JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1179627 JIV report S/N: 0520

(Note: As practicable as possible the JIT report is to be signed in the field by all the participating parties)

The production of the production of the signed in the ju	eta ay an me participating parties)
A. GENERAL INFORMATION:	
1. Spill incident Number:	incident* OIL SPILL WATER
3. Name of Location 24" NKPOKU - BOMY T	RAMS NIGER PIPELINE
4. Name of nearest community BIARA 5. State: RIVE	SS 6. LGA GOKANA
7. Type of Production facility/Installation OLL PIPELINES. As	set owner/District PIPELINE LAND
B. INCIDENT INFORMATION:	
9. Details of incident a. Date of incident: 19 <sup>TH</sup> MAY 2014 b. Start date/time of investigation: 20 <sup>TH</sup> MAY 2014	AN A
•	
c. Investigation End date: 2014 MAY 2014 Ctual invest	igation duration, days: 1WO DAY
d. Description of spill point environment	
Firmed soil Loose soil	Execently excavated area
□Under water □Swampy	☐Exposed pipe surface
. □Weli Platform (on Water)	Drill Rig
Additional observations around the spill point:	,
e. Description of leak point (tick as applicable);  Drilled hole  Complete Rupture  Failed Weld-on illegal hot tap valve,	☐ Tear (), ☐ Well head tampering ☐ 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,
□Corrosión □Saver-pit over flow,	□Surge vessel overflow,
	l failure Accidental 3 <sup>rd</sup> party equipment
<u> </u>	unit failure
Relief valve failure Others (specify)	<u></u> :
f. Incident caused by:  Third party interference (Sabotage ; crude theft ; Line theft  Operational  Others (including Mystery spills)	

<sup>\*</sup>This can be: a) Oil Spill b) Drilling fluid/Chemical c) Siliation d) construction e) Encroachment f) Fire,

OINT INVESTIGATION		ICIDENT NO:	11796	27 JIV repo	ort S/N:	0520
g. Spill point of	coordinates uring unit (M)			Marina	MID-E	1-17
Northi		-		Easting:	איי עויוזי ב	) <u>f-</u> -
	76 890	. 64		535	142.	96
<u></u>		<u> </u>				<del></del> .
						-:
C. RISK ASSESS						
4	ype of environment:	•				
Land	☐ Swamp	□Water	□Se	asonal swamp 🗖 S	horeline/Wa	terfront
i. Ty	pe of environment to	which oil has	spread:			
Land	☐ Swamp	□Water	□Ri	ver (identify)		
ii. We	eather condition					
☐Rain	Sunny om the nearest sensiti	Dry ive habitat	□Wet	□Windy	□Hot	□cool
	nds rm/Pond g net	esignated prote	ected area	[ NIL ,m] [ HIL ,m] [ 5 ,m] [ MIL ,m] [ NIL ,m] [ NIL ,m]		
12. Containmer	nt measures put in pla	ace;		,		
□Booms □Others:		□Dyke	ŊΝε	ntural depression	□Pit	□None
13. Any picture	s or video coverage?	,		[Y]		
14. Further res	sponse/repair initiate	d as at the time	of JIV?	[Y] [N]		
If yes to item 14, give 1	brief description:					,
- (RE	PAIR 1	WORK	(OMP	LELED B.	4 CLA	mping)
15. Was there a	ny disruption to the	investigation?		[Y] [N]		
If yes to item 15 give	e brief description:	(FT0)	) FRE	ebom Ti	s ( <del>-</del> -	PERATE
FAILEN.		\*\ ·	<del>/                                    </del>			

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# D. TYPE/NUMBERS OF PROPERTIES, IF ANY, FOUND WITHIN THE AREA OF SPREAD OF OIL

16. Structures / Properties

S/N Type of Structures	Description	Size	Number	Comments
NoT	API	h.	MBLE	
17. Crops/Economic Trees	,			

S/N Type of crops	Young	Medium	Matured	Quantity	Comments
NOT	APP	I C-A	PIT		
		~( )		۷	

