

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0390 867128

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 **NOT** [Nil ,m]
- Built up area **NOT** [Nil ,m]
- Farmlands **APPLICABLE** [Nil ,m]
- Fish Farm/Pond **APPLICABLE** [Nil ,m]
- Fishing net **APPLICABLE** [Nil ,m]
- Others (specify). **APPLICABLE** [Nil ,m]

12. Containment measures put in place;

- Booms Trench Dyke

Others: NATURAL DEPRESSION

13. Any pictures or video coverage? [N]

14. Was there any disruption to the investigation? [Y]

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

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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			

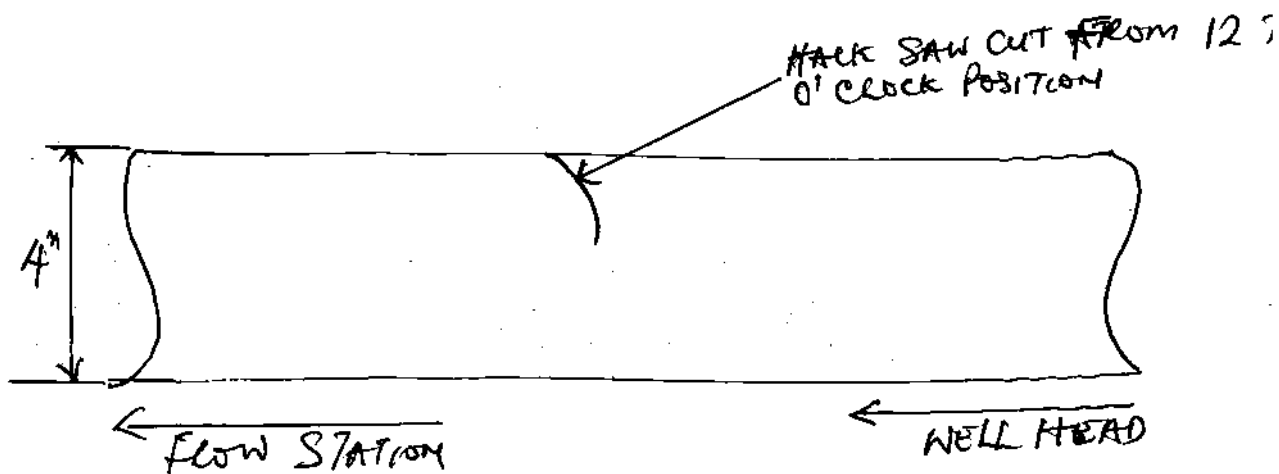
18. Others (Specify) i.e. Animal Traps

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)

A SECTION OF 4" CAWTHRONE CHANNEL 1 WELL 49L FLOWLINE.

HACK SAW CUT FROM 12 TO 3 O' CLOCK POSITION.



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iii. Emulsification factor: NUL

iv.

Volume of pool of free phase oil V_{pool}	6.29	barrel
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Volume of INFILTRATED OIL AT SPILL POINT
 AREA = 3 m²
 AVERAGE DEPTH = 1.5 m
 SOIL TYPE = CLAY
 P_e = 8%
 341.5 x 0.08 = 2.26
 2.26 BARRELS

b. Computation of volume of infiltrated oil in the soil (V_{int}).
 Area *(m²) covered by the oil: 8097
 ii Area of the pool of free phase oil in touch with soil: 100
 iii Average Depth (m) below ground surface of infiltration of oil: 0.001
 iv Soil type: CLAY
 v P_e (effective porosity of the soil): 8%
 iv.

Volume of infiltrated oil V_{int}	4.12 + 2.26 = 6.38	barrel
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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: NUL
 ii. Table of average depth of oil on water based on coloration**

	Thickness (mm)	Percentage coverage	Volume (m ³)
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>NUL</u> bbl

iii.

Volume of oil on open water V_{ow}	NUL	barrel
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22. Calculation of evaporated volume:

i. Oil type: BONNY LIGHT
 ii. E-Factor: 25%

iii.

Volume of evaporated oil V_{evap}	4.22	barrel
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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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23. Gross Total Estimated Spilled Volume

$$V_{Est}(\text{bbbls}) = V_{evap}(\text{bbbls}) + V_{wat}(\text{bbbls}) + V_{inf}(\text{bbbls}) + V_{pool}(\text{bbbls}) + V_{recd}(\text{bbbls})$$

$$V_{Est}(\text{bbbls}) = 4.22 + \text{NIL} + 6.38 + 6.29 + \text{NIL} = 16.89 \text{ BARRELS}$$

24. Net Total Estimated Spilled Volume

$$V_{Est}(\text{bbbls}) = V_{evap}(\text{bbbls}) + 0.6 * V_{wat}(\text{bbbls}) + V_{inf}(\text{bbbls}) + V_{pool}(\text{bbbls}) + V_{recd}(\text{bbbls})$$

$$V_{Est}(\text{bbbls}) = 4.22 + \text{NIL} + 6.38 + 6.29 + \text{NIL} = 16.89 \text{ BARRELS}$$

*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 19/09/2012 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

