

JOINT INVESTIGATION REPORT

INCIDENT NO: 2081058 JIV report S/N: 1141

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

A. GENERAL INFORMATION:

1. Spill incident Number: 2081058 2. Type of incident* OIL SPILL
3. Name of Location 24" TRANS - RAMOS PIPELINE
4. Name of nearest community AGHORO 2 5. State: BAYELSA 6. LGA EKEREMOR
7. Type of Production facility/Installation OIL PIPELINE
8. Asset owner/District THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED / PIPELINE

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 18TH MAY 2018
b. Start date/time of investigation: 24TH MAY 2018 AT 09:23 HRS
c. Investigation End date: 1ST AUGUST 2018 Actual investigation duration, days: 3 DAYS
d. Description of spill point environment

- | | | |
|---|--|--|
| <input type="checkbox"/> Firm soil | <input type="checkbox"/> Loose soil | <input type="checkbox"/> Recently excavated area |
| <input type="checkbox"/> Under water | <input checked="" type="checkbox"/> Swampy | <input type="checkbox"/> Exposed pipe surface |
| <input type="checkbox"/> Well Platform (on Water) | <input type="checkbox"/> Drill Rig | |

Additional observations around the spill point: THE JOINT INVESTIGATION TEAM OBSERVED LONGITUDINAL AND CIRCUMFERENTIAL CRACKS ON THE CONCRETE COATING AROUND THE LEAK POINT

c. Description of leak point (tick as applicable);

- | | | |
|---|---|--|
| <input type="checkbox"/> Drilled hole | <input type="checkbox"/> Hack saw cut | <input type="checkbox"/> Tear (_____) |
| <input type="checkbox"/> Complete Rupture | <input type="checkbox"/> Inward dent, | <input type="checkbox"/> Well head tampering |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve | <input type="checkbox"/> Failed Clamp, | <input type="checkbox"/> Missing Pipeline/Flowline |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point, | <input type="checkbox"/> Saver-pit over flow | <input type="checkbox"/> Third party tampering with Clamp |
| <input type="checkbox"/> Third party tampering with valve setting | <input type="checkbox"/> Bulging Outward | <input type="checkbox"/> Third party tampering with flange, |
| <input type="checkbox"/> Flare System/Bund wall failure | <input type="checkbox"/> Cold vent | <input type="checkbox"/> Surge vessel overflow, |
| <input type="checkbox"/> Valve Failure | <input type="checkbox"/> Relief valve failure | <input type="checkbox"/> Accidental 3 rd party equipment impact |
| <input checked="" type="checkbox"/> Corrosion | <input type="checkbox"/> Others (specify) <u>CIRCUMFERENTIAL CRACK ON</u> | |

f. Incident caused by:

- Third party interference (Sabotage ; crude theft ; Line theft ; Accidental 3rd party damage
 Operational Mystery spills Others (specify) _____

*This can be: a) Oil Spill b) Drilling fluid/Chemical c) Siltation d) construction e) Encroachment f) Fire,

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g. Spill point coordinates

h. Measuring unit

WGS-84

Northing:	Easting:
<u>05.124877</u>	<u>005.418610</u>

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

- Government reserved and designated protected area [Nil ,m]

 Drinking water source [2 ,m] → IMPACTED BY SPILL

 Built up area [Nil ,m]

 Farmlands [Nil ,m]

 Fish Farm/pond [Nil ,m]

 Fishing net [Nil ,m] → IMPACTED BY SPILL

 Others (specify) MANAGROVES FISH TRAPS AND FISH CAGES → IMPACTED BY SPILL

12. Containment measures put in place;

- Booms
 Trench
 Dyke
 Natural depression
 Pit
 None

 Others: _____

13. Any pictures or video coverage? [N]

14. Further response/repair initiated as at the time of JIV? [N]

if yes to item 14. give brief description:

REPAIR WORK ACTIVITIES ARE ONGOING

15. Was there any disruption to the investigation? [Y]

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If yes to item 15 give brief description: NOT APPLICABLE