### 18. Fish/Nets/Ponds

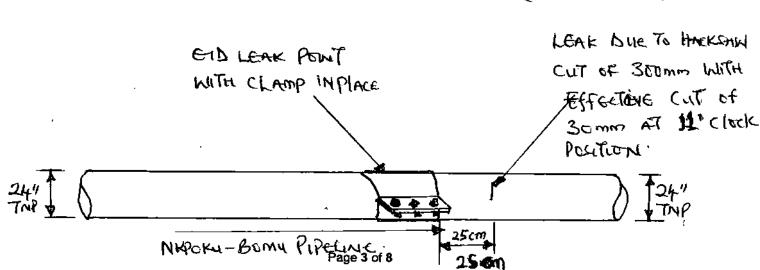
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NOT	APPLIC	ASL	

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

S/N	Others	Description	Quantity/Size	Comments
	KINT	APDILO	1 (2)	
	1401	MILL	TOL.	
<u> </u>		<u> </u>		

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)

BIARA SHOWING A SABOTAGE SPILL (HACKSAU (UT)



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F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION 20. Impacted area boundary Coordinates (If more, Print and attach as an appendix)

S/N	Northing (M)	Easting (m)
SP	76 890.64	535 142.96
P165	76890.02	535/39.02
166	76 889.28	535 147.20
167	76876.99	535 147. 18
168	76 840.15	535137.87
P169	76 827.86	535 137.85
P(Do	76 824.79	535/37.84
P171	76 818.65	535 137.83
1112	76 821.73	535 131.67
<u> 173</u>	76 846.29	535 137.88
174	76886.21	535 144.11
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ESTIMATION OF OIL SPILL VOLUME

FID NO 1179627 = 24" NKPOKU - BOMU TRANS NIGER PIPELINE AT BIARA JIV VOLUME CAL REPORT

A OIL SPILLED ONSHORE/OFFSHORE (Leak stopped at source)

