

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0006 695276

(Note: As practicable as possible the JIT report is to be signed in the field by all the participating parties)

**A. GENERAL INFORMATION:**

1. Spill incident Number: 695276 2. Type of incident\* SPILL  
 3. Name of Location CANTHORNE CHANNEL WELL 21 L FLOWLINE  
 4. Name of nearest community MBIAMA 5. State: RIVERS 6. LGA DEGEMA  
 7. Type of Production facility/Installation OIL FLOWLINE 8. Asset owner/District NESP / SWAMP 1

**B. INCIDENT INFORMATION:**

9. Details of incident

a. Date of incident: 31st JULY 2011

b. Date/Period of investigation: 3rd AUGUST 2011

c. Description of spill point environment

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Firmed soil              | <input checked="" type="checkbox"/> Loose soil | <input checked="" type="checkbox"/> Previously excavated area |
| <input type="checkbox"/> Under water              | <input checked="" type="checkbox"/> Swampy     | <input type="checkbox"/> Exposed pipe surface                 |
| <input type="checkbox"/> Well Platform (on Water) |  | <input type="checkbox"/> Rig                                  |

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

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Drilled hole                               | <input type="checkbox"/> Hack saw cut           | <input type="checkbox"/> Explosive tear,                                 |
| <input type="checkbox"/> Complete Rupture                           | <input type="checkbox"/> Inward dent,           | <input type="checkbox"/> Well head tampering                             |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve,      |   | <input type="checkbox"/> Missing Pipeline/Flowline)                      |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point, |   | <input type="checkbox"/> Third party tampering with Clamp                |
| <input type="checkbox"/> Third party tampering with valve setting,  |   | <input type="checkbox"/> Third party tampering with flange,              |
| <input type="checkbox"/> External Corrosion                         |   | <input type="checkbox"/> Internal Corrosion                              |
| <input type="checkbox"/> Saver-pit over flow,                       | <input type="checkbox"/> Surge vessel overflow, | <input type="checkbox"/> Outward dent                                    |
| <input type="checkbox"/> Flare System/Bund wall Failure             | <input type="checkbox"/> Valve Failure          | <input type="checkbox"/> com unit failure                                |
| <input type="checkbox"/> Cold vent                                  | <input type="checkbox"/> Relief valve failure   | <input checked="" type="checkbox"/> Others (specify) <u>FAILED CLAMP</u> |

e. Incident due to:

- ☐ Third party interference ☒ Operational ☐ Others (specify \_\_\_\_\_)

f. Spill point coordinates

Measuring unit <u>(meter)</u> <u>(Minna Mid-Belt)</u>		(meter)
Northing: <u>61369.15</u>		Easting: <u>505388.64</u>

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## C. RISK ASSESSMENT

10. Type of environment:

☐ Land ☒ Swamp ☐ Water ☐ Seasonal swamp

i. Type of environment to which oil has spread:

☐ Land ☒ Swamp ☐ Water ☐ River (identify) \_\_\_\_\_

ii. Weather condition

☒ Raining ☐ Sunny

11. Distance from the nearest sensitive habitat

☐ Government reserved and designated protected area [ Nil,m]  
☐ Drinking water source [ Nil,m]  
☐ Built up area [ Nil,m]  
☐ Farmlands [ Nil,m]  
☐ Fish Farm/Pond [ Nil,m]  
☐ Fishing net [ Nil,m]  
☐ Others (specify). [ Nil,m]

**NOT APPLICABLE**

12. Containment measures put in place;

☐ Booms ☐ Trench ☐ Dyke

☐ Others: NOT APPLICABLE

13. Any pictures or video coverage?

[☒] [N]

14. Was there any disruption to the investigation?

[Y] [☒]

If yes give brief description:

NOT APPLICABLE

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

15. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments

**NONE WITHIN AREA OF IMPACT**

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16. Crops/Economic Trees

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

17. Fish/Nets/Ponds

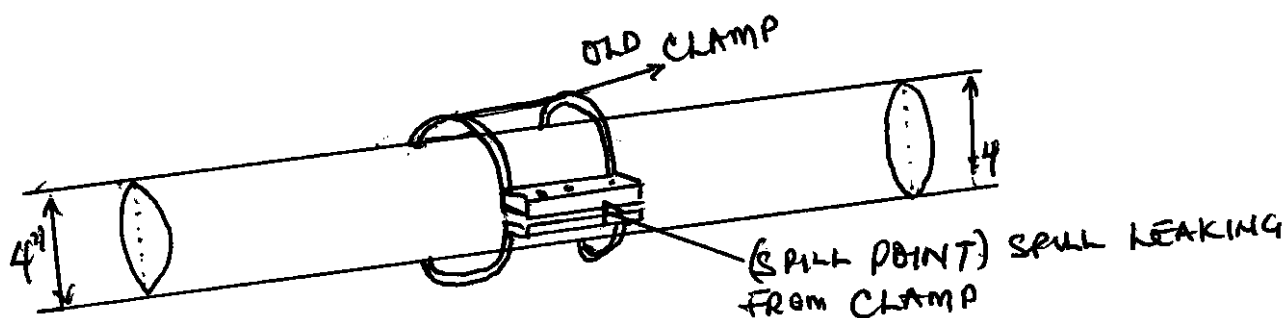
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE	WITHIN AREA OF IMPACT		

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

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

E. GRAPHIC DESCRIPTION OF LEAK POINT (Overview sketch of the site should be added as an appendix)

A SECTION OF 4" CANTHRONE CHANNEL WELL 21L FLOWLINE  
SHOWING THE LEAK FROM OLD CLAMP



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19. Impacted area boundary Coordinates (If more than 12 points, Attach as an appendix 2)

(Minna Mid-Belt)

**G. INCIDENT INFORMATION:**

- Total calculated area of impact 0.02 Ha
- Impact within SPDC R.O.W 0.02 Ha
- Impact outside R.O.W NIL

**21. Volume of oil recovered before completion of JIV ( $V_{rec}$ ):**

## 20. Computation of the residual volume on site

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

- i. Area (m<sup>2</sup>) occupied by pool of free phase oil NOT
- ii. Average Depth (m) of pool of free phase oil NOT
- iii. Emulsification factor: APPLICABLE

iv. Volume of pool of free phase oil. $V_{\text{pool}}$ :	NIL	barrels
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b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).

- i. Area ( $m^2$ ) covered by the oil: 200  $m^2$
- ii. Area of the pool of free phase oil in touch with soil: NIL
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.007
- iv. Soil type: CLAY
- v.  $P_e$  (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. $V_{inf}$	<u>0.7</u>	barrels
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21. Computation of volume of oil on open water based on standard coloration.

- i. Total area of oil on open water: NIL
- ii. Table of average depth of oil on water based on coloration \*

	Thickness (mm)	Percentage coverage	Volume ( $m^3$ )
Barely Visible	0.00004	NOT	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003	APPLICABLE	
Dull	0.001		
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume <u>NIL</u> bbl

iii. Volume of oil on open water. $V_{wat}$	<u>NIL</u>	barrels
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22. Calculation of evaporated volume:

- i. Oil type: BONNY LIGHT
- ii. E-Factor: 25%

iii. Volume of evaporated oil. $V_{evap}$	<u>0.23</u>	barrels
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Evaporation Factors (E-Factor) for SPDC Crude oil			
Oil Type	Days on site	Bonny Light	Bonny Medium
Period Since Oil Spill	< 1 day	10%	5%
	1-7 days	25% ✓	15%
	> 7 days	40%	25%

23. Gross Total Estimated Spilled Volume $V_{Est}(bbls) = V_{cvap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 0.23 + NIL + 0.7 + NIL + NIL = 0.93$ <u>Barrels</u>
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<u>V<sub>Est</sub>(bbls)=</u> <b>0.93 BARRELS</b>
<b>24. Net Total Estimated Spilled Volume</b> $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls)$ $= 0.23 + NIL + 0.7 + NIL + NIL = 0.93$
<u>V<sub>Est</sub>(bbls)=</u> <b>0.93 BARRELS</b>

\*Calculation of the respective estimated volume is to be done using the new spill estimation software on site

\*Conversion of m3 to barrels is Total volume VT (m3) x 6.29

\*Emulsification factor for spill on water to consider is 60% of volume of oil.

