

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0135 787833

(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: 787833 2. Type of incident\* OIL SPILL  
 3. Name of Location 36" RUMUEKPE - NKPOKU PIPELINE  
 4. Name of nearest community MBODO-ALUU 5. State: RIVERS 6. LGA IKWERRE  
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/District NPE/PH I

**B. INCIDENT INFORMATION:**

9. Details of incident

- a. Date of incident: 11TH MARCH, 2012  
 b. Date/Period of investigation: 12TH AND 13TH MARCH, 2012.

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) \_\_\_\_\_

e. Incident due to:

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

f. Spill point coordinates (MINNA MID-BELT)

Measuring unit (m)	
Northing:  <u>104208.19</u>	Easting:  <u>498523.68</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 [ NIL ,m] FARMLAND IMPACTED BY SPILL.  
 Fish Farm/Pond [      ,m]  
 Fishing net [      ,m]  
 Others (specify). [      ,m]

12. Containment measures put in place;

- Booms       Trench       Dyke

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

13. Any pictures or video coverage? [  ] [ 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 STEMS			✓	NUMEROUS	SUPERFICIAL IMPACT ON FARMLAND VEGETATION

17. Fish/Nets/Ponds

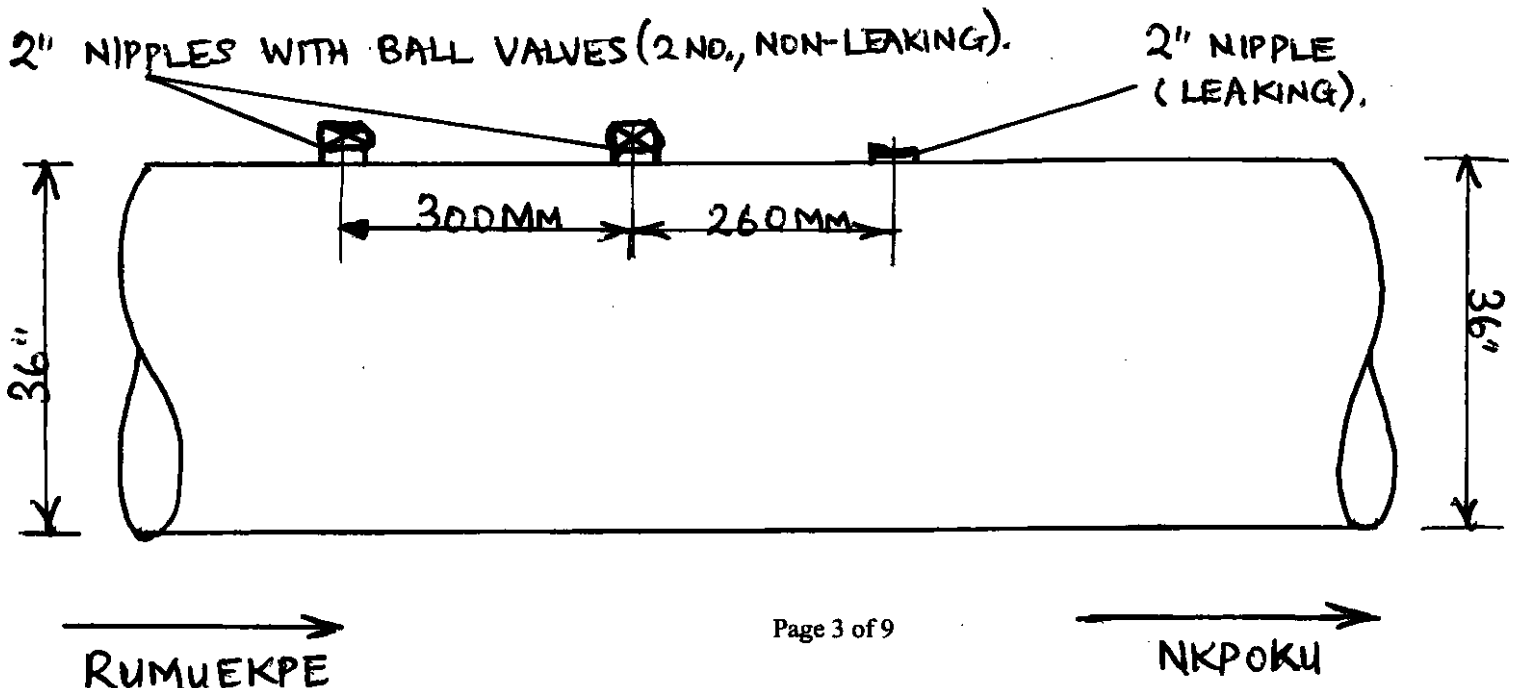
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
		NONE WITHIN AREA OF IMPACT		