	111111111111111111111111111111111111111	acted Area Details				
		Total Calculated Area (	of Impact			200.00 m²
	i	Impact within SPDC R.C	D.W			
		Impact outside SPDC R				
						L <del></del> "'''
1 :	Volu	ıme of oil recovered be	fore completion of JIV (V <sub>mc.</sub> )			
		Estimated Recovered oil				bbls
						obis
		Estimated Recovered	oil (Net) V <sub>real</sub>			0.00 bbls
			<u> </u>			0.00 0013
2 (	Соп	routation of estimated p	residual votume on site			
	4	Computation of volume	of free phase oil (on land or confin	ed water body)		
	j	Total area occupied by p				0.00 m <sup>2</sup>
	Ä	Average depth of pool of	free phase oil			0.000 m
	报	Emulsification factor	(if applicable, else 0%)			30.000 %
		Estimated Volume of p	ool of free phase oil, V <sub>pool</sub>			6.00 m²
		Estimated Volume of p	ool of free phase oil, V <sub>pool</sub>			0.00 bbls
1	b	Computation of estima	ted volume of inflitrated oil in the so.	ii (V)		
	7	Volume of infiltrated o		467		
		Total area covered by th				2.00 m <sup>2</sup>
			ion above leaking facility i.e. pipeline/fl	owline		0.300 m
		Soil type				Silt.
	iv	P. (effective porosity of t	he soil)			<b>*</b>
	٧	Cause of spill				Third party interference
	vi	Calculation of days for	r infiltration below the leaking point on	pipeline or flowline		
		Incident Date	JIV Date	Days on Site		
		5/19/2014 13:40	5/20/2014 14:35	1		
			rational, use 1 week as worst case	_		
		<u>scenario excent y</u>	mere 'days on site' exceeds 7.	7		
			Indition Many of all the second second			1
		Soil type	Infiltration of oil types in various soil			
		Oil type	Approximate time to reach Sand			1
		Oil typo	VARV.	Loam	Clay	
		Sonny Medium	3 upoks	3 veam	3 10 venue	1
		Bonny Medium Bonny Light	3 weeks	3 years 2 months	> 10 years > 10 years	]
	:	Bonny Medium Bonny Light	3 weeks 2 days	3 years 2 months	> 10 years > 10 years	]
	vil					Boney Medium
		Bonny Light Oil type	2 days	2 months		Bonay Medium
		Bonny Light Oil type		2 months		Bonny Medium Tri
	VIII	Bonny Light Oil type Average depth of infiltrati	2 days	2 months		
	VIII	Bonny Light Oil type Average depth of infiltrati	2 days on befow leaking facility i.e. pipeline/fi	2 months		m
	vill ix	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in	2 days on below leaking facility i.e. pipeline/flu d surface of infiltration of oil filtrated of, V tota	2 months		m m
	vill ix	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground	2 days on below leaking facility i.e. pipeline/flu d surface of infiltration of oil filtrated of, V tota	2 months		m
	vill ix	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in	2 days on below leaking facility i.e. pipeline/flu d surface of infiltration of oil filtrated of, V tota	2 months		m m 0.13 m³
	vill ix	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated oil	2 days  on below leaking facility i.e. pipeline/flu  d surface of infiltration of oil  distrated oil, V <sub>hd a</sub> filtrated oil, V <sub>hd a</sub> il at second spill point (if applicable	2 months		m m 0.13 m³
	vill ix	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated of  Total area covered by the	2 days  on below leaking facility i.e. pipeline/fle  d surface of infiltration of oil  filtrated of, V <sub>infit</sub> filtrated of, V <sub>infit</sub> if at second spill point [if applicable e oil (infiltration)	2 months  owline  (V <sub>tot b</sub> )		m m 0.13 m³
	vill ix 2 ii	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated of  Total area covered by th  Average depth of infiltrati	2 days  on below leaking facility i.e. pipeline/flu  d surface of infiltration of oil  distrated oil, V <sub>hd a</sub> filtrated oil, V <sub>hd a</sub> il at second spill point (if applicable	2 months  owline  (V <sub>tot b</sub> )		0.13 m² 0.78 bbls  0.00 m²
	vill ix 2 ii ii	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of In  Volume of infiltrated of  Total area covered by th  Average depth of infiltrati  Soil type	2 days  con below leaking facility i.e. pipeline/fluid surface of infiltration of oil  filtrated oil, V int a  iii at second spill point (if applicable e oil (infiltration))  on above leaking facility i.e. pipeline/fluid	2 months  owline  (V <sub>tot b</sub> )		0.13 m² 0.79 bbls
	vill ix 2 ii ii	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated of  Total area covered by th  Average depth of infiltrati	2 days  con below leaking facility i.e. pipeline/fluid surface of infiltration of oil  filtrated oil, V int a  iii at second spill point (if applicable e oil (infiltration))  on above leaking facility i.e. pipeline/fluid	2 months  owline  (V <sub>tot b</sub> )		0.13 m² 0.78 bbls  0.00 m²
