

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED.**

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 999300 JIV report S/N: 0089

(Note: As practicable as possible the JIT report is to be signed in the field by all the participating parties)

**A. GENERAL INFORMATION:**

1. Spill incident Number: 999300 2. Type of incident\* OIL SPILL  
 3. Name of Location 12" OGUTA - EGBEMA PIPELINE  
 4. Name of nearest community OBLAKPU 5. State: IMO 6. LGA OHATI/EGBEMA  
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/District PIPELINE

**B. INCIDENT INFORMATION:**

9. Details of incident

- a. Date of incident: 29TH JUNE, 2013.  
 b. Start date/time of investigation: 3RD JULY, 2013 / 12:02 HOURS  
 c. Investigation End date: 3RD JULY, 2013 Actual investigation duration, days: ONE (1) DAY  
 d. Description of spill point environment  
 Firmed soil  Loose soil  Recently excavated area  
 Under water  Swampy  Exposed pipe surface  
 Well Platform (on Water)  Drill Rig  
 e. Description of leak point (tick as applicable);  
 Drilled hole  Hack saw cut  Tear (\_\_\_\_).  
 Complete Rupture  Inward dent,  Well head tampering  
 Failed Weld-on illegal hot tap valve,  Failed Clamp  Missing Pipeline/Flowline  
 Crude oil theft (illegal bunkering) point,  Third party tampering with Clamp  
 Third party tampering with valve setting,  Third party tampering with flange,  
 Corrosion  Saver-pit over flow,  Surge vessel overflow,  
 Bulging Outward  Flare System/Bund wall failure  Accidental 3<sup>rd</sup> party equipment  
 impact  Valve Failure  com unit failure  Cold vent  
 Relief valve failure  Others (specify) \_\_\_\_\_

f. Incident caused by:

- Third party interference (Sabotage ; crude theft ; Line theft ; Accidental 3<sup>rd</sup> party damage   
 Operational  Others (including Mystery spills) \_\_\_\_\_

g. Spill point coordinates

Measuring unit (M) <u>Minna Mid-belt.</u>	
Northing: <u>SP</u> <u>172525.46</u>	Easting: <u>478026.53</u>

\*This can be: a) Oil Spill b) Drilling fluid/Chemical c) Siltation d) construction e) Encroachment f) Fire,

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED.**

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 9993.00 JIV report S/N: 0089

**C. RISK ASSESSMENT**

10. Type of environment:

- Land       Swamp       Water       Seasonal swamp       Shoreline/Waterfront

i. Type of environment to which oil has spread:

- Land       Swamp       Water       River (identify) \_\_\_\_\_

ii. Weather condition

- Rain       Sunny       Dry       Wet       Windy       Hot       cool

11. Distance from the nearest sensitive habitat

- Government reserved and designated protected area [      ,m]
- Drinking water source [      ,m]
- Built up area [      ,m]
- Farmlands [ 3 ,m]
- Fish Farm/Pond [      ,m]
- Fishing net [      ,m]
- Others (specify). [      ,m]

12. Containment measures put in place:

- Booms       Trench       Dyke       Natural depression       Pit  
 Others: \_\_\_\_\_

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

14. 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**

15. Structures / Properties

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 999300 JIV report S/N:

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16. Crops/Economic Trees

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

17. Fish/Nets/Ponds

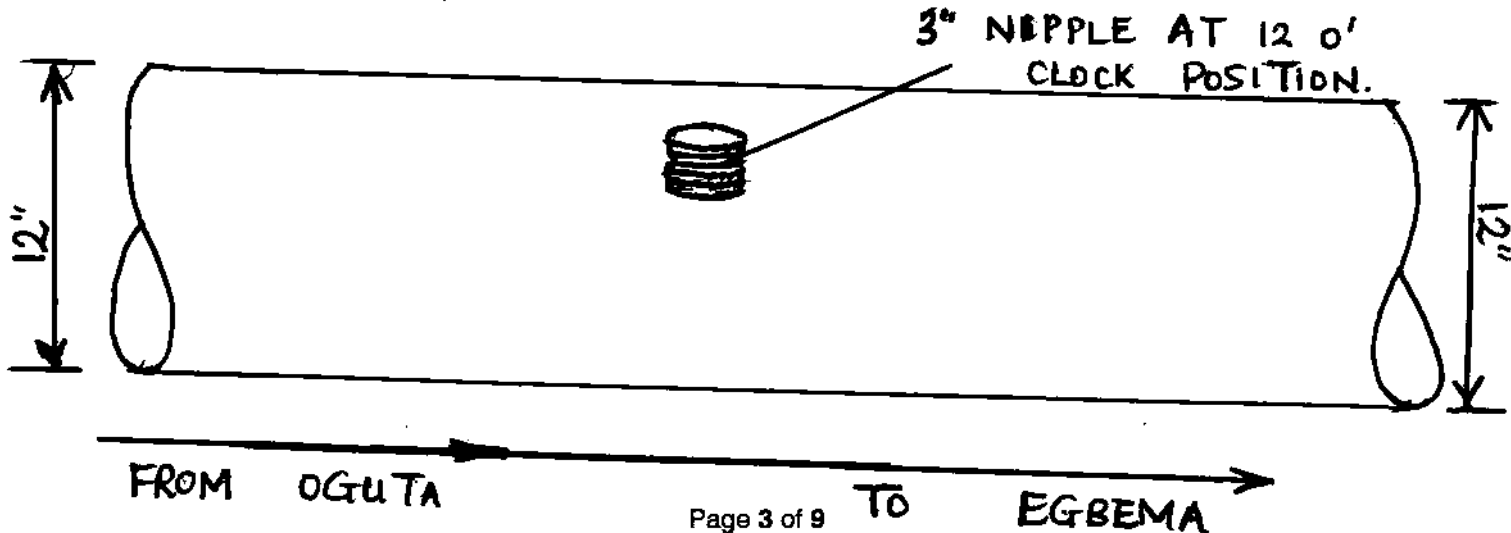
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
NONE WITHIN AREA OF IMPACT				

