

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: ... 0017 700480

(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: 700480 2. Type of incident* SPILL
 3. Name of Location 14" OKORDIA - RUMUEKPE PIPELINE
 4. Name of nearest community IKARAMA 5. State: BAYELSA 6. LGA YENAGODA
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/District NESP/LAND 2

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 15TH AUGUST 2011
 b. Date/Period of investigation: 19TH AUGUST 2011

c. Description of spill point environment

Firmed soil Loose soil Previously excavated area

Under water Swampy

Well Platform (on Water)

Exposed pipe surface BURNT/CRUDE

Rig

d. Description of leak point (tick as applicable);

Drilled hole Hack saw cut

Complete Rupture Inward dent,

Failed Weld-on illegal hot tap valve,

Explosive tear,

Well head tampering

Crude oil theft (illegal bunkering) point,

Missing Pipeline/Flowline)

Third party tampering with valve setting,

Third party tampering with Clamp

External Corrosion

Third party tampering with flange,

Saver-pit over flow, Surge vessel overflow,

Internal Corrosion

Flare System/Bund wall Failure Valve Failure

Outward dent

Cold vent

Relief valve failure

com unit failure

Others (specify) _____

e. Incident due to:

Third party interference

Operational

Others (specify) _____

f. Spill point coordinates

Measuring unit (m) <u>MID-BELT</u>	
Northing: <u>127779.39</u>	Easting: <u>443691.10</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 NIL ,m]
- Drinking water source NIL ,m]
- Built up area KID ,m]
- Farmlands [NIL ,m]
- Fish Farm/Pond NIL ,m]
- Fishing net NIL ,m]
- Others (specify).

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] []

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
	DALM TREES			✓	THREE	
	RAFFIA PALM		✓		TEN	
	BAMBOO TREE				ONE CLUSTER	

17. Fish/Nets/Ponds

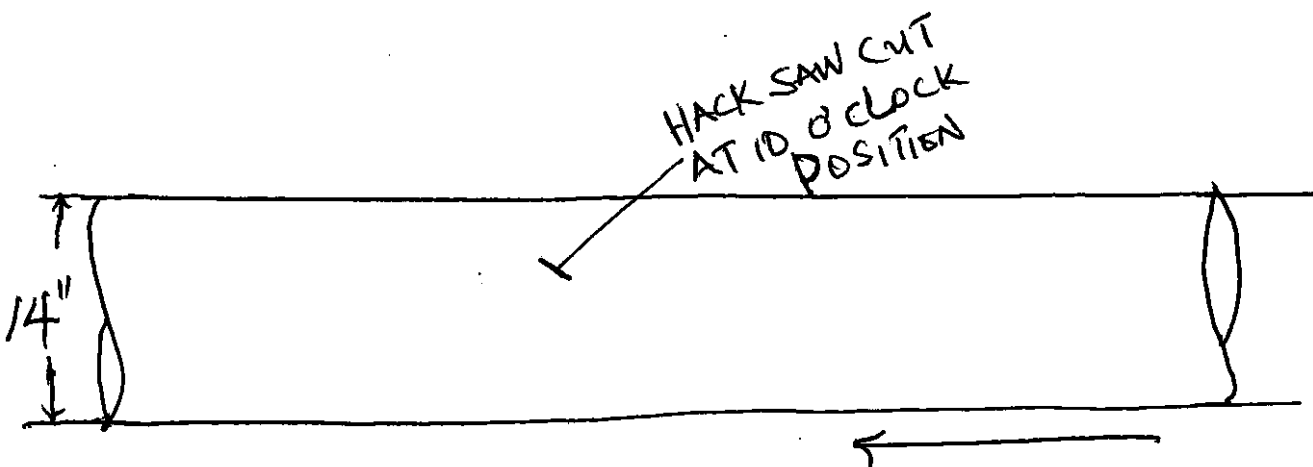
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE	WITHIN AREA OF IMPACT		

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!)

A SECTION OF 14" OKORDIA-RUMUKEPE PIPELINE
SHOWING HACK SAW CUT AT 10 O'CLOCK POSITION



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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
1	127 731.22	443 724.99
2	127 776.33	443 684.93
3	127 767.92	443 734.27
4	127 773.19	443 706.48
5	127 770.09	443 715.72
6	127 770.02	443 737.28
7	127 739.28	443 740.26
8	127 726.97	443 746.39
9	127 723.92	443 741.22
10	127 743.49	443 721.80
11	127 653.50	443 650.64
12	127 638.40	443 576.65
13	127 672.28	443 552.11

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 1.17 Ha
- Impact within SPDC R.O.W 0.13 Ha
- Impact outside R.O.W 1.04 Ha

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 71200
- Average Depth (m) of pool of free phase oil 0.601
- Emulsification factor: NIL

iv. Volume of pool of free phase oil. V_{pool} :	<u>71.71</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: 300
- 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
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. V_{inf}	<u>0.30</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: NIL
- ii. Table of average depth of oil on water based on coloration *

