

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0228-809483

(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: 809483 2. Type of incident * OIL SPILL
 3. Name of Location 16" NUN RIVER - KOLOCREEK PIPELINE
 4. Name of nearest community AGUOBIRI 5. State: BAYELSA 6. LGA SOUTHERN IJAW
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/ District NPE / NUN RIVER

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 1ST MAY, 2012
 b. Start date/time of investigation: 5TH MAY 2012
 c. Investigation End date: 5TH MAY 2012
 d. Description of spill point environment
 Firmed soil Loose soil Previously excavated area
 Under water Swampy Exposed pipe surface
 Well Platform (on Water) (SEASONAL) Rig
 e. 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,
 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) _____
 f. Incident caused by:
 Third party interference Operational Mystery _____

g. Spill point coordinates

Measuring unit		<u>MINNA MID BELT</u>	
Northing:	<u>91317.31m</u>	Easting:	<u>409101.89m</u>

*This can be a) Oil spill b) Drilling fluid/Chemical c) siltation d) construction e) Encroachment f) Fire,

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0228 809483

C. RISK ASSESSMENT

10. Type of environment:

- Land Swamp Water Seasonal swamp

i. Type of environment to which oil has spread:

- Land Swamp (SEASONAL) 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 [5 ,m]
 Fish Farm/Pond [,m]
 Fishing net [,m]
 Others (specify). [,m]

12. Containment measures put in place;

- Booms Trench Dyke

Others: NATURAL DEPRESSION

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
NONE WITHIN AREA OF IMPACT					

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0238 809483

16. Crops/Economic Trees

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

17. Fish/Nets/Ponds

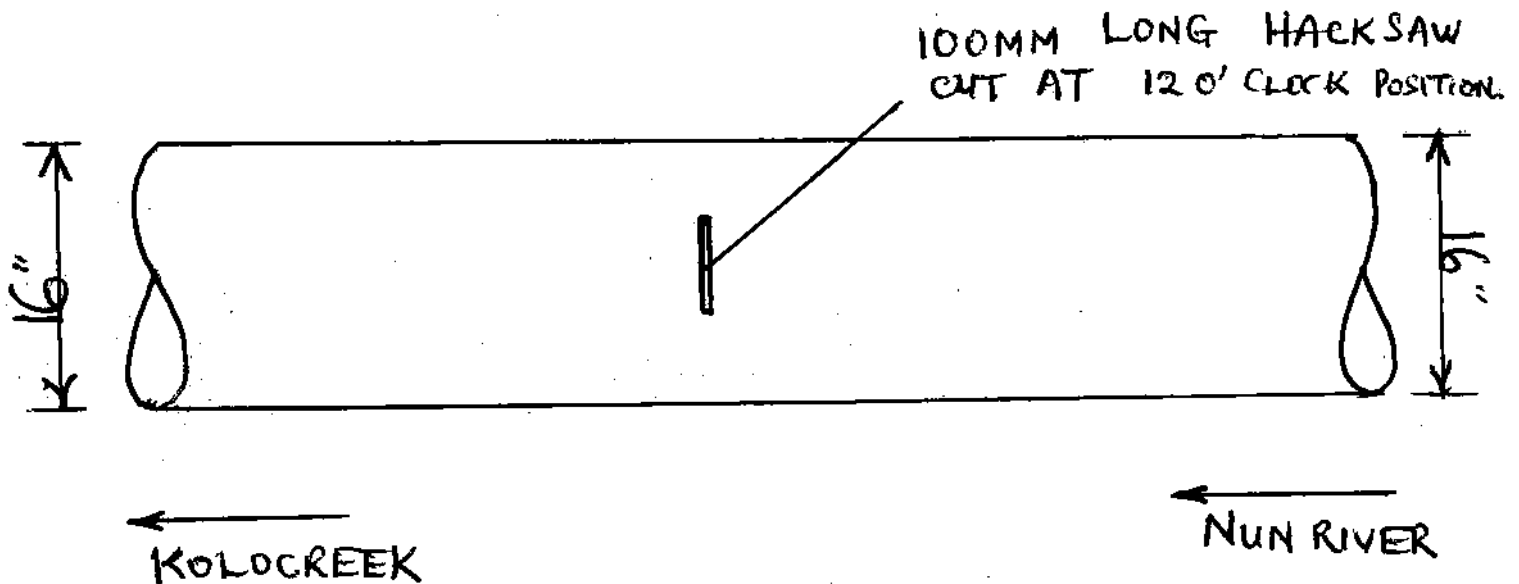
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
NONE WITHIN AREA OF IMPACT				

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)

SECTION OF 16" NUN RIVER - KOLOCREEK PIPELINE (SHOWING PLAN) AT AGUOBIRI SHOWING POSITION OF HACKSAW CUT.



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0228 809483

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)

MINNA MID BELT

S/N	Northing	Easting
1.	91335.76m	409098.87m
2.	91332.64m	409111.19m
3.	91347.93m	409135.19m
4.	91341.76m	409142.06m
5.	91360.15m	409157.53m
6.	91350.88m	409169.84m
7.	91356.86m	409219.19m
8.	91341.45m	409231.47m
9.	91356.64m	409280.85m
10.	91344.34m	409283.89m
11.	91344.10m	409351.72m
12.	91350.23m	409357.91m
13.	91368.63m	409370.30m

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.79Ha
- Impact within SPDC R.O.W YES
- Impact outside R.O.W YES

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).
- Area (m^2) occupied by pool of free phase oil 5840
 - Average Depth (m) of pool of free phase oil 0.019

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0228 809483

iii. Emulsification factor: NIL

iv.

