

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0547

(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: 915834 2. Type of incident \* OIL SPILL  
 3. Name of Location KANBO WELL 5 L AND S FLOWLINE  
 4. Name of nearest community AMABULU 5. State: BAYELSA 6. LGA EKEREMOR  
 7. Type of Production facility/Installation FLOWLINE 8. Asset owner/ District NWS2

**B. INCIDENT INFORMATION:**

**9. Details of incident**

- a. Date of incident: 12/01/2013  
 b. Start date/time of investigation: 18/01/2013 AT 1247 HRS  
 c. Investigation End date: 19/01/2013

d. Description of spill point environment

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Firmed soil              | <input type="checkbox"/> Loose soil        | <input type="checkbox"/> Previously excavated area |
| <input checked="" type="checkbox"/> Under water   | <input checked="" type="checkbox"/> Swampy | <input type="checkbox"/> Exposed pipe surface      |
| <input type="checkbox"/> Well Platform (on Water) |  | <input type="checkbox"/> Rig                       |

e. Description of leak point (tick as applicable);

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> Drilled hole                                | <input type="checkbox"/> Hack saw cut  | <input type="checkbox"/> Explosive tear,                    |
| <input type="checkbox"/> Complete Rupture                            | <input type="checkbox"/> Inward dent,  | <input type="checkbox"/> Well head tampering                |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve,       |  | <input type="checkbox"/> Missing Pipeline/Flowline)         |
| <input type="checkbox"/> Crude oil theft (illegal) bunkering) point, |  | <input type="checkbox"/> Third party tampering with Clamp   |
| <input type="checkbox"/> Third party tampering with valve setting,   |  | <input type="checkbox"/> Third party tampering with flange, |
| <input type="checkbox"/> Corrosion                                   | <input type="checkbox"/> Saver-pit over flow,  | <input type="checkbox"/> Surge vessel overflow              |
| <input type="checkbox"/> Outward dent                                | <input type="checkbox"/> Flare System/Bund wall failure                                      |   |
| <input type="checkbox"/> Valve Failure                               | <input type="checkbox"/> com unit failure  | <input type="checkbox"/> Cold vent                          |
| <input type="checkbox"/> Relief valve failure                        | <input checked="" type="checkbox"/> Others (specify) <u>FAILED WELDED JOINT AND PIN HOLE</u> |   |

f. Incident caused by:

- Third party interference  Operational  Mystery \_\_\_\_\_

g. Spill point coordinates

Measuring unit	
Northing: ① 100494m ② 100372m ③ 100241m	Easting: 359834m 359604m 359243m

\*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 [            ,m]
- Farmlands [            ,m]
- Fish Farm/Pond [            ,m]
- Fishing net [            ,m]
- Others (specify). [            ,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:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**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					

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16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1	MANGROVE	YES	/	/	LOT	/
/	/	/	/	/	/	/