	villi ix 2 ii ii iv	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of inf  Estimated Volume of infiltrated of  Total area covered by the Average depth of infiltrati  Soil type  Pe (effective porosity of the	2 days  ion below leaking facility i.e. pipeline/flu d surface of infiltration of oil  filtrated oil, V ints  iii at second spill point (if applicable e oil (Infiltration) on above leaking facility i.e. pipeline/flu ne soil)	2 months  whine  V <sub>tota</sub> )		0.13 m² 0.78 bbls  0.00 m²
	villi ix 2 ii ii iv	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of inf  Estimated Volume of infiltrated of  Total area covered by the Average depth of infiltrati  Soil type  Pe (effective porosity of the	2 days  con below leaking facility i.e. pipeline/fluid surface of infiltration of oil  filtrated oil, V int a  iii at second spill point (if applicable e oil (infiltration))  on above leaking facility i.e. pipeline/fluid	2 months  whine  V <sub>tota</sub> )		0.13 m² 0.78 bbls  0.00 m²
	villi ix 2 i ii iii iv	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated oi  Total area covered by the Average depth of infiltrati  Soil type  Queffective porosity of the  Average depth of infiltrati	2 days  ion below leaking facility i.e. pipeline/fit if surface of infiltration of oil  filtrated oil, V <sub>infit</sub> filtrated oil, V <sub>infit</sub> if at second spill point (if applicable e oil (infiltration) on above leaking facility i.e. pipeline/fit ne soil)  on below leaking facility i.e. pipeline/fit	2 months  whine  V <sub>tota</sub> )		0.13 m³ 0.79 bbis  0.00 m² m Clay  m m
	villi ix 2 i ii iii iv	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated oi  Total area covered by the Average depth of infiltrati  Soil type  Queffective porosity of the  Average depth of infiltrati	2 days  ion below leaking facility i.e. pipeline/flu d surface of infiltration of oil  filtrated oil, V ints  iii at second spill point (if applicable e oil (Infiltration) on above leaking facility i.e. pipeline/flu ne soil)	2 months  whine  V <sub>tota</sub> )		0.13 m² 0.78 bbls  0.00 m²
	villi ix 2 i ii iii iv v	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of inf  Estimated Volume of infi  Volume of infiltrated of  Total area covered by the Average depth of infiltrati  Soil type  P. (effective porosity of the  Average depth of infiltrati  Total depth below ground	2 days  on below leaking facility i.e. pipeline/fit d surface of infiltration of oil  distracted oil, V <sub>infit</sub> distracted	2 months  whine  V <sub>tota</sub> )		0.13 m² 0.79 bbis  0.00 m² m Clay  m m
	villixix 2 ii iii iii iv v vi	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated of  Total area covered by the Average depth of infiltrati  Soil type  Pe (effective porosity of the  Average depth of infiltrati  Total depth below ground  Estimated Volume of ini  Estimated Volume of ini	2 days  ion below leaking facility i.e. pipeline/fit d surface of infiltration of oil  filtrated of, V <sub>infe</sub> ii at second spill point [if applicable e oil (Infiltration) on above leaking facility i.e. pipeline/fit ne soil)  on below leaking facility i.e. pipeline/fit d surface of infiltration of oil	2 months  whine  V <sub>tota</sub> )		0.13 m² 0.79 bbis  0.00 m²  0.00 m²  0.00 m²
	villixix 2 ii iii iii iv v vi	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of inf  Estimated Volume of infi  Volume of infiltrated of  Total area covered by the Average depth of infiltrati  Soil type  P. (effective porosity of the  Average depth of infiltrati  Total depth below ground	2 days  ion below leaking facility i.e. pipeline/fit d surface of infiltration of oil  filtrated of, V <sub>infe</sub> ii at second spill point [if applicable e oil (Infiltration) on above leaking facility i.e. pipeline/fit ne soil)  on below leaking facility i.e. pipeline/fit d surface of infiltration of oil	2 months  whine  V <sub>tota</sub> )		0.13 m² 0.79 bbis  0.00 m² m Clay  m m
