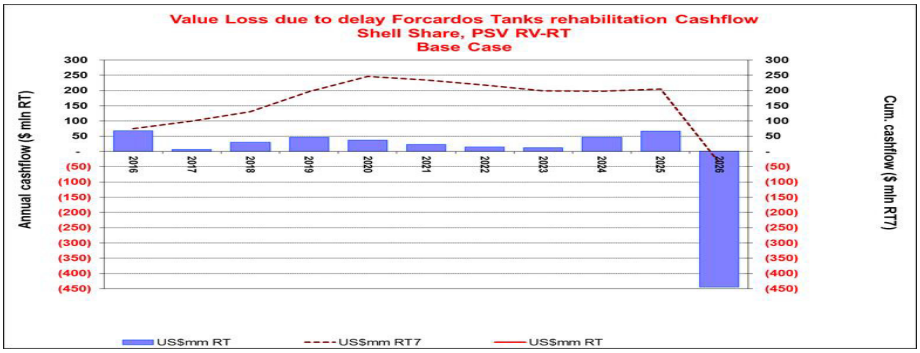
Business unit and Company	The Shell Petroleum Development Company (SPDC)
Group equity interest	100% in SPDC, whereas SPDC is the operator of an unincorporated JV with a 30% participating interest share.
Other Shareholders / partners	Nigerian National Petroleum Company (NNPC): 55%, Total E&P Nigeria Limited (TEPNL): 10%, Nigeria Agip Oil Company Limited (NAOC): 5%
Business or Function	Exploration & Production (EP)
Amount	Request for approval of additional US$52 million (Shell share) of which US$5.1 million was an overspent on previous IP. US$6.6 million (Shell share) had been approved in the previous IP, thus bringing the total Investment Proposal to US$58.6 million (Shell share).
Project	Rehabilitation of Forcados Terminal Crude Storage and Process Tanks

Main Commitments

Description	Previously Approved GIP (a)	Sunk Cost (b)	Estimate to Complete (c)	Lifecycle Estimate (d)=(b)+(c)	This Proposal (e)=(d)-(a)		Total GIP (f)=(e)+(a)	
					100% JV	Shell Share	100% JV	Shell Share
T201	5.5		14.1	14.1	8.6	2.6	14.1	4.2
T202		10.3	2.4	12.7	12.7	3.8	12.7	3.8
T203			11.7	11.7	11.7	3.5	11.7	3.5
T204	3.9	14.6	3.7	18.3	14.4	4.3	18.3	5.5
T205			11.6	11.6	11.6	3.5	11.6	3.5
T206	5	5		5	0	0	5	1.5
T207			13.8	13.8	13.8	4.1	13.8	4.1
T208			11.3	11.3	11.3	3.4	11.3	3.4
T209			13.9	13.9	13.9	4.2	13.9	4.2
T210	3.9	14.1	3	17.1	13.2	4	17.1	5.1
Process Tank 101, 102, 601, 602	3.7		15.7	15.7	12	3.6	15.7	4.7
Utility Tank 610, 620, 901, 1020			12.2	12.2	12.2	3.7	12.2	3.7
PMT (salaries, travels, logistics etc.)		1.6	16.3	17.8	17.8	5.3	17.8	5.3
SCD			2.2	2.2	2.2	0.7	2.2	0.7
Contingency			17.9	17.9	17.9	5.4	17.9	5.4
Total IP value	**22**	**45.5**	**149.9**	**195.4**	**173.4**	**52**	**195.4**	**58.6**

Source and form of financing	This investment will be financed with JV funding and Shell's share of the expenditure will be met by SPDC's own cash flow and/or the existing shareholder facility. Formal JV partners' approval will therefore be obtained.

Summary cash flow



Summary economics

Summary economics	NPV7% (USD mln)	VIR7
Base Case (P50)	-11.0	-0.32
High Case (P90)	-12.5	-0.32
Low Case (P10)	-9.8	-0.32
Value Loss	-37.1	NA

SECTION 1: MANAGEMENT SUMMARIES

The Proposal (Management Summary)

This investment proposal seeks supplementary approval for US$52 million Shell share MOD 50/50, (US$173.4 million 100% JV) for the rehabilitation of Forcados terminal crude storage and process tanks. Out of this, US$7.1 million Shell Share (US$23.5 million 100% JV) represents overspend on the previous IP as at July 2016, to cover completion of ongoing rehabilitation works on three crude storage tanks (Tank 202, 204 and 210) that are already out of service and to cater for enlarged scope covering rehabilitation of all crude storage and process tanks in the terminal either already out of service or being kept in service using Risk Based inspection waivers. Overspend as at end December 2015 was US$5.1 million Shell Share (US$16.9 million 100% JV). The learning from overspend on the original Investment Proposal has been documented and shared through a BCI in May 2015 when overspend was at $2.4 million Shell Share, UPO/G approval was received for subsequent overspend to ensure critical work continued to ensure required crude export capability at the Forcados Terminal. The remaining part of this supplementary request is to cater for enlarged scope covering rehabilitation of all tanks in the Terminal.