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 1)

SECTION OF 36" RUMUEKPE - NKPOKU  
 PIPELINE AT MBODO-ALUU SHOWING POSITIONS  
 OF 3 NO. CRUDE OIL THEFT POINTS. <sup>12 O' CLOCK</sup>



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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) (MINWA MID-BELT)

S/N	Northing (m)	Easting (m)
WP449	104205.44	498524.06
WP451	104205.45	498520.97
WP452	104205.46	498517.87
WP453	104208.53	498517.90
WP454	104211.60	498517.91
WP455	104223.89	498517.94
WP456	104233.09	498524.12
WP457	104229.96	498548.76
WP458	104217.70	498536.41
WP460	104205.39	498545.62
WP461	104208.51	498527.14
WP462	104177.77	498536.32
WP463	104193.18	498511.70

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.60 Ha.
- Impact within SPDC R.O.W \_\_\_\_\_
- Impact outside R.O.W \_\_\_\_\_

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 412
- Average Depth (m) of pool of free phase oil 0.015
- Emulsification factor: NIL

iv. Volume of pool of free phase oil. $V_{pool}$ :	<u>38.87</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: 5565
- ii. Area of the pool of free phase oil in touch with soil: 401
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.002
- iv. Soil type: CLAY
- v.  $P_e$  (effective porosity of the soil): 8%

iv. Volume of infiltrated oil, $V_{inf}$	<u>6.</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 (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 <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 MEDIUM
- ii. E-Factor: 15%

iii. Volume of evaporated oil, $V_{evap}$	<u>7.92</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  $V_{Est}(bbls) = V_{cvap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 7.92 + NIL + 6 + 38.87 + NIL = 52.79$

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$V_{Est}(bbls) =$	<b>52.8 BARRELS</b>
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rej}(bbls) = 7.92 + NIL + 6 + 38.87 + NIL = 52.79$	
$V_{Est}(bbls) =$	<b>52.8 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"/>

