The Shell Petroleum Development Company of Nigeria Limited

Internal Investment Proposal

Summary Information

<table>
<tr><td>Directorate</td><td>Technical Directorate</td></tr>
<tr><td>Group equity interest</td><td>100% in SPDC, whereas SPDC is the Joint Venture (JV) operator of an unincorporated JV with a 30% interest.</td></tr>
<tr><td>Other shareholders / partners</td><td>Nigeria National Petroleum Company (NNPC: 55%), Total: 10%, Nigeria Agip Oil Company (NAOC: 5%) in SPDC-JV</td></tr>
<tr><td>Amount</td><td>US$2.13 mln Shell share (CAPEX, MOD, 50/50) , (US$ 7.1 mln 100% JV)</td></tr>
<tr><td>Project</td><td>SPDC Water Facilities upgrade project (from 2010 to 2014)</td></tr>
<tr><td>Main commitments</td><td>
<table>
<tr><th></th><th colspan="2">US$mln</th></tr>
<tr><th></th><th>Shell Share</th><th>100% JV</th></tr>
<tr><td>New Water Treatment Plant (WTP) for RA Ogunu (1 No)</td><td>0.412</td><td>1.372</td></tr>
<tr><td>New Water Treatment Plant (WTP) for IA Jetty Ogunu (1 No)</td><td>0.500</td><td>1.666</td></tr>
<tr><td>Four (4 Nos) New WTPs for RA Port Harcourt</td><td>0.735</td><td>2.450</td></tr>
<tr><td>Two (2 Nos) New WTP For IA Port Harcourt</td><td>0.441</td><td>1.470</td></tr>
<tr><td>SCD</td><td>0.043</td><td>0.142</td></tr>
<tr><td>Total</td><td>2.13</td><td>7.10</td></tr>
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<tr><td>Summary cash flow</td><td>Not Applicable.</td></tr>
<tr><td>Summary economics</td><td>
<table>
<tr><th>Summary economics*</th><th>NPV7% (US$ mln)</th><th>RTEP (%)</th><th>VIR7%</th></tr>
<tr><td>Base case</td><td>-0.5</td><td>NA</td><td>-0.25</td></tr>
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Section 1: The proposal

Management Summary

This investment proposal seek approval for US$2.13 mln Shell share MOD 50/50 (US$7.10 mln 100% JV) for the Design, Engineering, Procurement, Construction, Installation, Training of host community staff for the Operations & Maintenance and commissioning for RA Ogunu , IA Jetty Ogunu, RA Port Harcourt and IA Port Harcourt Water Treatment Plants (WTP) over the period 2010 to 2014.

Project scope-

1. New Water Treatment Plant (WTP) for RA Ogunu (1 No).

2. New Water Treatment Plant (WTP) for IA Jetty Ogunu (1 No).

3. New WTPs for RA Port Harcourt (4 Nos).

4. New WTP for IA Port Harcourt. (2Nos).

There are eight non-functional and aged Water Treatment Plants (WTP) in SPDC (Two in Warri, office/Residential area, and Six at both the Industrial/Residential areas in Port Harcourt). Staff in Warri and Port Harcourt have experienced poor quality water supply from these plants. In addition neighbouring host communities draw their daily water supply from some of these water supply substations. It is therefore necessary to derive consistent quality in accordance with the install throughput in adherence to World Health Organisation (WHO) specifications while closing out major HSSE issues.

Presently, the proposed eight WTPs are estimated to treat about **7,000** cubic meter of water per day to World Health Organisation specifications but raw water currently passes through the WTPs without any remarkable change in quality apart from chlorination, which control bacteria infection.

The following benefits will be derived from replacing them with new Water Treatment Plants:

Staff and occupants will have confidence to drink good quality water produced by SPDC
Health and reputation issues created by consumption of poor quality water will cease.
Modern fit for purpose water treatment and conditioning plants will be installed to replace the WTPs installed about 35 years ago.

- It will necessitate reduction in Operating costs incurred from running the existing aged water treatment plants and the cessation of the use of bottled water and inherent cost.
- Brown colouration of sanitary wares and other related materials inherent in water with high iron inundation will cease.

Background

Technical Engineering Utilities (EPG-TPEUB) team and their nominated water consultants carried out water infrastructure studies on twenty (20) Water Treatment Plants (WTP's) in Warri and Port Harcourt to determine their operating conditions and where improvement or total change out is required.