	villi ix  2 i il iii iv v vi	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated oi  Total area covered by the Average depth of infiltrati  Soil type Pe (effective porosity of the  Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Estimated Volume of in	2 days  on below leaking facility i.e. pipeline/flu d surface of infiltration of oil  filtrated oil, V ints  filtrated oil, V ints  il at second spill point (if applicable e oil (infiltration) on above leaking facility i.e. pipeline/flu ne soil) on below leaking facility i.e. pipeline/flu is surface of infiltration of oil  filtrated oil, V ints  filtrated oil, V ints	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m² 0.79 bbis  0.00 m²  0.00 m²  0.00 m²
	villi ix 2 it iii iii iiv v vi	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Total area covered by the Average depth of infiltrati  Soil type Pe (effective porosity of it  Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Output  Description of infiltration of in  Output  Description of infiltration of infiltration of in  Estimated Volume of in  Estimated Volume of in  Estimated volume of in  Output  Description of infiltration of in  Output  Description of infiltration of infiltration of in  Estimated Volume of infiltration of in  Output  Description of infiltration of infiltration of in  University of infiltration o	2 days  ion below leaking facility i.e. pipeline/fluid surface of infiltration of oil  filtrated oil, V ints  iii at second spill point (if applicable oil (infiltration)) on above leaking facility i.e. pipeline/fluid in soil) on below leaking facility i.e. pipeline/fluid is urface of infiltration of oil  filtrated oil, V ints	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m <sup>3</sup> 0.79 bbis  0.00 m <sup>2</sup> m Ctay
	villi ix 2 it iii iii iiv v vi si i	Bonny Light  Oil type Average depth of infiltration Total depth below ground Estimated Volume of in Estimated Volume of in Estimated Volume of in Total area covered by the Average depth of infiltration Perfective porosity of the Average depth of infiltration Total depth below ground Estimated Volume of im Estimated Volume of im Estimated Volume of im Volume of infiltrated oi Total Area covered by the	2 days  ion below leaking facility i.e. pipeline/fluid surface of infiltration of oil  distracted oil, V inta  e oil (infiltration)  on above leaking facility i.e. pipeline/fluid  ne soil)  on below leaking facility i.e. pipeline/fluid  is unface of infiltration of oil  distracted oil, V inta  distracted oil (infiltration)	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m² 0.79 bbis  0.00 m² m  Cay
		Bonny Light  Oil type Average depth of infiltration Total depth below ground Estimated Volume of in Estimated Volume of in Estimated Volume of in Total area covered by the Average depth of infiltration Perfective porosity of the Average depth of infiltration Total depth below ground Estimated Volume of im Estimated Volume of im Estimated Volume of im Volume of infiltrated oi Total Area covered by the	2 days  ion below leaking facility i.e. pipeline/fluid surface of infiltration of oil  filtrated oil, V ints  iii at second spill point (if applicable oil (infiltration)) on above leaking facility i.e. pipeline/fluid in soil) on below leaking facility i.e. pipeline/fluid is urface of infiltration of oil  filtrated oil, V ints	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m <sup>3</sup> 0.79 bbls  0.00 m <sup>2</sup> m Cay
		Bonny Light  Oil type Average depth of infiltratic process of infiltratic process of infiltrate of i	2 days  ion below leaking facility i.e. pipeline/fit if surface of infiltration of oil  filtrated oil, V <sub>MA</sub> filtrated oil, V <sub>MA</sub> if at second spill point (if applicable e oil (infiltration) on above leaking facility i.e. pipeline/fit ne soil)  on below leaking facility i.e. pipeline/fit is unface of infiltration of oil  filtrated oil, V <sub>MA</sub> filtrated oil, V <sub>MA</sub> if outside immediate spill point(s) re e oil (infiltration) free phase oil in touch with soil	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m³ 0.79 bbls  0.00 m² m  0.00 m³ 0.00 m³ 0.00 bbls  0.00 m² 0.00 m²
		Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated oi  Total area covered by the Average depth of infiltrati  Soil type Pe (effective porosity of it  Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Volume of infiltrated oi  Total Area covered by the  Total Area of the pool of it  Soil type	2 days  ion below leaking facility i.e. pipeline/fit if surface of infiltration of oil  filtrated oil, V <sub>MA</sub> filtrated oil, V <sub>MA</sub> if at second spill point (if applicable e oil (infiltration) on above leaking facility i.e. pipeline/fit ne soil)  on below leaking facility i.e. pipeline/fit is unface of infiltration of oil  filtrated oil, V <sub>MA</sub> filtrated oil, V <sub>MA</sub> if outside immediate spill point(s) re e oil (infiltration) free phase oil in touch with soil	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m <sup>3</sup> 0.79 bbls  0.00 m <sup>2</sup> m Cay
