

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0239/809951

(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: 809951 2. Type of incident \* OIL SPILL  
 3. Name of Location 24" NEMBE - CREEK TRUNKLINE BEHIND SEGO MAINFIELD  
 4. Name of nearest community SEGO 5. State: RIVERS 6. LGA AKUKU - TORU  
 7. Type of Production facility/Installation PIPELINE 8. Asset owner/ District UIC/P/NESP

**B. INCIDENT INFORMATION:**

**9. Details of incident**

- a. Date of incident: 2<sup>ND</sup> MAY, 2012.  
 b. Start date/time of investigation: 26<sup>TH</sup> MAY, 2012  
 c. Investigation End date: 28<sup>TH</sup> MAY, 2012.  
 d. Description of spill point environment  
 Firmed soil  Loose soil  Previously excavated area  
 Under water  Swampy  Exposed pipe surface  
 Well Platform (on Water)  Rig  
 e. 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,  
 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) \_\_\_\_\_  
 f. Incident caused by:  
 Third party interference  Operational  Mystery \_\_\_\_\_

**g. Spill point coordinates**

Measuring unit <u>(METERS)</u> <u>MINNA MID-BELT</u>	
Northing: <u>55410.38</u>	Easting: <u>461324.97</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

- |  |   |     |                  |
|--|---|-----|------------------|
| <input type="checkbox"/> Government reserved and designated protected area | [ | .m] | } NOT APPLICABLE |
| <input type="checkbox"/> Drinking water source                             | [ | .m] |                  |
| <input type="checkbox"/> Built up area                                     | [ | .m] |                  |
| <input type="checkbox"/> Farmlands   | [ | .m] |                  |
| <input type="checkbox"/> Fish Farm/Pond                                    | [ | .m] |                  |
| <input type="checkbox"/> Fishing net                                       | [ | .m] |                  |
| <input type="checkbox"/> Others (specify).                                 | [ | .m] |                  |

12. Containment measures put in place;

- Booms     Trench     Dyke

Others: \_\_\_\_\_

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

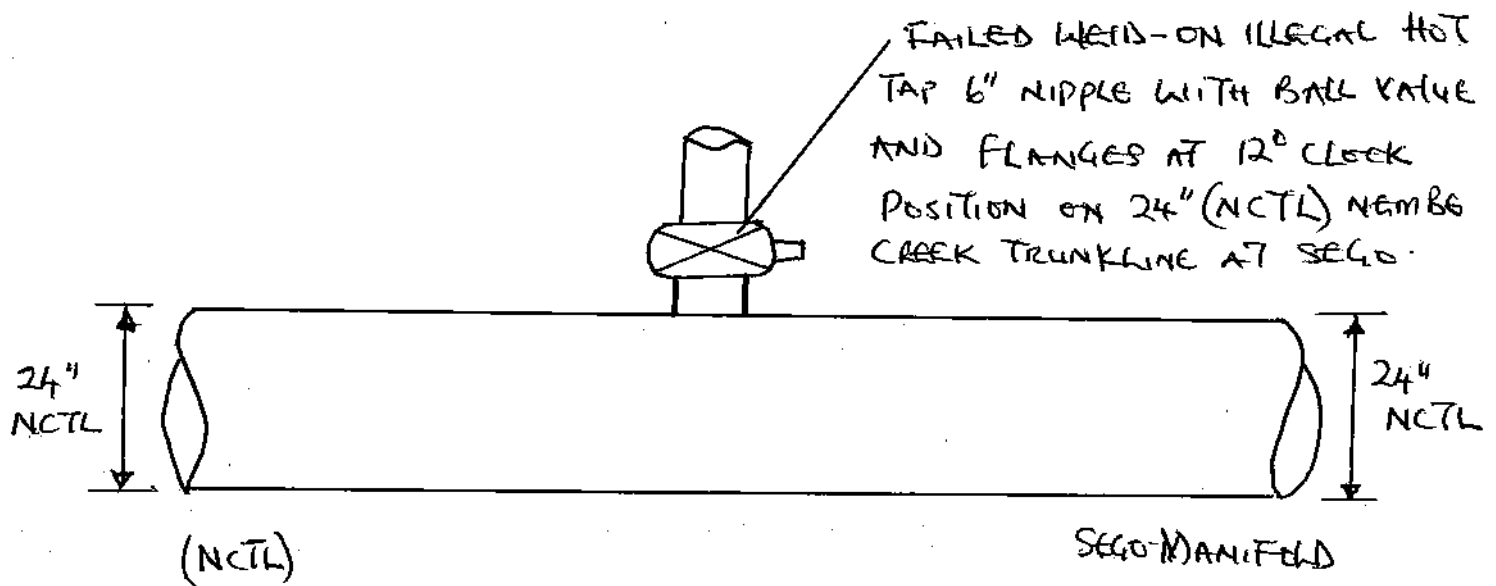
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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** *While detail report of the leak point should be contained in the Leak report, overview sketch of the site should be added as an appendix 1)*