Subsequent laboratory analyses of raw water samples were carried out which clearly indicated the pronounced deviation from the World Health Organisation (WHO) Guidelines for potable water supply. These water treatment plants have been identified and there is a phased plan to address asset integrity and HSSE issues resulting from their operating conditions.

A separate IP is to be proposed in 2014 to address the asset integrity issues of the poor operating condition of 10 other WTPs that produce treated water that does not conform with WHO specifications. Only 4 of the 20 WTP's tested by water analysis (Osubi, Edjeba, FMH and SOKU WTP's) currently produce potable water which conforms with WHO specifications

Below is the summary of the commitments under this proposal;

Table 1: Summary of commitments

	US$ mln; MOD					
	2010	**2011**	**2012**	**2013**	**2014**	**Total**
Water Treatment Plants for Warri and Port Harcourrt	0.441	0.529	0.382	0.186	0.540	2.087
SCD	0.009	0.011	0.008	0.004	0.011	0.043
Total – Shell Share	**0.45**	**0.54**	**0.39**	**0.19**	**0.56**	**2.13**
100% JV	**1.50**	**1.80**	**1.30**	**0.63**	**1.87**	**7.10**

Section 2: Value proposition and strategic and financial context

The descriptions of the various aspects of this project are as detailed in appendix-1. The SPDC New Water Treatment Plants Replacement Project will support SPDC's vision to provide a modern working and living environment for its staff and located families in SPDC's main business locations of Port Harcourt and Warri. It will provide potable water of improved quality, meeting WHO standards, for all staff in Port Harcourt, Warri and swamp locations to where water is presently barged from either location. This will appreciably reduce the amount of money spent on bottled water in Port Harcourt and Warri, as well as in associated swamp operations facilities.

The principal benefits associated with this proposal are:

- Adequate capacity and good quality water supply from modern water treatment plants to meet the increased water demand for SPDC operations in Port Harcourt, Warri and surrounding swamp locations.
- All the existing water treatment plants are aged and can no longer provide the required quality of water in accordance with the most recent WHO guidelines for drinking water. There are no as-built drawings and the capacity of each of the existing WTPs is grossly inadequate for the increased number of staff (& their SPDC accommodated families) since the WTP's were commissioned over 35 years ago. These will be replaced with WTP's of a modern design.
- Water treatment upgrade has suffered lack of investment in recent years hence the inefficient operation of the aged water plants; replacement of the water treatment plants is necessary for SPDC to meet the required HSE standards and asset integrity targets.
- SPDC staff and their families will develop confidence in SPDC's water supply scheme and thereby reduce the costs inherent in the use of bottled water.
- The upgrade will enhance SPDC's reputation on issues associated with the quality of water supplied to staff.

Summary Economics

The SPDC water facilities upgrade project was evaluated as a cost only Non-Oil infrastructure project using 50/50 cost estimate. The project returns an NPV7% of US$-0.5 mln RT10 and VIR 7% of –0.25. Sensitivity analysis was carried out to determine the value of the project under high Capex scenario. See table 2 below for further details.

Table 2:

Summary Economics Grid

PV Reference Date: 1/7/2010	**NPV (S/S $ mln)**		**VIR**	**RTEP**	**UTC (RT $/bbl or $/mln btu)**		**Payout-Time (RT)**	**Maximum Exposure$mln (RT)**
Cash flow forward from: 1/1/2010	**0%**	**7%**	**7%**	**%**	**0%**	**7%**		
SV ($50/bbl RT10)	-0.3	**-0.5**	**-0.25**	NA	NA	NA	NA	$0.9 mln (2014)
RV ($60/bbl RT10)	-0.3	**-0.5**	**-0.25**	NA	NA	NA	NA	$0.9 mln (2014)
HV($80/bbl RT10)	-0.3	**-0.5**	**-0.25**	NA	NA	NA	NA	$0.9 mln (2014)
Sensitivity								
High Capex (+20%)		**-0.5**	**-0.25**					$1.1 mln (2014)

Key Project Parameter Data Ranges (Shell Share)

	Unit	Bus Plan (BP09)	Low	Mid	High	Comments
Capex (MOD)	US$ mln	0.5		2.1	2.6	Provision made for 2010 only. While 2011-2014 expenditure to be provided for in Bus plan.
Opex (MOD)	US$ mln	NA	NA	0.04	0.04	
Production volume	Mmbbl	NA	NA	NA	NA	
Commissiom Date	mm/yyyy	NA	NA	NA	NA	
Production in first 12 months	Mmboe	NA	NA	NA	NA	

Economic Assumptions:

- SCD cost of 2% of Total Capex Expenditure.
- NDDC Levy of 3% of Total Expenditure.

