

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED JOINT INVESTIGATION REPORT FOR INCIDENT NO: 663 8 45

No. 60761

1. Spill incident Number: 66384-5 2. Name of Location BONNY - OLOMA WELL IZ S FLOWLINE 3. Name of nearest community OLOMA 4. State RIVERS LGA BONNY 5. Type of Production facility/Installation FLOWLINEAsset owner /District NESI/CAWTHORNE CHANNEL B. INCIDENT INFORMATION: 6. Details of incident a. Date of incident a. Date of incident a. Date of incident b. Date/Period of investigation, 14TH AND 15TH JUNE, 2011 c. Description of spill point environment Firmed soil	A. GENERAL INFORMATION:	·
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Loose soil	D. Firmed soil [Y] [N-1/	
Previously excavated area YY N Under water Y N Swampy YY N Exposed pipe surface Y N Drilled hole, Y N Hack saw cut, Y N Explosive tear, Y N Complete Rupture Y N Inward dent, Y N Hack tampering Y N Failed Weld-on illegal hot tap valve, Y N Missing pipeline (flowline) Y N Crude oil theft (illegal bunkering) point, Y N Third party tampering with Clamp Bolt/Nut, Y N Third party tampering with flange Nuts/bolts, Y N Third party tampering with flange Nuts/bolts, Y N Third party tampering with flange Nuts/bolts, Y N Surge vessel overflow, Y N Surge vessel overflow, Y N Surge vessel overflow, Y N Y N Third PARTY		
Under water Swampy Swampy Exposed pipe surface Description of leak point (tick as applicable); Drilled hole, Explosive tear, Complete Rupture Inward dent, Well head tampering Failed Weld-on illegal hot tap valve, Missing pipeline (flowline) Crude oil theft (illegal bunkering) point, Third party tampering with Clamp Bolt/Nut, Third party tampering with valve setting, Third party tampering with flange Nuts/bolts, Corrosion, Type: Not Applicable Saver-pit over flow, Surge vessel overflow,	□ Previously excavated area [Y] [N]	
Exposed pipe surface	□ Under water [Y] [N]	
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Missing pipeline (flowline)		* * * : : / INCHACIA
Third party tampering with Clamp Bolt/Nut, Third party tampering with valve setting, Third party tampering with flange Nuts/bolts, Corrosion, Type: Not Applicable Saver-pit over flow, Surge vessel overflow, Surge vessel overflow, Surge vessel overflow, Surge vessel overflow, Third party tampering with Clamp Bolt/Nut, Surge vessel overflow, Surge vessel overflow, Surge vessel overflow, Third party tampering with Clamp Bolt/Nut, Surge vessel overflow, Surge vessel overflow, Third party tampering with Clamp Bolt/Nut, Surge vessel overflow, Surge vessel overfl		[Y] [Nat
Third party tampering with valve setting, Third party tampering with flange Nuts/bolts, Corrosion, Type: Not Applicable Saver-pit over flow, Surge vessel overflow, [Y] [N] FOUND TO BE [Y] [N] THIRD PARTY		
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Type: Not Applicable Saver-pit over flow, Surge vessel overflow,		
Saver-pit over flow, Surge vessel overflow,	□ Corrosion,	[Y] [N]
Surge vessel overflow, [Y] [N]	Type: NOT APPLICABL	. ت
Others (specify). NOI APPLICABLE (NTERFERENCE		[Y] [N]
	Others (specify). NO. AYPLICABLE	INTERFERENCE
1.4.4.4.	/	·
e. Spill point coordinates (MINNA MID - BELT)	e. Spill point coordinates (MINNA MID - BE	LI)
Northing: (METRES) Easting: (METRES)	Northing: (METRES)	Easting: (METRES)
SPILL POINT 1: 51606.07 524850.27		524850.27
SPILL POINT 2: 51606. 82 524852.79	·	524852.79
\sim	SPILL POINT 2: 51608: 24	524855.02

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L.	KI3	\sim	UYIAGI	ニハンコ	E DOIL	IENI

No. 0761

7. Type of environment of spill site:		
☐ Land ☐ Swamp ☐ water		
Type of environment of which oil has spread:		
Land Swamp water 8. Distance from the nearest sensitive habitat		
Government reserved and designated protected area Drinking water source Built up area Farmlands Fish Farm/Pond Fishing net Others (specify). NOT APPLICABLE Containment measures put in place;		,m] ,m] ,m] ,m] ,m]
□ Booms □ Trench □ Dyke	[Y] [Y] [Y]	[N]
Others: NOT APPLICABLE		
10. Any pictures or video coverage?	[XX	[N]
11. Was there any disruption to the investigation?	[X]	[N]

If yes give brief description:

THE INITIAL TOINT INVESTIGATION VISIT(TIV) OF 26TH MAY, 2011 WAS

TERMED "IN CONCLUSIVE" DUE TO THE INABILITY OF THE JOINT INVESTIGATION TEAM
TO ACCESS THE EXACT LOCATION OF THE SPILL POINTS, A RE-SCHEDULED TOV WAS

COMMENCED ON 14-TH JUNE, 2011 AND CONCLUDED ON 15TH JUNE, 2011.

