

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0334 869735

(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: 869735 2. Type of incident * OIL SPILL
 3. Name of Location 28" NKPOKU - BDMU PIPELINE
 4. Name of nearest community G10 5. State: RIVERS 6. LGA TAI
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/ District NPE /PHI

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 22ND SEPTEMBER, 2012
 b. Start date/time of investigation: 24TH SEPTEMBER, 2012.
 c. Investigation End date: 27TH 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) _____
 f. Incident caused by:
 Third party interference Operational Mystery _____

g. Spill point coordinates

Measuring unit	MINNA MID BELT	
Northing: 1) 77445.53m 2) 77245.45m 3) 77694.91m	Easting: 531536.27m 531767.05m 531219.29m	

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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 [5 ,m]
 Fish Farm/Pond [,m]
 Fishing net [,m]
 Others (specify).

12. Containment measures put in place;

- Booms Trench Dyke

Others: NATURAL DEPRESSION

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
NONE WITHIN AREA OF IMPACT						

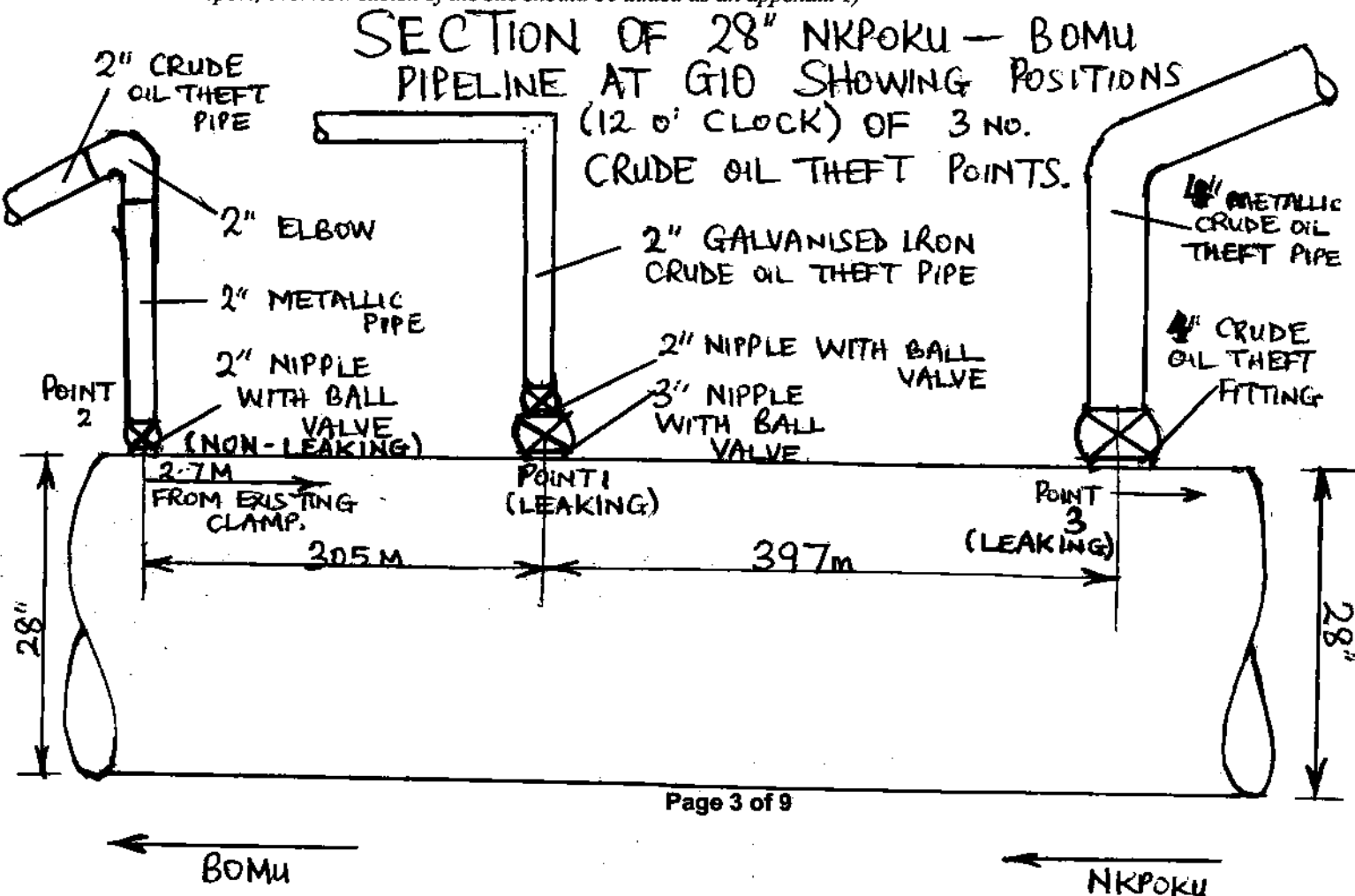
17. Fish/Nets/Ponds

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)*



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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
	SITE 1	
1.	77460.87m	531545.55m
2.	77454.72m	531548.62m
3.	77442.44m	531548.59m
4.	77430.12m	531563.98m
5.	77427.06m	531557.81m
6.	77427.08m	531548.57m
7.	77436.30m	531545.50m
8.	77439.40m	531530.10m
9.	77442.48m	531523.94m
10.	77451.68m	531533.20m
	SITE 2	
	NO IMPACT	

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.06 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}	7	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^2) occupied by pool of free phase oil 104
- ii. Average Depth (m) of pool of free phase oil 0.06