Summary of Supplementary Request

Description	Amount (USD$ mln)	
	100% JV	Shell Share
Cost increase on Original IP scope due to market escalation, standby cost etc.	17.9	5.4
Cost increase due to change in strategy from original scope of partial tank rehab to full rehab	48.3	14.5
New Scope (Tanks 202, 203, 205, 207, 208, 209, 610, 620, 901, 1020)	87.2	26.2
Increase in PMT costs due to new scope and prolongation	20.0	6.0
Total	**173.4**	**52.0**

This (reframed) project has the objectives of securing uninterrupted crude export capability from the SPDC JV's western assets and third-party commitments by providing the required tank operating capacity (processing and storage), asset integrity, statutory compliance and ultimately maintain License to Operate (LTO). Given the criticality of the project and the consequential loss/cost creep should the project stop, JV is still funding the project with SPDC cash calls still being approved by the JV Partners. Consequently, mobilised contractors are working on site, pending approval of revised GIP.

There are eighteen tanks in Forcados Terminal out of which ten are crude storage tanks (each/600,000bbls) while the remaining eight are process tanks (each/300,000bbls)

Out of the ten crude storage tanks, five are currently in service, four (T202, T204, T205 & T210) are undergoing rehabilitation while one is not being used.

The table below summarises work progress on the tanks.

Tank	Description	Capacity (kbbl)	Remark
Currently undergoing rehabilitation (Lot 1)			
202, 204, 210	Crude storage	600 each	Project is ongoing. Overall completion status: T202 and T210 (78%), T204 (73%)
201, 205	Crude storage	600 each	Site preparation works in progress.
206	Crude storage	600	**Tank already completed**
1020	Diesel storage	6	Work Order awaiting NAPIMS approval.
Next set of tanks to be rehabilitated (Lot 2)			
203, 207, 208, 209	Crude storage	600 each	Rehabilitation is required to ensure uninterrupted processing and storage of crude in the terminal.
901	Diesel storage	6	
101, 102	Cont. dehydration	185 each	
601, 602	Skim	53 each	
610, 620	Fire water	53 each	

Background

The Forcados oil storage and export terminal facilities ("Terminal") have been in operation since 1971. Oil from all the wells operated by SPDC in the Western Division of Nigeria is fed to this Terminal, via a number of flow stations. These flow stations are all located onshore with the exception of the inshore Estuary Platform and the Forcados Offshore Drilling and Production platform, FODP-A. Gas is also supplied to the

Terminal; this is fed from a gas well on the FODP-A Platform. Current production from the Terminal is about 246kbl/d

Over the years, the oil wells have been producing an increasing volume of water ('water-cut'), which in turn requires extra processing of the oil before export. It was considered inappropriate to install and replicate water removal facilities at each of the flow stations and as a consequence, the water removal facilities at the Terminal have been upgraded as part of the Forcados Terminal Integrated Projects (FTIP) programme.

The Statutory and Group requirements on tank inspection and maintenance, stipulates that tank inspection and maintenance must be carried out every five years.

A proposal to restore the technical integrity of the terminal tanks at a cost of $22.05 million ($6.6 million Shell Share) was considered sound on 30th March 2010. The project scope included the refurbishment of 8 tanks (4 Process and 4 Storage). Strategy was changed from partial rehab to full rehab due to outcome of detailed condition inspection of the tanks. All 18 tanks are now proposed for rehabilitation in order to put them into normal service, as securing yearly waiver for tanks in service under RBI, is becoming increasingly difficult. This major rehabilitation will increase the useful life of the tanks by up to 20 years. Contract for rehabilitation of all 18 tanks (8 Process and 10 Storage) was awarded in 2012 to three main contractors

The net book value (NBV) of those parts of the tank to be replaced will be de-recognised in accordance with the Group Financial Reporting Manual (GFRM) AP11, Section 5.6. The current cost of refurbishment and the remaining useful life of the tanks prior to refurbishment will be used to estimate the NBV of the parts to be replaced.