	villi ix 2 t ii iiv vi iv iiv iiv	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated of  Total area covered by the Average depth of infiltrati  Soil type  Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated oi  Total Area covered by the  Total Area of the pool of it  Soil type  P. (effective porosity of the	2 days  on below leaking facility i.e. pipeline/fit d surface of infiltration of oil  distracted oil, V <sub>infa</sub> e oil (Infiltration)  on above leaking facility i.e. pipeline/fit ne soil)  on below leaking facility i.e. pipeline/fit distracted oil, V <sub>infa</sub> distracted oil, V <sub>infa</sub> l outside immediate spill point(s) re e oil (Infiltration) ree phase oil in touch with soil lee soil)	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m² 0.79 bbls  0.00 m² m m clay   m m m m m m m m m m m m m m m m m m
	villi ix 2 t ii iiv vi iv iiv iiv	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated of  Total area covered by the Average depth of infiltrati  Soil type  Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated oi  Total Area covered by the  Total Area of the pool of it  Soil type  P. (effective porosity of the	2 days  ion below leaking facility i.e. pipeline/fit if surface of infiltration of oil  filtrated oil, V <sub>MA</sub> filtrated oil, V <sub>MA</sub> if at second spill point (if applicable e oil (infiltration) on above leaking facility i.e. pipeline/fit ne soil)  on below leaking facility i.e. pipeline/fit is unface of infiltration of oil  filtrated oil, V <sub>MA</sub> filtrated oil, V <sub>MA</sub> if outside immediate spill point(s) re e oil (infiltration) free phase oil in touch with soil	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m³ 0.79 bbls  0.00 m² m  0.00 m³ 0.00 m³ 0.00 bbls  0.00 m² 0.00 m²
	villi ix 2 i ii ii iv vii ii viii viii viii	Bonny Light  Oil type Average depth of infiltration Total depth below ground Estimated Volume of infiltrated of Total area covered by the Average depth of infiltration Soil type Pe (effective porosity of the Average depth of infiltration Total depth below ground Estimated Volume of infiltration Estimated Volume of infiltration Total Area covered by the Total Area of the pool of its Soil type Soil type Pe (effective porosity of the Average depth below ground Total Area of the pool of its Soil type Pe (effective porosity of the Average depth below ground	2 days  ion below leaking facility i.e. pipeline/fluid surface of infiltration of oil  filtrated oil, V ints  iii at second spill point (if applicable e oil (infiltration) on above leaking facility i.e. pipeline/fluid in soil)  on below leaking facility i.e. pipeline/fluid in soil  ii surface of infiltration of oil  filtrated oil, V ints  iii cutside immediate spill point(s) related oil (infiltration)  free phase oil in touch with soil  iie soil)  und surface of infiltration of oil	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m² 0.79 bbis  0.00 m² m m m m m m m m m m m m m m m m m m
	villi ix 2 tillililiv v vi	Bonny Light  Oil type Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated of  Total area covered by the Average depth of infiltrati  Soil type  Average depth of infiltrati  Total depth below ground  Estimated Volume of in  Estimated Volume of in  Volume of infiltrated oi  Total Area covered by the  Total Area of the pool of it  Soil type  P. (effective porosity of the	2 days  ion below leaking facility i.e. pipeline/fluid surface of infiltration of oil  filtrated oil, V ints  iii at second spill point (if applicable e oil (infiltration) on above leaking facility i.e. pipeline/fluid soil)  on below leaking facility i.e. pipeline/fluid surface of infiltration of oil  filtrated oil, V ints  iii oil (infiltration)  ree phase oil in touch with soil lee soil)  und surface of infiltration of oil  filtrated oil, V ints  iii oil (infiltration)  ree phase oil in touch with soil lee soil)  und surface of infiltration of oil  filtrated oil, V ints	2 months  2 white  2 (V <sub>total</sub> )  3 (V <sub>total</sub> )  5 (V <sub>total</sub> )		0.13 m² 0.79 bbls  0.00 m² m m clay   m m m m m m m m m m m m m m m m m m

