

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0195 777315

(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: 777315 2. Type of incident\* SPILL  
 3. Name of Location 28<sup>th</sup> NKPOKU - BOMU PIPELINE  
 4. Name of nearest community B-DERE 5. State: RIVERS 6. LGA GOKANA  
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/District NESP/PH2

**B. INCIDENT INFORMATION:**

9. Details of incident

- a. Date of incident: 6<sup>th</sup> FEBRUARY 2012  
 b. Date/Period of investigation: 14<sup>th</sup> FEBRUARY 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

Measuring unit	MINNA MID BELT	
Northing:	Easting:	
1) 77171.57m	531859.37m	
2) 77172.01m	531858.76m	

\*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 [ N/A,m]  
 Drinking water source [ N/A,m]  
 Built up area [ N/A,m]  
 Farmlands [ N/A,m]  
 Fish Farm/Pond [ N/A,m]  
 Fishing net [ N/A,m]  
 Others (specify). [ N/A,m]
- NOT APPLICABLE**

12. Containment measures put in place;

- Booms       Trench       Dyke

Others: NOT APPLICABLE

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
	NONE	WITHIN AREA OF IMPACT				

17. Fish/Nets/Ponds

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

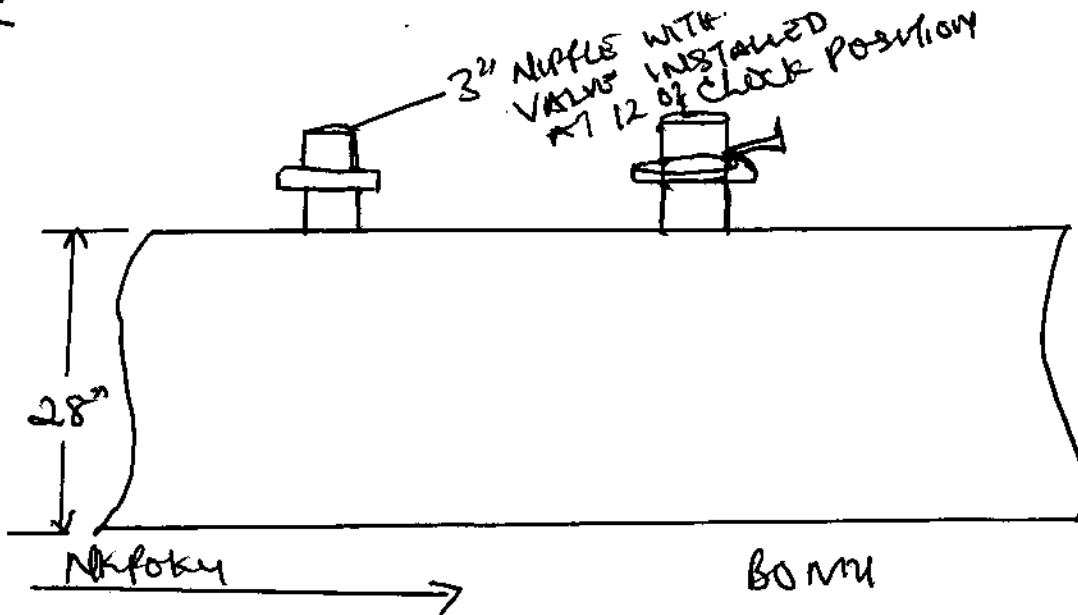
18. Others (Specify) i.e. Animal Traps

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)

A SECTION OF 28" NKPOKU-BOMU PIPELINE AT B-DERE

SHOWING (2) ILLEGAL BUNKERING POINTS INSTALLED 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 BELT

S/N	Northing	Easting
1.	77170.91m	531855.87m
2.	77173.94m	531859.32m
3.	77171.61m	531862.58m
4.	77168.77m	531859.11m

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 17m<sup>2</sup>
- Impact within SPDC R.O.W 17m<sup>2</sup>
- Impact outside R.O.W NIL

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).

