

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED**

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0025 701341

(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: 701341      2. Type of incident\* SPILL  
 3. Name of Location 24" NEMBE CREEK TRUNKLINE (PIPELINE)  
 4. Name of nearest community TORA - IWENIKRIS. State: BAYELSA 6. LGA NEMBE  
 7. Type of Production facility/Installation PIPELINE.      8. Asset owner/District NESP

**B. INCIDENT INFORMATION:**

9. Details of incident

- a. Date of incident: 17<sup>TH</sup> AUGUST, 2011  
 b. Date/Period of investigation: 22<sup>ND</sup> TO 26<sup>TH</sup> AUGUST, 2011  
 c. Description of spill point environment  
 Firmed soil                                       Loose soil                                       Previously excavated area  
 Under water                                       Swampy     Exposed pipe surface  
 Well Platform (on Water)                                       Rig  
 d. Description of leak point (tick as applicable);  
 Drilled hole                                       Hack saw cut                                       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  
 Third party tampering with valve setting,                                       Third party tampering with flange,  
 External Corrosion                                       Internal Corrosion  
 Saver-pit over flow,                                       Surge vessel overflow,                                       Outward dent  
 Flare System/Bund wall Failure                                       Valve Failure                                       com unit failure  
 Cold vent                                       Relief valve failure                                       Others (specify) FAILED CLAMP  
 e. Incident due to:  
 Third party interference                                       Operational                                       Others (specify \_\_\_\_\_)

f. Spill point coordinates

Measuring unit <u>METERS</u> ( <u>MINNA MID-BELT</u> )	
Northing: <u>53546.87m</u>	Easting: <u>452574.51m</u>

\*This can be: a) Oil Spill b) Drilling fluid/Chemical c) Siltation d) construction e) Encroachment f) Fire,

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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 [    ,m]  
 Drinking water source [    ,m]  
 Built up area [    ,m]  
 Farmlands [    ,m]  
 Fish Farm/Pond [    ,m]  
 Fishing net [    ,m]  
 Others (specify). [    ,m]

} NOT APPLICABLE

12. Containment measures put in place;

- Booms     Trench     Dyke

Others: CONTAINMENT PIT.

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

14. 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**

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

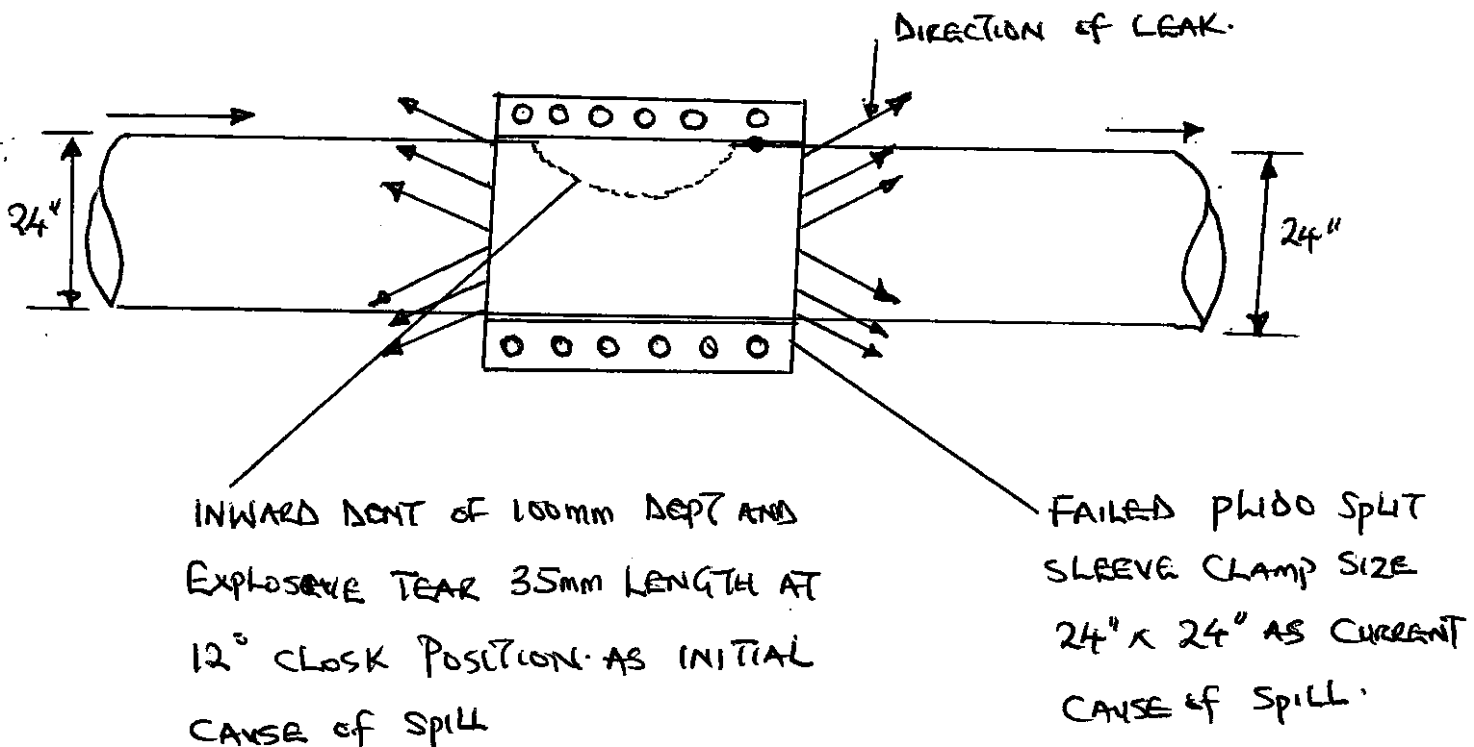
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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)

