



C. RISK/DAMAGE ASSESSMENT

No. 0982

7. Type of environment of spill site:

- Land
- Swamp
- water

[NON-LEAKING CRUDE OIL THEFT (ILLEGAL BUNKERING) POINTS WERE OBSERVED].

Type of environment of which oil has spread:

- Land
- Swamp
- water

ABOUT 500M AWAY FROM THE NON-LEAKING THEFT POINTS, FREE PHASE CRUDE OIL WAS OBSERVED SPILT IN THE ENVIRONMENT. NO DIRECT LINK COULD BE ESTABLISHED BETWEEN THE SPILL IMPACT AND THE THEFT POINTS.

8. Distance from the nearest sensitive habitat

- Government reserved and designated protected area
- Drinking water source
- Built up area
- Farmlands
- Fish Farm/Pond
- Fishing net
- Others (specify).

[. ,m]
 [. ,m]
 [15 ,m]
 [10 ,m]
 [. ,m]
 [. ,m]

9. Containment measures put in place;

- Booms
- Trench
- Dyke

[Y] [N]
 [Y] [N]
 [Y] [N]

Others: NONE

10. Any pictures or video coverage?

[Y] [N]

11. 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

A. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments
NONE WITHIN AREA OF IMPACT					



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B. Crops/Economic Trees

S/N	Types of crops	Young	Medium	Matured	Quantity	Comments
NONE WITHIN AREA OF IMPACT						

