

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED**  
**JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0294/838397**

*(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: 838397      2. Type of incident \* OIL SPILL  
 3. Name of Location 36" Rumuekpe - NKPOKU TRANS NIGER PIPELINE  
 4. Name of nearest community MGBODU ALUUS. State: RIVERS      6. LGA IKWERRE  
 7. Type of Production facility/Installation PIPELINE      8. Asset owner/ District NPE / PHL

**B. INCIDENT INFORMATION:**

**9. Details of incident**

- a. Date of incident: 6<sup>TH</sup> JULY, 2012
- b. Start date/time of investigation: 8<sup>TH</sup> JULY, 2012
- c. Investigation End date: 9<sup>TH</sup> JULY, 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 - BEET</u> )	
Northing:  <div style="font-size: 2em; text-align: center;">102591.92</div>	Easting:  <div style="font-size: 2em; text-align: center;">501468.99</div>

\*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: \_\_\_\_\_

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

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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

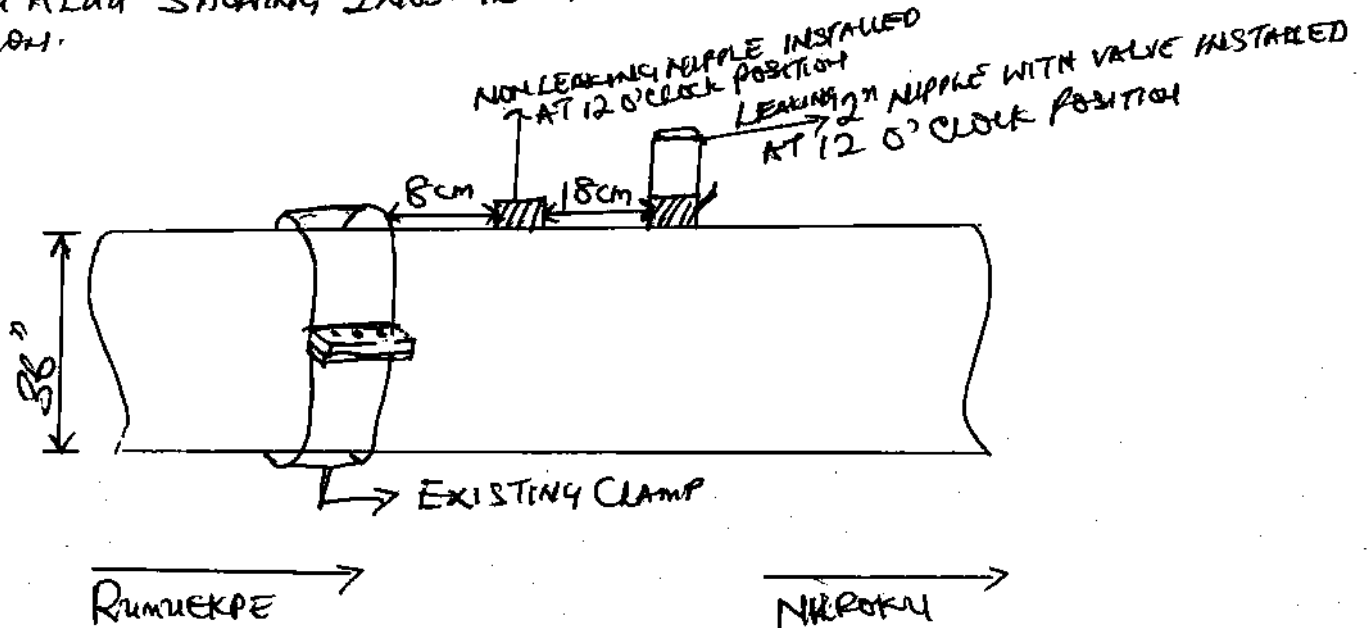
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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)

A SECTION OF 36" RUMUEKPE - NKPOKU TRANS NIGER PIPELINE AT NGBODU ALUM SHOWING 2 NOS. ILLEGAL BUNKERING POINTS AT 12 O'CLOCK POSITION.



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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-BAIT)

S/N	Northing (METER)	Easting (METER)
1	102638.02	501459.85
2	102579.69	501441.23
3	102536.68	501444.21
4	102512.10	501444.15
5	102478.29	501453.32
6	102447.58	501447.09
7	102604.14	501496.75
8	102413.78	501450.09
9	102392.33	501428.47
10	102352.42	501416.06
11	102327.77	501446.81
12	102647.14	501503.01
13	102631.73	501524.54

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 4.47 Ha
- 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>142.5</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 400.0000
  - Average Depth (m) of pool of free phase oil 0.006m

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iii. Emulsification factor: 40%

iv. 

Volume of pool of free phase oil $V_{pool}$	<u>90.58</u>	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: 44,300m
- ii Area of the pool of free phase oil in touch with soil: —
- iii Average Depth (m) below ground surface of infiltration of oil: 0.004m
- iv Soil type: CLAY
- v  $P_e$  (effective porosity of the soil): 8%

iv. 

