



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED  
 JOINT INVESTIGATION REPORT FOR INCIDENT NO: 646744

No. 00779

A. GENERAL INFORMATION:

1. Spill incident Number: 646744
2. Name of Location ADIBAWA NORTH EAST W/L FLOW LINE
3. Name of nearest community BISENI
4. State BAYELSA LGA YENEGOA
5. Type of Production facility/Installation FLOW LINE Asset owner /District NELR/KOLOCREEK

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 9/4/11
- b. Date/Period of investigation, 11/4/11
- 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] |

AFTER DUE INVESTIGATION OF THE INCIDENT, SPILL WAS FOUND TO BE DUE TO THIRD PARTY INTERFERENCE

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>NOT APPLICABLE</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>        | [Y] | [N] |

e. Spill point coordinates (MINNA MID-BELT)

Northing: (m)

139056.395

Easting: (m)

451552.682



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 [ ,m]
- Drinking water source [ ,m]
- Built up area [ ,m]
- Farmlands [ ,m]
- Fish Farm/Pond [ ,m]
- Fishing net [ ,m]
- Others (specify). [ ,m]

} NOT APPLICABLE

9. Containment measures put in place;

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

Others: LOCAL BOOM (PALM FRONDS)

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

11. 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

A. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments
<u>NONE WITHIN AREA OF IMPACT</u>					



No. 0773

B. Crops/Economic Trees

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

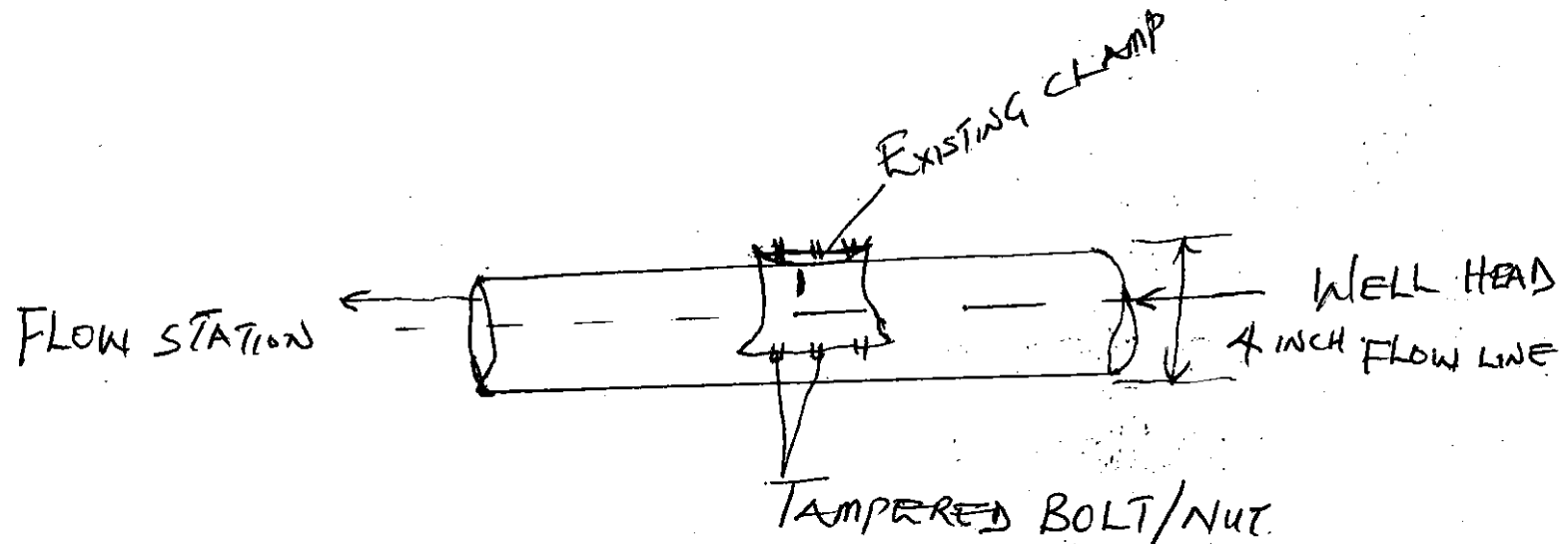
C. Fish/Nets/Ponds

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)







G INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact 0.12 Ha
  - Impact within SPDC R.O.W 0.12 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).

1. No FREE PHASE OIL WAS OBSERVED AT THE LEAK POINT.

- i. Area ( $m^2$ ) occupied by pool of free phase oil 0.10 Ha  $\Rightarrow$  1,000  $m^2$
- ii. Average Depth (m) of pool of free phase oil 0.02 m

Volume of pooled of free phase oil,  $V_{pool}$ : 125.8 barrels

b. Computation of volume of infiltrated oil in the soil ( $V-3$ ).

2. OIL STAINS ON VEGETATION/SOIL WERE OBSERVED AROUND THE SPILL POINT

- i. Area ( $m^2$ ) covered by the oil: 0.12 Ha  $\Rightarrow$  1,200  $m^2$
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.002 m
- iii. Soil type: clay
- iv.  $p_e$  (effective porosity of the soil): 8%

Volume of infiltrated oil,  $V_{inf}$ : 1.2 barrels

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

3. POOL OF CRUDE OIL WAS OBSERVED IN A NEARBY BORROW PIT, ABOUT 12 METERS AWAY FROM THE SPILL POINT

	Thickness (mm)	Percentage coverage	Volume (m3)
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>NOT APPLICABLE</u>

Spill Factors from USCG FOG (2000 Edition)



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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  $V_{vap}$ : 22.4 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%

4. THE TEAM COULD NOT ESTABLISH A CLEAR PATH/LINK BETWEEN THE SPILL POINT AND THE POOL OF OIL IN THE BORROW PIT. AS TRIAL PITS DUG IN THE SPACE BETWEEN THE SPILL POINT AND THE BORROW PIT, REVEALED MINIMAL IMPACT ON THE SOIL.

9. Gross Total Estimated Spilled Volume  $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

$V_{Est}(bbls) = 125.8 + 1.2 + 22.4 = 149.4$  BARRELS

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

$V_{Est}(bbls) = 149.4 = 149$  BARRELS

5. THE SURVEILLANCE CONTRACTOR IN A SHORT INTERVIEW, TOLD THE JIV TEAM THAT AN UNKNOWN TANKER WAS SITED DISCHARGING SUB-STANTLE WHICH COULD BE CAUSE OIL INTO THE BORROW PIT ON THE DAY OF INCIDENT.

- \* 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) x 6.29
- \* Emulsification factor for spill on water to consider is 60% of volume of oil.

This report was filled and signed on the 11 / 04 / 2011 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