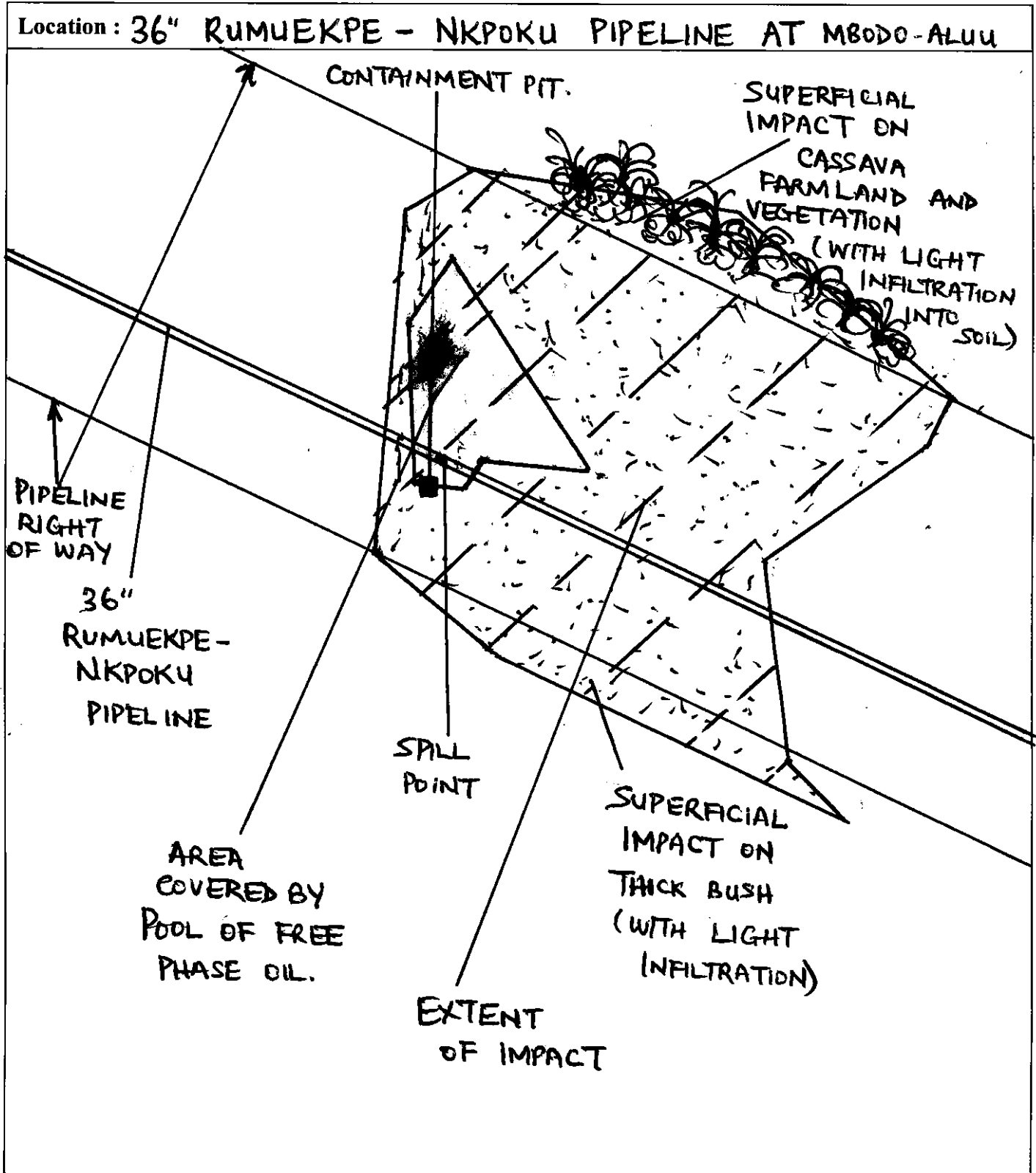
26 Signatories

This report was filled and signed on the <u>13 / 03 / 2012</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 checked="" type="checkbox"/> <b>DPR INCIDENT INVESTIGATION REPORT ATTACHED.</b></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









DEPARTMENT OF PETROLEUM RESOURCES

FIELD JOINT INVESTIGATION REPORT

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

- 1. Company SPDC
- 2. Incident Serial Number 787833
- 3. Name of Location/Facility 36" RUMUEKPE - NIKPOKU PIPELINE @ MBODO, ALUU, IKWERRE L.G.A, RIVERS STATE.

4. Type of Incident: (Indicate  where appropriate and X where not applicable)

- Crude Oil Spill
- Product Spill (Specify)
- Drilling Mud/Chemicals Spill
- Fire
- Others (specify)

5. Details of Incident

- i. Date of Incident: 11/03/2012
- ii. Date Reported to the DPR:
- iii. Date/Period of First Investigation: 13/03/2012
- iv. Date/Period of Second/Subsequent Investigation:
- v. Cause of Incident (Indicate  where appropriate and X where not applicable)

- Corrosion
- Equipment Failure
- Human Error (Production/Maintenance)
- Third Party Interference (BUNKERING)
- Mystery Spill
- Others (Specify)

Additional description of cause of incident (if any): Three (3) two inch nipples were installed on the 36" pipeline at 12 o'clock position. The leakage occurred as a result of bunkering activities.

6. Coordinates of Spill Point/Location(s): Northing 10720819 Easting 49852368

7. Brief Description of Circumstances Around Spill Point(s) (Please indicate containment measures put in place, point of breach along pipeline and any necessary details observed at site. Attach additional sheets if necessary)

**8. Delineation of Impacted Area:** (Indicate ✓ where appropriate and X where not applicable)

- a) Within company's facilities/ROW
- b) Outside company's facilities/ROW

**9. Description of Environment Around Spill Point/Location(s):** (Indicate ✓ where appropriate and X where not applicable)

- Land
- Seasonal Swamp
- Swamp
- Coastland
- Inland waters
- Near shore
- Offshore

Please provide a graphic sketch of spill site/leak point (Detailed sketches and maps can be attached where necessary)

**Table of Key Coordinates of Mapped Area**

S/N	Eastings	Northings

S/N	Eastings	Northings

**10. Property Impacted** (Provide details)  
 Farmlands and vegetation.

**11. Communities Impacted**  
 a) MRSDO, ALUU b)

c)

d)

e)

f)

12. Estimated Quantity Spilled (bbls): 52.8 BBL  
 (Please provide below, the methodology used, standards adopted and any assumptions made in the estimate. Where relevant, make brief comments on quantities unaccounted for. Attach and endorse additional sheets if necessary)

13. Quantity Recovered (As at time of the investigation): 45 BBL

14. Any Photograph or Video Recording? (Provide details):  
 .....  
 .....

15. Additional Comments/Remarks, if any:  
 The spill occurred as a result of bunkering activities.  
 Surveillance activities should as a matter of urgency be stepped-up to prevent a re-occurrence.