Volume of infiltrated oil $V_{int}$	<u>89.17</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	NOT APPLICABLE		
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 $V_{open}$	<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>56.87</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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**23. Gross Total Estimated Spilled Volume**

$$V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls)$$

$$V_{Est}(bbls) = 56.87 + Nil + 89.17 + 90.58 + 142.5 = 379.12 \text{ BARRELS}$$

**24. Net Total Estimated Spilled Volume**

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

$$V_{Est}(bbls) = 56.87 + Nil + 89.17 + 90.58 + 142.5 = 379.12 \text{ BARRELS}$$

\*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

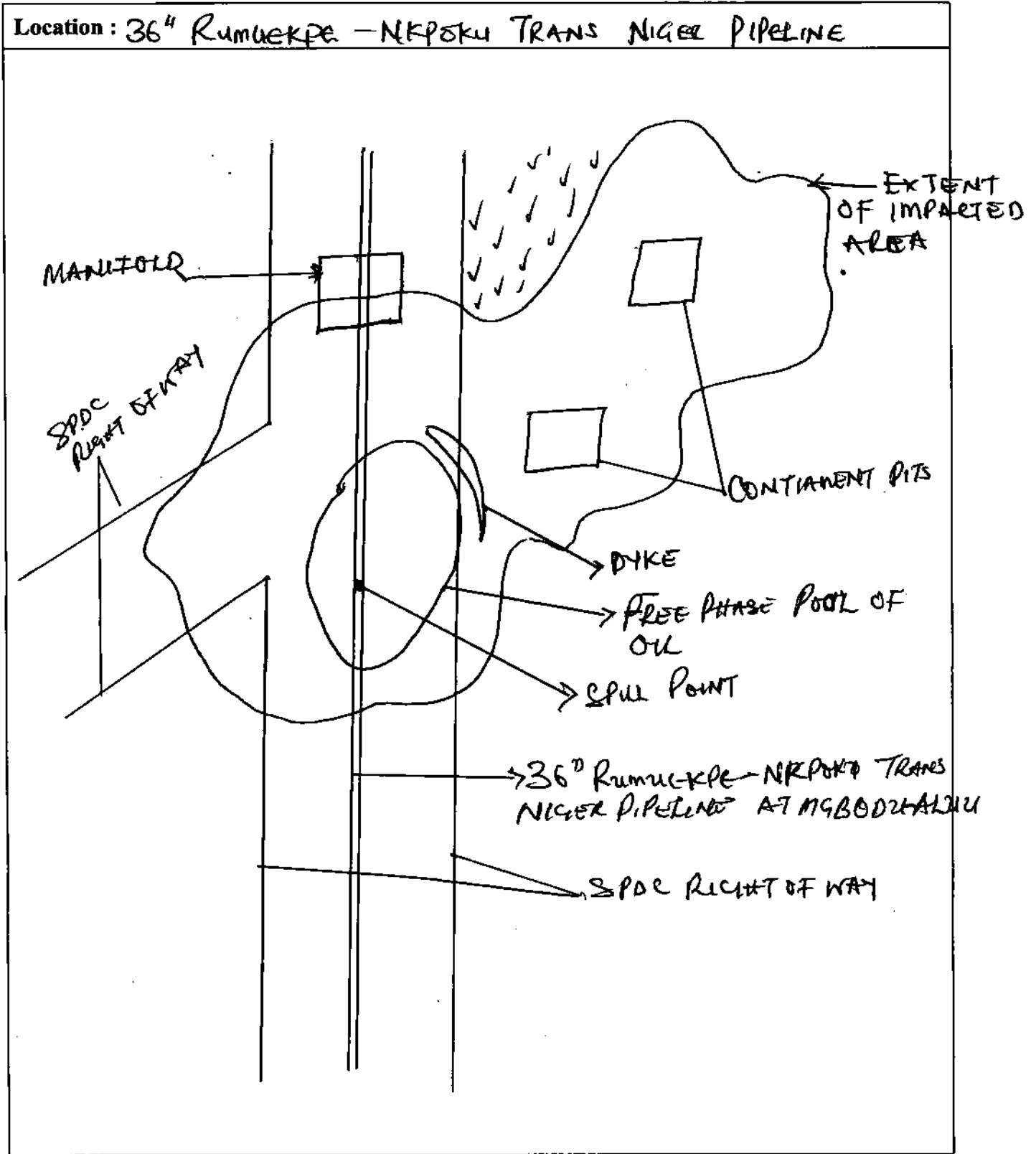
**26 REPRESENTATIVES**

This report was filled and signed on the 09/07/2012 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



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

(MINNA MID-BEIT)

S/N	Northing (METER)	Easting (METER)
14	102607.11	501539.89
15	102548.84	501496.62
16	102450.62	501462.50
17	102561.22	501456.59
18	102567.35	501462.77
19	102576.59	501453.55
20	102585.80	501456.65
21	102601.12	501475.17
22	102598.03	501481.33
23	102459.56	501579.61
24	102521.13	501524.29
25	102273.46	501461.91
26	102253.62	501475.80
27	102242.372	501511.52
28	102245.68	501545.25
29	102257.59	501575.02
30	102438.83	501585.60
31	102411.045	501592.22