

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0412 858521

(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: 858521 2. Type of incident \* LOSS OF PRIMARY CONTAINMENT (LOPE) WITH SECONDARY CONTAINMENT.
3. Name of Location OBIGBO FLOWLINE GATHERING MANIFOLD
4. Name of nearest community UMUWALIA 5. State: RIVERS 6. LGA: OYIGBO
7. Type of Production facility/Installation MANIFOLD. 8. Asset owner/ District: NELL/PH I

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 27TH AUGUST, 2012
- b. Start date/time of investigation: 29TH AUGUST, 2012
- c. Investigation End date: 29TH AUGUST, 2012
- d. Description of spill point environment
- Firmed soil
  - Loose soil
  - Previously excavated area
  - Under water
  - Swampy
  - Exposed pipe surface
  - Well Platform (on Water)
  - Rig
- e. Description of leak point (tick as applicable);
- Drilled hole
  - Hack saw cut
  - Explosive tear,
  - Complete Rupture
  - Inward dent,
  - Well head tampering
  - Failed Weld-on illegal hot tap valve,
  - 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
  - Outward dent
  - Flare System/Bund wall failure
  - Valve Failure
  - com unit failure
  - Cold vent
  - Relief valve failure
  - Others (specify) \_\_\_\_\_

- f. Incident caused by:
- Third party interference
  - Operational
  - Mystery \_\_\_\_\_

g. Spill point coordinates

MINOTA BLD BELI

Measuring unit Northing: (m)  <div style="font-size: 24px; text-align: center;">98728.83</div>	Easting: (m)  <div style="font-size: 24px; text-align: center;">517732.19</div>
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\*This can be a) Oil spill b) Drilling fluid/Chemical c) siltation d) construction e) Encroachment f) Fire,

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**C. RISK ASSESSMENT**

10. Type of environment:

- Land       Swamp       Water       Seasonal swamp

i. Type of environment to which oil has spread:

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

ii. Weather condition

- Raining       Sunny

11. Distance from the nearest sensitive habitat

- Government reserved and designated protected area [      ,m]  
 Drinking water source [      ,m]  
 Built up area [ **50** ,m]  
 Farmlands [      ,m]  
 Fish Farm/Pond [      ,m]  
 Fishing net [      ,m]  
 Others (specify). [      ,m]

12. Containment measures put in place;

- Booms       Trench       Dyke  
 Others: **NATURAL DEPRESSION WITHIN GATHERING MANIFOLD.**

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
	<b>NONE WITHIN AREA OF IMPACT</b>				