SECTION 2: VALUE PROPOSITION AND STRATEGIC AND FINANCIAL CONTEXT

Executing the proposed Forcados terminal tank inspection and refurbishment works will give the following benefits:

- Ensure compliance with Statutory Regulations thus eliminate the need for waiver received so far for non-compliance from Department of Petroleum Resources (DPR).
- Restore 100% availability and reliability and assure technical integrity of SPDC Tanks in line with group minimum standards.
- Reduce to 'as low as reasonably practicable' (ALARP) the risk of failure to process the crude received at the Terminal, thus ensure uninterrupted export operations, compliance with HSSE requirements and safeguard business reputation.
- Ensure uninterrupted processing of 3rd Party crude (203kbl/d) being handled in the Terminal, in line with SPDC's contractual obligations to such parties. This has additional strategic significance as the major 3rd party producer into the Terminal, NPDC, is a wholly owned NNPC subsidiary.
- Capex recovery is not captured in the current Crude Handling Agreements (CHAs) for 3rd Party injectors, but will be accounted for in future tariffs when the CHAs are renewed.
- There is a potential upside from income that will be generated from storage capacity that will be added after rehabilitation of the tanks. It will also help reduce potential tank-top situations in the terminal.

Economics

Cost Phasing Table (MOD JV100%) Economics

Description	Capex Cost Phasing in US$ mln. MOD, (50/50 JV 100%)												
	Prior	Prior Overspent	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Tank Rehabilitation works (previous approval)	22.0												22.0
Additional sunk cost (overspent) on previous GIP		16.9											16.9
Sub-Total 1 (sunk cost)	**22.0**	**16.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**38.9**
Outstanding works													
Tank Rehabilitation Works			18.3	13.1	17.4	17.4	17.4	17.4	14.8	9.1	7.0	4.4	**136.3**
SCD			0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	**2.2**
Contingency			2.4	1.7	2.3	2.3	2.3	2.3	1.9	1.2	0.9	0.6	**17.9**
Sub-Total 2 (forward look)	**0.0**	**0.0**	**21.0**	**15.0**	**20.0**	**20.0**	**20.0**	**20.0**	**17.0**	**10.5**	**8.0**	**5.0**	**156.5**
Total (100% JV)	**22.0**	**16.9**	**21.0**	**15.0**	**20.0**	**20.0**	**20.0**	**20.0**	**17.0**	**10.5**	**8.0**	**5.0**	**195.4**
Total (Shell Share, 30%)	**6.6**	**5.1**	**6.3**	**4.5**	**6.0**	**6.0**	**6.0**	**6.0**	**5.1**	**3.2**	**2.4**	**1.5**	**58.6**

Overall cost is within the project's capital efficiency target and cost saving opportunities will be rigorously pursued.

Summary Economics

The IP was evaluated as a cost only using the 50/50 LE Cost estimates provided. In addition to the Base evaluation the following sensitivities were carried out to show their impact on the project's value:

- High and Low CAPEX.
- VaR of 1 Year cost delay.
- Full Life Cycle (FLC) costs.
- 1 Year cost delay

The value at risk computation shows that for every day that there is a deferment of production due to supply disruption as a result of tank-related problems, there is a loss of $10.2k Shell Share, which leads to loss of $37.1mln Shell Share in one year. Some other incidental costs due to non-delivery of contractual volumes, and resource maintenance costs have not been factored in. There could be some reputational costs, in addition.

Details of the economics results and sensitivities are shown in Table 1 below and Key project parameters in Table 2.

Table 1: Economics Grid (Shell Share RT16)

PV Reference : 1/07/2016	NPV (S/S $ mln)		VIR	RTEP	UTC (RT $/bbl or $/mln btu)		Payout-Time (RT)	Maximum Exposure (RT)
Cash flow forward from: 1/07/2016	0%	7%	7%	%	0%	7%		
Base Case								
RV	(12.3)	(11.0)	(0.32)	NA	NA	NA	NA	14.2
Sensitivities (using RV)								
High Capex (Prob < 0.90)		(12.5)	(0.32)					
Low CAPEX (Prob < 0.10)		(9.8)	(0.32)					
Life-Cycle Economics		(15.0)	(0.32)	NA				
1 Year Delay		(10.1)	(0.32)					
Value Loss of 1 Year Delay		(37.1)	NA					

