

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0329 867418

(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: 867418 2. Type of incident \* OIL SPILL  
 3. Name of Location 18" ASSA - RUMUEKPE PIPELINE  
 4. Name of nearest community AWARA 5. State: IMO 6. LGA OHATI/EGBEMA  
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/ District NPE/EGBEMA

**B. INCIDENT INFORMATION:**

**9. Details of incident**

- a. Date of incident: 15TH SEPTEMBER, 2012.  
 b. Start date/time of investigation: 19TH SEPTEMBER, 2012.  
 c. Investigation End date: 19TH SEPTEMBER, 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) FAILED CLAMP

- f. Incident caused by:  
 Third party interference  Operational  Mystery \_\_\_\_\_

g. Spill point coordinates

Measuring unit	
Minna - Mid belt.	
Northing: (m)	Easting: (m)
142572.504	480108.610

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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] **FARMLAND SLIGHTLY IMPACTED**  
 Fish Farm/Pond [      ,m]  
 Fishing net [      ,m]  
 Others (specify). [      ,m]

12. Containment measures put in place;

- Booms       Trench       Dyke

Others: NATURAL DEPRESSION

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
	<u>NONE WITHIN AREA OF IMPACT</u>				

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16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1	CASSAVA			✓	30	WITHIN IMPACTED FARMLAND

