

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0044 709344

(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: 709344 2. Type of incident\* OIL SPILL  
 3. Name of Location OPUKUSHI WELL 34 FLOWLINE  
 4. Name of nearest community AGBIDIAMA & EGBEMO - ANGALABIRI 5. State: BAYELSA 6. LGA EKEREMO  
 7. Type of Production facility/Installation FLOWLINE 8. Asset owner/District NWSZ

**B. INCIDENT INFORMATION:**

9. Details of incident

- a. Date of incident: 01/09/2011 @ 1530 HRS  
 b. Date/Period of investigation: 06/09/2011 @ 1250 HRS

c. Description of spill point environment

- Firmed soil  Loose soil  Previously excavated area  
 Under water  Swampy  Exposed pipe surface  
 Well Platform (on Water)  Rig

d. 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,  
 External Corrosion  Internal 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) \_\_\_\_\_

e. Incident due to:

- Third party interference  Operational  Others (specify) \_\_\_\_\_

f. Spill point coordinates

Measuring unit	
Northing:  <u>100849m</u>	Easting:  <u>374276m</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: 0044 709344

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

12. Containment measures put in place;

- Booms       Trench       Dyke

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
	NONE WITHIN AREA OF IMPACT				

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED  
 JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0044 709344

16. Crops/Economic Trees

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

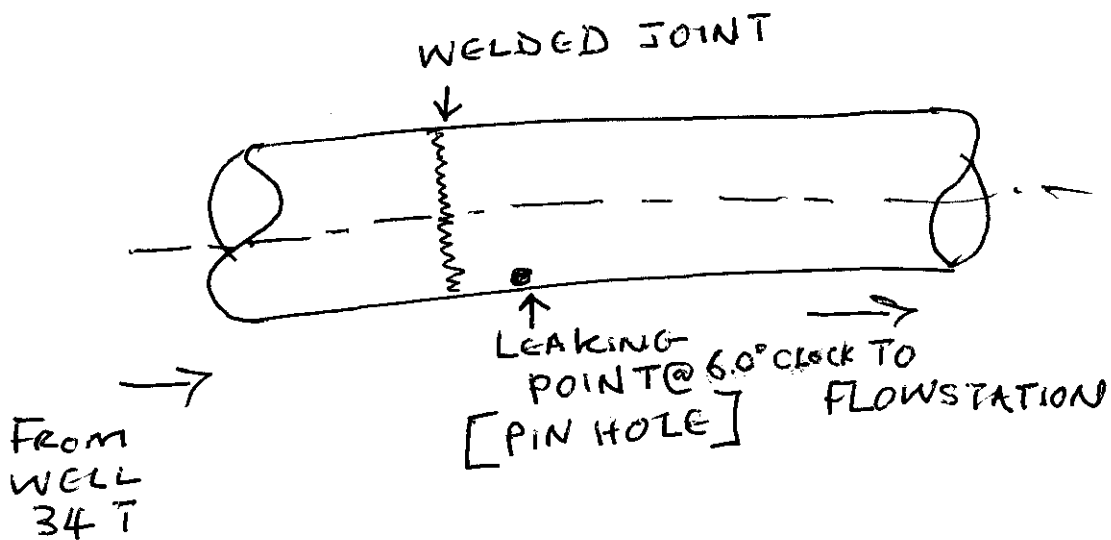
17. Fish/Nets/Ponds

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 (Overview sketch of the site should be added as an appendix1)



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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0044 709344

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

19. Impacted area boundary Coordinates (If more than 12 points, Attach as an appendix 2)

S/N	Northing	Easting
SP	100849.0	374276.0
	100797.0	374277.0
	100796.9	374269.9
	100807.0	374277.0
	100860.0	374275.0
	100878.0	374277.0
	100878.6	374294.4
	100887.1	374280.9
	100890.0	374269.0
	100893.0	374276.0
	100888.6	374283.10
	100890.6	374298.50
	100899.0	374297.0

**G. INCIDENT INFORMATION:**

20. Impacted Area Details

- Total calculated area of impact 1567.73M<sup>2</sup>
- Impact within SPDC R.O.W 1567.73M<sup>2</sup>
- Impact outside R.O.W NIL

21. Volume of oil recovered before completion of JIV (V<sub>recJ</sub>):

Recovered oil V <sub>recJ</sub> :	<u>NIL</u>	barrels
-----------------------------------	------------	---------

20. Computation of the residual volume on site

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

- i. Area (m<sup>2</sup>) occupied by pool of free phase oil 1567.73m<sup>2</sup>
- ii. Average Depth (m) of pool of free phase oil 0.001M
- iii. Emulsification factor: 60%

iv. Volume of pool of free phase oil. V <sub>pool</sub> :	<u>3.94</u>	barrels
---	-------------	---------

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0044 709344

b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).