LOCATION: 24" NEMBE CREEK TRUNKLINE AT TORA TWEKIKI



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**F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION**

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

S/N	Northing METRES	Easting METERS
1	53489.44	452225.72
2	53567.38	452210.39
3	53646.05	452206.31
4	53694.55	452194.86
5	53686.47	452204.24
6	53644.68	452211.59
7	53618.09	452374.25
8	53577.60	452574.59
9	53561.52	452839.76
10	53521.56	452845.82
11	53522.09	452648.46
12	53513.07	452577.50
13	53561.32	452227.28

**G. INCIDENT INFORMATION:**

20. Impacted Area Details

- Total calculated area of impact 4.13 Ha
- Impact within SPDC R.O.W 2.11 Ha
- Impact outside R.O.W 2.02 Ha

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

Recovered oil $V_{recJ}$	<u>NIL</u>	barrels
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20. Computation of the residual volume on site

- a. Computation of volume of pool of free phase oil (on land or confined water body) 120m<sup>2</sup>
- Area (m<sup>2</sup>) occupied by pool of free phase oil \_\_\_\_\_
  - Average Depth (m) of pool of free phase oil 0.45m
  - Emulsification factor: NIL

iv. Volume of pool of free phase oil. $V_{pool}$ :	<u>339.33</u>	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: 39,400  $m^2$
- ii. Area of the pool of free phase oil in touch with soil: 39,400  $m^2$
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.001
- iv. Soil type: CLAY
- v.  $P_e$  (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. $V_{inf}$	19.83	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: \_\_\_\_\_
- ii. Table of average depth of oil on water based on coloration \*

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004		
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003	100	0.00057
Dull	0.001		
Dark	0.002		
Blackoil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume 0.0036 bbl

iii. Volume of oil on open water. $V_{wat}$ :	0.0036	barrels
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22. Calculation of evaporated volume:

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

iii. Volume of evaporated oil. $V_{evap}$ :	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) =  $V_{evap}$  (bbls) +  $V_{wat}$  (bbls) +  $V_{inf}$  (bbls) +  $V_{pool}$  (bbls) +  $V_{rec}$  (bbls)

19.83 + 0.0036 + 19.83 + 339.66 + NIL = 479.49

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$V_{Est}(bbls) = 119.83 + 0.0036 + 19.83 + 339.66 + NIL = 479.49 \text{ BARRELS}$
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls)$
$V_{Est}(bbls) = 119.83 + 0.0036 + 19.83 + 339.66 + NIL = 479.49 \text{ BARRELS}$