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iii. Emulsification factor: NIL

iv.

Volume of pool of free phase oil, V_{pool} :	39.25	barrels
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b. Computation of volume of infiltrated oil in the soil (V_{inf}).

1) COMPUTATION OF VOLUME OF OIL INFILTRATION AT SPILL POINT 1:
 AREA = 1M²
 DEPTH = 2M
 VOLUME = 1 x 2 x 0.25 (EFFECTIVE POROSITY

- i Area *(m²) covered by the oil: 425
- ii Area of the pool of free phase oil in touch with soil: 4
- iii Average Depth (m) below ground surface of infiltration of oil: 0.008
- iv Soil type: SAND - MEDIUM
- v P_c (effective porosity of the soil): 25%

VOLUME OF OIL INFILTRATION OUTSIDE SPILL POINT = 5.4 BARRELS

iv.

Volume of infiltrated oil, V_{inf} (TOTAL)	3.15 + 2.09 + 5.4 = 10.64	barrels
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21. Computation of volume of oil on open water based on standard coloration.

2) COMPUTATION OF VOLUME OF OIL INFILTRATION WITHIN SPILL POINT 3 WITH: AREA - 70m² DEPTH - 0.019 VOLUME = 70 x 0.019 x 0.25 x 6.29 = 2.09 BARRELS.

- 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 NIL bbl

iii.

Volume of oil on open water, V_{wat}	NIL	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}	10.04	barrels
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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	= 10.04 + NIL + 10.64 + 39.25 + 7 = 66.93
$V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls)$	
$V_{Est}(bbls) =$	67 BARRELS
24. Net Total Estimated Spilled Volume	= 10.04 + NIL + 10.64 + 39.25 + 7 = 66.93
$V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls)$	
$V_{Est}(bbls) =$	67 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 <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 REPRESENTATIVES

This report was filled and signed on the 27/09/2012 at incident site by joint investigation representatives from

