



No. 00104

**A. GENERAL INFORMATION:**

1. Spill incident Number: 649293
2. Name of Location NEMBE CREEK 2 FLOWSTATION
3. Name of nearest community ELESUO
4. State BAYELSA LGA NEMBE
5. Type of Production facility/Installation FLOWSTATION Asset owner /District NES2/NEMBE

**B. INCIDENT INFORMATION:**

6. Details of incident

- a. Date of incident 16TH APRIL, 2011
- b. Date/Period of investigation, 28TH APRIL, 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] ✓ |

PLATFORM  
ON WATER

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>       |       |       |

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

e. Spill point coordinates (MINNA MID-BELT)

Northing: 50420.28 m

Easting: 429138.63 m



No. 0104

C. RISK/DAMAGE ASSESSMENT

7. Type of environment of spill site:

- Land
- Swamp
- water (PLATFORM ON WATER)

Type of environment of which oil has spread:

- Land
- Swamp
- water (NO RESIDUAL IMPACT OBSERVED DURING JOINT INVESTIGATION VISIT)

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). NOT APPLICABLE

9. Containment measures put in place;

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

THE INITIAL JOINT INVESTIGATION VISIT CARRIED OUT ON 20TH APRIL 2011 WAS DISRUPTED (AND TERMED INCONCLUSIVE) DUE TO A DISAGREEMENT WITH THE COMMUNITY REPRESENTATIVES OVER THE ROOT CAUSE OF SPILL. THIS WAS HOWEVER RESOLVED ON THE RE-SCHEDULED VISIT CONDUCTED TODAY, 28TH APRIL, 2011.

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 FOUND TO BE IMPACTED.</u> |                    |             |      |        |          |
|                                   |                    |             |      |        |          |
|                                   |                    |             |      |        |          |



B. Crops/Economic Trees

| S/N                        | Types of crops | Young | Medium | Matured | Quantity | Comments |
|----------------------------|----------------|-------|--------|---------|----------|----------|
| NONE FOUND TO BE IMPACTED. |                |       |        |         |          |          |