24" NEMBE - CREEK PIPELINE BEHIND SEGO MANIFOLD AT SEGO





Impacted Area boundary Coordinates

name	Minna Mid-Belt (meter)		Remarks
	northing	easting	
p1	55170.42	461441.53	impacted Area
p2	55158.16	461429.16	impacted Area
p3	55155.49	461424.49	impacted Area
p4	55207.47	461392.33	impacted Area
p5	55241.97	461378.14	impacted Area
p6	55296.58	461341.73	impacted Area
p7	55320.01	461317.56	impacted Area
p8	55351.55	461297.45	impacted Area
p9	55370.18	461275.22	impacted Area
p10	55382.91	461253.98	impacted Area
p11	55398.40	461207.76	impacted Area
p12	55407.65	461186.31	impacted Area
p13	55418.27	461051.70	impacted Area
p14	55429.55	460943.76	impacted Area
p15	55415.76	460935.39	impacted Area
p16	55405.19	460938.57	impacted Area
p17	55386.77	460938.86	impacted Area
p18	55375.19	460938.61	impacted Area
p19	55354.95	460942.33	impacted Area
p20	55296.11	460964.59	impacted Area
p21	55276.39	460973.81	impacted Area
p22	55261.95	460976.29	impacted Area
p23	55250.73	460978.22	impacted Area
p24	55273.45	460963.00	impacted Area
p25	55292.50	460939.46	impacted Area
p26	55322.14	460919.88	impacted Area
p27	55280.33	460910.09	impacted Area
p28	55235.15	460918.95	impacted Area
p29	55307.85	460888.66	impacted Area
p30	55344.97	460875.16	impacted Area
p31	55393.65	460855.58	impacted Area
p32	55444.98	460824.10	impacted Area
p33	55464.56	460818.01	impacted Area
p34	55546.90	460816.52	impacted Area
p35	55633.63	460814.57	impacted Area
p36	55701.04	460827.20	impacted Area
p37	55686.26	460832.83	impacted Area
p38	55643.66	460833.62	impacted Area
p39	55636.52	460841.03	impacted Area
p40	55640.22	460849.23	impacted Area
p41	55645.12	460856.86	impacted Area
p42	55670.12	460858.49	impacted Area
p43	55693.75	460865.91	impacted Area
p44	55639.56	460877.54	impacted Area
p45	55602.97	460907.60	impacted Area
p46	55566.35	460943.58	impacted Area
p47	55529.94	461009.86	impacted Area



name	Minna Mid-Belt (meter)		Remarks
	northing	easting	
p48	55509.77	461057.49	impacted Area
p49	55500.51	461104.78	impacted Area
p50	55486.95	461136.00	impacted Area
p51	55480.33	461150.55	impacted Area
p52	55476.20	461159.51	impacted Area
p53	55470.38	461184.70	impacted Area
p54	55457.78	461216.15	impacted Area
p55	55447.16	461232.98	impacted Area
p56	55425.03	461263.18	impacted Area
p57	55419.60	461324.99	impacted Area
p58	55416.47	461349.66	impacted Area
p59	55406.25	461364.31	impacted Area
p60	55394.35	461365.11	impacted Area
p61	55388.50	461336.50	impacted Area
p62	55333.50	461352.52	impacted Area
p63	55311.95	461367.89	impacted Area
p64	55253.18	461402.02	impacted Area
p65	55235.02	461413.94	impacted Area
p66	55176.86	461441.70	impacted Area
p67	55170.42	461441.53	impacted Area



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iii. Emulsification factor: 40%

iv. 

Volume of pool of free phase oil, $V_{pool}$	18.12	barrels
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b. Computation of volume of infiltrated oil in the soil ( $V_{int}$ ).

i. Area \*(m<sup>2</sup>) covered by the oil: 35,200 m<sup>2</sup>

ii. Area of the pool of free phase oil in touch with soil: 6.25 m

iii. Average Depth (m) below ground surface of infiltration of oil: 0.50 m

iv. Soil type: CLAY

v.  $P_c$  (effective porosity of the soil): 8%

iv. 

Volume of infiltrated oil, $V_{int}$	17.71	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: 36,200 m<sup>2</sup>

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		
Dull	0.001		
Dark	0.002	80%	0.058
Black oil	0.1	20%	0.724
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume bbl

iii. 

Volume of oil on open water, $V_{wat}$	4.9 Barrels	barrels
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22. Calculation of evaporated volume:

i. Oil type: BONNY LIGHT

ii. E-Factor: 40%

iii. 

Volume of evaporated oil, $V_{evap}$	34.88	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%

\*If area is not same as the total area of impact, please indicate in the overview sketch  
 \*\* Spill Factor from USCG FOG (2000 Edition)

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## 23. Gross Total Estimated Spilled Volume

$$V_{Est}(\text{bbls}) = V_{evap}(\text{bbls}) + V_{wat}(\text{bbls}) + V_{inf}(\text{bbls}) + V_{pool}(\text{bbls}) + V_{recf}(\text{bbls})$$

$$V_{Est}(\text{bbls}) = 34.68 + 4.9 + 17.71 + 18.12 + (22.61 \times 0.60) = 88.67 \text{ BARRELS}$$

## 24. Net Total Estimated Spilled Volume

$$V_{Est}(\text{bbls}) = V_{evap}(\text{bbls}) + 0.6 * V_{wat}(\text{bbls}) + V_{inf}(\text{bbls}) + V_{pool}(\text{bbls}) + V_{recf}(\text{bbls})$$

$$V_{Est}(\text{bbls}) = 34.68 + (4.9 \times 0.60) + 17.71 + 18.12 + 13.26 = 86.71 \text{ BARRELS}$$

\*Calculation of the respective estimated volume is to be done on site as far as practicable using the new spill volume 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

B. Investigation of the incident site showed that there is residual impact on site requiring further works

## 26 REPRESENTATIVES

This report was filled and signed on the 28 / 05 / 2012 at incident site by joint investigation representatives 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



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27. Appendix 1: Overview sketch of the site

