



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 685360

No. 00998

A. GENERAL INFORMATION:

1. Spill incident Number: 685360
2. Name of Location AWIOBA WELL 2T RISER BY THE INLET MAINFOLD
3. Name of nearest community BILLE
4. State RIVERS LGA DEDEMA
5. Type of Production facility/Installation FLOWLINE Asset owner /District NESI

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 8th JULY, 2011
- b. Date/Period of investigation, 12th JULY, 2011
- c. Description of spill point environment

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

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

- | | | |
|--|------|------|
| <input type="checkbox"/> Drilled hole, | [Y] | [N]✓ |
| <input type="checkbox"/> Hack saw cut, | [Y] | [N]✓ |
| <input type="checkbox"/> Explosive tear, | [Y] | [N]✓ |
| <input type="checkbox"/> Complete Rupture | [Y] | [N]✓ |
| <input type="checkbox"/> Inward dent, | [Y] | [N]✓ |
| <input type="checkbox"/> Well head tampering | [Y] | [N]✓ |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve, | [Y] | [N]✓ |
| <input type="checkbox"/> Missing pipeline (flowline) | [Y] | [N]✓ |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point, | [Y] | [N]✓ |
| <input type="checkbox"/> Third party tampering with Clamp Bolt/Nut, | [Y] | [N]✓ |
| <input type="checkbox"/> Third party tampering with valve setting, | [Y] | [N]✓ |
| <input type="checkbox"/> Third party tampering with flange Nuts/bolts, | [Y] | [N]✓ |
| <input type="checkbox"/> Corrosion, | [Y]✓ | [N] |
| Type: <u>EXTERNAL</u> | | |
| <input type="checkbox"/> Saver-pit over flow, | [Y] | [N]✓ |
| <input type="checkbox"/> Surge vessel overflow, | [Y] | [N]✓ |
| <input type="checkbox"/> Outward dent | [Y] | [N]✓ |
| <input type="checkbox"/> Others (specify). <u>NOT APPLICABLE</u> | | |

AFTER JOINT
INVESTIGATION
OF THE INCIDENT,
SPILL WAS FOUND
TO BE DUE TO
EQUIPMENT
FAILURE.

e. Spill point coordinates (MINNA MID-BETT)

Northings:

58918.32 m

Easting:

484123.1m



C. RISK/DAMAGE ASSESSMENT

No. 0998

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
☐ Drinking water source
☐ Built up area
☐ Farmlands
☐ Fish Farm/Pond
☐ Fishing net
☐ Others (specify).

[,m]
[,m]
[,m]
[,m]
[,m]
[,m]
} NOT APPLICABLE

9. Containment measures put in place;

- ☐ Booms
☐ Trench
☐ Dyke

[Y] [N]
[Y] [N]
[Y] [N]