Section 3: Risks, opportunities and alternatives

Risks

S/N	*Risk Description*	**Mitigation / Remedial effort**
1.	Lack of Budget	Adequate budget has been provided for the preferred priority (RA Ogunu) in 2010. The 2011 budget requirement will be submitted during the 2011 – 2014 programme build.
2.	Managing Community Issues	SPDC and contractors shall mitigate this with proactive engagement of communities through the cluster Development Board (CDB) where the GMoU is operational. All community engagements to be carried out by the respective Asset Team Community Interface Coordinators (CIC). The community work force shall be engaged to execute activities they can perform. Provision has been made for the training of community staff for the operation and maintenance of the WTP. However, the cost of homage payment shall be borne by the Asset Team/Budget Holder, as this cost is not included in the project cost supplied above.
3.	Lack of Security	The Nigerian crisis team headed by the Managing Director is in place to manage the security issues in our operating facilities and environs. Freedom to operate (FTO) will be guaranteed before moving to work site(s). Measures will be put in place to safely evacuate personnel in case of heightened security breaches. The contractors will be put on "force Majeure" at minimal cost to SPDC if security in area of operation deteriorates.
4.	HSE	**Plan-** The HSE plan will be prepared and approved by HSE support in the line and will cover all construction / logistics activities, hazard analysis and mitigation methods. SPDC HSE policies will be strictly adhered to during construction.
		Risk of striking live electrical/telecoms cable or water lines during construction- Sonic surveys will be done within the project site to determine the presence and identify the location of underground facilities like electricity and telecommunication cables, water lines etc.
		Risk of Working around built and operating facilities- Detailed job hazard analysis prior to commencement of construction - This shall ensure that the chosen work method, speed and sequence of construction activities do not constitute additional threat to the integrity of existing facility and safety of construction workers

		Risks of Generation of wastes such as broken concrete, steel off-cuts, sand and aggregate debris etc during construction-A dedicated SPDC HSE Inspector shall be maintained on site during the construction period. SPDC waste management plan shall be implemented
		Risks of Road & marine transportation hazards- Application of SPDC journey management policies and guidelines.
		Risks for dismantling aged Water Treatment Facilities- Detailed job hazard analysis prior to commencement of dismantling of disused water treatment plant - this shall ensure that the chosen work method, speed and sequence of construction activities do not constitute additional threat to the integrity of existing facility and safety of construction workers

Alternative Considered

Do Nothing. This would result in continued supply of poor quality water, often of inadequate quantity to staff and the host communities and the attendant health and safety issues while the reputation of SPDC will suffer. The implication of this would be incurring avoidable financial losses resulting from dependence on bottled water and disruption of field operations due to inadequate quantity of required water.

Priority – RA Ogunu and IA Jetty, each has only one WTP, hence a step improvement will be noted when each WTP is upgraded. RA and IA in Port Harcourt have more than one (1) WTP at each location, hence the sudden breakdown of a WTP is less acute since they empty into the Oloibiri ring main water loop.

It is also important in view of maintaining proper asset integrity, minimal standards and DPR guidelines. The risk of operating these facilities would be extreme leading to increase in abandoned production facilities and loss of revenue to the company since staff and family will suffer poor water supply.

Section 4: Corporate Structure and Governance

The existing corporate structure and arrangements of SPDC-JV with SPDC as operator of an Unincorporated JV with 30% interest, with Under Operational Control (UOC) and Joint Controlled Assets (JCA) will be used as the vehicle for the investment and operations. This proposal is within the SPDC corporate structure and governance framework.

Section 5: Functional Support and consistency with Group and Business Standards

SPDC functional support has been obtained for the project, with budget allocated for the work.
JV partners have been continuously engaged upfront since 2005 on project proposal while further engagement is ongoing at commercial stage on implementation strategy. The project proposal and details were again consented to, at the budget defence sessions. In addition, Location Services team in both divisions are aware of planned upgrade works.

Regional Finance, Tax, Treasury, HSE/SD and Legal have provided full functional support for this IP.

