



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 688702

No. 01000

A. GENERAL INFORMATION:

1. Spill incident Number: 688702
2. Name of Location 4" OBELE DELIVERY LINE AT IBAA
3. Name of nearest community IBAA
4. State RIVERS LGA EMUKOHA
5. Type of Production facility/Installation Oil PIPELINE Asset owner /District NESP

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 19TH JULY 2011
- b. Date/Period of investigation, 21ST JULY 2011
- c. Description of spill point environment

- | | | |
|--|---|---|
| <input type="checkbox"/> Firmed soil | <input checked="" type="checkbox"/> [Y] | <input type="checkbox"/> [N] |
| <input type="checkbox"/> Loose soil | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Previously excavated area | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Under water | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Swampy | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Exposed pipe surface | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |

d. Description of leak point (tick as applicable);

- | | | |
|--|---|---|
| <input type="checkbox"/> Drilled hole, | <input checked="" type="checkbox"/> [Y] | <input type="checkbox"/> [N] |
| <input type="checkbox"/> Hack saw cut, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Explosive tear, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Complete Rupture | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Inward dent, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Well head tampering | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Missing pipeline (flowline) | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Third party tampering with Clamp Bolt/Nut, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Third party tampering with valve setting, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Third party tampering with flange Nuts/bolts, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Corrosion, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |

Type: _____

- | | | |
|--|------------------------------|---|
| <input type="checkbox"/> Saver-pit over flow, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Surge vessel overflow, | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Outward dent | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |
| <input type="checkbox"/> Others (specify). <u>NOT APPLICABLE</u> | <input type="checkbox"/> [Y] | <input checked="" type="checkbox"/> [N] |

e. Spill point coordinates

Northings:

Easting:

107037.4m

482527.2m



No. 1000

C. RISK/DAMAGE ASSESSMENT

7. Type of environment of spill site:

- ☒ Land
☐ Swamp
☐ water

Type of environment of which oil has spread:

- ☒ Land
☐ Swamp
☐ water

8. 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 [6m ,m]
☐ Fish Farm/Pond [NIL ,m]
☐ Fishing net [NIL ,m]
☐ Others (specify).

9. Containment measures put in place;

- ☐ Booms [Y] [N]
☐ Trench [Y] [N]
☐ Dyke [Y] [N]

☐ Others: NOT APPLICABLE

10. Any pictures or video coverage? [X] [N]

11. 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

A. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments

NONE WITHIN AREA OF IMPACT



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 688702

No. 1000

B. Crops/Economic Trees

S/N	Types of crops	Young	Medium	Matured	Quantity	Comments
	NONE WITHIN AREA OF IMPACT					

C. Fish/Nets/Ponds

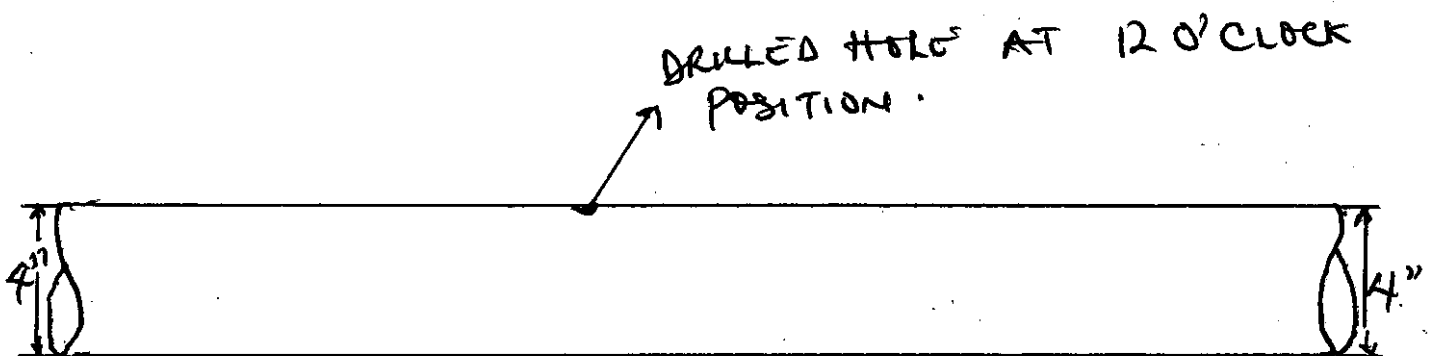
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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

S/N	Others	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

E. GRAPHIC DESCRIPTION OF LEAK POINT (Details should be contained in leak repair report)

A SECTION OF 4" OBELE DELIVERY LINE SHOWING DRILLED
HOLE AT 12 O'CLOCK POSITION





F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

E. Coordinates

Minna Mid-Belt

S/N	Northing (meters)	Easting (meters)
2	107230.416	482548.538
3	107231.285	482548.410
4	107222.277	482551.133
5	107222.046	482550.014
6	107200.707	482546.571
7	107160.565	482543.969
8	107138.931	482543.969
9	107043.42	482543.969
10	107036.222	482531.308
11	107036.127	482525.308
12	107040.303	482525.242
13	107040.537	482529.242
14	107043.574	482529.309
15	107139.063	482541.969
16	107147.935	482541.969
17	107160.630	482541.969
18	107200.931	482544.581
19	107221.408	482548.262
20	107230.416	482545.538



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 688702

No. 1000

G INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact 0.0415 HA
- Impact within SPDC R.O.W 0.0415 HA
 - Impact outside R.O.W NIL

18 Volume of oil recovered before completion of JIV (V_{rec}):

Recovered oil V_{rec} : NIL barrels

19. Computation of the residual volume on site

- a. Computation of the volume of pooled free phase oil (on land or confined water body).

- i. Area (m^2) occupied by pool of free phase oil NOT APPLICABLE
- ii. Average Depth (m) of pool of free phase oil NOT APPLICABLE
- iii.

Volume of pooled of free phase oil. V_{pool} : NIL barrels

iv.

- b. Computation of volume of infiltrated oil in the soil (V_3).

- i. Area (m^2) covered by the oil: 415
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.01 m
- iii. Soil type: CLAY
- iv. p_e (effective porosity of the soil): 8%
- v.

Volume of infiltrated oil. V_{inf} : 2.1 barrels

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

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004	<u>NOT APPLICABLE</u>	
Silvery	0.00008		
Slight Colour	0.00015		
Bright Colour	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

Spill Factors from USCG FOG (2000 Edition)



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 888702

No. 1000

Volume of oil on open water V_{wat}

NIL

barrels

21. Calculation of evaporated volume:

i. Oil type: BONNY MEDIUM

ii. E-Factor: 15%

iii.

Volume of evaporated oil V_{vap}

0.4

barrels

Oil Type		Bonny Light	Bonny Medium
		E-Factor	E-Factor
Period Since Oil Spill	<1 day	10%	5%
	1-7 days	25%	15%
	>7 days	40%	25%

9. Gross Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$
 $= 0.4 + NIL + 2.1 + NIL + NIL = 2.5 \text{ BARREL}$

$V_{Est}(bbls) = 2.5 \text{ BARREL}$

10. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 \cdot V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$
 $= 0.4 + NIL + 2.1 + NIL + NIL = 2.5 \text{ BARREL}$

$V_{Est}(bbls) = 2.5 \text{ BARREL}$

- *Calculation of the respective estimated volume is to done using the new spill estimation software on site
- *Conversion of m3 to barrel is Total volume VT (m3) x6.29
- *Emulsification factor for spill on water to consider is 60% of volume of oil.

This report was filled and signed on the 21 / 07/20 11 at incident site by joint investigation representative 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