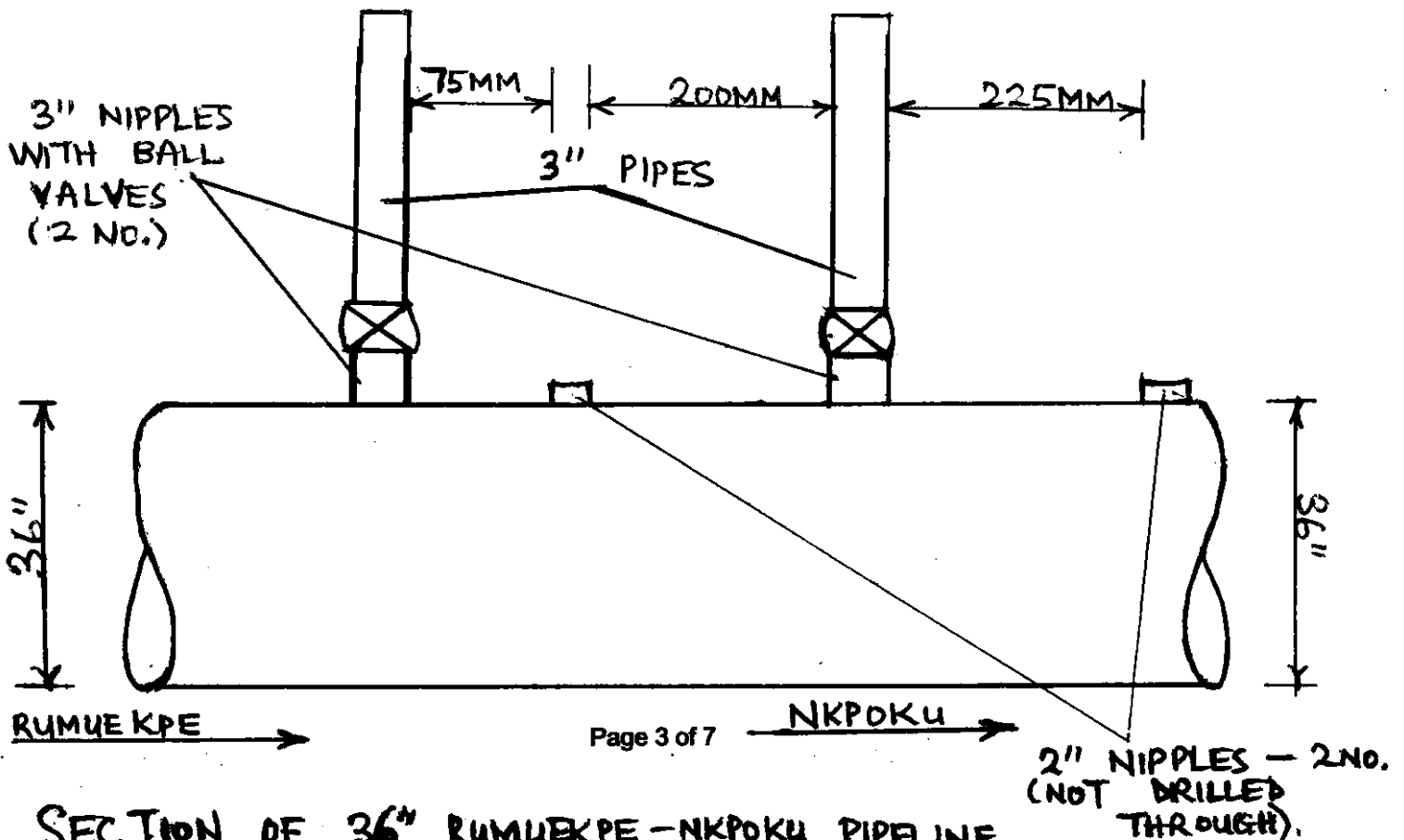
C. Fish/Nets/Ponds

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

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

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

E. GRAPHIC DESCRIPTION OF LEAK POINT (Details should be contained in leak repair report)



SECTION OF 36" RUMUEKPE - NKPOKU PIPELINE AT ALUU SHOWING LOCATIONS OF 4 NO. CRUDE OIL THEFT (NON-LEAKING ILLEGAL BUNKERING) POINTS INSTALLED AT 12 O' CLOCK POSITIONS.



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 674162

No. 0982

G INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact 0.11 Ha
 - Impact within SPDC R.O.W 0.11 Ha
 - Impact outside R.O.W NIL

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

Recovered oil V _{rec} :	<u>NIL</u>	barrels
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19. Computation of the residual volume on site (BASED ON SPILL IMPACT FOUND 500M AWAY FROM NON-LEAKING CRUDE OIL THEFT POINTS)

- a. Computation of the volume of pooled free phase oil (on land or confined water body).
 - i. Area (m²) occupied by pool of free phase oil 900
 - ii. Average Depth (m) of pool of free phase oil 0.001
 - iii.

Volume of pooled of free phase oil. V _{pool} :	<u>5.66</u>	barrels
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b. Computation of volume of infiltrated oil in the soil (V-3).

- i. Area (m²) covered by the oil: 189
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.003
- iii. Soil type: CLAY
- iv. p_e (effective porosity of the soil): 8%
- v.

Volume of infiltrated oil. V _{inf} :	<u>0.29</u>	barrels
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20. Computation of volume of oil on open water based on standard coloration.

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004		
Silvery	0.00008	NOT	
Slight Colour	0.00015		
Bright Colour	0.0003		
Dull	0.001	APPLICABLE	
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume <u>NIL</u> bbl

Spill Factors from USCG FOG (2000 Edition)



Volume of oil on open water V_{wat} : NIL barrels

21. Calculation of evaporated volume:

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

Volume of evaporated oil V_{vap} : 1.05 barrels

Oil Type		Bonny Light	Bonny Medium
		E-Factor	E-Factor
Period Since Oil Spill	<1 day	10%	5%
	1-7 days	25%	15%
	>7 days	40%	25%

9. Gross Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 1.05 + NIL + 0.29 + 5.66 + NIL = 7$

$V_{Est}(bbls) = 7$ BARRELS

10. Net Total Estimated Spilled Volume $VEst(bbls) = V_{vap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 1.05 + NIL + 0.29 + 5.66 + NIL = 7$

$VEst(bbls) = 7$ BARRELS

- *Calculation of the respective estimated volume is to done using the new spill estimation software on site
- *Conversion of m3 to barrel is Total volume VT (m3) x6.29
- *Emulsification factor for spill on water to consider is 60% of volume of oil.

This report was filled and signed on the 19 / 06 / 20 11 at incident site by joint investigation representative 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