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

17. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
	BULK ASSESSMENT ADOPTED RECOMMENDED					

18. Fishing Nets/Fish Ponds

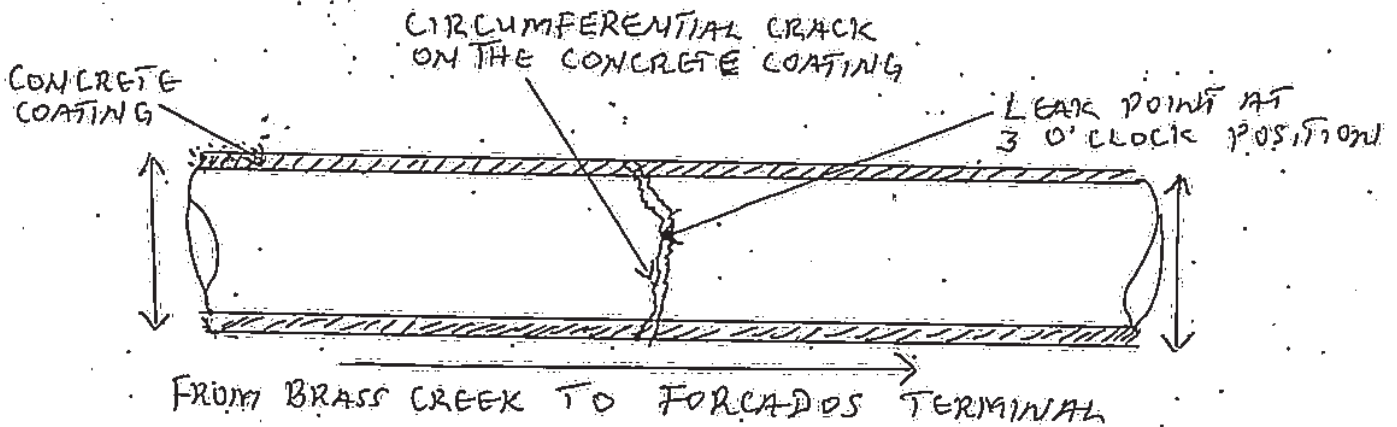
S/N	Nets/Ponds	Description	Quantity/Size	Comments
	BULK ASSESSMENT ADOPTED RECOMMENDED			

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

S/N	Others	Description	Quantity/Size	Comments

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 I)

SECTION OF 24" TRAYS - RAMOS PIPELINE AT AGITORO 2 SHOWING A CIRCUMFERENTIAL CRACK ON THE CONCRETE COATING.



JIV_2081058_AGHORO-2

PT_ID	LONG_X	LAT_Y
SP	5.41861	5.124877
14	5.437047	5.126989
15	5.437043	5.126472
16	5.429373	5.127705
17	5.433139	5.130037
18	5.43026	5.125605
19	5.430359	5.125948
20	5.430298	5.126618
21	5.429887	5.126847
22	5.429141	5.127144
23	5.429065	5.128545
24	5.430249	5.1262
25	5.426885	5.12862
26	5.427199	5.129042
27	5.427239	5.129482
28	5.4254	5.130436
29	5.424537	5.128848
30	5.424218	5.128226
31	5.424132	5.127957
32	5.424006	5.127529
33	5.421625	5.127209
34	5.421722	5.126901
35	5.421756	5.126547
36	5.421562	5.126335
37	5.420974	5.126587
38	5.420409	5.126775
39	5.419484	5.125901
40	5.41847	5.125182
41	5.416669	5.124371
42	5.416491	5.123802
43	5.416945	5.123469
44	5.414587	5.125353
45	5.41433	5.125399
46	5.414529	5.125644
47	5.414312	5.12557
210	5.41855	5.12479
211	5.41856	5.12484
212	5.41855	5.12473
213	5.41855	5.12463
214	5.41857	5.12456
215	5.41871	5.12444
216	5.41879	5.12446
217	5.41881	5.12432
218	5.41892	5.12422

