

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0147 784201

(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: 784201 2. Type of incident* OIL SPILL
 3. Name of Location 36" RUMUEKPE - NKPOKU PIPELINE
 4. Name of nearest community OMUIGWE-ALU 5. State: RIVERS 6. LGA IKWERRE
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/District NPE/PH I

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 29TH FEBRUARY, 2012.
 b. Date/Period of investigation: 2ND MARCH, 2012
 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 (MUNA MID-BELT)

Measuring unit <u>m</u>	
Northing: <u>104563.91</u>	Easting: <u>497628.28</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: 0147784201

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 [15 ,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
<u>NONE WITHIN AREA OF IMPACT</u>					

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0147784201

16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1	PALM TREES			✓	34	SUPERFICIAL IMPACT ON VEGETATION

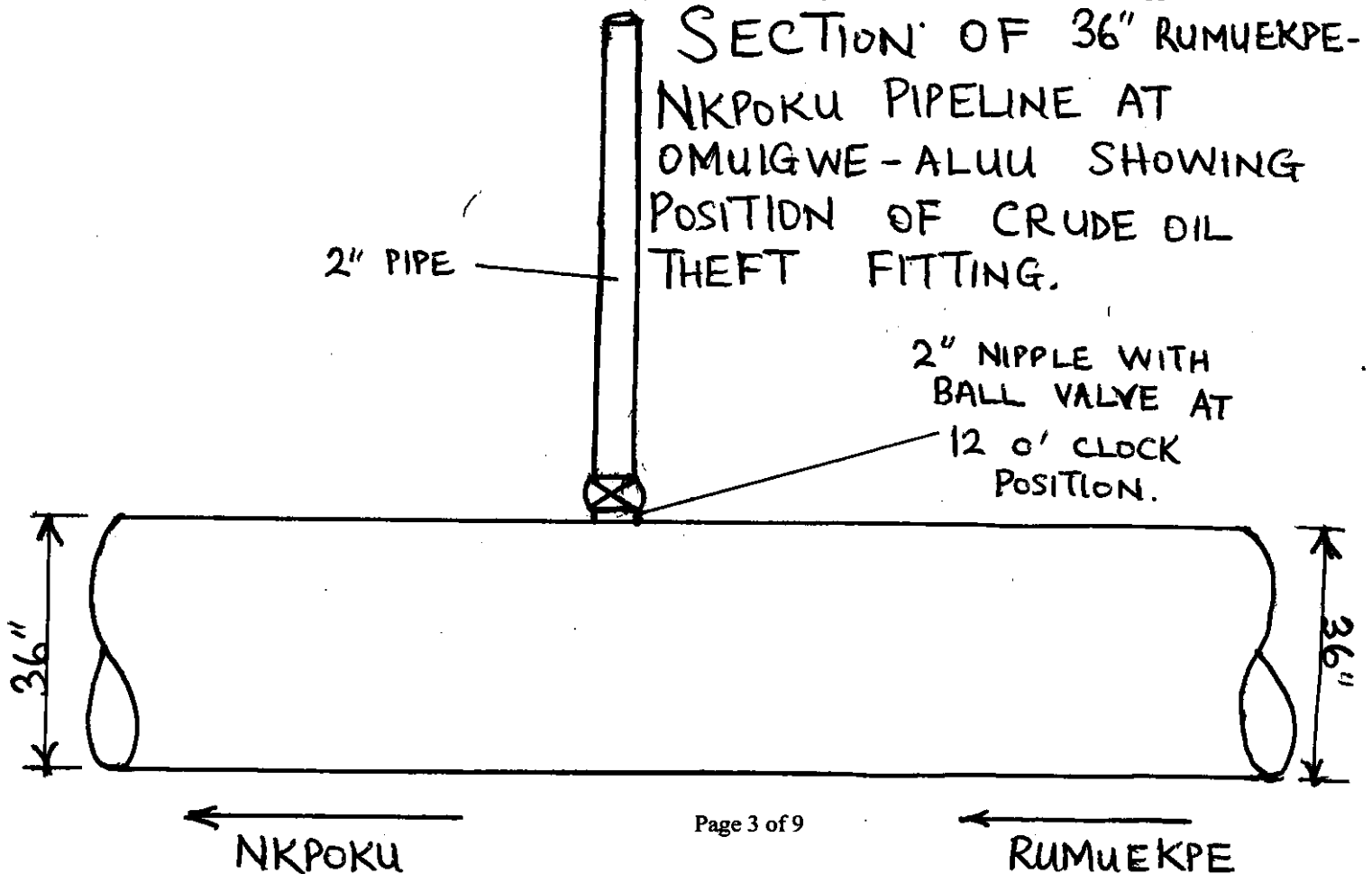
17. Fish/Nets/Ponds

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)*



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0147 784201

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) (MUNA MD-BLT)

S/N	Northing (m)	Easting (m)
WP384	104508.30	497760.64
WP385	104508.27	497776.05
WP386	104502.09	497788.36
WP387 391 WP387	104505.17	497788.36
WP390	104505.16	497791.44
WP387	104505.15	497794.53
WP392	104502.06	497800.68
WP389	104498.97	497809.92
WP393	104480.44	497853.01
WP395	104468.10	497871.47
WP394	104465.01	497880.70
WP396	104458.86	497883.77
WP397	104452.69	497893.00

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 1.11 Ha