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

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

E. GRAPHIC DESCRIPTION OF LEAK POINT (while detail report of the leak point should be contained in the leak report, overview sketch of the site should be added as an appendix 1)

SECTION OF 12" OGUTA - EGBEMA PIPELINE AT OBIAKPU SHOWING POSITION OF ONE NO. CRUDE OIL THEFT FITTING.



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED.

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 999300 JIV report S/N:

0089

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

19. Impacted area boundary Coordinates (If more, Print and attach as an appendix)

MINNA - MID BELI

S/N	Northing (m)	Easting (m)
WP459	172 522.41	478 017.28
WP460	172 525.50	478 014.22
WP461	172 516.26	478 020.35
WP462	172 516.23	478 029.58
WP463	172 513.16	478 029.57
WP464	172 522.38	478 029.59
WP465	172 534.67	478 026.56
WP466	172 559.25	478 029.71
WP467	172 580.75	478 029.77
WP468	172 599.19	478 029.82
WP469	172 629.94	478 020.68
WP470	172 614.57	478 023.71
WP471	172 602.27	478 026.75
WP472	172 596.13	478 023.66
WP473	172 599.22	478 020.59
WP474	172 583.85	478 023.62
WP475	172 565.42	478 020.49
WP476	172 550.05	478 023.52
WP478	172 531.61	478 023.47

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED.**

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 999300 JIV report S/N:

**0089**

**G. INCIDENT INFORMATION:**

**20. Impacted Area Details**

- Total calculated area of impact 0.068099ha (0.07ha)
- Impact within SPDC R.O.W Yes
- Impact outside SPDC R.O.W Yes

**21. Volume of oil recovered before completion of JIV ( $V_{rec}$ ):**

Recovered oil $V_{rec}$ :	<b>10</b>	Barrels
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**22. Computation of estimated residual volume on site**

**a. Computation of estimated volume of pool of free phase oil (on land or confined water body).**

- i. Area ( $m^2$ ) occupied by pool of free phase oil 80
- ii. Average Depth (m) of pool of free phase oil 0.07
- iii. Emulsification factor: NIL

iv. 

Estimated Volume of pool of free phase oil. $V_{pool}$ :	<b>35.22</b>	barrels
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**b. Computation of estimated volume of infiltrated oil in the soil ( $V_{inf}$ ).**

**1. Estimated Volume of infiltrated oil at spill point ( $V_{inf a}$ )**

- i. Area\* ( $m^2$ ) of soil covered by the oil: 2
- ii. Average Depth (m) above leaking facility i.e. pipeline/flowline: 1.41
- iii. Soil type: CLAY iv.  $P_e$  (effective porosity of the soil): 8%
- v. Cause of spill: THIRD PARTY INTERFERENCE vi. Oil type: BONNY LIGHT
- vii. Oil Residence time on site, day: 4 DAYS
- viii. Average depth of infiltration below leaking facility i.e. pipeline/flowline: 0.001m
- ix. Estimated depth of infiltration around spill point: 1.401m

x. 