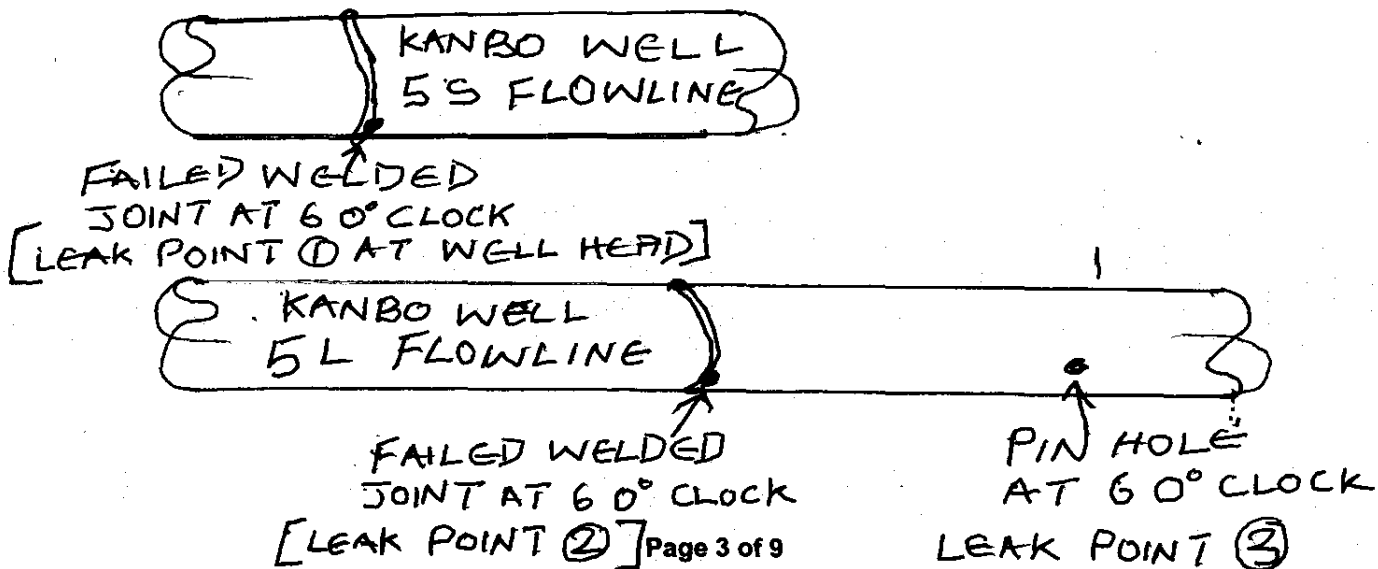
17. Fish/Nets/Ponds

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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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
	100495	359858
	100485	359860
	100483	359869
	100488	359875
	100494	359877
	100499	359872
	100501	359868
	100501	359864
	100498	359860
	100495	359858
	100241	359243
	B100372	359604
	100494	359864

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 6052 M<sup>2</sup>
- Impact within SPDC R.O.W 3773 M<sup>2</sup>
- Impact outside R.O.W 2279 M<sup>2</sup>

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

Recovered oil V <sub>rec</sub>	NIL	barrels
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20. Computation of the residual volume on site

- a. Computation of volume of pool of free phase oil (on land or confined water body).
- Area (m<sup>2</sup>) occupied by pool of free phase oil 249 M<sup>2</sup>
  - Average Depth (m) of pool of free phase oil 0.003 M

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iii. Emulsification factor: 40%

iv. 

Volume of pool of free phase oil. $V_{pool}$ :	<b>2.82</b> barrels
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b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).

i. Area \*(m<sup>2</sup>) 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: NOT APPLICABLE

iv. Soil type: NOT APPLICABLE

v.  $P_e$  (effective porosity of the soil). NOT APPLICABLE

iv. 

Volume of infiltrated oil. $V_{inf}$ :	<b>NIL</b> 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: 5803 m<sup>2</sup>

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	60%	0.000278544
Slight Color	0.00015	20%	0.00017409
Bright Color	0.0003	20%	0.00034818
Dull	0.001	/	/
Dark	0.002	/	/
Black oil	0.1	/	/
Emulsion (30% Oil)	1	/	/
Percent Total		100%	Total Volume <b>0.00 m<sup>3</sup></b>

iii. 

Volume of oil on open water. $V_{wat}$ :	<b>0.01</b> barrels
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22. Calculation of evaporated volume:

i. Oil type: BONNY MEDIUM

ii. E-Factor: 15%

iii. 

Volume of evaporated oil. $V_{evap}$ :	<b>0.50</b> barrels
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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%