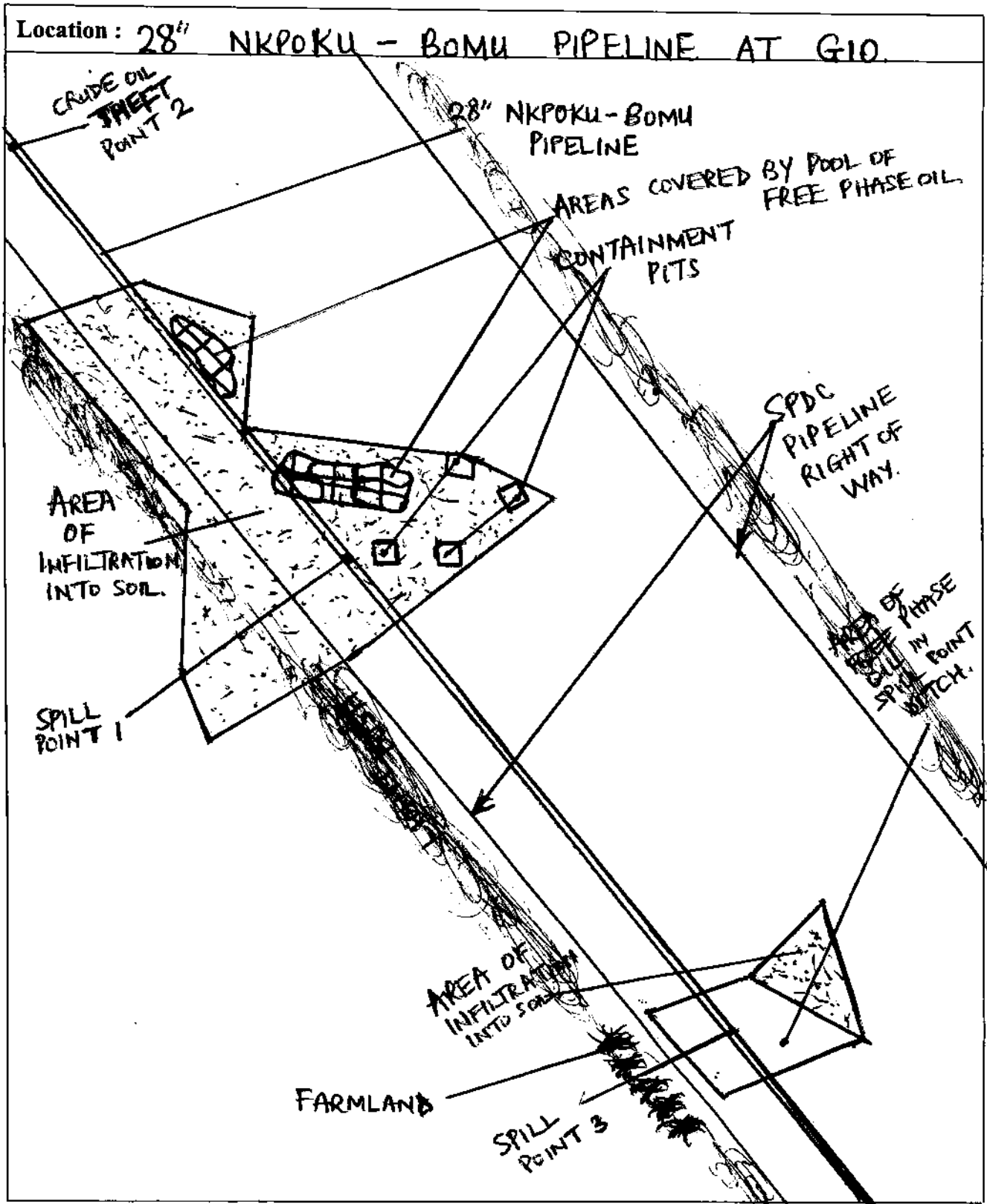
- Host Community
- Department of Petroleum Resources [DPR]:
- National Oil Spill Detection and Response Agency [NOSDRA]:
- State Ministry of Environment [SME]:
- Nigeria Police Force [NPF]:
- Shell Petroleum Development Company [SPDC]:

Tick as applicable

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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 BELT

S/N	Northing	Easting
SITE 3		
1.	77701.04m	531225.47m
2.	77697.96m	531228.54m
3.	77694.90m	531225.46m
4.	77685.69m	531222.36m
5.	77691.85m	531213.12m
		