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16. Crops/Economic Trees

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

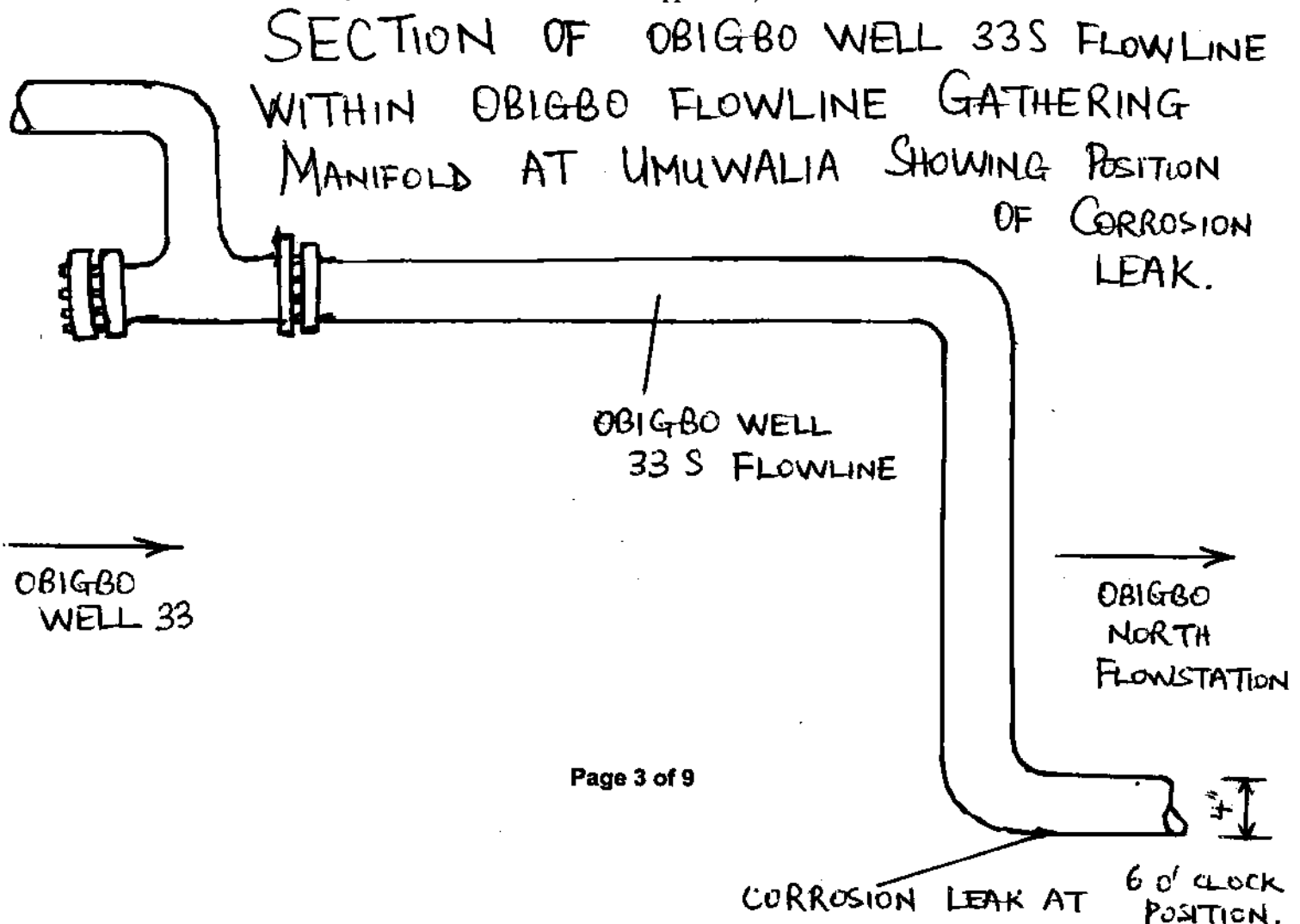
17. Fish/Nets/Ponds

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)





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iii. Emulsification factor: NIL

iv. 

Volume of pool of free phase oil. $V_{pool}$ :	0.06	barrels
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b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).

COMPUTATION OF OIL-INFILTRATION VOLUME AT SPILL POINT:  
AREA OF OIL-INFILTRATION =  $1M^2$   
DEPTH OF INFILTRATED OIL =  $1M$   
VOLUME =  $21. 1M^2 \times 1M \times 8\%$   
 $0.5 \text{ BARREL}$

- i Area \*(m<sup>2</sup>) covered by the oil: 17
- ii Area of the pool of free phase oil in touch with soil: 2
- iii Average Depth (m) below ground surface of infiltration of oil: 0.03
- iv Soil type: CLAY
- v  $P_e$  (effective porosity of the soil): 8%

VOLUME OF OIL-INFILTRATION OUTSIDE SPILL POINT IS 0.29 BARREL

iv. 

Volume of infiltrated oil. $V_{inf}$ (TOTAL)	$0.5 + 0.29 = 0.79$	barrels
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21. Computation of 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 \*\*

8% (EFFECTIVE POROSITY OF CLAY SOIL)  
 $\times 6.29 = 0.5 \text{ BARREL}$

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004	NOT APPLICABLE	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	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

iii. 

Volume of oil on open water. $V_{wat}$ :	NIL	barrels
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22. Calculation of evaporated volume:

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

iii. 

Volume of evaporated oil. $V_{evap}$ :	0.15	barrels
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Oil Type	Days on site	Bonny Light	Bonny Medium
Period Since Oil Spill	< 1 day	10%	5%
	1-7 days	25%	15%
	> 7 days	40%	25%

\*If area is not same as the total area of impact, please indicate in the overview sketch  
\*\* Spill Factor from USCG FOG (2000 Edition)

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<b>23. Gross Total Estimated Spilled Volume</b>	<b>= 0.15 + NIL + 0.79</b>
$V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recd}(bbls)$	<b>+ 0.06 + NIL = 1</b>
$V_{Est}(bbls) =$	<b>1 BARREL</b>
<b>24. Net Total Estimated Spilled Volume</b>	<b>= 0.15 + NIL + 0.79</b>
$V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recd}(bbls)$	<b>+ 0.06 + NIL = 1</b>
$V_{Est}(bbls) =$	<b>1 BARREL</b>

\*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 m3 to barrels is Total volume VT (m3) x 6.29

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

**25. 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"/>

**26 REPRESENTATIVES**

This report was filled and signed on the <u>29/08/2012</u> at incident site by joint investigation representatives from
<ul style="list-style-type: none"> <li>• Host Community <input checked="" type="checkbox"/></li> <li>• Department of Petroleum Resources [DPR]: <input type="checkbox"/></li> <li>• National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/></li> <li>• State Ministry of Environment [SME]: <input checked="" type="checkbox"/></li> <li>• Nigeria Police Force [NPF]: <input type="checkbox"/></li> <li>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/></li> </ul>
<i>Tick as applicable</i>

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27. Appendix 1: Overview sketch of the site