Table 2: Key Project Parameters Shell Share

Parameter	Unit	Bus Plan (RV)	Low	Mid	High	Comments[2)]
Capex (MOD)	US$ mln	46.3	41.2	46.3	52.3	
Start Up Date		Dec-16	Apr-16	Dec-16	Oct-16	
Production	Mln Boe	NA	NA	NA	NA	
Opex	US$ mln	0.66	0.60	0.66	0.75	Social Performance (SP) Opex

Chart 1: Value at Risk Cash Flow Plot (Shell Share RV-RT)

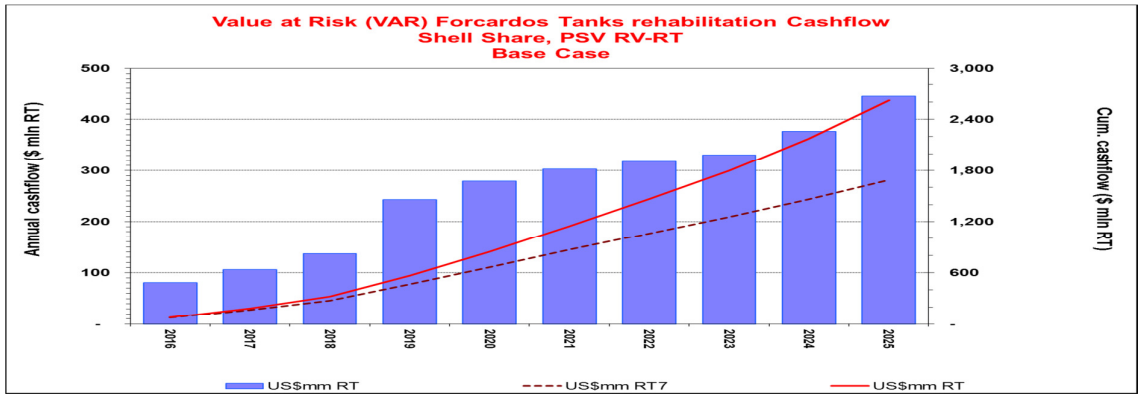
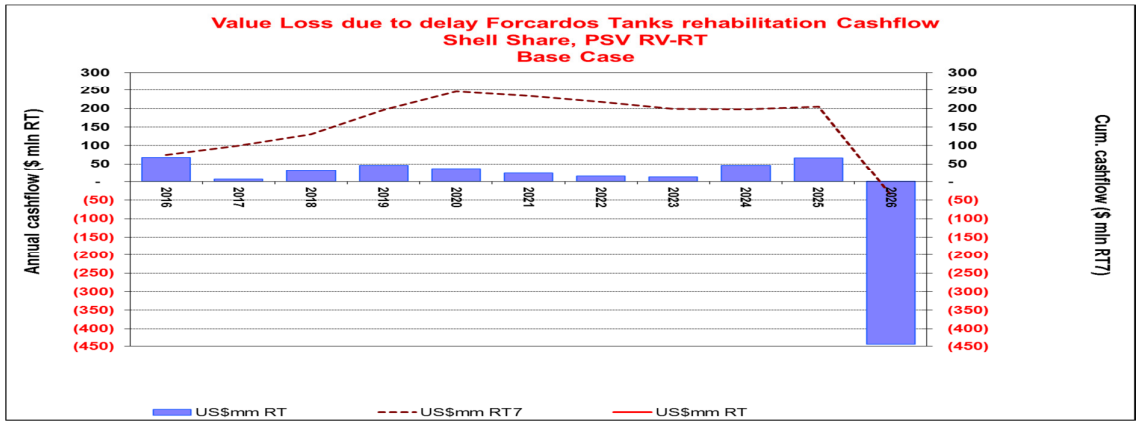


Chart 2: Value Loss Cash Flow Plot (Shell Share RV-RT)



Economics Assumptions

Cost Only (Base).

- 10% RT CAPEX assumed as abandonment cost
- Project SP (Social Performance) Opex applied.
- NDDC levy 3% of total expenditure.
- Education tax of 2% assessable profit.