☐ Others: NOT APPLICABLE

10. Any pictures or video coverage?

[Y] [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: CS-366

No. 0998

B. Crops/Economic Trees

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

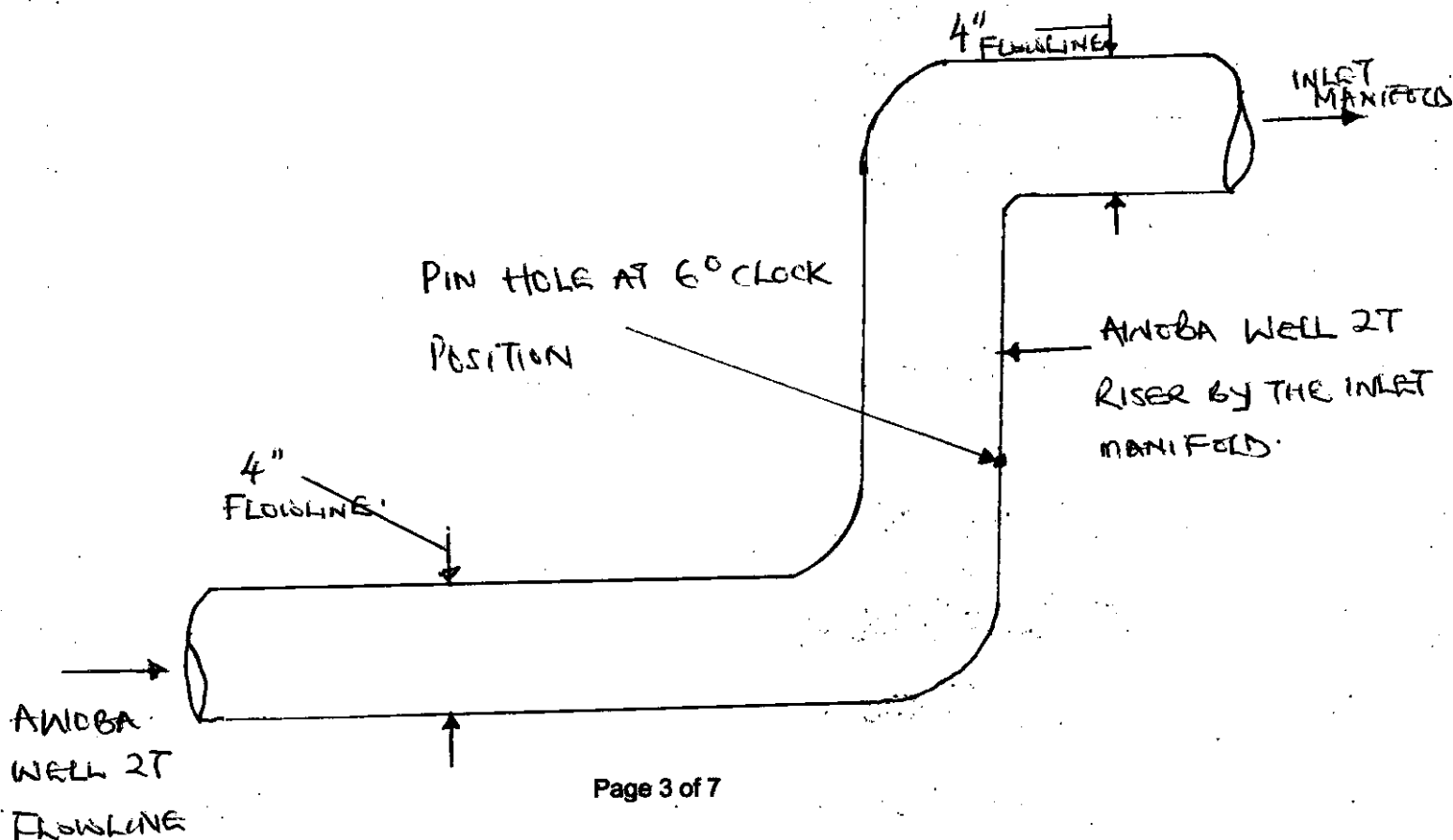
C. Fish/Nets/Ponds

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)





OF NIGERIA LIMITED
685360

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

Page 4 of 7



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 685360

No. **0998**

G INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact NO IMPACT
- Impact within SPDC R.O.W NIL
 - Impact outside R.O.W NIL

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

Recovered oil V_{rec} :

15 LITRES

barrels

"SPILL WAS
CONTAINED
AND RECOVERED
WAS FROM SOURCE"

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: NOT APPLICABLE
- ii. Average Depth (m) below ground surface of infiltration of oil: NOT APPLICABLE
- iii. Soil type: NOT APPLICABLE
- iv. p_e (effective porosity of the soil): NOT APPLICABLE
- v.

Volume of infiltrated oil. V_{int} :

NIL

barrels

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

	Thickness (mm)	Percentage coverage	Volume (m^3)
Barely Visible	0.00004		
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: 6853EC

No. 0998

Volume of oil on open water V_{wat}

NIL

barrels

21. Calculation of evaporated volume:

i. Oil type: BONNY LIGHT

ii. E-Factor: 25%

iii.

Volume of evaporated oil V_{vap}

5 LITRES

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 $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

$V_{Est}(bbls) = 5 \text{ LITRES} + 15 \text{ LITRES} = 20 \text{ LITRES} = 0.13 \text{ BARRELS}$

10. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

$V_{Est}(bbls) = 20 \text{ LITRES} = 0.13 \text{ BARRELS}$

* 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 $V_T (m3) \times 6.29$

* Emulsification factor for spill on water to consider is 60% of volume of oil.

This report was filled and signed on the 12 / 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