

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0085

(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: 864855 2. Type of incident* OIL SPILL
3. Name of Location OPUKUSHI WELL 25
4. Name of nearest community AGBEDIAMA 5. State: BAYELSA 6. LGA EKEREMO
7. Type of Production facility/Installation WELL HEAD 8. Asset owner/District NWS2

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 09/09/2012
b. Date/Period of investigation: 13/09/2012 AT 1230 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:	Easting:
<u>101270m</u>	<u>369588m</u>

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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).

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] []

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	PALM TREE	/	YES	YES	LOT	/
/	/	/	/	/	/	/

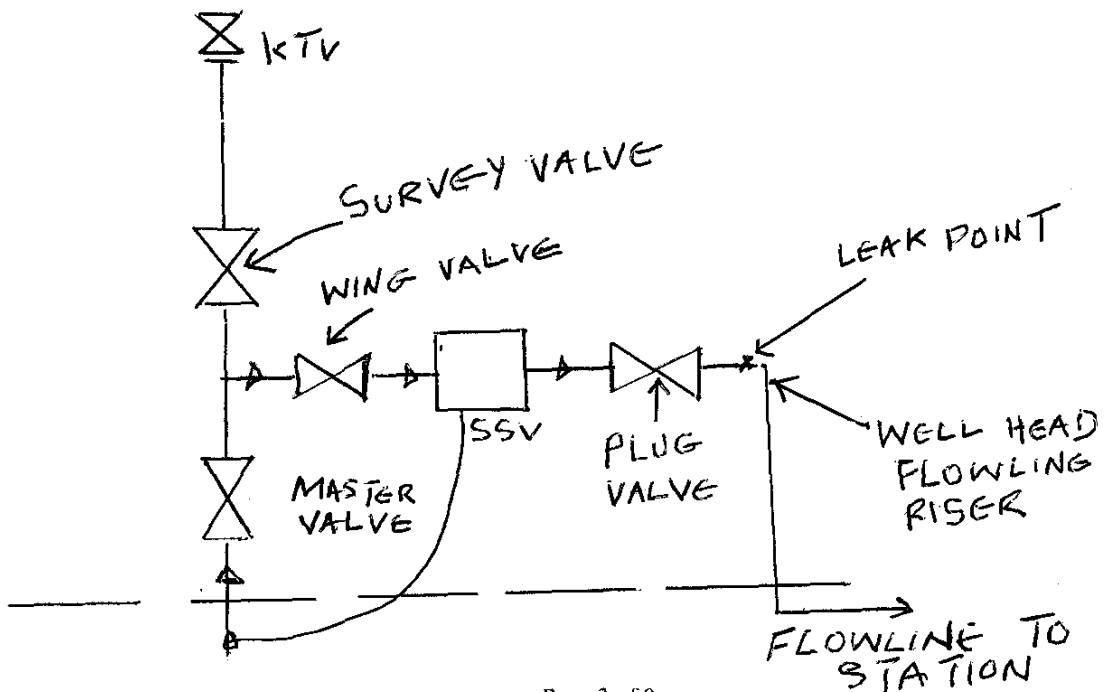
17. Fish/Nets/Ponds

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 (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
SP	101270	369588
1	101172	369508
2	101219	369499
3	101180	369514
4	101158	369515
5	101249	369493
6	101266	369495
7	101264	369537
8	101270	369557
9	101280	369580
10	101281	369590
11	101276	369600
12	101269	369603

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 5982.5 m²
- Impact within SPDC R.O.W 4209.15 m²
- Impact outside R.O.W 1773.35 m²

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

Recovered oil V_{rec} :	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 (m²) occupied by pool of free phase oil NIL
- Average Depth (m) of pool of free phase oil NOT APPLICABLE
- Emulsification factor: NOT APPLICABLE

iv. Volume of pool of free phase oil. V_{pool} :	NIL	barrels
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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: NOT APPLICABLE
- 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
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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: 5982.5 m^2
- ii. Table of average depth of oil on water based on coloration *

	Thickness (mm)	Percentage coverage	Volume (m^3)
Barely Visible	0.00004	/	/
Silvery	0.00008	5%	0.00002393
Slight Color	0.00015	/	/
Bright Color	0.0003	/	/
Dull	0.001	30%	0.00179475
Dark	0.002	/	/
Black oil	0.1	40%	0.2393
Emulsion (30% Oil)	1	25%	1.495625
Percent Total		100%	Total Volume <u>1.74 m^3</u>

iii. Volume of oil on open water. V_{wat}	<u>10.92</u>	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}	<u>1.93</u>	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%

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

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$V_{Est}(bbls) = 12.9 BBLs$
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rej}(bbls)$
$V_{Est}(bbls) = 8.5 BBLs$

*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.

