

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 019A 774177

(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: 774177 2. Type of incident\* SPILL  
 3. Name of Location 28" NKPOKU - BOMU PIPELINE  
 4. Name of nearest community B-DERE 5. State: RWERS 6. LGA CIOKANA  
 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: 11<sup>TH</sup> TO 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  corn 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	<u>MINNA MID BELT</u>	
Northing:	Easting:	
1. <u>76442.52mN</u>	<u>532449.79mE</u>	
2. <u>76439.72mN</u>	<u>532449.96mE</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 [ NIL,m]  
 Drinking water source [ NIL,m]  
 Built up area [ NIL,m]  
 Farmlands [ NIL,m]  
 Fish Farm/Pond [ NIL,m]  
 Fishing net [ NIL,m]  
 Others (specify) [ NIL,m]
- NOT APPLICABLE**

12. Containment measures put in place;

- Booms       Trench       Dyke

Others: NO CONTAINMENT IN PLACE

13. Any pictures or video coverage?       [N]

14. Was there any disruption to the investigation?      [Y]

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</u>	<u>WITHIN</u>		<u>AREA</u>	<u>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

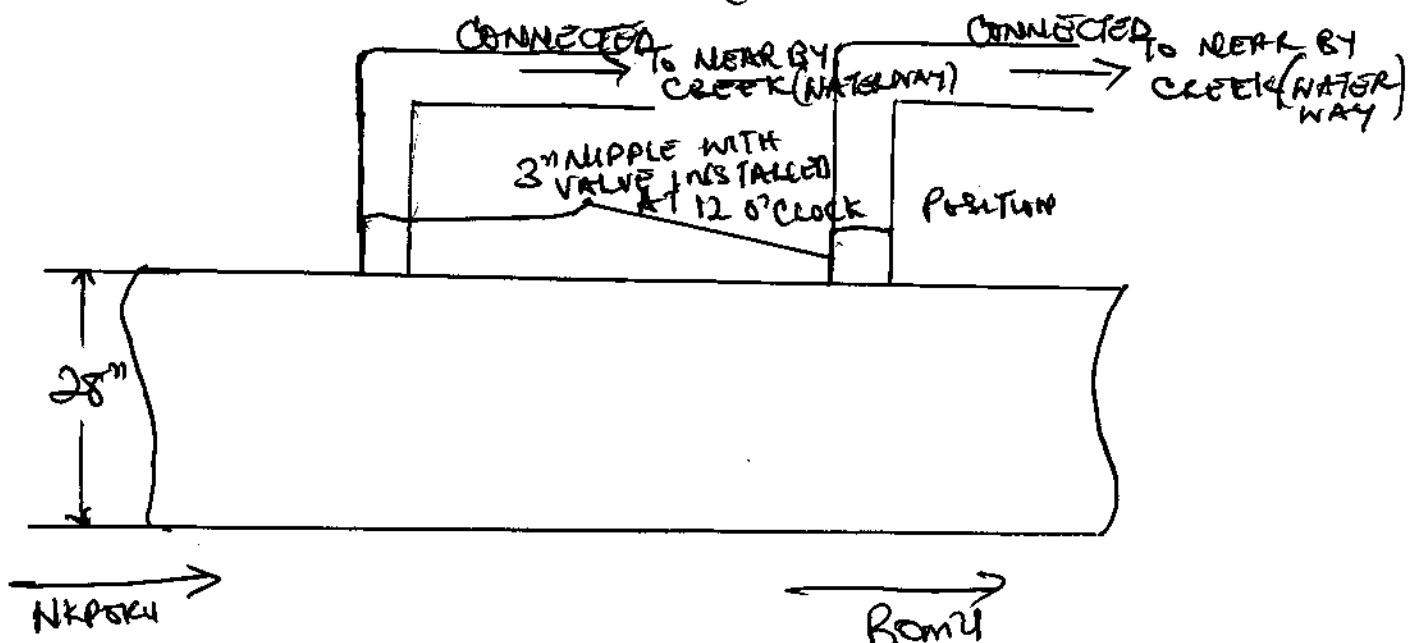
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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 1)

A SECTION OF 28" NKPOKU-BOMU PIPELINE AT B-DERE SHOWING TWO ILLEGAL BUNKERING POINTS CONNECTION INSTALLED AT 12 O'CLOCK POSITION PIPED TO A NEAR BY CREEK (WATER WAY)