Estaliated Total Volum	me of infiltrated oil, V <sub>inf</sub>			0.79 bbls
Computation of				
	e of oil on open water based on stand	lard coloration		
i Total area of oil on oper				198.00 m²
1 1 acte of average depth	of oil on water based on coloration			
Spill Factors from LISCG FOO	3 (2000 Edition)	Link to Coverage Visual Aid	•	
		y ercentage coverage	<del></del>	7
Barely Visible	Thickness (mm)	(%)	Volume (m3)	
Silven			0.0000	4
Slight Colo			0.0000	-
Bright Color			0,0000	
Dul		20%		4
Dark		80%	0.0002	4
Black of			0.0000	=
Emulsion (30% Oil)			0.0000	
	Percent Total:	40.00	0.0000	<b>-</b>
<u> </u>	resourt four	100%	0.0002	1
Estimated Volume of	oll on open water V			1
Estimated Volume of	oll on onec water V		<del></del>	0.00 m³
	A DI SPAN HOLDI, FARE			0.00 bbis
ulation of evaporated v				
			<u>_</u>	3
]	EVADORATION FACTORS /FLFORTOR for S	DOC COMA AN		
	Evaporation Factors (E-Factor) for S			4
Residence tim	e of spilled oil (days on site)	Oil ty		1
Residence tim	e of spilled oil (days on site)	Oil ty Bonny Light	Bonny Medium	
Residence tim	e of spilled oil (days on site)	Oil ty Bonny Light 10%	Benny Medium 5%	
Residence tim	e of spilled oil (days on site)	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	
	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days	Oil ty Bonny Light 10%	Benny Medium 5%	
	e of spilled oil (days on site) <1 day 1-7 days	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	
Was oil recovery before	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  JIV completion done before JIV date?	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	  No
Was oil recovery before Estimated volume availa	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  JIV completion done before JIV date?	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	
Was oil recovery before Estimated volume availa	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  JIV completion done before JIV date?	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	  No
Was oil recovery before Estimated volume availa E-factor	e of spifled oil (days on site)  <1 days  1-7 days  > 7 days  JIV completion done before JIV date? ble for evaporation	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	Ho Dbls
Was oil recovery before Estimated volume availa E-factor	e of spifled oil (days on site)  <1 days  1-7 days  > 7 days  JIV completion done before JIV date? ble for evaporation	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	Ho Dbls
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  Very  JIV completion done before JIV date? ble for evaporation	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	No Dobis
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e	e of spifled oil (days on site)  <1 days  1-7 days  > 7 days  JIV completion done before JIV date? ble for evaporation	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  Very  JIV completion done before JIV date? ble for evaporation	Oil ty Bonny Light 10% 25%	Bonny Medium 5% 15%	No Dobis
Was oil recovery before Estimated volume availa E-factor Estimated Volume of a	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  JIV completion done before JIV date? ble for evaporation  responsited oil, V <sub>evap</sub> I Spilled Volume, V <sub>Est</sub>	Oil ty Bonny Light 10% 25% 40%	Bonny Medium 5% 15%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of a Net Total Estimated CALCULATION OF	te of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  Very  JIV completion done before JIV date? ble for evaporation  IVaporated oil, Vevap  I Spitled Volume, Vest  SPILLED VOLUME FROM A WEI	Oil ty Bonny Light 10% 25% 40%	Bonny Medium 5% 15%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated CALCULATION OF Delty Gross Production rate (6)	te of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  Very  JIV completion done before JIV date? ble for evaporation  IVaporated oil, Vevap  I Spitled Volume, Vest  SPILLED VOLUME FROM A WEI	Oil ty Banny Light 10% 25% 40%	Bonny Medium 5% 15%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated CALCULATION OF Daily Gross Production rate (c) Well Gas-Oil-Ratio	te of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  Very  JIV completion done before JIV date? ble for evaporation  IVaporated oil, Vevap  I Spitled Volume, Vest  SPILLED VOLUME FROM A WEI	Oil ty Banny Light 10% 25% 40%	Bonny Medium 5% 15% 25%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated CALCULATION OF Daily Gross Production sate (c) Well Gas-OB-Ratio Well on Fire	te of spilled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  JIV completion done before JIV date? ble for evaporation  response oil, V <sub>evap</sub> I Spilled Volume, V <sub>Est</sub> SPILLED VOLUME FROM A WEI  3:	Oil ty Banny Light 10% 25% 40%	Bonny Medium 5% 15% 25%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated CALCULATION OF Daily Gross Production rate (c) Well Gas -OB-Ratio Well on Fire Ratio of OB production from W	te of spilled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  JIV completion done before JIV date? ble for evaporation  response oil, V <sub>evap</sub> I Spilled Volume, V <sub>Est</sub> SPILLED VOLUME FROM A WEI  3:	Oil ty Banny Light 10% 25% 40%	Bonny Medium 5% 15% 25%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated  CALCULATION OF Delty Gross Production rate (6 West Gas-Oil-Ratio West on Fire Ratio of Oil production from W Average hausty oil flow rate	e of spilled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  If your before JIV date?  ble for evaporation  responshion  Spilled Volume, V <sub>Est</sub> SPILLED VOLUME FROM A WEIGHT	Oil ty Bonny Light 10% 25% 40%	Bonny Medium 5% 15% 25%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated  CALCULATION OF Deity Gross Production rate (c Well on Fire Ratio of Oil production from W Average halisty oil flow rate Automatic what down (Cooper	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  JIV completion done before JIV date? ble for evaporation  responsition  I Spifled Volume, V <sub>Est</sub> SPILLED VOLUME FROM A WE	Oil ty Bonny Light 10% 25% 40%	Bonny Medium 5% 15% 25%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated  CALCULATION OF Delty Gross Production rate (6 West Gas-Oil-Ratio West on Fire Ratio of Oil production from W Average hausty oil flow rate	e of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  JIV completion done before JIV date? ble for evaporation  responsition  I Spifled Volume, V <sub>Est</sub> SPILLED VOLUME FROM A WE	Oil ty Banny Light 10% 25% 40%  LLHEAD  res 0% 0.0	Bonny Medium 5% 15% 25%	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated  CALCULATION OF Deity Gross Production rate (c Well Gas-Oi-Rado Well on Fire Ratio of Oil production from W Average hausty oil flow rate Automatic what down (Cooper	te of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  If your sports of the spirit of the spiri	Oil ty Bonny Light  10% 25% 40%  40%  LLHEAD  (es	Bonny Medium 5% 15% 25% bbl/d	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of a Net Total Estimated  CALCULATION OF Daily Gross Production rate (c Well Gas-Oil-Ratio Well Gas-Oil-Ratio Well Gas-Oil-Ratio Avarage hourly oil flow rate Automatic while down (Cooper Percentage of Valve opening Avg Hourly fealt to the environ	te of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  If your sports of the spirit of the spiri	Oil ty Banny Light  10% 25% 40%  LLHEAD  (es 0% 0.0)	Bonny Medium 5% 15% 25% bbl/d	No Dbis %
Was oil recovery before Estimated volume availa E-factor Estimated Volume of e Net Total Estimated  CALCULATION OF Delty Gross Production rate (c Well on File Ratio of Oil production from W Average housing oil flow rate Automatic what down (Cooper Percentage of Valve opening	te of spifled oil (days on site)  < 1 day  1-7 days  > 7 days  > 7 days  If your sports of the spirit of the spiri	Oil ty Bonny Light  10% 25% 40%  40%  LLHEAD  (es	Bonny Medium 5% 15% 25% bbl/d	No Dbis %

