

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED.**

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 979856 JIV report S/N: 0106

*(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: 979856 2. Type of incident\* OIL SPILL  
 3. Name of Location 12" IMO RIVER II PIPELINE  
UMUEDEOKWARA  
 4. Name of nearest community ODAGWA 5. State: RIVERS 6. LGA ETCHE  
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/District PIPELINE EAST

**B. INCIDENT INFORMATION:**

9. Details of incident

- a. Date of incident: 22ND MAY 2013  
 b. Start date/time of investigation: 24TH MAY 2013 / 12:45 PMS  
 c. Investigation End date: 24-MAY-2013 Actual investigation duration, days: 1  
 d. Description of spill point environment  
 Firmed soil  Loose soil  Recently excavated area  
 Under water  Swampy  Exposed pipe surface  
 Well Platform (on Water)  Drill Rig  
 e. Description of leak point (tick as applicable);  
 Drilled hole  Hack saw cut  Tear ( \_\_\_\_\_ ),  
 Complete Rupture  Inward dent,  Well head tampering  
 Failed Weld-on illegal hot tap valve,  Failed Clamp  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,  
 Bulging Outward  Flare System/Bund wall failure  Accidental 3<sup>rd</sup> party equipment  
 impact  Valve Failure  com unit failure  Cold vent  
 Relief valve failure  Others (specify) \_\_\_\_\_  
 f. Incident caused by:  
 Third party interference (Sabotage; crude theft; Line theft; Accidental 3<sup>rd</sup> party damage  
 Operational  Others (including Mystery spills) \_\_\_\_\_

g. Spill point coordinates

Measuring unit		<u>MINNA MID BELT</u>	
Northing:	<u>108627.68m</u>	Easting:	<u>523054.67m</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  Shoreline/Waterfront

i. Type of environment to which oil has spread:

- Land       Swamp       Water       River (identify) \_\_\_\_\_

ii. Weather condition

- Rain       Sunny       Dry       Wet       Windy       Hot       cool

11. Distance from the nearest sensitive habitat

- |  |   |   |                                  |
|--|---|---|----------------------------------|
| <input type="checkbox"/> Government reserved and designated protected area | [ | [ | } NONE SEEN WITHIN<br>} VISINITY |
| <input type="checkbox"/> Drinking water source                             | [ | [ |                                  |
| <input type="checkbox"/> Built up area                                     | [ | [ |                                  |
| <input type="checkbox"/> Farmlands   | [ | [ |                                  |
| <input type="checkbox"/> Fish Farm/Pond                                    | [ | [ |                                  |
| <input type="checkbox"/> Fishing net                                       | [ | [ |                                  |
| <input type="checkbox"/> Others (specify).                                 | [ | [ |                                  |

12. Containment measures put in place:

- Booms       Trench       Dyke       Natural depression       Pit  
 Others: \_\_\_\_\_

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				

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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			

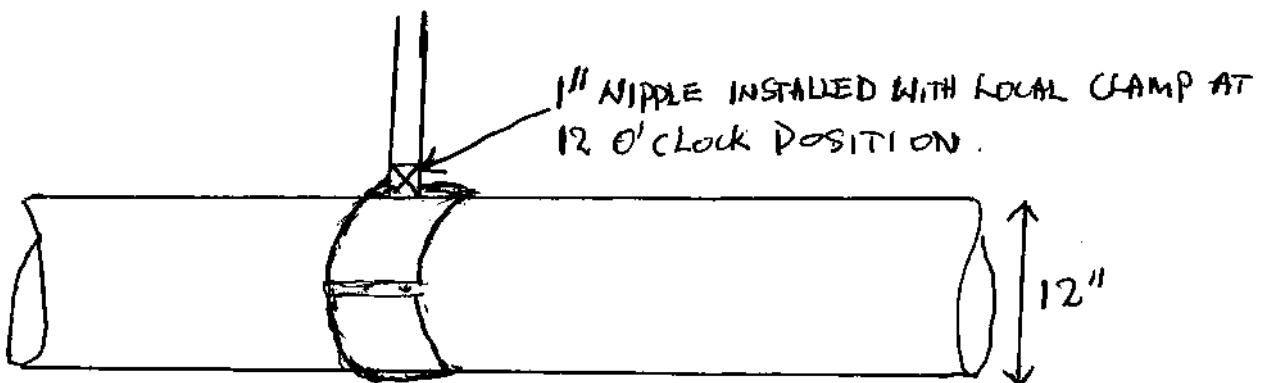
18. Others (Specify) i.e. Animal Traps

S/N	Others	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

E. GRAPHIC DESCRIPTION OF LEAK POINT (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)

A SECTION OF 12" IMO RIVER II PIPELINE AT UMUEDEOKWARA

ODAGWA SHOWING ILLEGAL BUNKERING POINT INSTALLED AT 12 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, Print and attach as an appendix)

MINNA MID BELT

S/N	Northing	Easting
1	108627.68m	523054.67m
2	108 630.75m	523054.67m
3	108 636.91m	523045.44m
4	108 649.22m	523033.15m
5	108 652.28m	523042.39m
6	108 652.27m	523045.48m
<del>7</del>	<del>108 65</del>	
7	108 646.12m	523048.54m
8	108 630.74m	523060.83m

  
24/05/2018

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**G. INCIDENT INFORMATION:**

**20. Impacted Area Details**

- Total calculated area of impact 0.02 Hg
- Impact within SPDC R.O.W YES
- Impact outside SPDC R.O.W NO

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

Recovered oil $V_{rec}$ :	<u>NIL</u>	Barrels
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**22. Computation of estimated residual volume on site**

**a. Computation of estimated volume of pool of free phase oil (on land or confined water body).**

- i. Area ( $m^2$ ) occupied by pool of free phase oil 100  $m^2$
- ii. Average Depth (m) of pool of free phase oil 0.008
- iii. Emulsification factor: NIL

iv. 