\*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"/>

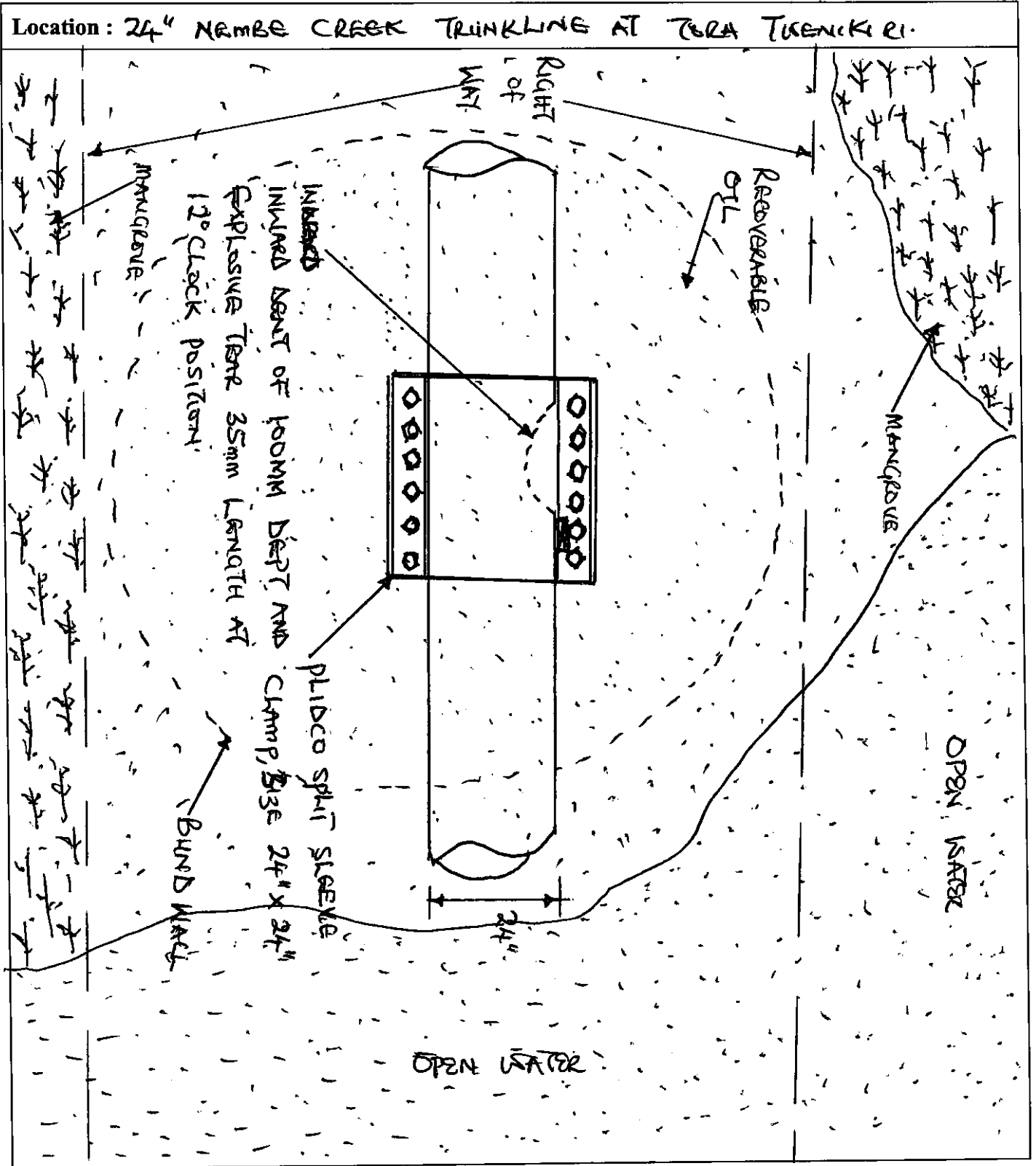
26 Signatories

This report was filled and signed on the <u>26/08/2011</u> at incident site by joint investigation representatives from
<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 checked="" type="checkbox"/></li><li>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/></li></ul>
<i>Tick as applicable</i>

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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**

S/N	Northing METERS	Easting METERS
14	53537.55	452229.74