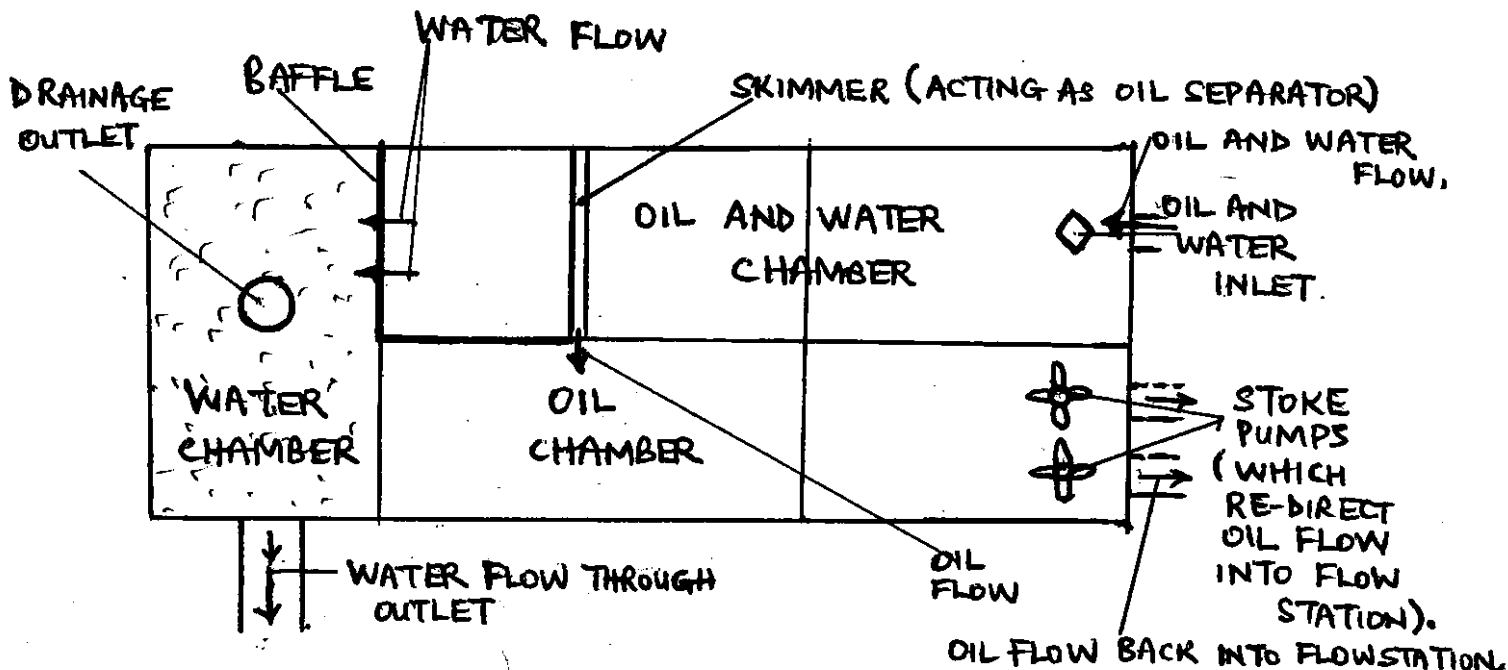
C. Fish/Nets/Ponds

| S/N                        | Fish/Nets/Ponds | Description | Quantity/Size | Comments |
|----------------------------|-----------------|-------------|---------------|----------|
| NONE FOUND TO BE IMPACTED. |                 |             |               |          |

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

| S/N                        | Others | Description | Quantity/Size | Comments |
|----------------------------|--------|-------------|---------------|----------|
| NONE FOUND TO BE IMPACTED. |        |             |               |          |

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



SCHEMATIC DIAGRAM OF THE SAVER PIT AT NEMBE CREEK 2

FLOWSTATION.





No. 0104

G INCIDENT INFORMATION:

17 Impacted Area Details

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

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

COMPUTATION OF ESTIMATED SPILLED VOLUME BASED ON FLOWRATE OF 8" CRUDE OIL EXPORT PUMP WITH 4" GATE VALVE (IDENTIFIED AS SOURCE OF SPILL):

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. (IDENTIFIED AS SOURCE OF SPILL):

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. NIL barrels

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

|                    | Thickness (mm) | Percentage coverage | Volume (m3)  |
|--------------------|----------------|---------------------|--------------|
| Barely Visible     | 0.00004        |                     |              |
| Silvery            | 0.00008        |                     |              |
| Slight Colour      | 0.00015        | <u>NOT</u>          |              |
| Bright Colour      | 0.0003         |                     |              |
| Dull               | 0.001          | <u>APPLICABLE</u>   |              |
| Dark               | 0.002          |                     |              |
| Black oil          | 0.1            |                     |              |
| Emulsion (30% Oil) | 1              |                     |              |
|                    | Percent Total  | 100%                | Total Volume |

4) DURATION OF LEAK  
 $= 16:30 \text{ hours} - 10:15 \text{ hours}$   
 $= 6 \text{ hours } 15 \text{ minutes}$   
 $= 6 \frac{1}{4} \text{ hours.}$

5) ESTIMATION OF HOURLY FLOWRATE:  
 $24 \text{ hours} \equiv 6,000 \text{ barrels}$   
 $\therefore 1 \text{ hour} \equiv \frac{1}{24} \times 6,000$   
 $= 250 \text{ BARRELS.}$

6) VALVE WAS OBSERVED TO BE ADJUSTED TO ABOUT 5% OF MAXIMUM CAPACITY.

THEREFORE, CORRESPONDING HOURLY FLOWRATE  $= \frac{5}{100} \times 250$

7) THEREFORE, TOTAL ESTIMATED SPILL (FOR A DURATION OF  $6 \frac{1}{4}$  HOURS) IS CALCULATED THUS:  
 $6 \frac{1}{4} \text{ HOURS} \times 12.5 \text{ BARRELS} = 78.1 \text{ BARRELS}$



|                                       |     |         |
|---------------------------------------|-----|---------|
| Volume of oil on open water $V_{wat}$ | NIL | barrels |
|---------------------------------------|-----|---------|

21. Calculation of evaporated volume:

- i. Oil type: BONNY LIGHT
- ii. E-Factor: NOT APPLICABLE
- iii.

NOTE: EVAPORATION FACTOR NOT APPLICABLE SINCE OIL SPILL ESTIMATION WAS ASSESSED DIRECTLY AT SOURCE OF SPILL.

|                                     |                |         |
|-------------------------------------|----------------|---------|
| Volume of evaporated oil $V_{evap}$ | NOT APPLICABLE | 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 $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$      |
| $V_{Est}(bbls) =$ <u>78.1 BARRELS</u>  |
| 10. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$ |
| $V_{Est}(bbls) =$ <u>78.1 BARRELS</u>  |

- \*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 28 / 04 / 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*