



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
 JOINT INVESTIGATION REPORT FOR INCIDENT NO: 673169

No. 00774

A. GENERAL INFORMATION:

1. Spill incident Number: 673169
2. Name of Location IMO RIVER WELL 56 L FLOWLINE
3. Name of nearest community ISIETITIOHA
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

- | | | |
|--|-------|-------|
| <input type="checkbox"/> Firmed soil | [Y] ✓ | [N] |
| <input type="checkbox"/> Loose soil | [Y] | [N] ✓ |
| <input type="checkbox"/> Previously excavated area | [Y] ✓ | [N] |
| <input type="checkbox"/> Under water | [Y] | [N] ✓ |
| <input type="checkbox"/> Swampy | [Y] | [N] ✓ |
| <input type="checkbox"/> Exposed pipe surface | [Y] | [N] ✓ |

SPILL POINT ENVIRONMENT
 BURNT AS A RESULT OF
 FIRE INCIDENT.

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

- | | | |
|--|-------|-------|
| <input type="checkbox"/> Drilled hole, | [Y] | [N] ✓ |
| <input type="checkbox"/> Hack saw cut, | [Y] | [N] ✓ |
| <input type="checkbox"/> Explosive tear, | [Y] | [N] ✓ |
| <input type="checkbox"/> Complete Rupture | [Y] | [N] ✓ |
| <input type="checkbox"/> Inward dent, | [Y] | [N] ✓ |
| <input type="checkbox"/> Well head tampering | [Y] | [N] ✓ |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve, | [Y] ✓ | [N] |
| <input type="checkbox"/> Missing pipeline (flowline) | [Y] | [N] ✓ |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point, | [Y] ✓ | [N] |
| <input type="checkbox"/> Third party tampering with Clamp Bolt/Nut, | [Y] | [N] ✓ |
| <input type="checkbox"/> Third party tampering with valve setting, | [Y] | [N] ✓ |
| <input type="checkbox"/> Third party tampering with flange Nuts/bolts, | [Y] | [N] ✓ |
| <input type="checkbox"/> Corrosion, | [Y] | [N] ✓ |
| Type: <u>NOT APPLICABLE</u> | | |
| <input type="checkbox"/> Saver-pit over flow, | [Y] | [N] ✓ |
| <input type="checkbox"/> Surge vessel overflow, | [Y] | [N] ✓ |
| <input type="checkbox"/> Outward dent | [Y] | [N] ✓ |
| <input type="checkbox"/> Others (specify). <u>NOT APPLICABLE</u> | | |

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

e. Spill point coordinates (MINNA MID-BELT).

Northing: (METRES)
107635.85

Easting: (METRES)
524398.93



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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** [. ,m]

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

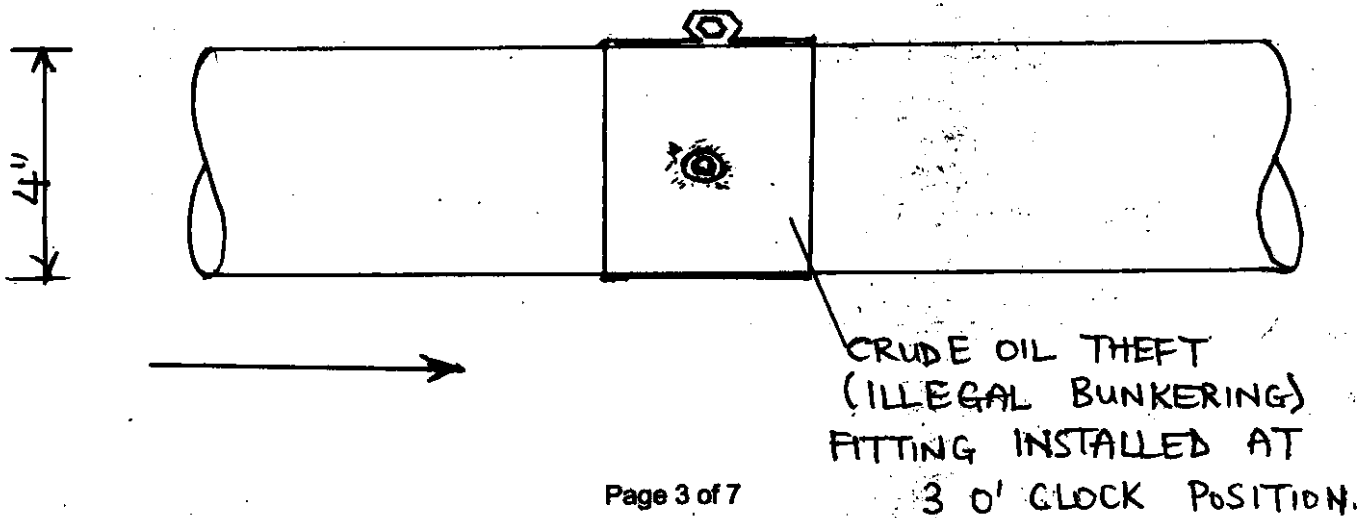
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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 IMD RIVER WELL 56L FLOWLINE AT
 ISIETITIOHA SHOWING LOCATION OF ILLEGAL
 BUNKERING FITTING.





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G. INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact 0.0095 Ha
- Impact within SPDC R.O.W 0.0095 Ha
 - Impact outside R.O.W NIL

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

Recovered oil V_{rec} :	<u>NOT APPLICABLE</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 NOT APPLICABLE
- ii. Average Depth (m) of pool of free phase oil NOT APPLICABLE
- iii.

Volume of pooled of free phase oil. V_{pool} :	<u>NIL</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: 95
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.005
- iii. Soil type: CLAY
- iv. p_e (effective porosity of the soil): 8%
- v.

	<u>0.24</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	<u>NOT</u>	
Silvery	0.00008		
Slight Colour	0.00015		
Bright Colour	0.0003	<u>APPLICABLE</u>	
Dull	0.001		
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume <u>NIL</u> bbl

VOLUME OF OIL SPILL BURNED BY FIRE INCIDENT IS ESTIMATED THUS:
 AREA X APPROXIMATE THICKNESS OF BURNED OIL =
 $95 \times 0.001 \times 6.29$
 BARRELS \approx 0.6 BARREL

Spill Factors from USCG FOG (2000 Edition)



Volume of oil on open water	NIL	barrels
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21. Calculation of evaporated volume:

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

Volume of evaporated	0.15	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 $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 0.15 + NIL + 0.24 + NIL + NIL + 0.6$ (VOLUME BURNT BY FIRE) = 0.99 = 1

$V_{Est}(bbls) =$ 1 BARREL

10. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 \cdot V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 0.15 + NIL + 0.24 + NIL + ML + 0.6$ (VOLUME BURNT BY FIRE) = 0.99 = 1

$V_{Est}(bbls) =$ 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.

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