



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 673170

No. **00978**

A. GENERAL INFORMATION:

- 1. Spill incident Number: 673170
- 2. Name of Location IMO RIVER WELL 55S FLOWLINE
- 3. Name of nearest community IGRIUKWU
- 4. State ABIA LGA UKWA - WEST
- 5. Type of Production facility/Installation FLOWLINE Asset owner /District NELI

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 14TH JUNE, 2011
- b. Date/Period of investigation, 17TH JUNE, 2011
- c. Description of spill point environment

- Firmed soil [Y] [N]
- Loose soil [Y] [N]
- Previously excavated area [Y] [N]
- Under water [Y] [N]
- Swampy [Y] [N]
- Exposed pipe surface [Y] [N]

d. Description of leak point (tick as applicable);

- Drilled hole, [Y] [N]
- Hack saw cut, [Y] [N]
- Explosive tear, [Y] [N]
- Complete Rupture [Y] [N]
- Inward dent, [Y] [N]
- Well head 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 valve setting, [Y] [N]
- Third party tampering with flange Nuts/bolts, [Y] [N]
- Corrosion, [Y] [N]

Type: NOT APPLICABLE

- Saver-pit over flow, [Y] [N]
- Surge vessel overflow, [Y] [N]
- Outward dent [Y] [N]
- Others (specify). NOT APPLICABLE

AFTER JOINT INVESTIGATION OF THE INCIDENT, SPILL WAS FOUND TO BE DUE TO THIRD PARTY

e. Spill point coordinates (MINNA MID-BELT)

Northing: (METRES)

109573.88

Easting: (METRES)

524529.13

INTERFERENCE



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C. RISK/DAMAGE ASSESSMENT

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 [,m]
- Drinking water source [,m]
- Built up area [,m]
- Farmlands [,m]
- Fish Farm/Pond [,m]
- Fishing net [,m]
- Others (specify). **NOT APPLICABLE**

9. Containment measures put in place;

- Booms [Y] [N]
- Trench [Y] [N]
- Dyke [Y] [N]

Others: NOT APPLICABLE

10. Any pictures or video coverage? [Y] [N]

11. Was there any disruption to the investigation? [Y] [N]

If yes give brief description:

NOT APPLICABLE

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

A. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments
NONE WITHIN AREA OF IMPACT					



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B. Crops/Economic Trees

S/N	Types of crops	Young	Medium	Matured	Quantity	Comments
	NONE	WITHIN	AREA	OF	IMPACT	

C. Fish/Nets/Ponds

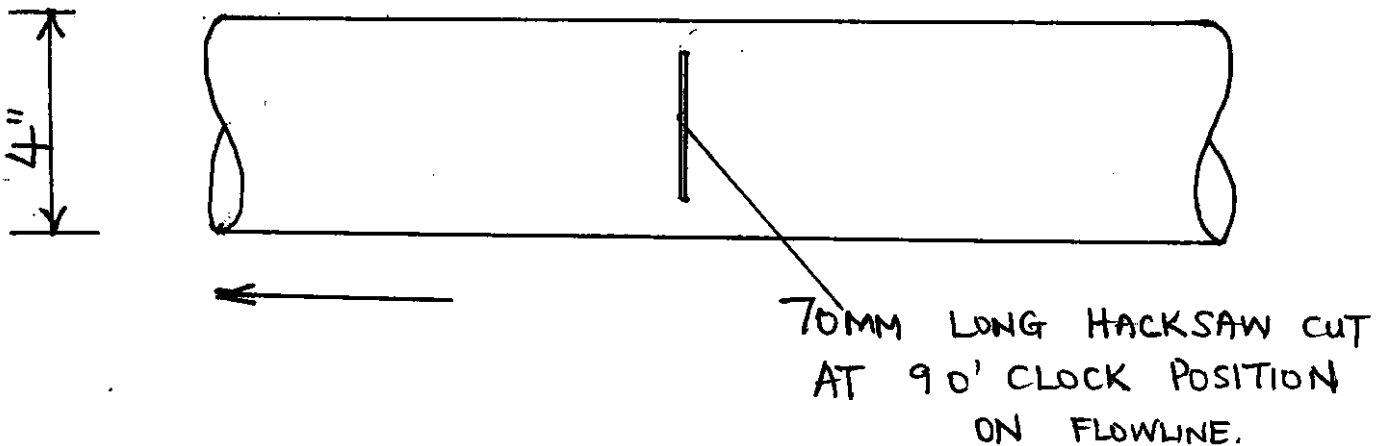
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE	WITHIN	AREA	OF IMPACT

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

S/N	Others	Description	Quantity/Size	Comments
	NONE	WITHIN	AREA	OF IMPACT.

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

SECTION OF IMO RIVER WELL 55 S FLOWLINE AT
 IGRIUKWU SHOWING LOCATION OF 'HACKSAW CUT





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G INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact 0.0057 Ha
- Impact within SPDC R.O.W 0.0057 Ha
 - Impact outside R.O.W NIL

18 Volume of oil recovered before completion of JIV (V_{rec}):

Recovered oil V_{rec} :	<u>NIL</u>	barrels
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19. Computation of the residual volume on site

a. Computation of the volume of pooled free phase oil (on land or confined water body).

- i. Area (m^2) occupied by pool of free phase oil 21
- ii. Average Depth (m) of pool of free phase oil 0.019
- iii.

Volume of pooled of free phase oil V_{pool} :	<u>2.51</u>	barrels
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iv.

b. Computation of volume of infiltrated oil in the soil (V-3).

- i. Area (m^2) covered by the oil: 36
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.003
- iii. Soil type: CLAY
- iv. p_e (effective porosity of the soil): 8%
- v.

Volume of infiltrated oil V_{in} :	<u>0.05</u>	barrels
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20. Computation of volume of oil on open water based on standard coloration.

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004	NOT	
Silvery	0.00008		
Slight Colour	0.00015		
Bright Colour	0.0003		
Dull	0.001		
Dark	0.002	APPLICABLE	
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume <u>NIL</u> bbl

Spill Factors from USCG FOG (2000 Edition)



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Volume of oil on open water: V_{wat}	NIL	barrels
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21. Calculation of evaporated volume:

- i. Oil type: **BONNY MEDIUM**
- ii. E-Factor: **15%**
- iii.

Volume of evaporated oil: V_{vap}	0.45	barrels
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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	40%	25%

9. Gross Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 0.45 + NIL + 0.05 + 2.51 + NIL = 3.01$

$V_{Est}(bbls) =$ **3 BARRELS**

10. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 0.45 + NIL + 0.05 + 2.51 + NIL = 3.01$

$V_{Est}(bbls) =$ **3 BARRELS**

- * 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.

This report was filled and signed on the 17 / 06 / 20 11 at incident site by joint 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