# MINNA MID BELT

774177_B_DERE		
NAME	EAST	NORTH
1	532455.99	76464.01
2	532462.11	76442.5
3	532449.78	76436.38
4	532452.8	76405.66
5	532398.77	76365
6	532302.72	76326.92
7	532155.96	76202.74
8	532153.68	76199.93
9	532150.35	76196.44
10	532144.95	76191.57
11	532143.63	76190.4
12	532131.8	76181.31
13	532127.23	76177.53
14	5321313.2	76180.88
15	532122.83	76173.52
16	532119.55	76169.87
17	532117.91	76167.92
18	532116.96	76166.65
19	532117.43	76167.33
20	532112.19	76160.14
21	532108.54	76154.69
22	532105.69	76150.14
23	532101.24	76142.14
24	532096.8	76133.25
25	532094.84	76128.6
26	532091.5	76119.28
27	532089.97	76114.26
28	532088.28	76107.54
29	532086.69	76098.49
30	532084.89	76079.76
31	532083.94	76070.92
32	532082.24	76059.81
33	532080.29	76044.2
34	532078.7	76036.21
35	532077.59	76031.76
36	532075.47	76025.46
37	532072.98	76020.22
38	532070.02	76015.25
39	532067.64	76012.23
40	532063.72	76008.85
41	532060.5	76006.62
42	532044.57	75998.11
43	532037.9	75995.51
44	532023.14	75991.23
45	532017.95	75989.37
46	532011.18	75985.72
47	532007	75982.34
48	532004.46	75979.38

~~14~~ 14/02/2012

MINNA M.D BELT

49	532002.71	75976.78
50	532000.43	75972.12
51	531998.79	75967.68
52	531997.47	75961.8
53	531997.1	75958.31
54	531996.99	75949.95
55	531997.74	75942.75
56	532001.02	75919.26
57	532001.39	75910.85
58	532000.86	75903.81
59	531998.58	75891.69
60	531994.4	75868.72
61	531989.96	75844.49
62	531989.5	75840.57
63	531987.07	75790.3
64	531973.39	75783.68
65	531972.42	75831.59
66	531973.63	75844.61
67	531974.9	75862.58
68	531977.41	75913.8
69	531978.72	75938.6
70	531979.59	75949.52
71	531980.62	75959.28
72	531982.33	75972.14
73	531984.92	75986.58
74	531986.27	75992.49
75	531988.04	76000.47
76	531990.12	76007.91
77	531991.66	76010.76
78	531994.09	76012.81
79	531999.22	76014.62
80	532003.96	76015.16
81	532009.63	76015.2
82	532026.4	76014.43
83	532029.3	76014.55
84	532033.7	76014.98
85	532037.14	76015.86
86	532039.9	76017.26
87	532042.31	76020
88	532043.27	76022.39
89	532045.38	76031.85
90	532047.7	76046.5
91	532048.58	76051.84
92	532049.72	76057.87
93	532050.2	76060.31
94	532056.62	76085.64
95	532059.89	76098.31
96	532064.18	76113.22
97	532068.72	76127.99
98	532073.04	76141.94

*PR* 14/02/2012

# MINNA MID BELT

99	532077.3	76155.66
100	532081.96	76170.49
101	532086.47	76184.69
102	532090.22	76196.28
103	532094.91	76210.76
104	532099.26	76224.25
105	532102.87	76235.37
106	532107.46	76234.31
107	532113.04	76231.2
108	532117.7	76227.55
109	532124.79	76220.99
110	532128.23	76217.97
111	532132.57	76214.69
112	532139.12	76211.28
113	532222.27	76275.86
114	532317.8	76360.46
115	532379.72	76411.85
116	532437.45	76436.4
117	532446.72	76448.67
118	532452.88	76451.73

14/02/2012

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

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b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).

- i. Area ( $m^2$ ) covered by the oil: 9000
  - ii. Area of the pool of free phase oil in touch with soil: 600
  - iii. Average Depth (m) below ground surface of infiltration of oil: 0.51
  - iv. Soil type: CLAY
  - v.  $P_e$  (effective porosity of the soil): 8%
- |  |              |         |
|--|--------------|---------|
| iv. Volume of infiltrated oil, $V_{inf}$ | <u>24.15</u> | barrels |
|--|--------------|---------|

21. Computation of volume of oil on open water based on standard coloration.

- i. Total area of oil on open water: 12700
- 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	5%	0.00019
Dull	0.001		
Dark	0.002		
Black oil	0.1	35%	0.44
Emulsion (30% Oil)	1	60%	7.62
Percent Total		100%	Total Volume <u>50.72 bbl</u>

iii. Volume of oil on open water, $V_{wat}$ :	<u>50.72</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>19.87</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%

<p>23. <u>Gross Total Estimated Spilled Volume</u> <math>V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls) = 19.87 + 50.72 + 24.15 + 37.74 + 0 = 132.48</math></p>
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**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED**

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$V_{Est}(bbls) = 132.48 \text{ BARRELS}$
<p>24. Net Total Estimated Spilled Volume <math>V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls) = 19.87 + (0.6 * 50.72) + 24.15 + 37.74 + NUL</math>  <math>= 112.19 \text{ BARRELS}</math></p>
$V_{Est}(bbls) = 112.19 \text{ BARRELS}$

