

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 756863
0142

(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: 756863 2. Type of incident* SPILL
 3. Name of Location NUN RWER WELL 15 S FLOWLINE
 4. Name of nearest community ONYOMA 5. State: BAYELSA 6. LGA SOUTHERN IJAW
 7. Type of Production facility/Installation OIL FLOWLINE 8. Asset owner/District NESP/LAND 2

B. INCIDENT INFORMATION:

9. Details of incident
 a. Date of incident: 21ST DECEMBER 2011
 b. Date/Period of investigation: 23RD DECEMBER 2011 AND 19TH JANUARY, 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) CLAMP FAILURE

e. Incident due to:

- Third party interference Operational Others (specify _____)

f. Spill point coordinates

Measuring unit		<u>MINTA MID BELT</u>	
Northing: (m)		Easting: (m)	
87299.57		402221.22	

*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 [Nil ,m]
 Farmlands [120 ,m]
 Fish Farm/Pond [Nil ,m]
 Fishing net [Nil ,m]
 Others (specify).

12. Containment measures put in place;

- Booms Trench Dyke

Others: _____

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
	NONE	WITHIN AREA OF			IMPACT	

17. Fish/Nets/Ponds

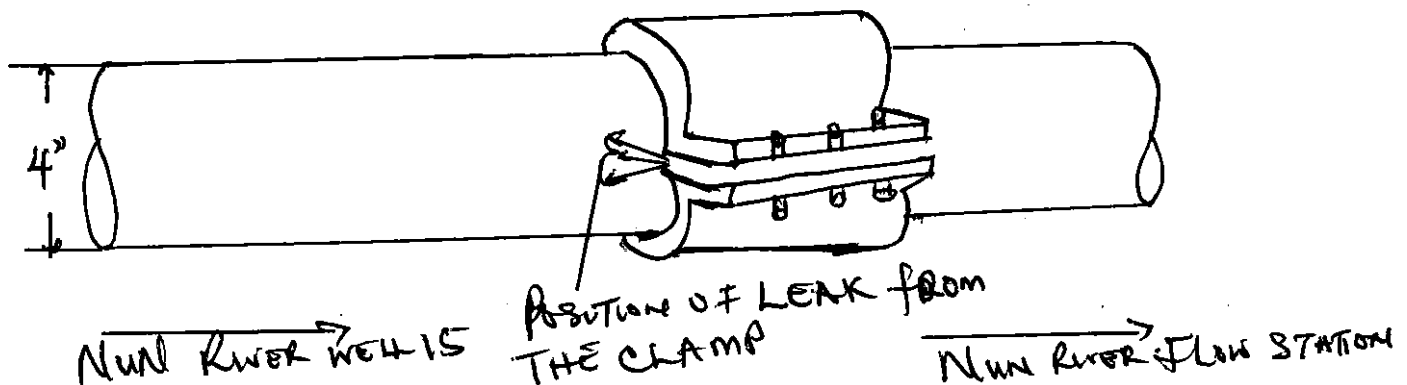
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE	WITHIN AREA OF		IMPACT

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 4" NUN RIVER WELL IS FLOWLINE AT ONYOMA SHOWING LEAKING CLAMP AT 3 O'CLOCK POSITION



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F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

● Impacted area boundary Coordinates (If more than 12 points, Attach as an appendix 2)

MINNA MID BELT

S/N	Northing (M)	Easting (M)
441	87302.66	402215.06
443	87296.48	402224.29
425	87290.37	402215.02
426	87281.18	402205.74
427	87275.03	402205.71
429	87256.64	402190.23
432	87238.26	402174.75
431	87232.79	402168.27
433	87235.21	402168.49
434	87241.35	402168.59
435	87250.54	402177.88
432	87253.61	402177.89
437	87262.80	402187.17

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.06119
- 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>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 200 m^2
 - Average Depth (m) of pool of free phase oil 0.051
 - Emulsification factor: Nil

iv. Volume of pool of free phase oil. V_{pool} :	<u>1.3</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: 400 m^2
- ii. Area of the pool of free phase oil in touch with soil: 200 m^2
- 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>0.6</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: NUL
- ii. Table of average depth of oil on water based on coloration *

