

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0063 737431

(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: 737431 2. Type of incident* OIL SPILL
 3. Name of Location OLOMORO COMPRESSOR STATION 2
 4. Name of nearest community OLOMORO 5. State: DELTA 6. LGA ISOKO-SOUTH
 7. Type of Production facility/Installation OLOMORO COMPRESSOR STATION 2 8. Asset owner/District NWL

B. INCIDENT INFORMATION:

9. Details of incident
 a. Date of incident: 06/11/2011 @ 1742 HRS
 b. Date/Period of investigation: 09/11/2011 @ 1535 HRS
 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

Measuring unit	
Northing: <p style="text-align: center; font-size: 1.2em;">161521m</p>	Easting: <p style="text-align: center; font-size: 1.2em;">416645m</p>

*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 [221L ,m]
 Drinking water source [221L ,m]
 Built up area [221L ,m]
 Farmlands [225 ,m]
 Fish Farm/Pond [221L ,m]
 Fishing net [221L ,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
1	SOFT WOOD	—	—	YES	1	—
2	PLANTAIN	—	—	YES	25	—
/	/	/	/	/	/	/

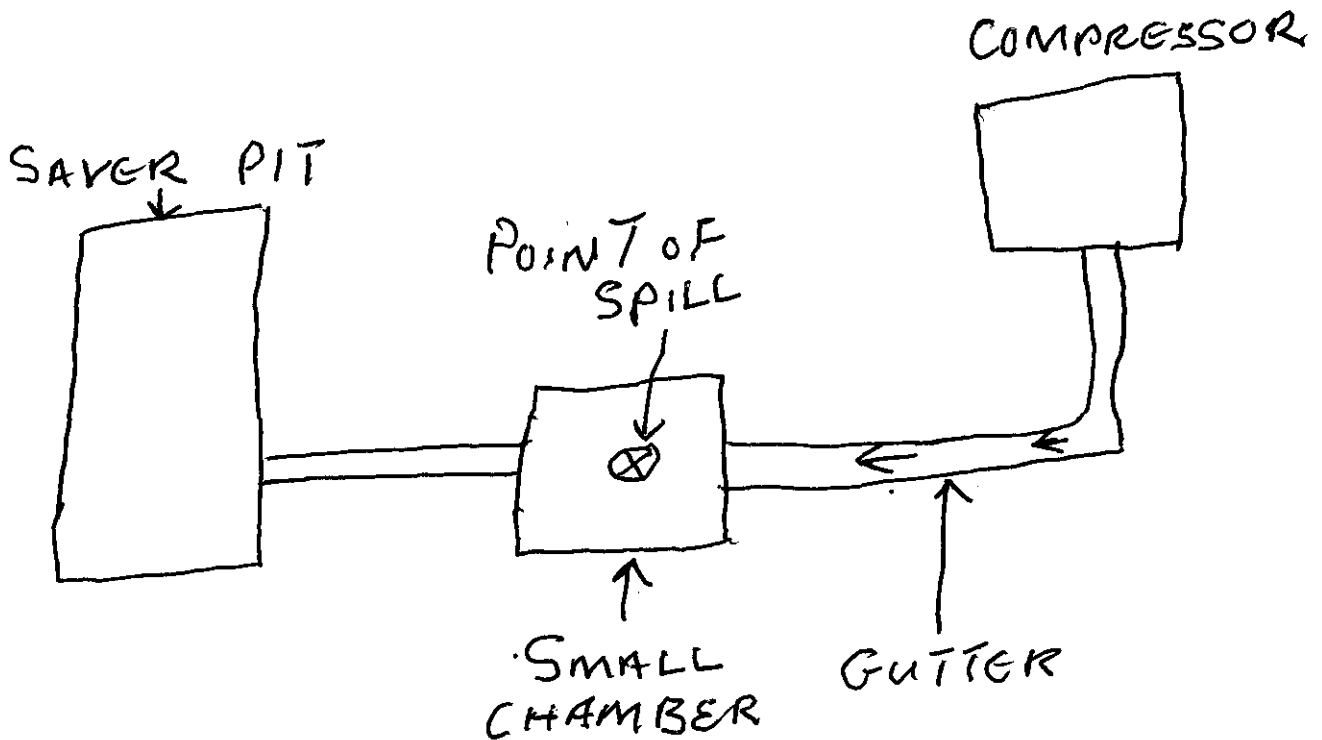
17. Fish/Nets/Ponds

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)



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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	161 562	416 613
2	161 563	416 608
3	161 564	416 608
4	161 552	416 609
5	161 551	416 613
6	161 550	416 612
7	161 561	416 611
8	161 558	416 613
9	161 553	416 609
10	161 532	416 622
11	161 529	416 620
12	161 530	416 622
13	161 525	416 622

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 276 M²
- Impact within SPDC R.O.W 271 M²
- Impact outside R.O.W 5 M²

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).