Section 6: Project management, monitoring and review

The Corporate Utilities team (TPEUB) in conjunction with the location services team will monitor the project during execution. Post implementation training of the operations personnel will be implemented and the project handed over 6 months after commissioning while the installer will manage the WTP for another period of eighteen months. A warranty period of at least 12 months shall be secured.

A project engineer and two (2 Nos) QA/QC inspectors shall be employed to monitor quality and ensure the works are carried out to required specification and standards.

No CPR was carried out for this project, as total value is less than US$20m. The project execution will be in line with SHELL Project management guidelines.

Section 7: Budget provision

There is a provision for US$0.5 mln Shell Share in the 2010 budget proposal for the most favoured priority i.e. RA Ogunu Warri WTP. The remaining balance of US$1.7 mln shell share for funding for 2011 and beyond will be requested during the next programme build.

Section 8: Group Financial Reporting Impact
The financial impact of this proposal on Shell Group financials is as outlined in the table below:

US$ mln	2010	2011	2012	2013	2014	Post 2014
Total Commitment	0.45	0.54	0.39	0.19	0.56	0.00
Cash Flow						
SCD Expenditure	0.01	0.01	0.01	0.00	0.01	0.00
Capital Expenditure	0.44	0.53	0.38	0.19	0.55	0.00
Operating Expenditure	0.01	0.02	0.01	0.01	0.02	0.00
Cash Flow from Operations	0.07	0.17	0.24	0.27	0.36	0.76
Cash Surplus/(Deficit)	(0.38)	(0.37)	(0.15)	0.08	(0.20)	0.76
Profit and Loss						
NIBIAT +/-	0.02	0.02	0.02	0.02	0.03	(0.36)
Balance Sheet						
Average Capital Employed	0.27	0.87	1.42	1.76	2.21	12.02

Section 9: Disclosure
Disclosures, if required, will be done in line with existing Group and SPDC policies and guidelines

Section 10: Financing
The investment will be financed by JV funding while Shell share capital expenditure will be met by SPDC's own cash flow.

Section 11: Taxation
There are no unusual Taxation features.

Section 12: Key Parameters
New Water Treatment Plants for IA Jetty Ogunu (1 No), RA Ogunu (1 No), RA Port Harcourt (4 Nos) and IA Port Harcourt (4 Nos) is US$2.13 mln Shell share, MOD 50/50 (US$ 7.10 mln 100% JV).

Section 13: Signatures

This Proposal is submitted to GM DeepWater Projects for approval.

Supported by:	Approved by:
.....	.....
Ogunjimi Kayode	*Jerry Jackson*
EPF-G-PI	*SNEPCO-UIG/T/E*
Date …../..……/..……	Date …../……../..….

Initiator: *Abinusawa, Babs (Mr)*

Head Corproate Utilities (EPG-TPEU)

Date …../…../…..

Appendix 1. – Detailed Project Descriptions

New Water Treatment Plants for SPDC at IA Jetty, RA Ogunu Warri and IA/RA Port-Harcourt

S/N	DESCRIPTION
1.0	***New Water Treatment Plant for RA Ogunu, Warri*** The objective of this project is to replace the existing water treatment plant at the RA Ogunu with a modern water treatment plant made of stainless steel components producing water in accordance with WHO requirements, and of enough capacity to meet the water demand of RA occupants. Water samples confirmed the usual compliant of RA residents of high iron content in the water. This additional unwanted characteristic and the significantly increased capacity demand increases the cost of the WTP. The existing water treatment plant at RA Ogunu was installed about 35 years ago. It serves as the only source of water supply to IA clinic, occupants of RA Ogunu and a back up to IA Jetty Ogunu during periods of high water demand or maintenance shutdown of the latter Plant. The RA Ogunu water treatment plant has been kept going by 'patching-up' maintenance which has not tackled the root problems of high iron content, low capacity and poor quality water output. Due to their age and obsolescent state, much equipment can no longer be maintained as the components viz aeration units, sand filter, sedimentation tanks, ozonation unit, clear water vessels and pH filters can no longer effectively perform their function and replacement parts cannot be obtained. The implication is that staff constantly complain about the low output pressure of the water and have lost confidence in its consistent quality to meet the necessary parameters recommended by WHO in their latest guidelines for drinking water. The scope of the project involves the analysis of the raw water which is highly inundated with iron and other unwanted parameters, suitable process equipment design and sizing of the proposed water treatment plant; bearing in mind the increased and future water demand. Manufacture and Procurement of components made with stainless steel, construction of the civil /structural works of the New Water Treatment plant, installation of the components and accessories, two years running spares, commissioning and training of personnel to man the plant. Execution of this activity will close HSE issues, enhance portable water supply to SPDC staff, reduce drastically the cost of bottled water incurred by SPDC staff and meet operations demand for safe drinking water.
2.0	***New Water Treatment Plant for IA Jetty, Ogunu, Warri*** The objective of this project is to replace the existing water treatment plant at the IA jetty Ogunu with a modern water plant with enough capacity to meet the water demand for the swamp operations. It will also act as partial back-up during periods of maintenance shutdown of the Ogunu RA Plant. Water samples confirmed high iron content and significant salt content in the water. These additional unwanted characteristic and the increased capacity demand increases the cost of the WTP. The existing plant was installed about 35 years ago. The components were made of galvanised iron, include the aeration unit, sedimentation tank, and dosing units, which are all rusty and leaking due to corrosion and the attack of other unwanted water borne parameters on the galvanised plates. There are no as built drawings to effect like to like replacement of the existing equipment and for much equipment the technology is obsolete anyway hence the Plant is not suitable for ongoing use. The scope of the project involves the analysis of the raw water samples, suitable process design and sizing of the proposed water treatment plant bearing in mind the increased water demand.