Volume of pool of free phase oil, V_{pool} :	697.94	barrels
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b. Computation of volume of infiltrated oil in the soil (V_{inf}).

i. Area *(m²) covered by the oil: 400

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: 0.025

iv. Soil type: CLAY

v. P_e (effective porosity of the soil): 8%

iv.

Volume of infiltrated oil, V_{inf} :	5.03	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: NIL

ii. Table of average depth of oil on water based on coloration**

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004	NOT	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003		
Dull	0.001		
Dark	0.002	APPLICABLE	
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume <u>NIL</u> bbl

iii.

Volume of oil on open water, V_{wat} :	NIL	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} :	234.32	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)

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0228 809483

23. Gross Total Estimated Spilled Volume	$V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls)$	$= 234.32 + NIL + 5.03 + 697.94 + NIL = 937.29$
$V_{Est}(bbls) =$	937.3 BARRELS	
24. Net Total Estimated Spilled Volume	$V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls)$	$= 234.32 + NIL + 5.03 + 697.94 + NIL = 937.29$
$V_{Est}(bbls) =$	937.3 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.

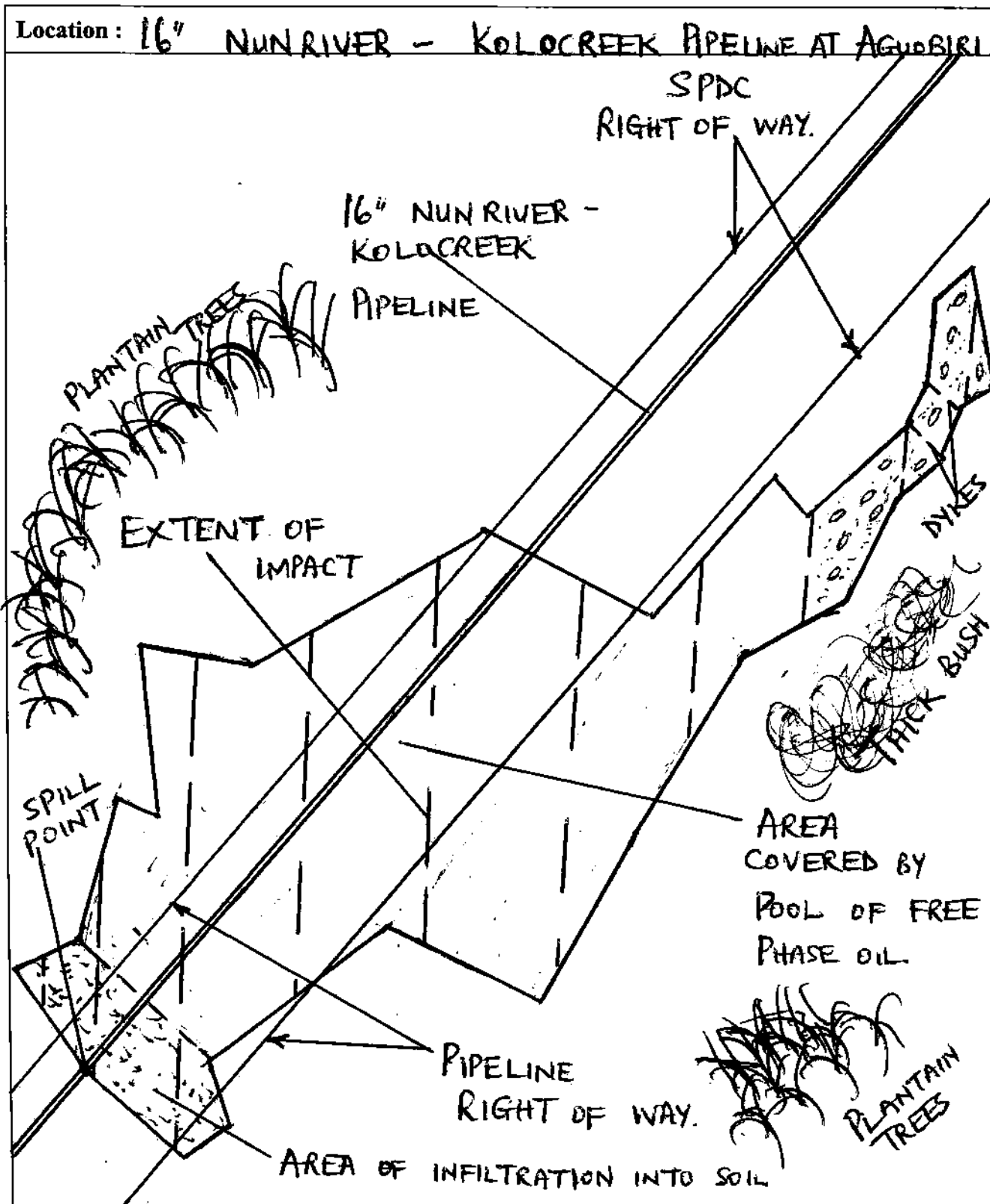
25. GENERAL STATUS OF THE SITE

- | |
|--|
| 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 <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 REPRESENTATIVES

This report was filled and signed on the <u>05/05/2012</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>

27. Appendix 1: Overview sketch of the site

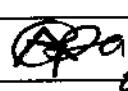


THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0228 809483

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

MINNA MID BELT

S/N	Northing	Easting
14.	91371.67m	409379.56m
15.	91344.01m	409379.47m
16.	91340.99m	409364.04m
17.	91331.80m	409354.76m
18.	91328.83m	409323.92m
19.	91322.81m	409286.90m
20.	91326.03m	409246.83m
21.	91313.85m	409212.87m
22.	913 ² 98.61m	409175.82m
23.	91320.19m	409157.40m
24.	91314.18m	409117.29m
25.	91304.97m	409114.18m
26.	91305.00m	409104.93m
27.	91317.31m	409101.89m
		 05/05/2012