\*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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**23. Gross Total Estimated Spilled Volume**

$$V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$$

$V_{Est}(bbls) =$  4 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 BBLs

\*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

B. Investigation of the incident site showed that there is residual impact on site requiring further works

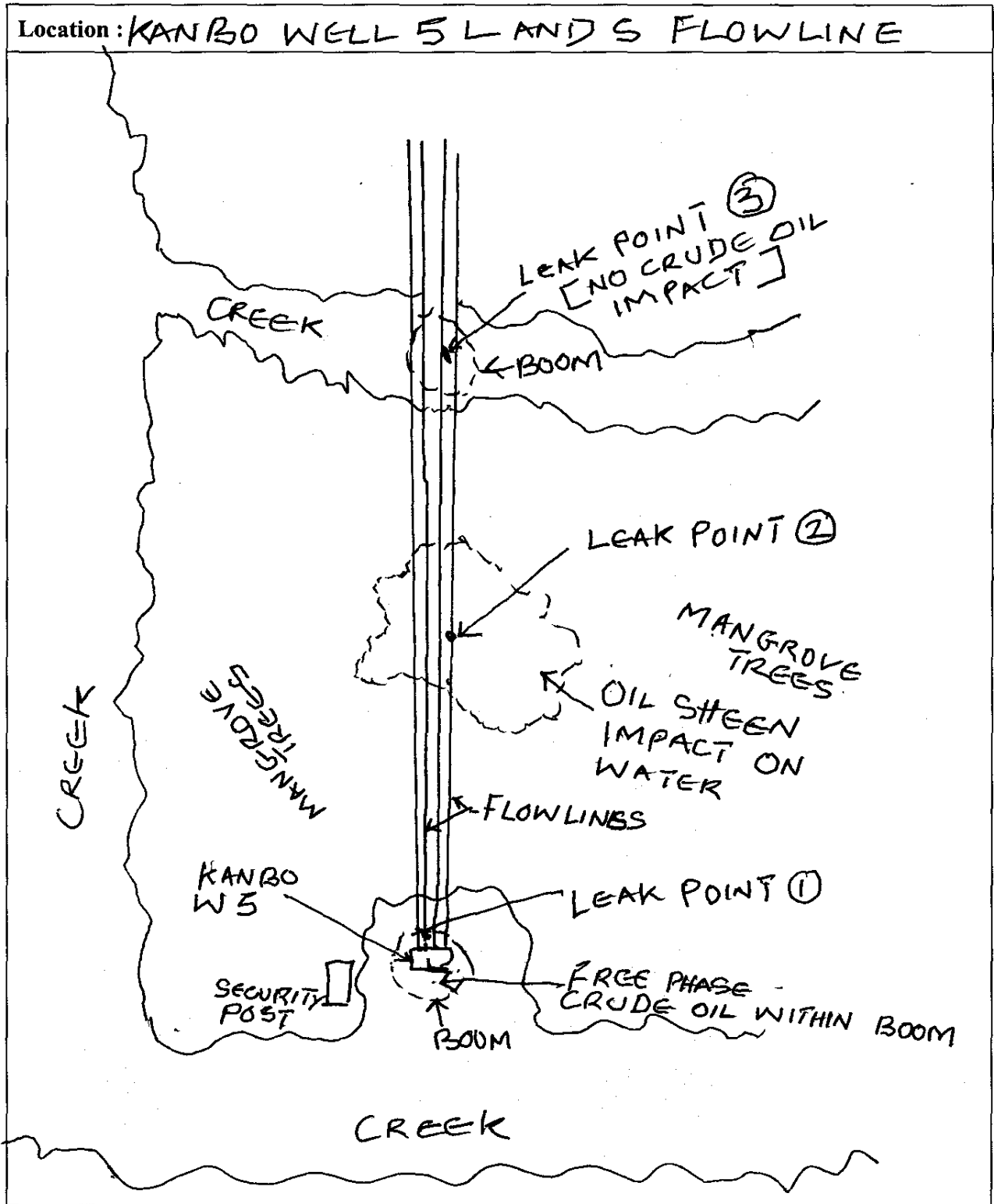
**26 REPRESENTATIVES**

This report was filled and signed on the 19/10/2013 at incident site by joint investigation representatives 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*

27. Appendix 1: Overview sketch of the site



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

S/N	Northing	Easting
	100360	359520
	100373	359533
	100387	359556
	100395	359578
	100397	359584
	100353	359630
	100332	359535
	100332	359528
	100345	359520
	100357	359520
	100360	359520
	100496	359866
	100500	359865
	100490	359866
	100496	359866