

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0021 700104

(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: 700104 2. Type of incident* SPILL
 3. Name of Location 20" BULGUMA-ALAKIRI ^{PIPELINE} AT ABITANGA
 4. Name of nearest community BULGUMA 5. State: RIVERS 6. LGA ASARI-TORY
 7. Type of Production facility/Installation TRUNK LINE 8. Asset owner/District NESP

B. INCIDENT INFORMATION:

9. Details of incident
 a. Date of incident: 14/08/2011
 b. Date/Period of investigation: 19/08/2011

- c. Description of spill point environment
- Firmed soil
 - Under water
 - Well Platform (on Water)
 - Loose soil
 - Swampy
 - Previously excavated area
 - Exposed pipe surface
 - Rig
- d. Description of leak point (tick as applicable);
- Drilled hole
 - Complete Rupture
 - Failed Weld-on illegal hot tap valve,
 - Crude oil theft (illegal bunkering) point,
 - Third party tampering with valve setting,
 - External Corrosion
 - Saver-pit over flow,
 - Flare System/Bund wall Failure
 - Cold vent
 - Hack saw cut
 - Inward dent,
 - Explosive tear,
 - Well head tampering
 - Missing Pipeline/Flowline)
 - Third party tampering with Clamp
 - Third party tampering with flange,
 - Internal Corrosion
 - Surge vessel overflow,
 - Valve Failure
 - Outward dent
 - com unit failure
 - Others (specify) _____

e. Incident due to:

- Third party interference
- Operational
- Others (specify) _____

f. Spill point coordinates

Measuring unit <u>MRTS</u> (<u>MINNA MID - BGT</u>)	
Northing: <u>82689.92mN</u>	Easting: <u>490313.24mE</u>

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

[,m]
[,m]
[,m]
[,m]
[,m]
[,m]
[,m] } NOT APPLICABLE

12. Containment measures put in place;

- Booms Trench Dyke

Others: _____

13. Any pictures or video coverage?

[Y] [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
<u>NONE WITHIN AREA OF IMPACT</u>					

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16. Crops/Economic Trees

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

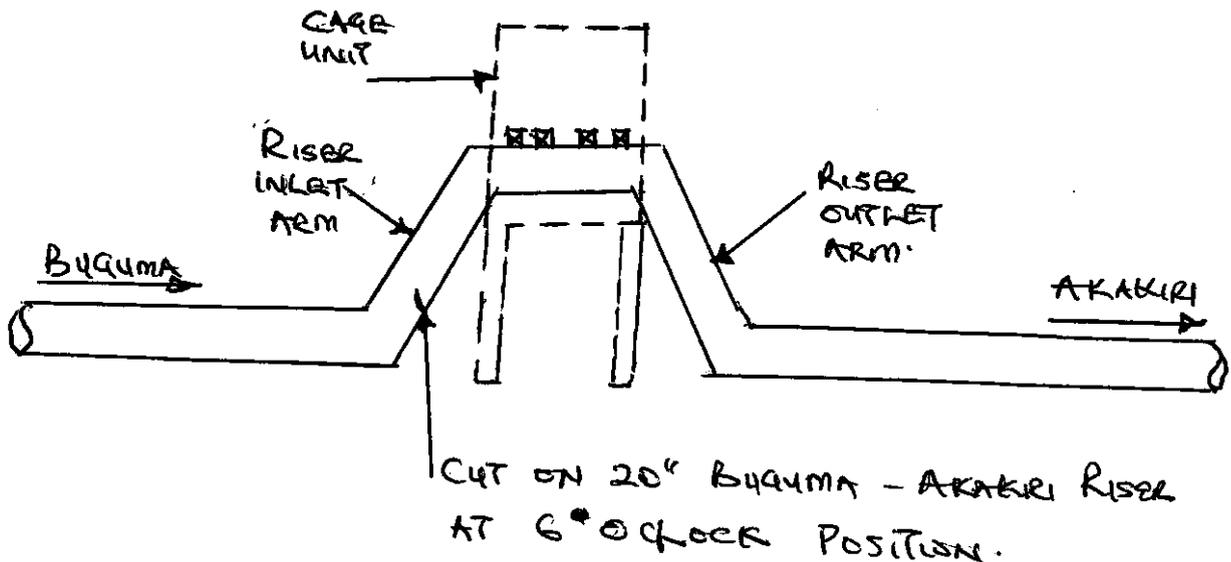
17. Fish/Nets/Ponds

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 (Overview sketch of the site should be added as an appendix 1)



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

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

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: 46.1 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		
Slight Color	0.00015		
Bright Color	0.0003		
Dull	0.001		
Dark	0.002	<u>100 %</u>	<u>9.22×10^{-5}</u>
Blackoil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume <u>0.0006 bbl</u>

iii. Volume of oil on open water. V_{wat}	<u>0.0006</u>	barrels
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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}	<u>0.21</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 $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recf}(bbls)$
 $0.21 + 0.0006 + NIL + 0.63 + NIL = 0.84$ Barrels

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$V_{Est}(bbls) = 0.21 + 0.0006 + NIL + 0.63 + NIL = 0.84 \text{ BARRELS}$
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rej}(bbls)$
$V_{Est}(bbls) = 0.21 + 0.0006 + 0.63 = 0.84 \text{ BARRELS}$

*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 checked="" type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input type="checkbox"/>

26 Signatories

This report was filed and signed on the <u>19/08/2011</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>

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20. Appendix 1: Overview sketch of the site