Estimated Volume of pool of free phase oil. $V_{pool}$ :	<u>5.03</u>	barrels
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**b. Computation of estimated volume of infiltrated oil in the soil ( $V_{inf}$ ).**

**1. Estimated Volume of infiltrated oil at spill point ( $V_{inf a}$ )**

- i. Area\* ( $m^2$ ) of soil covered by the oil: 3.0  $m^2$
- ii. Average Depth (m) above leaking facility i.e. pipeline/flowline: 1.06 M
- iii. Soil type: CLAY iv.  $P_e$  (effective porosity of the soil): 8%
- v. Cause of spill: INTERFERENCE vi. Oil type: BONNY MEDIUM
- vii. Oil Residence time on site, day: 2
- viii. Average depth of infiltration below leaking facility i.e. pipeline/flowline: 0.0005 M
- ix. Estimated depth of infiltration around spill point: 1.0605 M

x. 

Estimated Volume of infiltrated oil at spill point. $V_{inf a}$ :	<u>1.60</u>	barrels
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**2. Estimated Volume of infiltrated oil at second spill point [if applicable] ( $V_{inf b}$ )**

- i. Area\* ( $m^2$ ) of soil covered by the oil: \_\_\_\_\_
- ii. Average Depth (m) above leaking facility i.e. pipeline/flowline: \_\_\_\_\_
- iii. Soil type: \_\_\_\_\_ iv.  $P_e$  (effective porosity of the soil): \_\_\_\_\_
- v. Cause of spill: \_\_\_\_\_ vi. Oil type: \_\_\_\_\_
- vii. Oil Residence time on site, day: \_\_\_\_\_
- viii. Average depth of infiltration below leaking facility i.e. pipeline/flowline: \_\_\_\_\_
- ix. Estimated depth of infiltration around spill point: \_\_\_\_\_

Estimated Volume of infiltrated oil at spill point. $V_{inf b}$ :		barrels
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**3. Estimated Volume of infiltrated oil outside immediate spill point(s) region ( $V_{inf c}$ )**

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- i. Area (m<sup>2</sup>) of soil covered by the oil: 197 M<sup>2</sup>
- ii. Area (m<sup>2</sup>) of the pool of free phase oil in touch with soil: 100 M<sup>2</sup>
- v.  $P_e$  (effective porosity of the soil): 8%
- vi. 

Estimated Volume of infiltrated oil. At $V_{inf}$ :	<u>1.68</u>	barrels
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23. Computation of estimated 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 \*\*Spill Factors from USCG FOG (2000 Edition)

	Thickness (mm)	Percentage coverage	Volume (m <sup>3</sup> )
Barely Visible	0.00004		
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003	<b>NOT</b>	
Dull	0.001		
Dark	0.002	<b>APPLICABLE</b>	
Black oil	0.1		
Emulsion (30% Oil)	1		

- iii. 

Percent Total	100%
Estimated Volume of oil on open water. $V_{wat}$ :	<u>NIL</u>

Barrels

24. Calculation of evaporated volume:

- i. Estimated Volume available for evaporation within surface area: 6.71 BBL
- ii. E-Factor: 15%
- iii. 

Estimated Volume of evaporated oil. $V_{evap}$ :	<u>1.18</u>	Barrels
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Evaporation Factors (E-Factor) for SPDC Crude oil			
Oil Type	Days on site	Bonny Light	Bonny Medium
Oil Residence time	< 1 day	10%	5%
	1-7 days	25%	15%
	> 7 days	40%	25%

25. **Net Estimated Spilled Volume  $V_{est}$  (bbls) =  $V_{evap}$  (bbls) +  $V_{wat}$  (bbls) +  $V_{inf}$  (bbls) +  $V_{pool}$  (bbls) +  $V_{recd}$  (bbls) =**  
1.18 BBL + NIL + 1.68 BBL + 5.03 + NIL  
= 7.89 BBL

**Estimated Reported Volume\*\*  $V_{rep}$  (bbls) =** 8.0 BBL

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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 m<sup>3</sup> to barrels is Volume (m<sup>3</sup>) x 6.29; \*\*Round up estimated volume to next whole number using the following rules:

- Any spill volume in excess of 1 bbl is rounded up to the next whole number.
- Any spill volume in less than 1 bbl is rounded up to the next 0.1 bbl.

Examples:      Calculated volume = 15.3 bbl ----- Reported volume = 16 bbl  
                    Calculated volume = 0.35 bbl ----- Reported volume = 0.4 bbl  
                    Calculated volume = 0.01 bbl ----- Reported volume = 0.1 bbl.

Wherever this estimation tool is not applicable please refer to paragraph 6c (Deviations) of the JIV procedure to use appropriate steps for column estimation; record the calculation in a plain sheet of paper and attach to the JIV report.

**26. 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

B. Investigation of the incident site showed that there is residual impact on site requiring further works

**27. REPRESENTATIVES**

This report was filled, agreed and signed on the 24/05/2013 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]:
- Signatories agree with reported findings:
- Separate DPR form has been filled out with same findings:

Tick as applicable

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28. Appendix 1: Overview sketch of the site