D. TYPE/NUMBERS OF PROPERTIES, IF ANY, FOUND WITHIN THE AREA OF SPREAD OF OIL

A. Structures / Properties

NONE WITHIN AREA OF IMPACT	S/N	Type of Stru	ctures	Description	Size	Number	Comments
	M	SNE	WIT	IN A	REA	OF 1	MPACT



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B. Crops/Economic Trees

S/N	Types of crops	Young	Medium	Matured	Quantity	Comments
1	10 NI	WITH	NA	REA	OF IM	PACT
-						

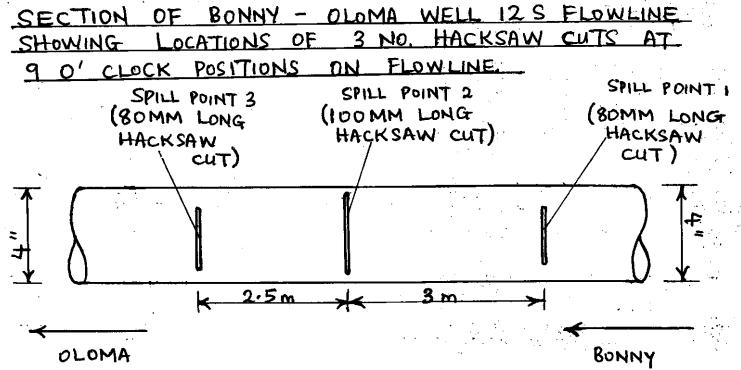
C. Fish/Nets/Ponds

S/N	Fish/Nets/Ponds	Description	Quantity/Size Comments
N	ONE W	THIN ARE	A OF IMPACT
T •			

D. Others (Specify) i.e. Animal Traps

S/N	Others	Description	Quantity/Size	Comments
1	MANGROVE	SWAMPY	A FEW	SLIGHT
*		MANGROVE	PLANTS WITHIN	IMPACT ON
		VEGETATION	A ROW	MANGROVE
				VEGETATION.

E. GRAPHIC DESCRIPTION OF LEAK POINT (Details should be contained in leak repair report)





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F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION E. Coordinates (IMPACTED AREA BOUNDARY COORDINATES - MINNA MID-BELT)

S/N	Northing (METRES)	Easting (METRES)
1	51603.54	524850.54
2.	51610.16	524843.24
3.	51625.22	524871·08
4,	5 16 16.43	524877.70

			INO.	• .	
G INCIDENT INF	ORMATION:		• 075		
17 Impacted Area I	Details			•	-
a. Total calcul	ated area of impact	0.03 Ha	<u> </u>		
• Im	pact within SPDC R.O.W	0.01 Ha			
• Im	pact outside R.O.W	0.02 Ha			
N Volume of oil	recovered before completion of J	IV (V _{rec}]):			
	Recovered		41L	barrels	
	Average Depth (m) of pool of fre	e phase oil	• •	ICAB	LE
	Volume of pooled of free phase	oil. V _{pool} :	NIL	barrels	
iv.					
b. Computati	on of volume of infiltrated oil in the	soil (V-3).	3on		
	i Area (m²) covered by the oil:		- -	~ /L	
	ii Average Depth (m) below gr	ound surface of infiltrat	tion of oil:	20.T	
	iii Soll type: <u>CLAY</u>	- 001			
	iv. p _e (effective porosity of the	soil: &/			
	v.				
	THE RESERVATIONS OF INTI	NAMES OF STREET	0.6	barrels	7

20. Computation of volume of oil on open water based on standard coloration.

	Thickness (mm)	Percentage coverage	Volume (m3)		
Barely Visible	0.00004				
Silvery	0.00008	()	$\perp T$		
Slight Colour	0.00015				
Bright Colour	0.0003				
Dull	0.001				
Dark	0.002	APPI	CARI F		
Black oil	0.1	1111			
Emulsion (30% Oil)	1				
, ,	Percent Total	100%	Total Volume	NIL	bbl

Spill Factors from USCG FOG (2000 Edition)



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Volume of evaporated oil. V :=

No.

0.4

barrels

Volume of all on open water. V _{val} :	NIL	barrels
21. Calculation of evaporated volume:		

Oil type: BONNY LIGHT i.

E-Factor: 40 % ii.

iii.

Oil Type		Bonny Light	Bonny Medium
		E-Factor	E-Factor
Period Since Oil Spill	<1 day	10%	5%
	1-7 days	25%	15%
	>7 days	4094	25%

9. Gross Total Esti V _{rec1} (bbls)	nated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{p$
V _{Est} (bbls)=	I BARREL
10. <u>Net Total Estima</u> (bbls) + VrecJ (b	ed Spilled Volume VEst(bbls) = V vap (bbls) + 0.6*Vwat (bbls) + Vinf (bbls) + Vpo els) = 0.4+ NIL+ 0.6 + NIL+ NIL = 1
VEst(bbls)=	1 BARREL

- *Calculation of the respective estimated volume is to done using the new spill estimation software on site
- *Conversion of m3 to barrel is Total volume VT (m3) x6.29
- *Emulsification factor for spill on water to consider is 60% of volume of oil.

/ 06 /20 || at incident site by joint This report was filled and signed on the _ investigation representative from

- Host Community
- Department of Petroleum Resources [DPR]:□
- National Oil Spill Detection and Response Agency [NOSDRA]:
- State Ministry of Environment [SME]:
- Nigeria Police Force [NPF]: □
- Shell Petroleum Development Company [SPDC]:

Tick as applicable