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004	<u>NUL</u>	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003	<u>APPLICABLE</u>	
Dull	0.001		
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume <u>NUL</u> bbl

iii. Volume of oil on open water. V_{wat}	<u>NUL</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>0.6</u>	barrels
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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 $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{ref}(bbls) = 0.6 + NUL + 0.6 + 1.3 + NUL = 2.5 \text{ barrels}$

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$V_{Est}(bbls) = 2.5 \text{ BARRELS}$
Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rej}(bbls) = 0.6 \text{ m}^3 + 0.6 + 1.3 \text{ m}^3 = 2.5 \text{ BARRELS}$
$V_{Est}(bbls) = 2.5 \text{ BARRELS}$

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

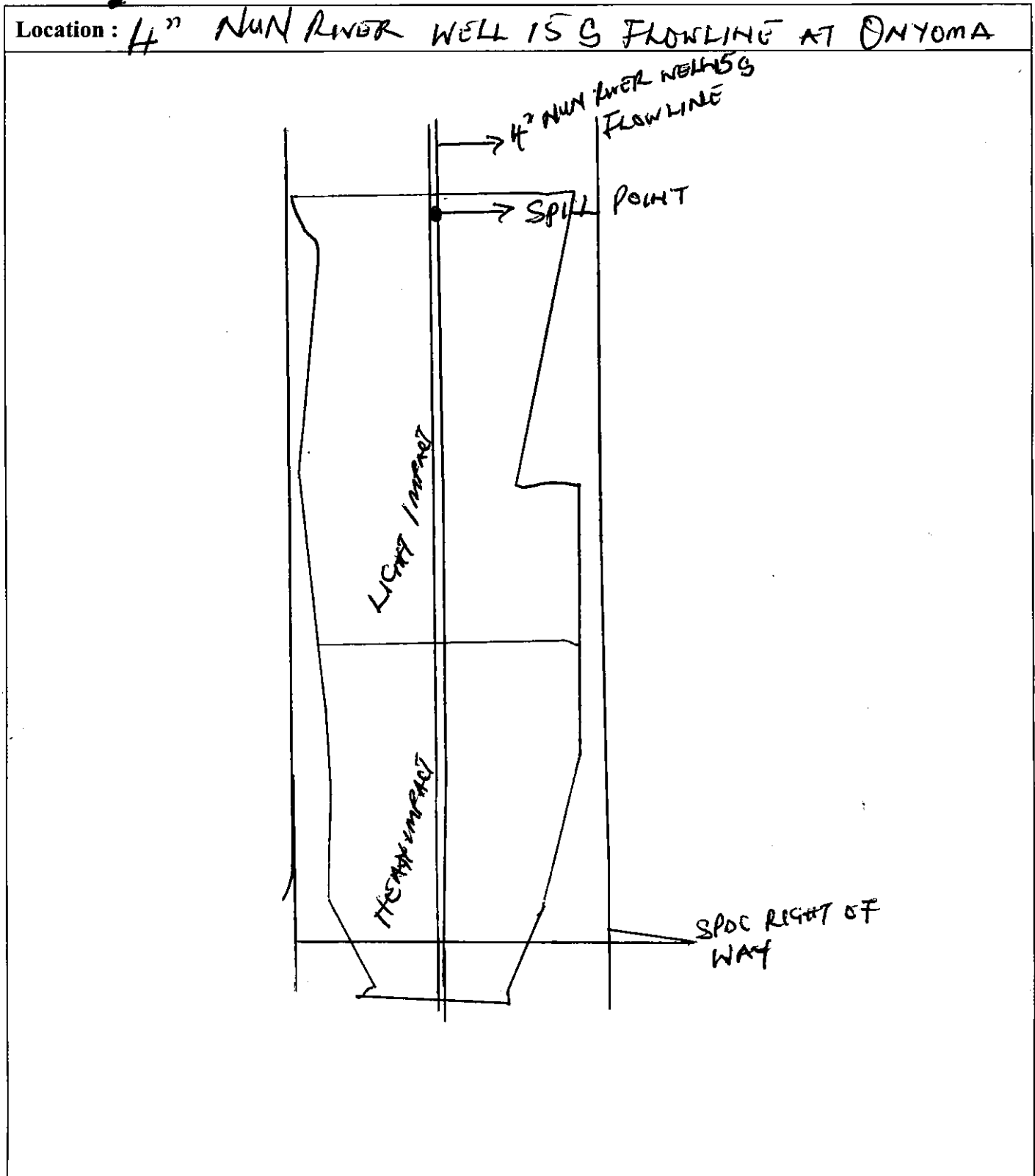
26 Signatories

This report was filled and signed on the <u>19/07/2012</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 checked="" type="checkbox"/> <i>DPR REPORT FOR THE INCIDENT ATTACHED</i>• 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>