Value at Risk Computation

- 10 year NFA forecast for facilities in the West
- Oil Short term PSVs of $42.5/bbl@MOD in 2016, $50/bbl@MOD in 2017, $60/bbl@MOD in 2018, $60/bbl@MOD in 2019, with applicable offset applied. RV-RT16 price used from 2020 onwards
- NGMP (Nigeria Gas Master Plan) Domestic gas profile RV-RT16.
- Gas was taxed under CITA (Company Income Tax Agreement) with Associated Gas Framework Agreement (AGFA) incentive.
- GHV of 1000 Btu/scf for Domestic market.
- Generic OPEX variable Opex of US$2.80/bbl
- NDDC levy 3% of total expenditure.
- Education tax of 2% assessable profit

Risks and Mitigation

The principal risks associated with this proposal are presented in the table below:

S/N	Risk Description	Mitigation/Remedial Effort
1	**Budget** Inadequate/delay in providing budget for 2016 activities and beyond. Cash-flow impact from delayed payments	Cut in 2016 budget and delay in providing adequate budget for activities in 2017 and beyond could delay completion of rehabilitation of the tanks. The tank rehabilitation has been phased in OP16 Plan over a 10-year period, following historical trends and current funding realities. Phasing of the work has been made robust enough to weather the storm of funding shortage without impacting too adversely on the project objective As a result of SPDC inability to meet 45 days payment obligation, contractor may not provide adequate resources as when due with likely consequence of slippage in rehabilitation works and potential standby costs. Major payment milestones have been broken down into smaller milestone elements to enhance cash-flow. Priority payment of contractor invoices is also being pursued due to project criticality. There is regular engagement with NAPIMS on project status to ensure timely approval of cash-calls.

S/N	Risk Description	Mitigation/Remedial Effort
2	**Contracting** NAPIMS/NNPC Board approval delay of Replacement Contracts	The current tank rehabilitation contract will expire in July 2017 and NAPIMS/NNPC Board approval of replacement contract may be delayed with consequence of work stoppage and delay of mobilisation for the next set of tanks in the plan after 2017. Engagement with NAPIMS is ongoing and the process of setting up a replacement contract has commenced. New contract to be in place by Q3 2017.
3	**HSE Risk** Harm to people and equipment. Pollution to the environment	The main risk is the pollution of environment due to structural failure and release of hydrocarbon. SPDC HSE policies will be strictly adhered to during the execution of all work with a view to minimizing the risk of accident/incident. A project-specific HSE plan incorporating all the potential hazards relating to these projects is in place. Mandatory Hazard and Effects Management Process (HEMP) activities are being carried out with a risk register (including security) developed for the work scope including contracted activities. Detailed job hazard analysis was done prior to commencement of high HSE risk work. Rigorous use of HEMP and other tools to control hazards are being deployed during the project execution. Contractor management for the execution of the site works is in line with the Group Standard EP 2005-0110 Contractor HSE Management.
4	**Security** General insecurity as applicable in the Niger-Delta area. (Political/Security)	The main risk is security during marine transportation of materials and equipment to the terminal and general security issues within the terminal during rehabilitation work. This project is being executed in full compliance with the corporate security plans for operating in the field. An approved security plan for this project is in place and strictly applied through all phases of the project. The work is being done within the Forcados Terminal and therefore not as vulnerable as other projects carried out in the field or on the Island itself. The Integrated Production Security Surveillance (IPSS) is in place and there is adequate security framework. There shall be increased intelligence gathering and sharing with contractors. The security arrangement that will be implemented by SPDC at the Terminal during periods of political uncertainties shall also be extended to the contractors.
5	**Community** Risk of community disruption during project execution	SPDC SCD policies will be strictly adhered to with a view to minimizing the risk of disruptions. Ogulagha and Odimodi Communities are being proactively engaged and an FTO was signed before commencement of work activities. The FTO outlines specific benefits to the host communities in terms of employment, sub-contracting of services and supplies and community development projects. Contractor to comply with its community related obligations under the contract.

Opportunities

- Ensure continuity in meeting statutory obligations on integrity of oil and gas infrastructures.
- Ensure capability for export of crude oil at the terminal at maximum production potentials from the Western Swamp fields, especially with additional production coming from Southern Swamp fields.
- Take on more production from third party injectors and thus generate additional income.

Alternatives

- **Do Nothing**: Failure to execute this project would imply that the anticipated opportunities would not be realised. This ultimately will mean attendant revenue loss for SPDC Ltd, JV and the stakeholders. Failure to comply with the statutory inspection and refurbishment has adverse impact on the reputation of the Company, with potential exposure to sanction by the regulatory authority.

Corporate Structure and Governance

The existing corporate structure and governance arrangements of SPDC JV with SPDC Ltd. as operator still subsist for this investment. The project fits within the existing SPDC corporate structure and governance.

