

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0038/807260

(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: 807260 2. Type of incident\* OIL SPILL  
 3. Name of Location BOMU MAINFOLD  
 4. Name of nearest community K-DERE 5. State: RIVER 6. LGA GOKANA  
 7. Type of Production facility/Installation MAINFOLD 8. Asset owner/District 4IGIP/NESP

**B. INCIDENT INFORMATION:**

9. Details of incident

a. Date of incident: 19<sup>th</sup> APRIL 2012

b. Date/Period of investigation: 7<sup>th</sup> MAY 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 (M&E)		(MINNA MID-BEIT)
Northings:		Easting:
SP1 → 73330mN		534984mE
SP2 → 73326mN		534984mE
SP3 → 73299mN		534975mE
SP4 → 73302mN		534978mE
SP5 → 73299mN		534999mE
SP6 → 73296mN		534996mE

\*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 [ 200 ,m]
- Built up area [ 200 ,m]
- Farmlands [ 400 ,m]
- Fish Farm/Pond [ 800 ,m]
- Fishing net [ NIL ,m]
- Others (specify).

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
1	Residential Building	✓	✓	FEW (3)	✓
<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					

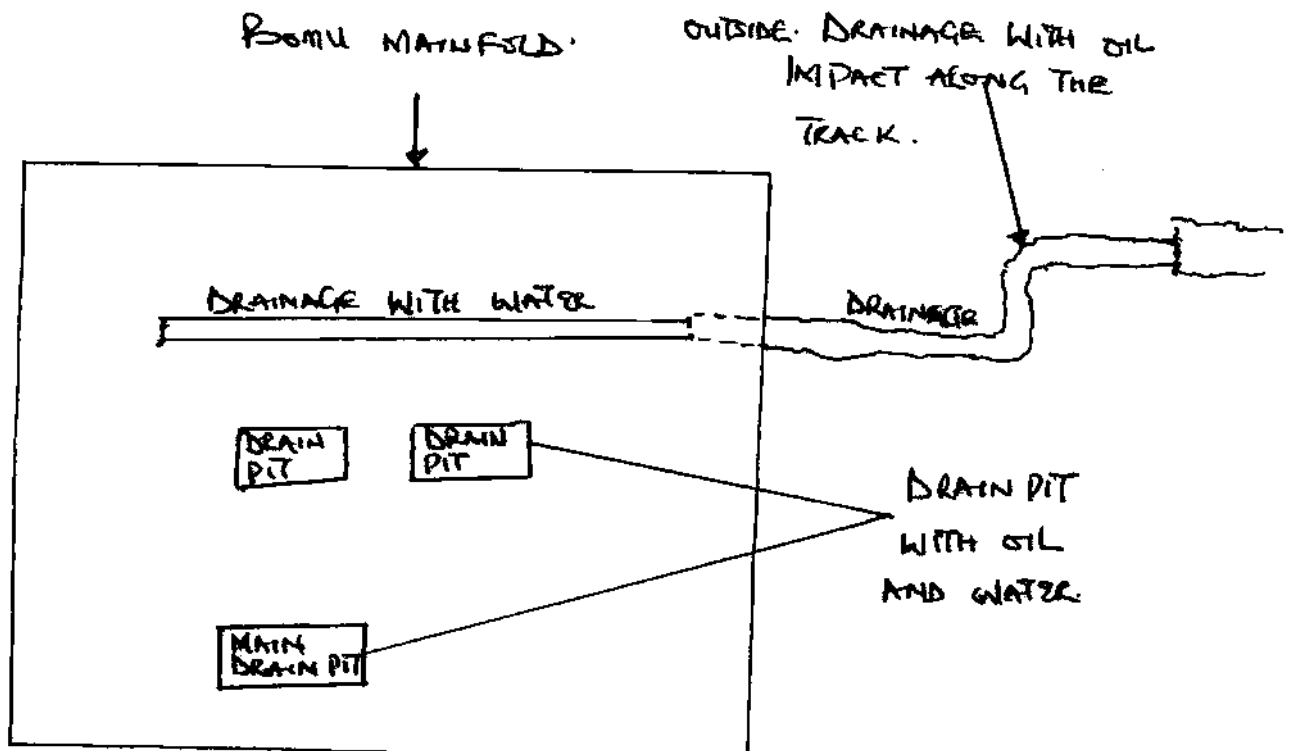
17. Fish/Nets/Ponds

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 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-BIT)

S/N	Northing	Easting
1.	73305mN	534978mE
2.	73305mN	534987mE
3.	73293mN	5349878mE
4.	73299mN	534971mE
5.	73287mN	534987mE
6.	73302mN	534993mE
7.	73305mN	535002mE
8.	73320mN	535012mE
9.	73314mN	535027mE
10.	73299mN	535018mE
11.	73277mN	535011mE
12.	73277mN	535005mE
13.	73274mN	534996mE