- i. Area ( $m^2$ ) covered by the oil: NIL
- ii. Area of the pool of free phase oil in touch with soil: NIL
- iii. Average Depth (m) below ground surface of infiltration of oil: NIL
- iv. Soil type: NOT APPLICABLE
- v.  $P_e$  (effective porosity of the soil): NOT APPLICABLE

iv. Volume of infiltrated oil. $V_{inf}$	<u>NIL</u>	barrels
--	------------	---------

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 \*

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004		
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

NOT APPLICABLE

iii. Volume of oil on open water. $V_{wat}$	<u>NIL</u>	barrels
---	------------	---------

22. Calculation of evaporated volume:

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

iii. Volume of evaporated oil. $V_{evap}$	<u>0.7</u>	barrels
---	------------	---------

Evaporation Factors (E-Factor) for SPDC Crude oil			
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%

23. Gross Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recf}(bbls)$
---

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0044 709344

$V_{Est}(bbls) = 4.64 \text{ BBLs}$
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$
$V_{Est}(bbls) = 4.64 \text{ BBLs}$

- \*Calculation of the respective estimated volume is to be done using the new spill 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 Signatories

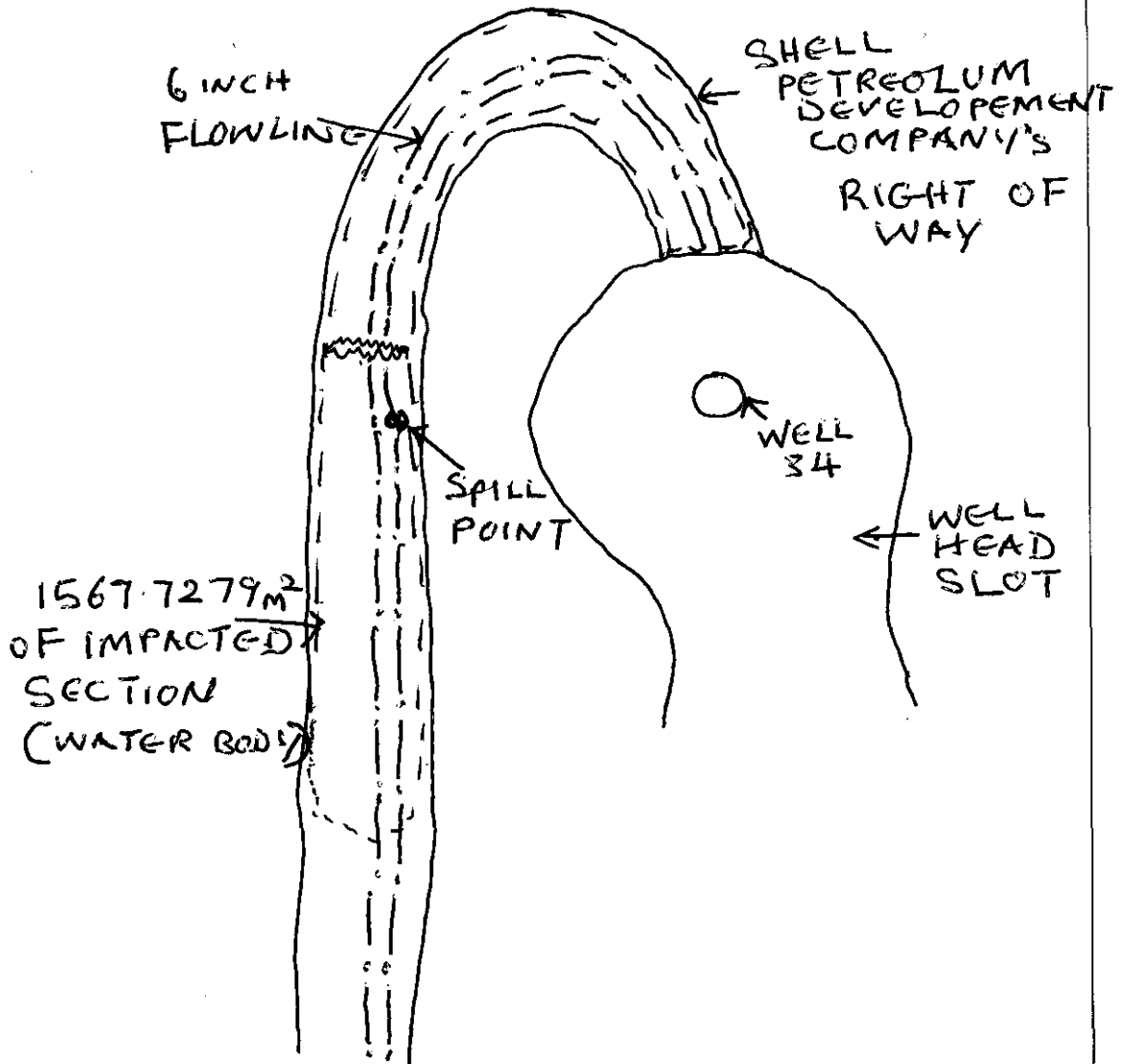
This report was filled and signed on the <u>06 / 09 / 20 11</u> at incident site by joint investigation representatives from
<ul style="list-style-type: none"><li>• Host Community <input checked="" type="checkbox"/></li><li>• Department of Petroleum Resources [DPR]: <input type="checkbox"/></li><li>• 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 checked="" type="checkbox"/></li><li>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/></li></ul>
<i>Tick as applicable</i>

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0044 709344

20. Appendix 1: Overview sketch of the site

Location: OPUKUSHI WELL 34 FLOWLINE



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: \_\_\_\_\_

0044-709344

21. Appendix 2: TABLE SHOWING ADDITIONAL COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

S/N	Northing	Easting
	100894.10	374310.60
	100905.00	374321.00
	100888.80	374313.11
	100906.89	374326.62
	100890.00	374323.00
	100875.25	374324.85
	100873.48	374316.31