Functional Support and consistency with Group and Business Standards

This proposal complies with Shell Group Business Principles, policies and standards. Functional support for this proposal is provided by Projects & Technology (P&T), Finance, Social Performance, Contracting & Procurement, HSE, Operations, Legal, Security, Treasury, Controllers and Tax functions.

Project Management, Monitoring and Review

Project Assurance is in place for all work scope and management of change. This is a "P&T executed" project with P&T being accountable for the delivery of technical project integration and execution. A DRB with UI Nigeria and P&T participation is in place.

Budget Provision

Project will be funded under the JV, it is unlikely to satisfy requirements for Alternative funding as there are no direct rewards accruing from the project.

Group Financial Reporting Impact.

There are no unusual accounting issues related to this GIP. Expenditure related to the project will be accounted for in line with Group Policy. The financial impact for project's full scope on Shell Group Financials is as indicated in the table below:

US$ mln	2015	2016	2017	2018	2019	2020	Post 2020
Total Commitment	5.0	6.3	3.8	6.0	6.0	6.0	18.2
SCD OPEX	0.0	0.1	0.1	0.1	0.1	0.1	0.3
Pre-FID	0.0	0.0	-0.7	0.0	0.0	0.0	0.0
Cash Flow							
Capital expenditure	5.0	6.2	4.4	5.9	5.9	5.9	17.9
Cash Flow from Operations	0.9	1.9	2.7	3.7	4.7	4.9	25.3
Cash Surplus/(Deficit)*	-4.1	-4.3	-1.7	-2.2	-1.3	-1.0	8.3
Profit and Loss							
NIBIAT +/-	0.2	0.3	0.2	-0.6	-0.6	-0.6	-4.9

Disclosure

Material disclosures, if any, will be done in line with the Group Disclosure Guidelines.

Financing

This investment is being financed with JV funding and shell share of the expenditure will be met by SPDC's own cash flow and/or the existing shareholder loan facility.

Taxation

No extraordinary tax issues would arise from this proposal.

Key Parameters

The key parameters of this supplementary proposal, which amounts to US$52 million Shell Share are as follows:

- Tank Rehabilitation Work US$45.9 million Shell share
- Contingency US$5.4 million Shell share
- Social Performance OPEX US$0.7 million Shell share

Initiator: _____

Bayo Karunwi (PTP/O/NA)

Date …/…./….

Supported by:

_____

Toyin Olagunju
(PTP/O/N)

Date ..../..../....

Supported by:

_____

Guy Janssens
(FUI/OG)

Date ..../..../....

For Business Approval:

_____

Markus Droll (UIO/G)

Date ..../..../....

SECTION 2: ATTACHMENT

Attachment 1 - Detailed Project Parameter Data

Project Focal Point / Indicator	James Aigboduwa
DRB: Decision Executive if applicable	Grzeg Kulawski
DRB: Members if applicable	Bayo Karunwi: BOM Toyin Olagunju Munster Robert

Attachment 2 – Forcados Terminal Tank Rehabilitation Plan

S/N	Tank	Tank Descr.	Cap. (kbbl)	Proposed Compl. Date	2015				2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				Amount ($mln)
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1	201	Crude storage	600	Q1-19																																											18.7
2	202	Crude storage	600	Q4-16																																											13.9
3	203	Crude storage	600	Q2-21																																											15.4
4	204	Crude storage	600	Q4-16																																											20.1
5	205	Crude storage	600	Q3-18																																											15.3
6	206	Crude storage	600																																												5.0
7	207	Crude storage	600	Q2-21																																											18.3
8	208	Crude storage	600	Q2-22																																											14.9
9	209	Crude storage	600	Q3-23																																											18.3
10	210	Crude storage	600	Q4-16																																											18.7
11	101	Cont. dehy.	185	Q2-19																																											5.1
12	102	Cont. dehy.	185	Q4-20																																											7.4
13	601	Skim	53	Q2-25																																											4.1
14	602	Skim	53	Q3-23																																											4.1
15	610	Fire water	53	Q2-25																																											6.3
16	620	Fire water	52	Q2-22																																											4.1
17	901	Diesel storage	6	Q4-24																																											2.6
18	1020	Diesel storage	5	Q2-18																																											3.1
																																													Total	195.4

Tank Out of Service Tank In Service Tank in Service with RBI Tank Under Rehabilitation