

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0115 704451

(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: 704451 2. Type of incident* OIL SPILL
 3. Name of Location 10" EKULAMA - SANBARTH PIPELINE.
 4. Name of nearest community SANBARTH 5. State: RIVERS 6. LGA AKUKU - TORU
 7. Type of Production facility/Installation PIPELINE 8. Asset owner/District UIG/P/NESP

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 23RD AUGUST, 2011
 b. Date/Period of investigation: 28TH AUGUST, AND 22ND SEPTEMBER, 2011

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 <u>METERS</u> (<u>MINNA MID-BERT.</u>)	
Northing: <u>56154.59mN</u>	Easting: <u>469523.00mE</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 [,m]
 Drinking water source [,m]
 Built up area [,m]
 Farmlands [,m]
 Fish Farm/Pond [,m]
 Fishing net [,m]
 Others (specify) [,m]

} NOT APPLICABLE

12. Containment measures put in place;

- Booms Trench Dyke

Others: NOT APPLICABLE

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
	<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					

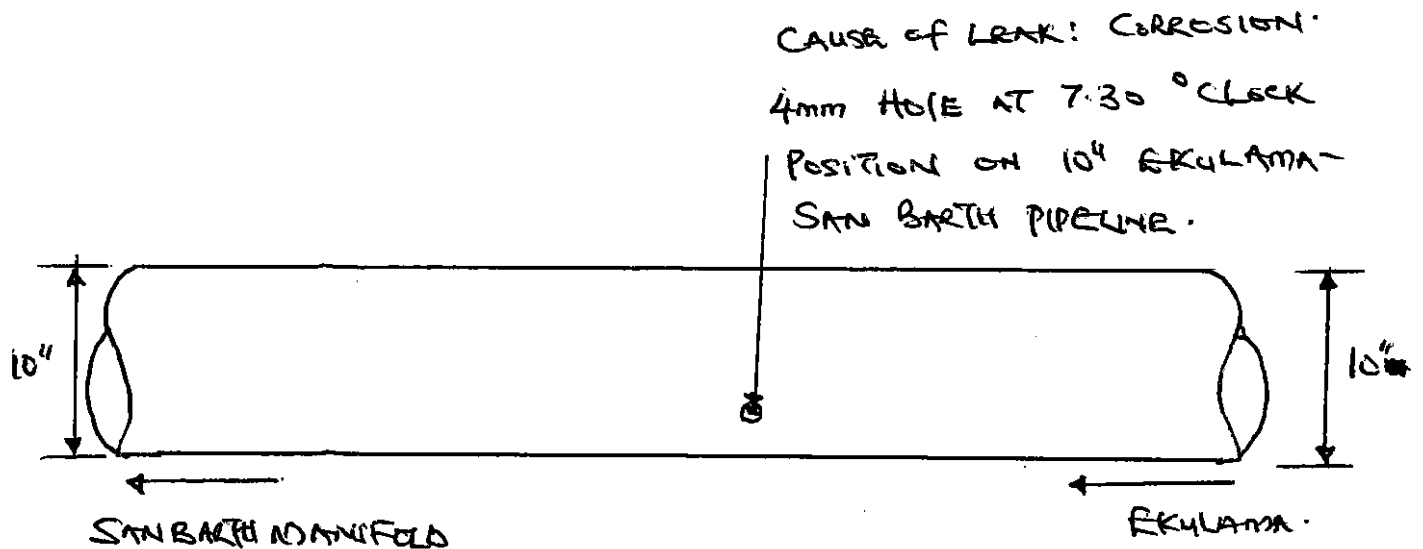
17. Fish/Nets/Ponds

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)



A. SECTION OF 10" EKULAMA-SAN BARTH PIPELINE OIL SPILL.

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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)

MINKA MID-BEIT

S/N	Northing (METERS)	Easting (METERS)
32	56157.71 m	469518.31 m
33	56160.68 m	469524.53 m
34	56157.44 m	469529.12 m
35	56149.60 m	469529.66 m
30	56148.25 m	469521.82 m
37	56133.11 m	469498.85 m
38	56157.49	469473.18 m

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.07 Ha
- Impact within SPDC R.O.W 0.07 Ha
- Impact outside R.O.W NIL

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

Recovered oil V_{rec} :	<u>NIL</u>	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). 80 m²
- i. Area (m²) occupied by pool of free phase oil 80 m²
 - ii. Average Depth (m) of pool of free phase oil 0.001 m
 - iii. Emulsification factor: NIL

iv. Volume of pool of free phase oil. V_{pool} :	<u>0.50</u>	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: 200 m^2
- 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: 0.002 m
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. V_{inf}	0.20	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: _____
- 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	100	0.0005 m^3
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume 0.0031 bbl

iii. Volume of oil on open water. V_{wat} :	0.0031	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} :	0.23	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 $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls)$
 $0.23 + 0.0031 + 0.20 + 0.50 = 0.9331$ barrels

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$V_{Est}(bbls) = 0.23 + 0.5031 + 0.20 + 0.50 = 0.93 \text{ Barrels}$
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls)$
$V_{Est}(bbls) = 0.23 + 0.00189 + 0.20 + 0.50 = 0.93189 \approx 0.93 \text{ Barrels}$

*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.