## 25. GENERAL STATUS OF THE SITE

A. Joint investigation of the incident site found that there is no residual impact After the initial response and therefore recommend that the site be closed out <input type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/>

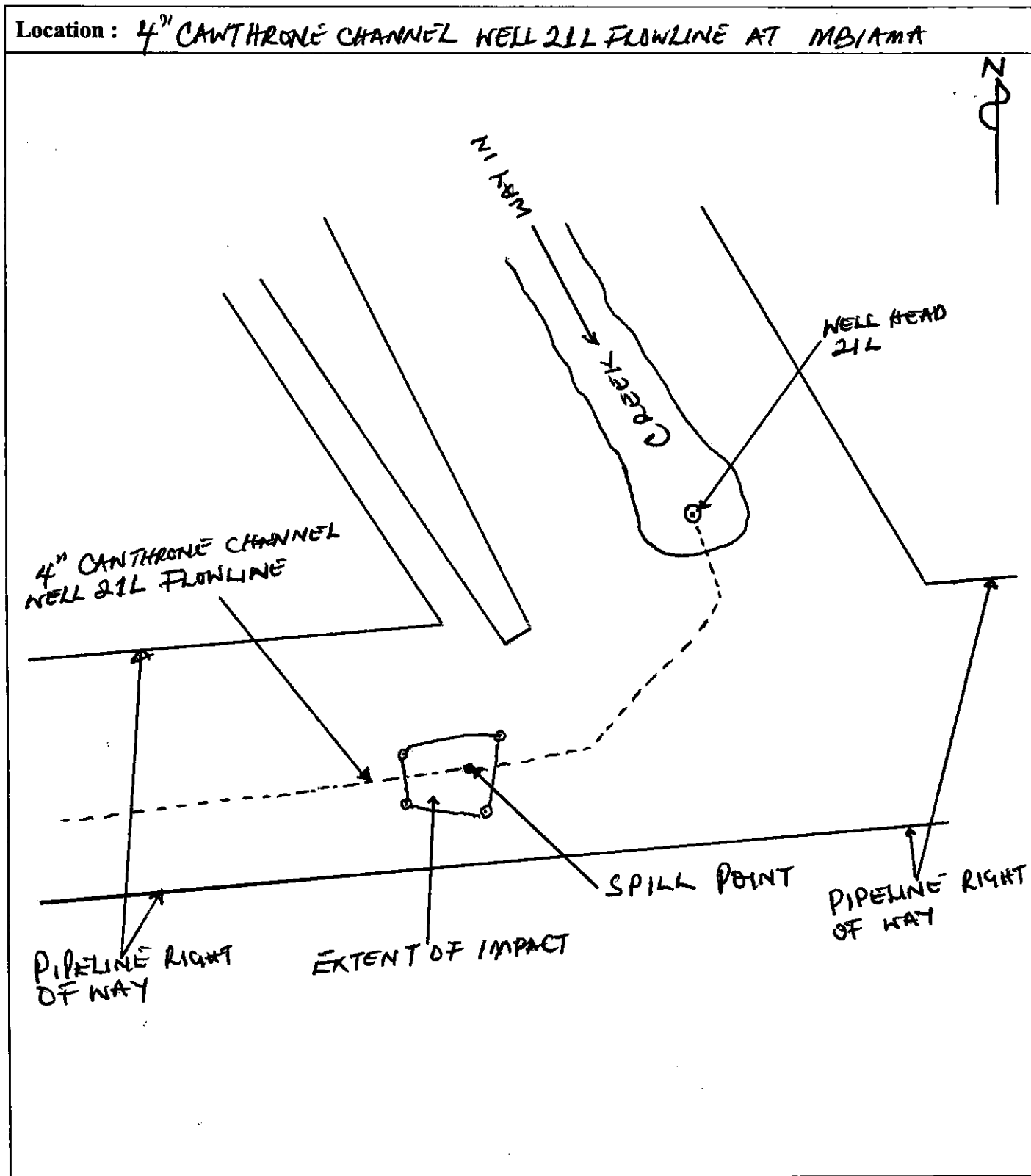
## 26 Signatories

<p>This report was filled and signed on the <u>03 / 08 /20 11</u> at incident site by joint investigation representatives from</p> <ul style="list-style-type: none"> <li>• Host Community <input checked="" type="checkbox"/></li> <li>• Department of Petroleum Resources [DPR]: <input type="checkbox"/></li> <li>• National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/></li> <li>• State Ministry of Environment [SME]: <input checked="" type="checkbox"/></li> <li>• Nigeria Police Force [NPF]: <input type="checkbox"/></li> <li>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/></li> </ul> <p style="text-align: right;"><i>Tick as applicable</i></p>
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20. Appendix 1: Overview sketch of the site



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**21. Appendix 2:TABLE SHOWING ADDITIONAL COORDINATES TAKEN DURING JIV FOR AREA CALCULATION**

[illegible]