- i. Area (m²) occupied by pool of free phase oil NIL
- ii. Average Depth (m) of pool of free phase oil NOT APPLICABLE
- iii. Emulsification factor: NOT APPLICABLE

iv. Volume of pool of free phase oil. V _{pool} :	<u>NIL</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: 276 m^2
- ii. Area of the pool of free phase oil in touch with soil: 164 m^2
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.01M
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil, V_{inf}	3.32	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		
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 NIL bbl

NOT APPLICABLE

iii. Volume of oil on open water, V_{wat} :	NIL	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} :	0.59	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%

<p>23. Gross Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls)$</p>

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$V_{Est}(bbls) =$ 3.9 BBLs
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recf}(bbls)$
$V_{Est}(bbls) =$ 3.9 BBLs

*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

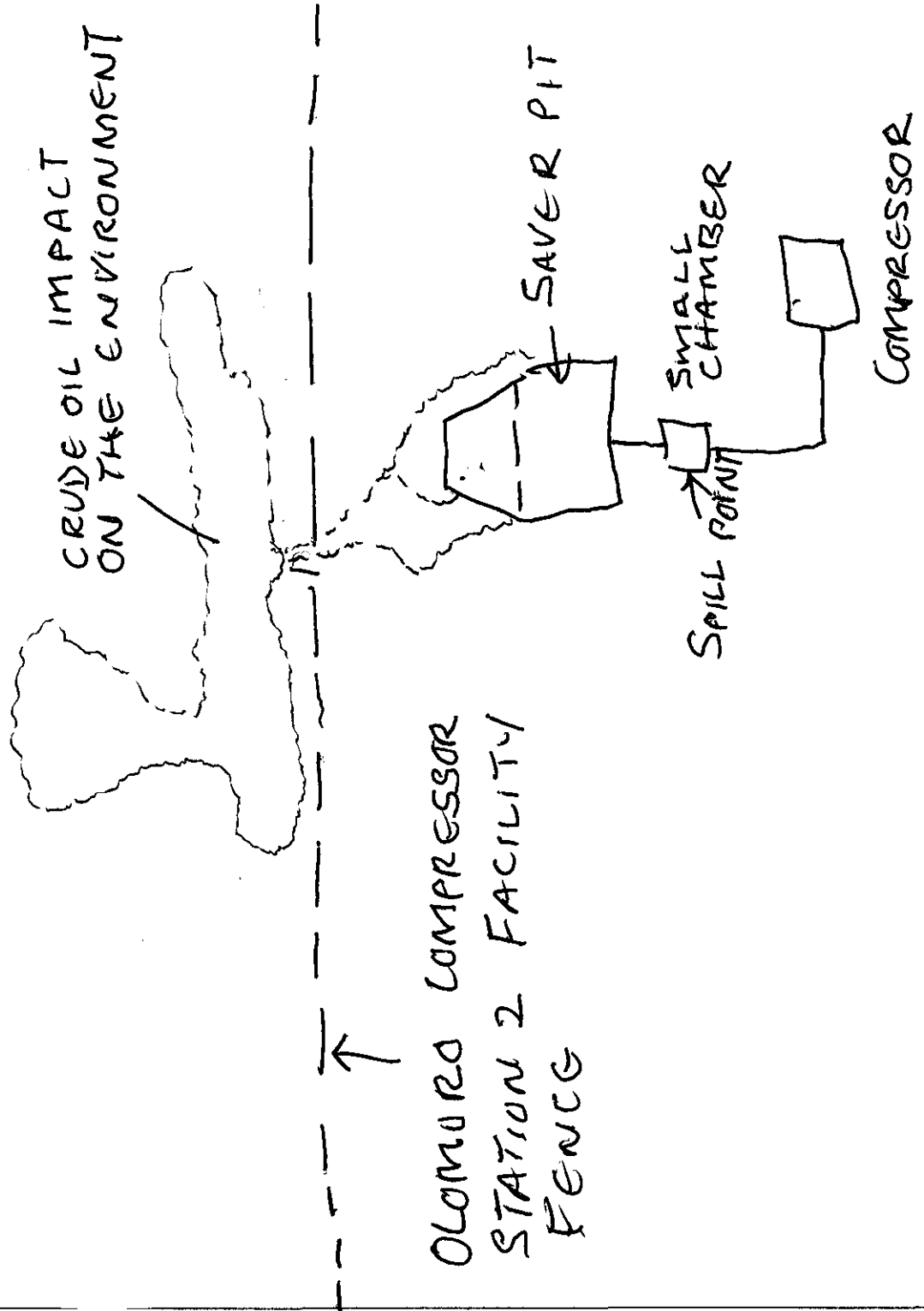
A. Joint investigation of the incident site found that there is no residual impact After the initial response and therefore recommend that the site be closed out <input type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/>

26 Signatories

This report was filled and signed on the 09/11/2011 at incident site by joint investigation representatives from
<ul style="list-style-type: none">• Host Community <input type="checkbox"/>• Department of Petroleum Resources [DPR]: <input checked="" 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>

20. Appendix 1: Overview sketch of the site

Location : OLOMORO COMPRESSOR STATION 2



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

S/N	Northing	Easting
14	161525	416624
15	161514	416623
16	161513	416624
17	161516	416627
18	161515	416623
19	161508	416624
20	161502	416628
21	161499	416634
22	161495	416631
23	161497	416628
24	161492	416627
25	161490	416625
26	161494	416621
27	161496	416619
28	161500	416621
* 29	161521	416645