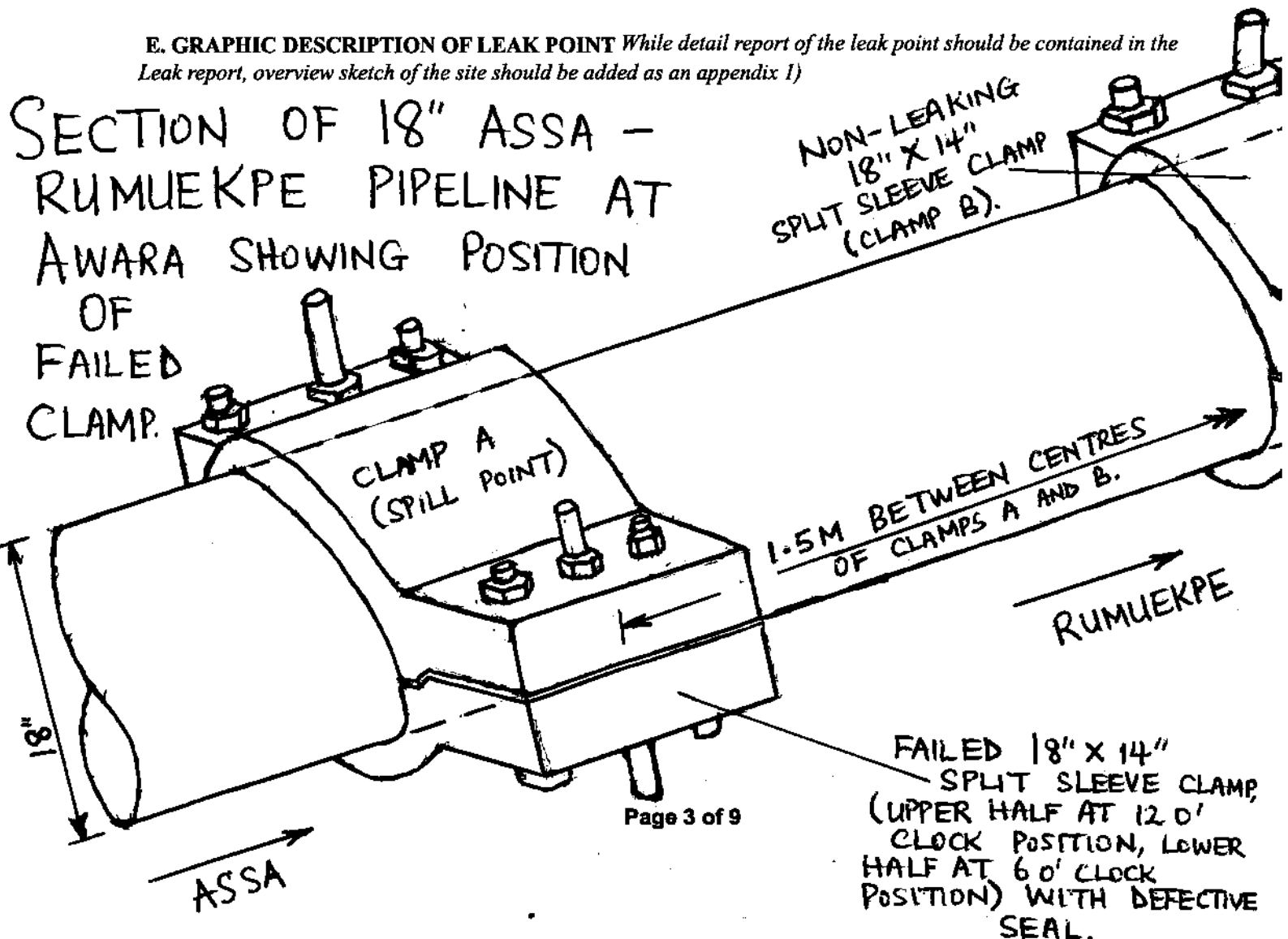
17. Fish/Nets/Ponds

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)



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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)

Minna - Mid belt.

S/N	Northing (m)	Easting (m)
WP142	142612.466	480139.412
WP143	142612.449	480145.571
WP144	142606.330	480136.315
WP145	142612.500	480127.093
WP146	142603.257	480136.306
WP147	142603.240	480142.466
WP148	142590.968	480136.272
WP149	142587.887	480139.344
WP150	142578.764	480105.441
WP152	142584.900	480108.538
WP153	142587.972	480108.546
WP154	142594.083	480120.882
WP155	142600.236	480117.82

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.1500ha
- Impact within SPDC R.O.W Yes
- Impact outside R.O.W Yes

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

Recovered oil $V_{rec}$	<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).

- Area ( $m^2$ ) occupied by pool of free phase oil 116
- Average Depth (m) of pool of free phase oil 0.039

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iii. Emulsification factor: NIL

iv. 

Volume of pool of free phase oil, $V_{pool}$ :	<u>28.46</u>	barrels
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b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).

**COMPUTATION OF VOLUME OF OIL INFILTRATION AT SPILL POINT:**  
**AREA OF OIL INFILTRATION AT SPILL POINT = 200<sup>2</sup>**

- i Area \*(m<sup>2</sup>) covered by the oil: 1382
- 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, $V_{inf}$ (TOTAL)	<u>2.52 + 4.87 = 7.39</u>	barrels
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DEPTH = 21. Computation of volume of oil on open water based on standard coloration.

2.5 M. i. Total area of oil on open water: NIL

VOLUME = ii. Table of average depth of oil on water based on coloration\*\*

2MX 2.5M X 8% (EFFECTIVE POROSITY OF CLAY SOIL) X 6.29 = 2.52 BARRELS

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004	<b>NOT APPLICABLE</b>	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003		
Dull	0.001		
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		

Percent Total 100% Total Volume NIL bb)

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>11.95</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%

\*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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<b>23. Gross Total Estimated Spilled Volume</b>		<b>= 11.95 + NIL + 7.39 +</b>
$V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls)$		<b>28.46 + NIL = 47.8</b>
$V_{Est}(bbls) =$	<b>48 BARRELS</b>	
<b>24. Net Total Estimated Spilled Volume</b>		<b>= 11.95 + NIL + 7.39</b>
$V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls)$		<b>+ 28.46 + NIL =</b>
$V_{Est}(bbls) =$	<b>48 BARRELS</b>	<b>47.8</b>

\*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 19/09/2012 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*

27. Appendix 1: Overview sketch of the site