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PT_ID	LONG_X	LAT_Y
221	5.41917	5.12387
222	5.4193	5.12375
223	5.41937	5.12356
224	5.41947	5.12337
225	5.41933	5.12303
226	5.41948	5.12303
227	5.41966	5.12318
228	5.41992	5.12315
229	5.42004	5.12334
230	5.42007	5.12335
231	5.41993	5.12348
232	5.4198	5.12371
233	5.41946	5.12377
234	5.41953	5.12385
235	5.41955	5.1239
236	5.41933	5.12414
237	5.41921	5.12415
238	5.4191	5.12434
239	5.41897	5.12453
240	5.41886	5.12464
241	5.41878	5.12481
242	5.41872	5.12481
243	5.41869	5.12492
244	5.41869	5.12502
245	5.41833	5.12499
246	5.41742	5.12459
247	5.41703	5.12458
248	5.41614	5.12493
250	5.41482	5.12536
251	5.41492	5.1249
252	5.41523	5.12478
253	5.41539	5.12485
254	5.41559	5.1249
255	5.41629	5.12497
256	5.41668	5.12482
257	5.41751	5.12458
258	5.41823	5.12486
259	5.41818	5.12472
260	5.41752	5.12438
261	5.41766	5.12367
262	5.41761	5.12344
263	5.41737	5.12322
264	5.41684	5.12334
265	5.41672	5.12344

S. S. 08/08/2018

PT_ID	LONG_X	LAT_Y
219	5.41899	5.12422
220	5.41919	5.12401
268	5.41638	5.12382
269	5.41693	5.12447
270	5.41678	5.12433
271	5.41661	5.12414
272	5.41669	5.12359
273	5.41719	5.1233
274	5.41736	5.12329
275	5.41762	5.12349
276	5.41756	5.12367
277	5.41735	5.12437
278	5.41716	5.1245
279	5.41667	5.12467
280	5.4161	5.12482
281	5.41577	5.12482
282	5.41514	5.1247
283	5.41482	5.12478
284	5.41481	5.12484
285	5.4148	5.12491
286	5.4148	5.12496
287	5.41471	5.1252
288	5.41463	5.12546
291	5.41407	5.12522
292	5.4141	5.12543
293	5.414	5.12566
316	5.41833	5.12508
317	5.41879	5.12533
318	5.41914	5.12548
319	5.4193	5.12589
320	5.41953	5.12629
321	5.41931	5.12711
322	5.41967	5.12735
323	5.42003	5.12781
324	5.42025	5.12774
325	5.4202	5.12718
326	5.42049	5.12684
327	5.42064	5.12652
328	5.42086	5.12642
329	5.42143	5.12646
330	5.42157	5.12648
331	5.42161	5.12648
332	5.42194	5.12642
333	5.42186	5.12693

PT_ID	LONG_X	LAT_Y
266	5.41654	5.12355
267	5.41637	5.12377
339	5.42347	5.12803
340	5.42355	5.12803
341	5.42374	5.12748
342	5.42406	5.12801
343	5.42427	5.12817
344	5.42461	5.1288
345	5.42506	5.12949
346	5.42505	5.12992
347	5.42544	5.13029
348	5.42574	5.13009
349	5.42578	5.12944
350	5.42585	5.12911
351	5.42632	5.12908
352	5.42651	5.12966
353	5.42675	5.12983
354	5.42705	5.1294
355	5.42707	5.12909
356	5.42671	5.12864
357	5.42646	5.12798
358	5.42667	5.12773
359	5.42758	5.12825
360	5.42791	5.12878
361	5.42843	5.12904
362	5.42882	5.12848
363	5.42922	5.12772
364	5.42959	5.12709
365	5.42982	5.12753
366	5.42969	5.12495
367	5.43125	5.12439
368	5.43133	5.12442
369	5.43061	5.12456
370	5.42978	5.12496
371	5.42991	5.12557
372	5.42998	5.12593
373	5.43008	5.12655
374	5.43006	5.12682
375	5.43	5.12689
376	5.43036	5.12817
377	5.43053	5.12871
378	5.43311	5.13094
379	5.4334	5.13187
380	5.43354	5.13211