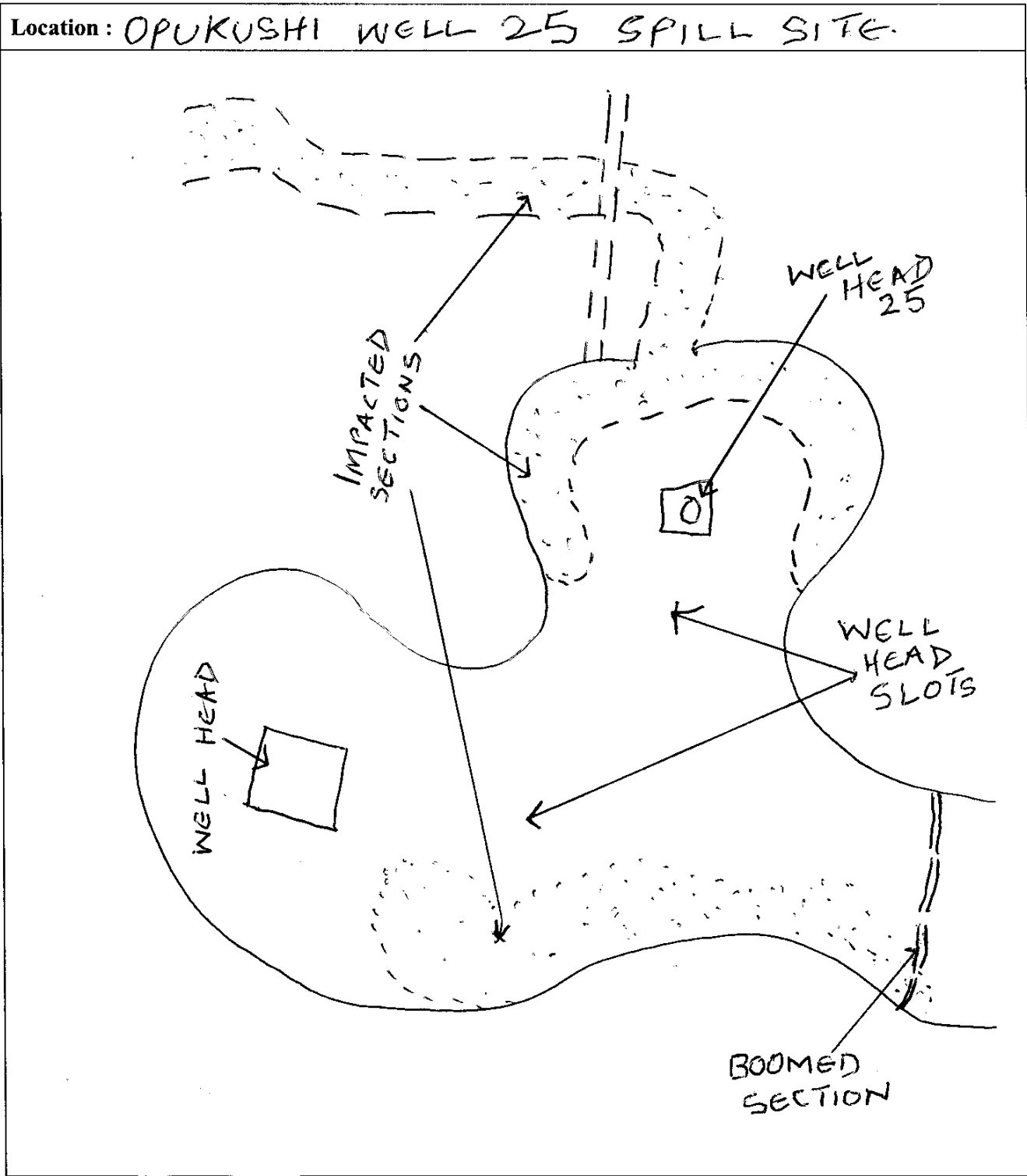
25. GENERAL STATUS OF THE SITE

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>13/09/2012</u> at incident site by joint investigation representatives from
<ul style="list-style-type: none">• Host Community <input checked="" type="checkbox"/>• Department of Petroleum Resources [DPR]: <input 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 checked="" type="checkbox"/>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/>
<i>Tick as applicable</i>

20. 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
13	101261	369592
14	101253	369578
15	101249	369569
16	101275	369617
17	101287	369628
18	101299	369638
19	101316	369636
20	101321	369619
21	101334	369605
22	101361	369575
23	101389	369528
24	101388	369476
25	101378	369449
26	101387	369448
27	101382	369476
28	101399	369528
29	101385	369553
30	101377	369549