- Impact within SPDC R.O.W _____
- Impact outside R.O.W _____

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

Recovered oil V_{rec} :	<u>75</u>	barrels
---------------------------	-----------	---------

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 1,690
 - Average Depth (m) of pool of free phase oil 0.014
 - Emulsification factor: NIL

iv. Volume of pool of free phase oil, V_{pool} :	<u>148.82</u>	barrels
--	---------------	---------

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0147 784201

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

- i. Area (m^2) covered by the oil: 9,390
- ii. Area of the pool of free phase oil in touch with soil: 72
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.005
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. V_{inf}	<u>23.81</u>	barrels
--	--------------	---------

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 <u>NIL</u> bbl

iii. Volume of oil on open water. V_{wat} :	<u>NIL</u>	barrels
---	------------	---------

22. Calculation of evaporated volume:

- i. Oil type: BONNY MEDIUM
- ii. E-Factor: 15%

iii. Volume of evaporated oil. V_{evap} :	<u>43.7</u>	barrels
---	-------------	---------

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 $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls) = 43.7 + NIL + 23.81 + 148.82 + 75 = 291.33$

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0147-784201

$V_{Est}(bbls)=$	291.3 BARRELS
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6*V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls) = 43.7 + NIL + 23.81 + 148.82 + 75 = 291.33$	
$V_{Est}(bbls)=$	291.3 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 type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/>