	Thickness (mm)	Percentage coverage	Volume (m3)
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 bbl

iii. Volume of oil on open water. V_{wat}	<u>NIL</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>12.7</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 $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls) = 0.30 + NIL + 12.7 + 71.70$

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$V_{Est}(bbls) =$	84.7
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls) = 12.7 + NIL + 0.30 + 71.70 + ML$	
$V_{Est}(bbls) =$	84.7

*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 19/08/2011 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]:

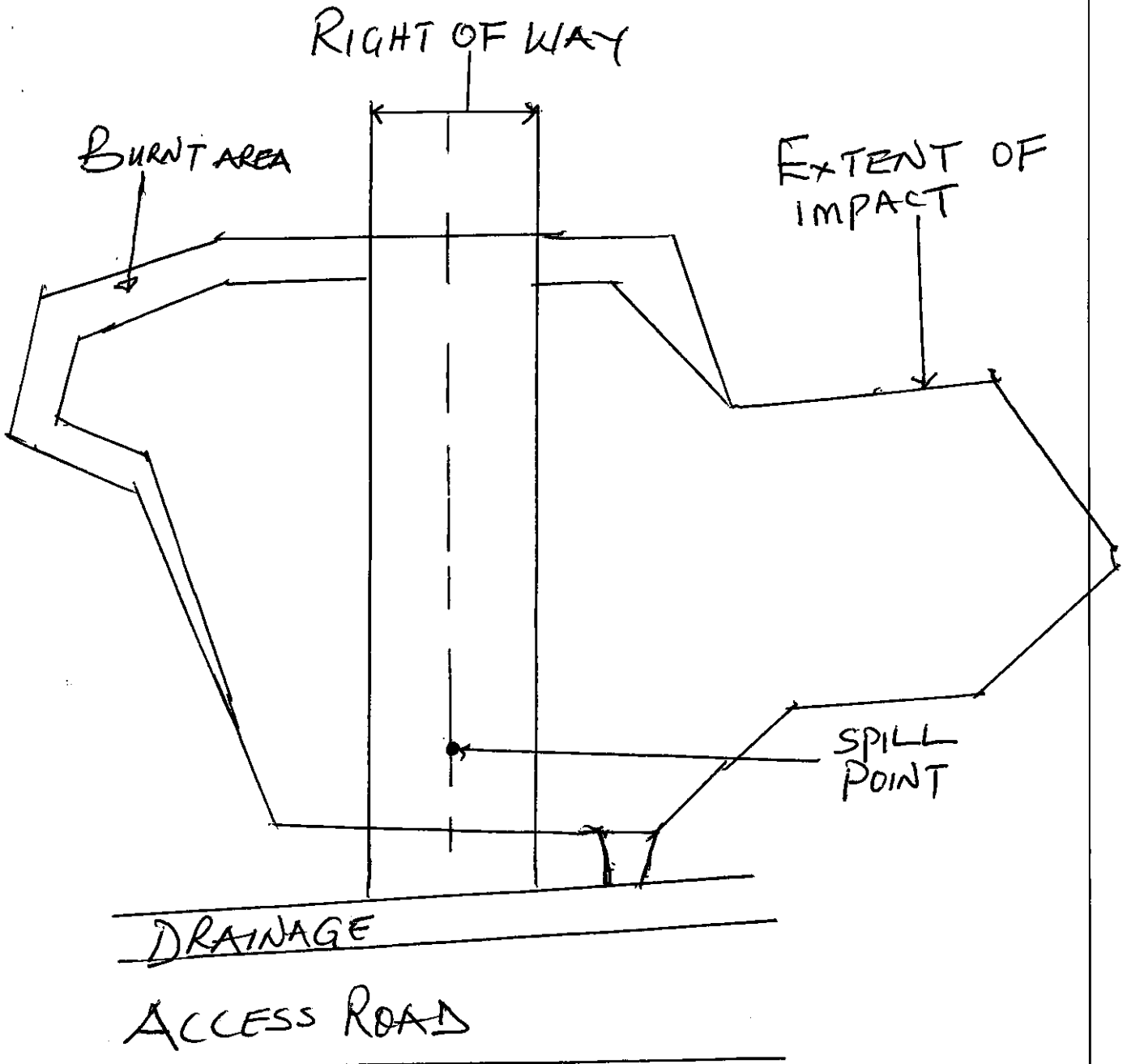
Tick as applicable

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20. Appendix 1: Overview sketch of the site

Location: 14" OKORDIA - RUMUEKPE PIPELINE AT IKARAMA



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

S/N	Northing	Easting
14	127693.73	443570.66
15	127724.20	443623.14
16	127733.52	443620.09
17	127718.25	443592.31
18	127739.68	443617.03
19	127767.24	443644.84
20	127764.16	443647.91
21	127754.93	443650.97
22	127745.71	443650.94
23	127776.40	443663.36
24	127782.54	443666.46
25	127797.81	443694.24
26	127803.97	443691.18
27	127788.64	443681.88
28	127791.69	443688.06
29	127757.85	443700.27
30	127779.39	443691.10
31	127752.54	443648.78