	Procurement of components manufactured with stainless steel, construction of the civil /structural works of the New Water Treatment plant, installation of the Water Treatment Plants components and accessories, two years running spare, commissioning and training of personnel to man the plant. Execution of this activity will close HSE issues, enhance portable water supply to SPDC staff, drastically reduce the cost of bottled water and meet operations demand. Furthermore SPDC reputation will be enhanced as the host communities' benefit from this project.
3	***New Water Treatment Plant for RA Port Harcourt*** The objective of this project is to replace existing four water treatment plants at the RA Port Harcourt with modern water plants capable of meeting the water demand of RA occupants. There are four existing water treatment plants in RA Port Harcourt; located at Ossiomo (sub-1), Ughelli (Sub-2), Akukwa (sub-3) and Ihuo/Oloibiri (Sub-4). They serve as the only source of potable water to RA occupants and surrounding host communities These plants were commissioned about 30 years ago and since then have undergone several maintenance upgrades, however, none of them singularly or together can meet the required water supply quality and demand. The components of the WTPs were manufactured from galvanised iron, hence are prone to attack by the treatment chemicals and other unwanted raw water parameters. The galvanised iron components, which include filtration unit and chlorination chambers, are no longer serviceable. The implication is that the SPDC staff and families have misgivings about the water due to its inability to meet essential parameters recommended by WHO in their guidelines for drinking water. The scope of the project involves the analysis of the raw water samples, process design and sizing of proposed water treatment plant also bearing in mind the increased water demand. Procurement of components manufactured with stainless steel, construction of the civil /structural works of the New Water Treatment plant, installation of the Water Treatment Plants components and accessories, two years running spares, commissioning and training of personnel to man the plant. The option of reducing the number of WTP's in RA has been considered. Execution of this activity will close HSE issues, enhance portable water supply to SPDC staff, reduce drastically the cost of bottled water and meet present demand. Furthermore SPDC reputation will be enhanced as the host communities' benefit from this project.
4	***New Water Treatment Plant for IA Port Harcourt*** The objective of this project is to replace the existing two water treatment plants at the IA Port Harcourt with modern water plants capable of meeting the water demand of IA Port Harcourt; the operational headquarters of SPDC. Four Water substations exist in SPDC IA Port Harcourt; a Water substation may be composed of a WTP and/or water storage tanks. Of the four; two have an existing WTP but only one is functional due to their obsolete technology with the other having been out of operation for the past year or more, due to the inability to derive replacement parts. Both WTP's shall be replaced as part of this project. The scope of the project involves the analysis of the raw water samples, process design and sizing of proposed water treatment plant bearing in mind the increased water demand occasioned by the new status of IA Port Harcourt as the operational headquarter of SPDC. Manufacture and procurement of components with stainless steel, construction of the civil

	/structural works of the New Water Treatment Plants, installation of the Water Treatment Plant components and accessories, two years running spare, commissioning and training of personnel to man the plants. Execution of this activity will close HSE issues, enhance portable water supply to SPDC staff, reduce drastically the cost of bottled water and meet operations demand. Furthermore SPDC reputation will be enhanced as the host communities' benefit from this project.