Estimated Volume of infiltrated oil at spill point. $V_{inf a}$ :	<b>1.41</b>	barrels
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**2. Estimated Volume of infiltrated oil at second spill point [if applicable] ( $V_{inf b}$ )**

- i. Area\* ( $m^2$ ) of soil covered by the oil: \_\_\_\_\_
- ii. Average Depth (m) above leaking facility i.e. pipeline/flowline: \_\_\_\_\_
- iii. Soil type: \_\_\_\_\_ iv.  $P_e$  (effective porosity of the soil): \_\_\_\_\_
- v. Cause of spill: NOT APPLICABLE vi. Oil type: \_\_\_\_\_
- vii. Oil Residence time on site, day: \_\_\_\_\_
- viii. Average depth of infiltration below leaking facility i.e. pipeline/flowline: \_\_\_\_\_
- ix. Estimated depth of infiltration around spill point: \_\_\_\_\_

Estimated Volume of infiltrated oil at spill point. $V_{inf b}$ :	<b>NIL</b>	barrels
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**3. Estimated Volume of infiltrated oil outside immediate spill point(s) region ( $V_{inf c}$ )**

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED.**

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 999300 JIV report S/N: 0089

- i. Area (m<sup>2</sup>) of soil covered by the oil: 601
- ii. Area (m<sup>2</sup>) of the pool of free phase oil in touch with soil: NIL
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.001
- iv. Soil type: CLAY
- v. P<sub>e</sub> (effective porosity of the soil): 8%
- vi. 

Estimated Volume of infiltrated oil. At V <sub>inf</sub> :	<u>0-33</u>	barrels
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**23. Computation of estimated volume of oil on open water based on standard coloration.**

- i. Total area of oil on open water: NIL
- ii. Table of average depth of oil on water based on coloration \*\*Spill Factors from USCG FOG (2000 Edition)

	Thickness (mm)	Percentage coverage	Volume (m <sup>3</sup> )
Barely Visible	0.00004	<b>NOT</b>	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003		
Dull	0.001	<b>APPLICABLE</b>	
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		

- iii. 

Percent Total	100%
Estimated Volume of oil on open water. V <sub>wat</sub> :	<u>NIL</u>

 Barrels

**24. Calculation of evaporated volume:**

- i. Estimated Volume available for evaporation within surface area: 46.97 BARRELS
- ii. E-Factor: 25%
- iii. 

Estimated Volume of evaporated oil. V <sub>evap</sub> :	<u>15.66</u>	Barrels
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Evaporation Factors (E-Factor) for SPDC Crude oil			
Oil Type	Days on site	Bonny Light	Bonny Medium
	< 1 day	10%	5%
	1-7 days	25%	15%
	> 7 days	40%	25%

**25. Net Estimated Spilled Volume V<sub>est</sub>(bbls) = V<sub>evap</sub>(bbls) + V<sub>wat</sub>(bbls) + V<sub>inf</sub>(bbls) + V<sub>pool</sub>(bbls) + V<sub>recf</sub>(bbls) =**  
15.66 + NIL + 1.74 + 35.22 + 10  
≈ 62.62

**Estimated Reported Volume\*\* V<sub>rep</sub>(bbls)=** 63 BARRELS

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED.**

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 999300 JIV report S/N: 0089

Calculation of the respective estimated volume is to be done on site as far as practicable using the new spill volume estimation software on site; Conversion of m<sup>3</sup> to barrels is Volume (m<sup>3</sup>) x 6.29; **\*\*Round up estimated volume to next whole number using the following rules:**

- Any spill volume in excess of 1 bbl is rounded up to the next whole number.
- Any spill volume in less than 1 bbl is rounded up to the next 0.1 bbl.

Examples: Calculated volume = 15.3 bbl ----- Reported volume = 16 bbl  
Calculated volume = 0.35 bbl ----- Reported volume = 0.4 bbl  
Calculated volume = 0.01 bbl ----- Reported volume = 0.1 bbl.

Wherever this estimation tool is not applicable please refer to paragraph 6c (Deviations) of the JIV procedure to use appropriate steps for column estimation; record the calculation in a plain sheet of paper and attach to the JIV report.

**26. GENERAL STATUS OF THE SITE**

A. Joint investigation of the incident site found that there is no residual impact after the initial response and therefore recommend that the site be closed out. <input type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/>

**27. REPRESENTATIVES**

This report was filled, agreed and signed on the <u>03/07/2013</u> by joint investigation representatives from
• Host Community: <input checked="" type="checkbox"/>
• Department of Petroleum Resources [DPR]: <input checked="" type="checkbox"/>
• National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/>
• State Ministry of Environment [SME]: <input checked="" type="checkbox"/>
• Nigeria Police Force [NPF]: <input type="checkbox"/>
• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/>
• Signatories agree with reported findings: <input checked="" type="checkbox"/>
• Separate DPR form has been filled out with same findings: <input checked="" type="checkbox"/>
<i>Tick as applicable</i>

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JOINT INVESTIGATION REPORT FOR INCIDENT NO: 999300 JIV report S/N: 0089

28. Appendix 1: Overview sketch of the site