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.20 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>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). 20m<sup>2</sup>
- Area (m<sup>2</sup>) occupied by pool of free phase oil 20m<sup>2</sup>
  - Average Depth (m) of pool of free phase oil 0.005m
  - Emulsification factor: 3070

iv. Volume of pool of free phase oil. $V_{res}$ :	<u>0.44</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: 1200  $m^2$
- 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: 0.002 m.
- iv. Soil type: SAND medium
- v.  $P_e$  (effective porosity of the soil): 20%

iv. Volume of infiltrated oil, $V_{inf}$	3.02	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 ( $m^3$ )
Barely Visible	0.00004	NOT	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003		
Dull	0.001	APPLICABLE	
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume
			NIL tbi

iii. Volume of oil on open water, $V_{wat}$ :	NIL	barrels
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22. Calculation of evaporated volume:

- i. Oil type: BONNY LIGHT
- ii. E-Factor: 40%

iii. Volume of evaporated oil, $V_{evap}$ :	2.31	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  $V_{EST}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls)$   
 $2.31 + NIL + 3.02 + 0.44 + NIL = 5.77 \text{ barrels}$

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$V_{est}(bbls) = 2.31 + NIL + 3.02 + 0.44 + NIL = 5.77 \text{ BARRELS}$
24. <b>Net Total Estimated Spilled Volume</b> $V_{est}(bbls) = V_{evap}(bbls) + 0.6 \cdot V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls)$
$V_{Est}(bbls) = 5.8 \text{ BARRELS}$

\*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**

This report was filed and signed on the <u>07/05/2012</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 type="checkbox"/></li><li>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/></li></ul>
<i>Tick as applicable</i>

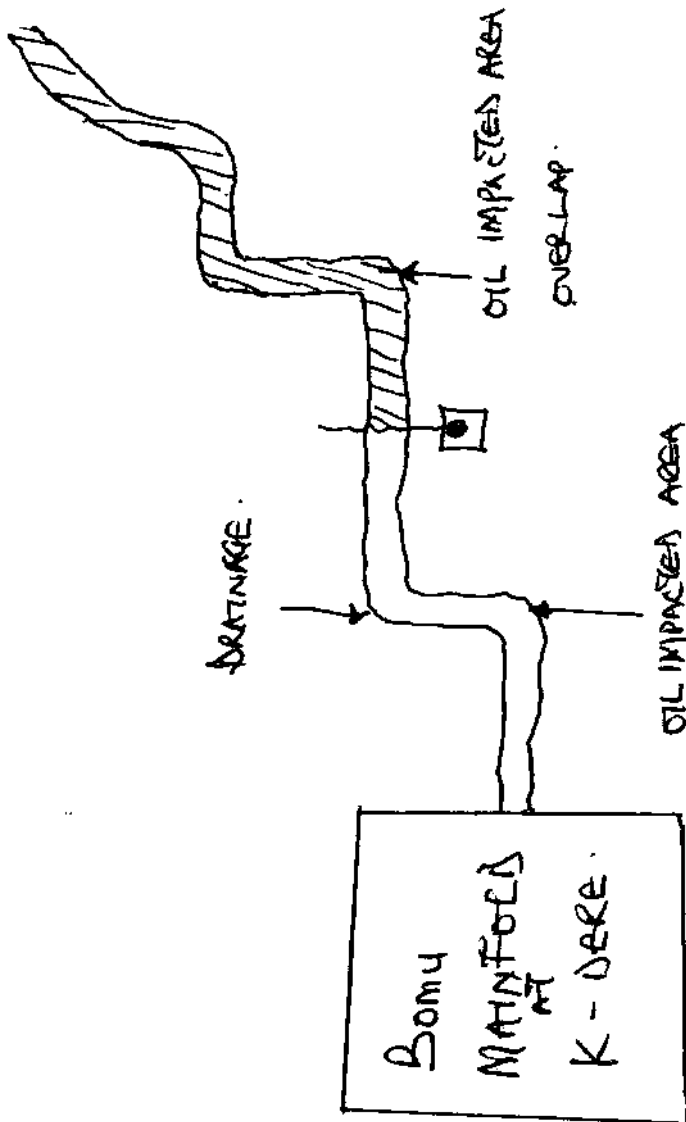
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20. Appendix 1: Overview sketch of the site

Location: BOMU MAINFOLD AT K-DERE.



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21. Appendix 2: TABLE SHOWING ADDITIONAL COORDINATES TAKEN DURING JIV FOR AREA CALCULATION (MINNA NID - BERT)

S/N	Northing (meter)	Easting (meter)
14.	73274mN	534999mE
15.	73262mN	534996mE
16.	73259mN	534990mE
17.	73250mN	534987mE
18.	73250mN	534987mE
19.	73228mN	534977mE
20.	73210mN	534959mE
21.	73176mN	534950mE
22.	73167mN	534974mE
23.	73127mN	534962mE
24.	73053mN	534937mE
25.	73053mN	534931mE
26.	73056mN	534928mE
27.	73053mN	534931mE
28.	73056mN	534928mE
29.	73029mN	534919mE
30.	73026mN	534928mE
31.	73019mN	534925mE
32.	72982mN	534971mE
33.	72973mN	534959mE
34.	72970mN	534965mE
35.	72946mN	534946mE
36.	72939mN	534946mE
37.	72912mN	534949mE
38.	72903mN	534940mE
39.	72887mN	534946mE
40.	72884mN	534943mE
41.	72875mN	Page 8 of 9 534949mE
42.	72875mN	534952mE
43.	72872mN	534949mE
44.	72893mN	534937mE
45.	72832mN	534958mE