\*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 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**

<p>This report was filled and signed on the <u>14/02/2012</u> at incident site by joint investigation representatives from</p> <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> <p style="text-align: right;"><i>Tick as applicable</i></p>
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**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**.....774177  
 3. **Name of Location/Facility**.....28" NKPOKU-BOMU PIPELINE @ B-DERE  
 GOMANA 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: 6<sup>TH</sup> FEBRUARY, 2012
- ii. Date Reported to the DPR: 10<sup>TH</sup> FEBRUARY, 2012
- iii. Date/Period of First Investigation: 11<sup>TH</sup> FEBRUARY, 2012 - 14<sup>TH</sup> FEB. 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
- Mystery Spill
- Others (Specify)

Additional description of cause of incident (if any): Along a section of the 28" NKPOKU-BOMU Pipeline at B-Dere, Two Illegal Bunkering Point Connection at 12'o'clock position piped to a nearby Creek was discovered.

6. **Coordinates of Spill Point/Location(s):**  
 (1) 76442.52mN 532449.79mE  
 (2) 76439.72mN 532449.96mE

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)*

On excavation of the suspected spill points, 2 Nos 3" Nipple with valve and piping connections were exposed. The pipe was leading to a nearby creek. A trench was dug to contain the spill resulting from the repairs of the pipeline

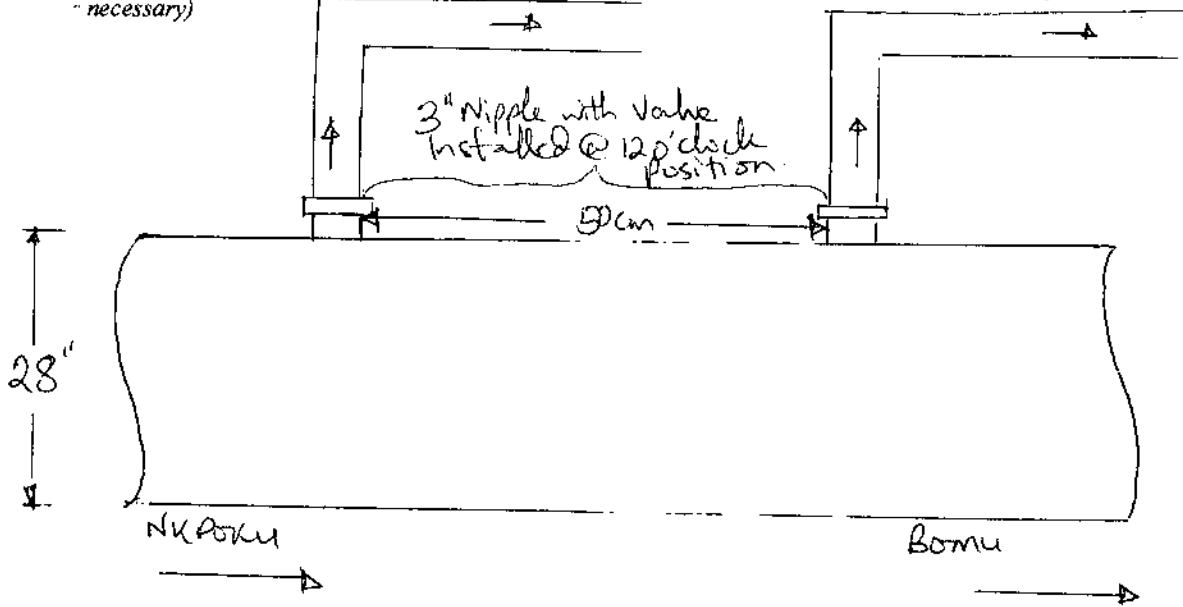
**8. Delineation of Impacted Area:** (Indicate ✓ where appropriate and X where not applicable)

- 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

*See attached Co-ordinates points.*

S/N	Eastings	Northings

*See Attached Co-ordinates points.*

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

## 11. Communities Impacted

a)

b)

c)

d)

e)

f)

12. Estimated Quantity Spilled (bbls): 112.19 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)

TOTAL VOL. OF EST. SPILLED = VOL. OF FREE PHASE OIL + VOL. OF INFILTRATED OIL +  
VOL. OF OIL IN OPEN WATER + VOL. OF EVAPORATED OIL

\*VOL. OF OIL = AREA COVERED BY SPILL X DEPTH OF SPILL.

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

14. Any Photograph or Video Recording? (Provide details): Photographs were  
taken. Video Recordings were also taken.

15. Additional Comments/Remarks, if any:

The creek is used as a loading bay by the oil  
thieves. There is also illegal artisanal refineries  
being operated along the adjoining creeks.

20. Appendix 1: Overview sketch of the site