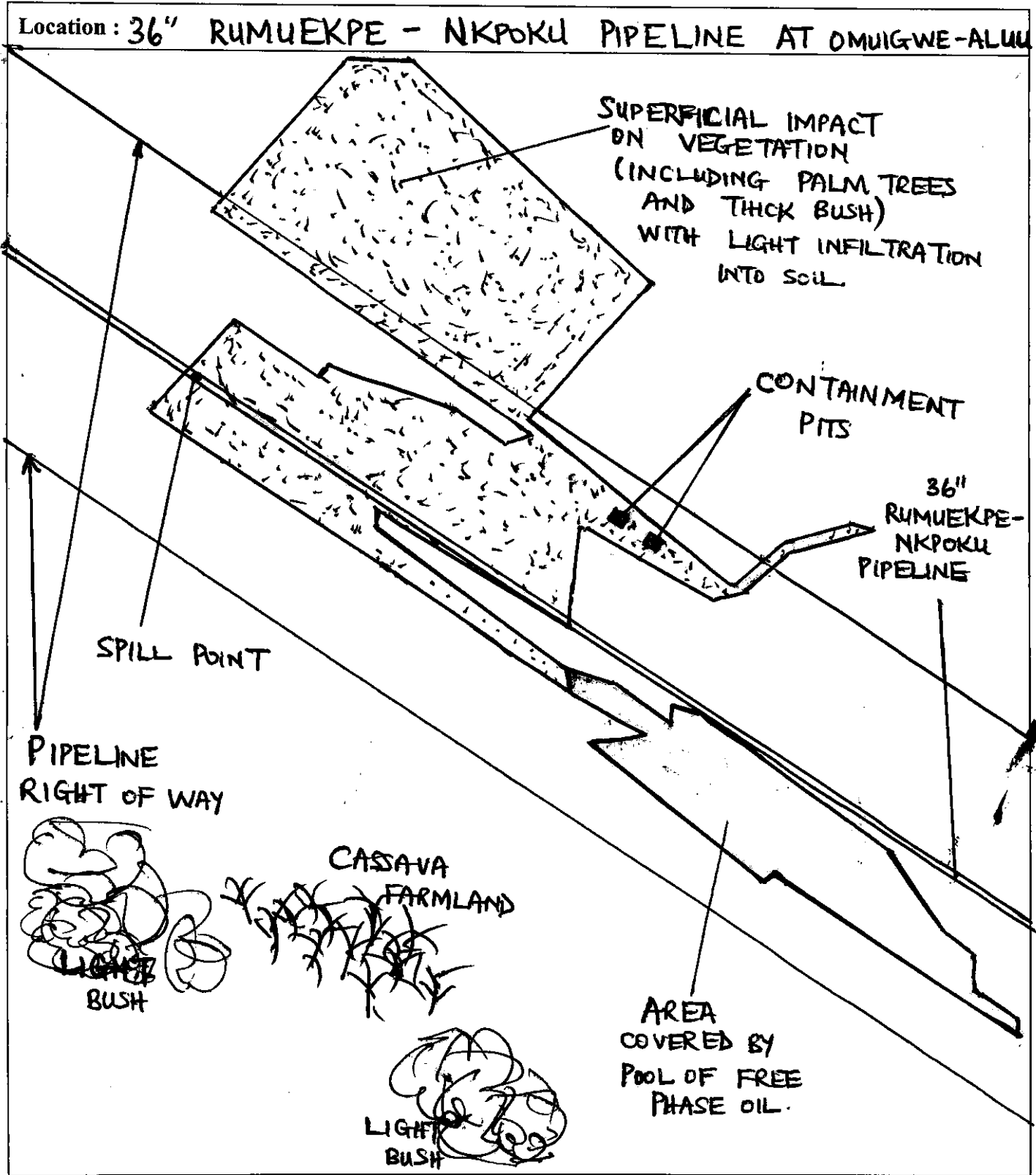
26 Signatories

This report was filled and signed on the <u>02/03/2012</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 type="checkbox"/>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/>
<i>Tick as applicable</i>

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: ⁰¹⁴⁷ 184201

20. Appendix 1: Overview sketch of the site



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0147784201

21. Appendix 2: TABLE SHOWING ADDITIONAL COORDINATES TAKEN DURING JIV FOR AREA CALCULATION (MINNA MID-BELT)

S/N	Northing (m)	Easting (m)
WP398	104 449.62	497 892.99
WP399	104 477.43	497 825.27
WP400	104 474.37	497 822.18
WP401	104 495.99	497 772.94
WP402	104 499.04	497 782.19
WP403	104 505.22	497 763.71
WP405	104 520.67	497 726.78
WP406	104 560.86	497 622.11
WP407	104 573.11	497 634.47
WP408	104 557.67	497 671.40
WP409	104 560.73	497 674.49
WP410	104 548.35	497 714.52
WP411	104 542.17	497 729.91
WP412	104 545.23	497 736.08
WP426	104 594.67	497 612.95
WP427	104 643.75	497 643.87
WP428	104 640.64	497 662.35
WP429	104 578.99	497 751.56
WP430	104 548.31	497 733.00
WP413	104 514.33	497 809.95
WP414	104 523.52	497 822.30
WP415	104 529.63	497 837.72
WP416	104 529.62	497 840.80
WP417	104 523.51	497 825.38
WP419	104 511.27	497 806.86
WP420	104 526.74	497 760.68
WP421	104 517.52	497 760.66
WP422	104 536.08	497 708.33
WP423	104 533.00	497 708.32
WP418	104 514.32	497 813.03