- i. Area (m<sup>2</sup>) occupied by pool of free phase oil NIL
- ii. Average Depth (m) of pool of free phase oil NIL
- iii. Emulsification factor: NIL

iv. Volume of pool of free phase oil. $V_{pool}$ :	<u>NIL</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: 17  $m^2$
- 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: 0.02
- iv. Soil type: CLAY
- v.  $P_e$  (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. $V_{inf}$	<u>0.17</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	<b>NOT APPLICABLE</b>	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003		
Dull	0.001		
Dark	0.002		
Black oil Emulsion (30% Oil)	0.1		
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: 25%

iii. Volume of evaporated oil. $V_{evap}$ :	<u>0.05</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  $V_{Est}(bbls) = V_{cvap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls) = 0.05 + NIL + 0.17 + NIL + NIL = 0.22 **BARRELS**$

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$V_{Est}(bbls) = 0.22 \text{ BARRELS}$
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls) = 0.05 + Nil + 0.17 + Nil + Nil = 0.22 \text{ BARRELS}$
$V_{Est}(bbls) = 0.22 \text{ BARRELS}$

\*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 checked="" type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input type="checkbox"/>

26 Signatories

This report was filled and signed on the <u>14/02/2012</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"/></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>



## 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 Shell Petroleum Development Company Ltd.
2. Incident Serial Number 777315
3. Name of Location/Facility 28" Nkpoku-Bomu Pipeline @ B-DERE  
GOWANA 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: 06-02-12
- ii. Date Reported to the DPR: 10-02-12
- iii. Date/Period of First Investigation: 14-02-12
- 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
  - Mystery Spill
  - Others (Specify)

Additional description of cause of incident (if any): Along a section of the 28" Nkpoku-Bomu Pipeline @ B-DERE. Two illegal bunkering point connections @ 12 o'clock position was discovered.

6. Coordinates of Spill Point/Location(s): (1) 77171.57mN 531859.37mE

(2) 77172.02mN 531858.76mE

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)

The bunkering points were not leaking @ the time of the JIU.

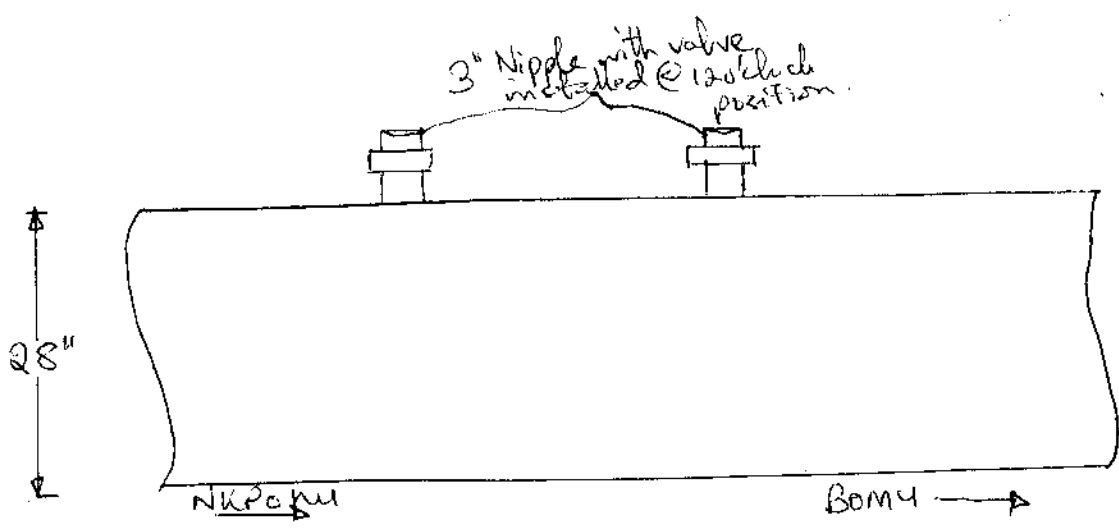
**8. Delineation of Impacted Area:** (Indicate ✓ where appropriate and X where not applicable)

- 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
1.	531855.87	77170.91
2.	531859.32	77173.94
3.	531862.58	77171.61
4.	531859.11	77168.77

S/N	Eastings	Northings

**10. Property Impacted** (Provide details)

NONE.



**11. Communities Impacted**

- a)
- b)
- c)
- d)
- e)
- f)

**12. Estimated Quantity Spilled (bbls):** 0.22 barrels

*(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)*

$$\text{TOTAL VOLUME OF ESTIMATED SPILL} = \text{VOL. OF FREE PHASE OIL} + \text{VOL. OF INFILTRATED OIL} + \text{VOL. OF OIL IN OPEN WATER} + \text{VOL. OF EVAPORATED OIL}$$

\*  $\text{VOLUME OF OIL} = \text{AREA COVERED BY SPILL} \times \text{DEPTH OF SPILL}$   
NIL

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

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

**15. Additional Comments/Remarks, if any:**

The Bunkering Point is about 1km away from another point with similar valve connection. Surveillance should be improved in this area.

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20. Appendix 1: Overview sketch of the site

Location: 28" NKPOKU-BOMU PIPELINE AT B-DERE

