



No. 01476

A. GENERAL INFORMATION:

635318

1. Spill incident Number: _____
2. Name of Location OPUKUSHI FLOW STATION
3. Name of nearest community AGBIDIAMA AND EGBEMOR-ANGALABIRI
4. State BAYELSA LGA EKEREMOR
5. Type of Production facility/Installation WELL 34 TANGO 4-INCH FLOWLINE Asset owner/District UIG/P/NWS2

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 15TH MARCH, 2011
- b. Date/Period of investigation, 18TH MARCH, 2011
- c. Description of spill point environment

- | | | |
|--|-------|--------|
| <input type="checkbox"/> Firmed soil | [Y] | [NV] |
| <input type="checkbox"/> Loose soil | [Y] | [NV] |
| <input type="checkbox"/> Previously excavated area | [Y] | [NV] |
| <input type="checkbox"/> Under water | [Y] | [NV] |
| <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] | [NV] |
| <input type="checkbox"/> Hack saw cut, | [Y] | [NV] |
| <input type="checkbox"/> Explosive tear, | [Y] | [NV] |
| <input type="checkbox"/> Complete Rupture | [Y] | [NV] |
| <input type="checkbox"/> Inward dent, | [Y] | [NV] |
| <input type="checkbox"/> Well head tampering | [Y] | [NV] |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve, | [Y] | [NV] |
| <input type="checkbox"/> Missing pipeline (flowline) | [Y] | [NV] |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point, | [Y] | [NV] |
| <input type="checkbox"/> Third party tampering with Clamp Bolt/Nut, | [Y] | [NV] |
| <input type="checkbox"/> Third party tampering with valve setting, | [Y] | [NV] |
| <input type="checkbox"/> Third party tampering with flange Nuts/bolts, | [Y] | [NV] |
| <input type="checkbox"/> Corrosion, | [X] | [N] |
- Type: PITTING
- | | | |
|---|-------|--------|
| <input type="checkbox"/> Saver-pit over flow, | [Y] | [NV] |
| <input type="checkbox"/> Surge vessel overflow, | [Y] | [NV] |
| <input type="checkbox"/> Outward dent | [Y] | [NV] |
| <input type="checkbox"/> Others (specify) <u>LACERATION ON PIPE</u> | [Y] | [NV] |

e. Spill point coordinates

Northing: 100892m

Easting: 374326m



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C. RISK/DAMAGE ASSESSMENT

7. Type of environment of spill site:

- Land
- Swamp (TIDAL)
- 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 [] [N]
- Trench [Y] [N]
- Dyke [Y] [N]
- Others: _____

10. Any pictures or video coverage? [] [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				



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B. Crops/Economic Trees

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

C. Fish/Nets/Ponds

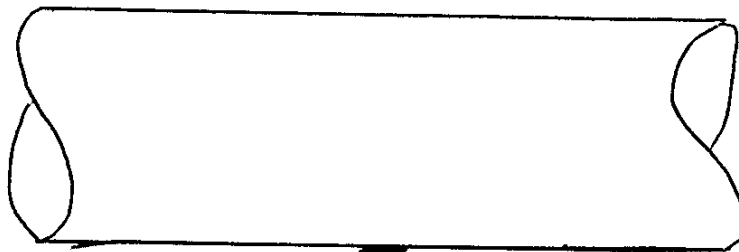
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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)

SKETCH OF LEAK POINT AT
OPYKUSHI WELL 34 TANGO
4-INCH FLOWLINE



↑
 LEAK POINT (LACERATION AT 6° CLOCK)



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

S/N	Northing (M)	Easting (M)
1	100783	374271
2	100781	374272
3	100784	374284
4	100788	374279
5	100843	374277
6	100847	374275
7	100893	374272
8	100888	374276
9	100909	374323
10	100893	374314
11	100873	374325
12	100873	374320
13	100866	374305
14	100770	374315
15	100764	374311
16	100755	374336
17	100727	374332
18	100747	374402
19	100776	374396
20	100784	374379
21	100880	374345



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G. INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact 9226.358 m²
- Impact within SPDC R.O.W 9226.358 m²
 - Impact outside R.O.W NIL

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

Recovered oil V_{recj}:

NIL	barrels
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19. Computation of the residual volume on site

- a. Computation of the volume of pooled free phase oil (on land or confined water body).
- Area (m²) occupied by pool of free phase oil 9068.480
 - Average Depth (m) of pool of free phase oil 0.002
 -

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

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

- Area (m²) covered by the oil: NIL
- Average Depth (m) below ground surface of infiltration of oil: NIL
- Soil type: NOT APPLICABLE
- p_e (effective porosity of the soil): NOT APPLICABLE
-

Volume of infiltrated oil. V_{in}:

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

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004	25	0.000002
Silvery	0.00008	10	0.000001
Slight Colour	0.00015	05	0.000001
Bright Colour	0.0003	10	0.000002
Dull	0.001	20	0.000032
Dark	0.002	10	0.000032
Black oil	0.1	—	—
Emulsion (30% Oil)	1	20	0.034576
Percent Total		100%	Total Volume

} 157.878 m²

0.2 bbl

Spill Factors from USCG FOG (2000 Edition)



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
 JOINT INVESTIGATION REPORT FOR INCIDENT NO: 635318

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Volume of oil on open water V_{wat} :

0.2

barrels

21. Calculation of evaporated volume:

- i. Oil type: BONNY MEDIUM
- ii. E-Factor: 15%
- iii.

Volume of evaporated oil V_{vap} :

20.17

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 $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$
 $20.17 + 0.2 + 114.1 = 134.47$

$V_{Est}(bbls) = 134.47$ BBLs

10. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$
 $20.17 + (0.6 * 0.2 = 0.12) + 114.1 = 134.39$

$V_{Est}(bbls) = 134.4$ BBLs

- * 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 filed and signed on the 18 / 03 / 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