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20. Appendix 1: Overview sketch of the site



DEPARTMENT OF PETROLEUM RESOURCES



OIL /CHEMICAL SPILL INSPECTION REPORT

A) Company: SPDC B) Spill Incident No: 756863
1. Facility/Location: NUN RIVER WELL 15S FLOWLINE @ ONYOMA COMMUNITY
2. Date/Time Observed: 21-12-2011 3. Date of JIV: 23/12/11 (INCONCLUSIVE) AND 19-01-2012
4. Known extent of pollution/impact: SPDC RIGHT-OF-WAY

5. Precautionary measures taken to prevent Hazard/ further pollution since the spillage/leakage occurred:
THE WELL HAS BEEN SHUT-IN

- (a) Bundwalls
(b) Booms
(c) Sorbents
(d) Others (Specify): DYKES

6. Cause of Spill:

- | | |
|---|---|
| <input type="checkbox"/> Drilled Hole | <input type="checkbox"/> Hack Saw Cut |
| <input type="checkbox"/> Explosive tear | <input type="checkbox"/> Inward Dent |
| <input type="checkbox"/> Failed Weld | <input type="checkbox"/> Crude Oil Theft (Illegal Bunkering) |
| <input type="checkbox"/> Acid Induced Corrosion | <input type="checkbox"/> Natural Corrosion |
| <input type="checkbox"/> Saver Pit Overflow | <input type="checkbox"/> Surge Vessel Overflow |
| <input type="checkbox"/> Blasting | <input type="checkbox"/> Blowout |
| <input type="checkbox"/> Third Party tampers with clamp | <input type="checkbox"/> Third party tamper with: valve, Boit, Nuts |
| <input type="checkbox"/> Operator/Maintenance Error | <input checked="" type="checkbox"/> Equipment Failure |
| <input type="checkbox"/> Others (Specify) | |

7. Estimated Quantity Spilled (bbbls):

(a) Detail Calculations (attach additional sheets if necessary)

2.5 BARRELS

8. Operational Area

- (i) Onshore (ii) Land
(iii) Offshore (iv) Coastland (v) Swamp (SEASONAL)
(vi) Inland waters
(vii) Inland Town: ONYOMA COMMUNITY

9. Type of Spill/Leak

- (i) Crude oil (ii) Product (Specify)
(iii) Drilling mud/Chemicals (iv) Others (Specify)

10. Type of Operation at Spill site: FLOWLINE

11. Weather Conditions:

- (a) Bright and Sunny (d) Others Specify
(b) Cloudy (e) Wind Direction
(c) Rainy (h) Wind speed
(f) Not Applicable

12. Sea Conditions

(a) Calm (b) Rough (c) Not Applicable

(Others (Specify).....)

(d) Direction of current:..... N/A

(e) Strength of current:.....

(f) Swell height:.....

(g) Tidal Condition: High Low

13. Quantity of Crude Oil/Contaminant Recovered as at Time of Reporting:

NIL. AWAITING CONCLUSION OF JIV

14. Any Casualties: (a) Yes (b) No

If Yes Give Details:.....

15. Steps taken to clean-up the spilled oil:

NONE YET. AWAITING CONCLUSION OF JIV

16. Chemical/ Dispersants Used: Yes No

OPF Approved: Yes No

Type:.....

Quantity:..... N/A

(c) Not applicable:.....

(d) Others (Specify):.....

17. Any Fire Incident: (a) Yes (b) No

If Yes Give Details:.....

18. Attachments: Maps Others: Pictures

19. Recommendations of the Investigation:

CARRY OUT REPAIRS ON THE FLOWLINE AND CLEAN-UP THE IMPACTED AREAS.