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PT_ID	LONG_X	LAT_Y
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PT_ID	LONG_X	LAT_Y
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274	5.41736	5.12329
275	5.41762	5.12349
276	5.41756	5.12367
277	5.41735	5.12437
278	5.41716	5.1245
279	5.41667	5.12467
280	5.4161	5.12482
281	5.41577	5.12482
282	5.41514	5.1247
283	5.41482	5.12478
284	5.41481	5.12484
285	5.4148	5.12491
286	5.4148	5.12496
287	5.41471	5.1252
288	5.41463	5.12546
291	5.41407	5.12522
292	5.4141	5.12543
293	5.414	5.12566
316	5.41833	5.12508
317	5.41879	5.12533
318	5.41914	5.12548
319	5.4193	5.12589
320	5.41953	5.12629
321	5.41931	5.12711
322	5.41967	5.12735
323	5.42003	5.12781
324	5.42025	5.12774
325	5.4202	5.12718
326	5.42049	5.12684
327	5.42064	5.12652
328	5.42086	5.12642
329	5.42143	5.12646
330	5.42157	5.12648
331	5.42161	5.12648
332	5.42194	5.12642
333	5.42186	5.12693

PT_ID	LONG_X	LAT_Y
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339	5.42347	5.12803
340	5.42355	5.12803
341	5.42374	5.12748
342	5.42406	5.12801
343	5.42427	5.12817
344	5.42461	5.1288
345	5.42506	5.12949
346	5.42505	5.12992
347	5.42544	5.13029
348	5.42574	5.13009
349	5.42578	5.12944
350	5.42585	5.12911
351	5.42632	5.12908
352	5.42651	5.12966
353	5.42675	5.12983
354	5.42705	5.1294
355	5.42707	5.12909
356	5.42671	5.12864
357	5.42646	5.12798
358	5.42667	5.12773
359	5.42758	5.12825
360	5.42791	5.12878
361	5.42843	5.12904
362	5.42882	5.12848
363	5.42922	5.12772
364	5.42959	5.12709
365	5.42982	5.12753
366	5.42969	5.12495
367	5.43125	5.12439
368	5.43133	5.12442
369	5.43061	5.12456
370	5.42978	5.12496
371	5.42991	5.12557
372	5.42998	5.12593
373	5.43008	5.12655
374	5.43006	5.12682
375	5.43	5.12689
376	5.43036	5.12817
377	5.43053	5.12871
378	5.43311	5.13094
379	5.4334	5.13187
380	5.43354	5.13211