В

OINT INVESTIGATION REPORT FOR INCIDENT NO: 11 1962 JUV report S/N:	0520
G. INCIDENT INFORMATION:	
20. Impacted Area Details	
• Total calculated area of impact	
Impact within SPDC R.O.W YES	
Impact outside SPDC R.O.W ND	_
21. Volume of oil recovered before completion of JIV (V <sub>reel</sub> ):	<del></del>
Recovered oil V <sub>rec.j</sub> :	Barrels
Controlled recovery/evacuation from source with no impact to environment:	
Barreis	
· · · · · · · · · · · · · · · · · · ·	
22. Net Estimated Spilled Volume V <sub>Est</sub> (bbls)* =	
0.94 BARRELS	
Estimated Reported Volume** V <sub>rep</sub> (bbls)= 1 BARRESS.	
*Notes:	
<ul> <li>Volume estimation was done using an excel based tool (see attached for details on the calculation)</li> <li>Reported spilled volume is an estimate</li> </ul>	
Write other relevant notes taken into consideration for estimating the spilled in the box below:	
WATER DISCHARGE WAS NOTICED FROM THE	AFFECTED
SECTION OF THE LINE. HOWEVER, OIL Film	
NOTICED ON THE WATER POOL THE WATER	
THE PREVIOUSLY OIL-IMPACTED AREA WHICH	1 15 YET
To be cleaned   Remediated.	

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  $m^3$  to barrels is Volume (m3) 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 valume = 16 bbl Calculated volume = 0.35 bbl —— Reported valume = 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.

### THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGHRESSING TO

JOINT INVESTIGATION REPORT FOR INCIDENT RO. 1179627 JEV report S/N. 0520

### 23. GENERAL STATUS OF THE SITE

	ation of the incident site found that there is no residual impact after the initial JIT therefore recommend that the site be closed out
B. Investigation works	of the incident site showed that there is residual impact on site requiring further $\Box$

### 24. REPRESENTATIVES

as filled, agreed and signed by the following joint investigation representatives:
Community:
rtment of Petroleum Resources [DPR]:
mal Oil Spill Detection and Response Agency [NOSDRA]:
Ministry of Environment [SME]:
ria Police Force [NPF]: 🖬
Petroleum Development Company [SPDC]:
ntories agree with reported findings:•□
rate DPR form has been filled out with same findings
Tick as applicable

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1174 627 JIV report S/N: 0520

25. Appendix 1: Overview sketch of the site