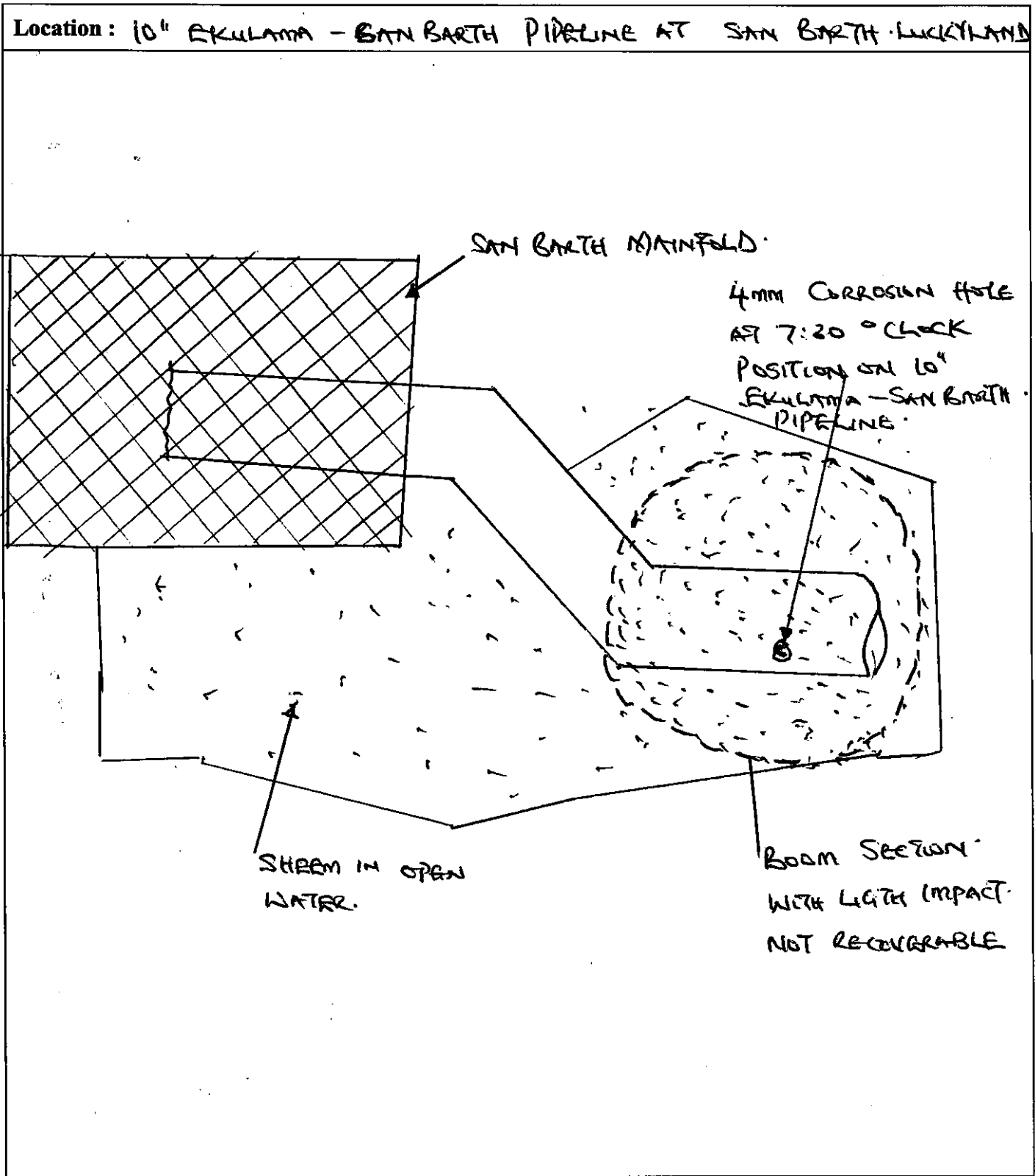
25. GENERAL STATUS OF THE SITE

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

26 Signatories

<p>This report was filled and signed on the <u>22/09/2011</u> at incident site by joint investigation representatives from</p> <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"/> <p style="text-align: right;"><i>Tick as applicable</i></p>
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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

(MINNA MID - BEIT)

S/N	Northing METERS	Easting METERS