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PT_ID	LONG_X	LAT_Y
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PT_ID	LONG_X	LAT_Y
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334	5.42175	5.12715	381	5.43354	5.13212
335	5.42173	5.12742	382	5.43354	5.13213
336	5.42171	5.1277	383	5.43354	5.13214
337	5.42219	5.12773	384	5.43554	5.13137
338	5.42286	5.12774	450	5.42409	5.12792
451	5.424198	5.128258	498	5.41485	5.12538
452	5.42359	5.128075	490	5.414557	5.125326
453	5.424043	5.127523	491	5.414678	5.125188
454	5.423731	5.127447	492	5.414764	5.124991
455	5.423468	5.128067	493	5.414797	5.124757
456	5.42219	5.127777	494	5.415156	5.124665
457	5.422864	5.127693	495	5.41576	5.124767
458	5.421798	5.127385	496	5.416096	5.124767
459	5.42163	5.127473	497	5.414661	5.125483
460	5.419612	5.12756	499	5.414942	5.124929
461	5.421657	5.12775	500	5.415213	5.124829
462	5.421847	5.127214	501	5.415565	5.124938
463	5.421558	5.127217	502	5.416031	5.124957
464	5.421942	5.126947	503	5.416279	5.125005
465	5.422049	5.126395	504	5.416469	5.124941
466	5.421646	5.126905	505	5.418296	5.12505
467	5.421691	5.126612	506	5.416378	5.124712
468	5.421489	5.126536	507	5.417475	5.12464
469	5.421017	5.126673	508	5.417151	5.124457
470	5.420572	5.126913	509	5.416938	5.124415
471	5.420317	5.127792	510	5.416649	5.124126
472	5.421581	5.12625	511	5.416546	5.123817
473	5.420595	5.126418	512	5.416721	5.123627
474	5.420351	5.126719	513	5.416942	5.123505
475	5.420123	5.127099	514	5.417201	5.123349
476	5.419727	5.127237	515	5.417349	5.123341
477	5.419605	5.125934	516	5.417521	5.123703
478	5.419308	5.125485	517	5.417315	5.124324
479	5.418795	5.124921	518	5.416851	5.124575
480	5.419987	5.127917	519	5.416634	5.124373
481	5.419211	5.127165	520	5.416321	5.123791
482	5.419209	5.125957	521	5.416527	5.12352
483	5.41874	5.125404	522	5.416854	5.123281
484	5.418421	5.125257	523	5.41741	5.123197
485	5.414005	5.125681	524	5.417643	5.12344
486	5.41431	5.125609	525	5.417703	5.123667
487	5.414552	5.125664	526	5.417612	5.124329
488	5.414088	5.125202	527	5.418202	5.124641
489	5.414341	5.125367	528	5.418485	5.124704

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PT_ID LONG_X LAT_Y

PT_ID LONG_X LAT_Y

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529	5.429814	5.125312
530	5.429877	5.125302
531	5.429906	5.125376
532	5.429856	5.125425
533	5.415462	5.124867
534	5.415457	5.124838
535	5.415425	5.124836
536	5.415412	5.124855
537	5.416697	5.123456
538	5.416715	5.123514
539	5.416628	5.123546
540	5.416584	5.123524
541	5.416764	5.124313
542	5.416726	5.124327
543	5.416697	5.124298
544	5.416672	5.124259
545	5.416689	5.124229
546	5.417094	5.124691
547	5.417083	5.124679
548	5.417053	5.12467
549	5.417006	5.12468
550	5.416975	5.124696
551	5.416969	5.12473
552	5.417819	5.124531
553	5.41779	5.124565
554	5.417705	5.124544
555	5.417637	5.124484
556	5.417667	5.124484
557	5.41769	5.124465

Plot

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G. INCIDENT INFORMATION:

a. Impacted Area Details

- Total calculated area of impact 18.254084 Ha
- Impact within R.O.W YES
- Impact outside R.O.W YES

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

Recovered oil V_{rec} :	<u>NIL</u>	Barrels
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Controlled recovery/evacuation from source with no impact to environment:

<u>NIL</u>	Barrels
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c. Net Estimated Spilled Volume V_{est} (bbls)* =

31.66 BARRELS

Estimated Reported Volume** V_{rep} (bbls) =

32 BARRELS

*Notes:

- Volume estimation was done using an excel based tool, (see attached for details on the calculation)
- Reported spilled volume is an estimate

Write other relevant notes taken into consideration for estimating the spilled in the box below:

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 m³ 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 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 6e (Deviations) of the JIV procedure to use appropriate steps for volume estimation; record the calculation in a plain sheet of paper and attach to the JIV report.

Pub.

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d. General Status of the site

- i. Joint investigation of the incident site found that there is no residual impact after the initial response and JIV therefore recommend that the site be closed-out
- ii. Investigation of the incident site showed that there is residual impact on site requiring further works

e. Representatives

- This report was filled, agreed and signed by the following joint investigation team representatives:
- Host Community:
 - Department of Petroleum Resources [DPR]:
 - National Oil Spill Detection and Response Agency [NOSDRA]:
 - State Ministry of Environment [SME]:
 - Asset Owner:
 - Signatories agree with reported findings:
 - Separate DPR form has been filled out with same findings
- Tick as applicable*

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f. Appendix 1: Overview sketch of the site

