UNEP

Environmental Assessment of Ogoniland
Site Specific Fact Sheets

GBENE-UE, DOR-UM

This fact sheet is part of a series prepared as part of the Environmental Assessment of Ogoniland by the United Nations Environment Programme (UNEP). It provides the observations and results from one of the individual sites studied in detail, plus the specific risk reduction measures for follow-up action.

This fact sheet should be read in conjunction with the main assessment report available at: www.unep.org/nigeria.

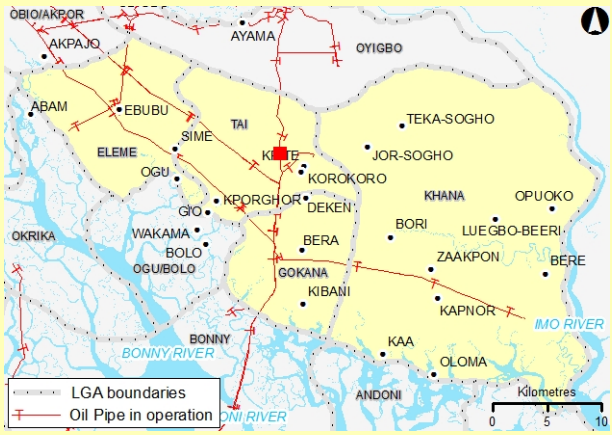
July 2011

Site fact sheet

See Guide to content and terminology on last page.

I - Site Description

Site Name	GBENE-UE, DOR-UM
Site Number	qc_005-009
LGA	TAI
Main community	GBENE UE DOR UM
Surrounding communities	GBENE UE GBENE UE DOR UM GBENEUE
Investigated area (ha)	2.55
Category	SPDC Pipeline ROW
Eastings (WGS 84, Zone 32N)	309398
Northings (WGS 84, Zone 32N)	524484



Recommendations for risk reduction	- Communities should be informed in community meetings about health and safety precautions. - Owners of hydrocarbon-contaminated community wells should be informed and alternative drinking water supply provided to them. - The site should be remodelled to prevent run off from the contaminated area into the downstream swamps. - Additional soil sampling along with trial pits should be done at the contaminated site to delineate the site to be excavated for clean up. - A system of ground water monitoring wells should be installed to act as early warning for communities which are not yet impacted by ground water contamination. - A detailed plan should be prepared for clean up of the contaminated water and risk reduction in the community. - While undertaking the clean up, management of excavation water should be handled properly to ensure that no pollutants are emitted into the environment without control.

II - Oilfield Infrastructure Type

Wells	No
Flowstations	No
Manifolds	No
Flaresites	No
Oil pipeline in operation	12" EGBERU M/F TO BOMU TRUNK LINE
NNPC crude line	No
NNPC product line	No

III - Spill History

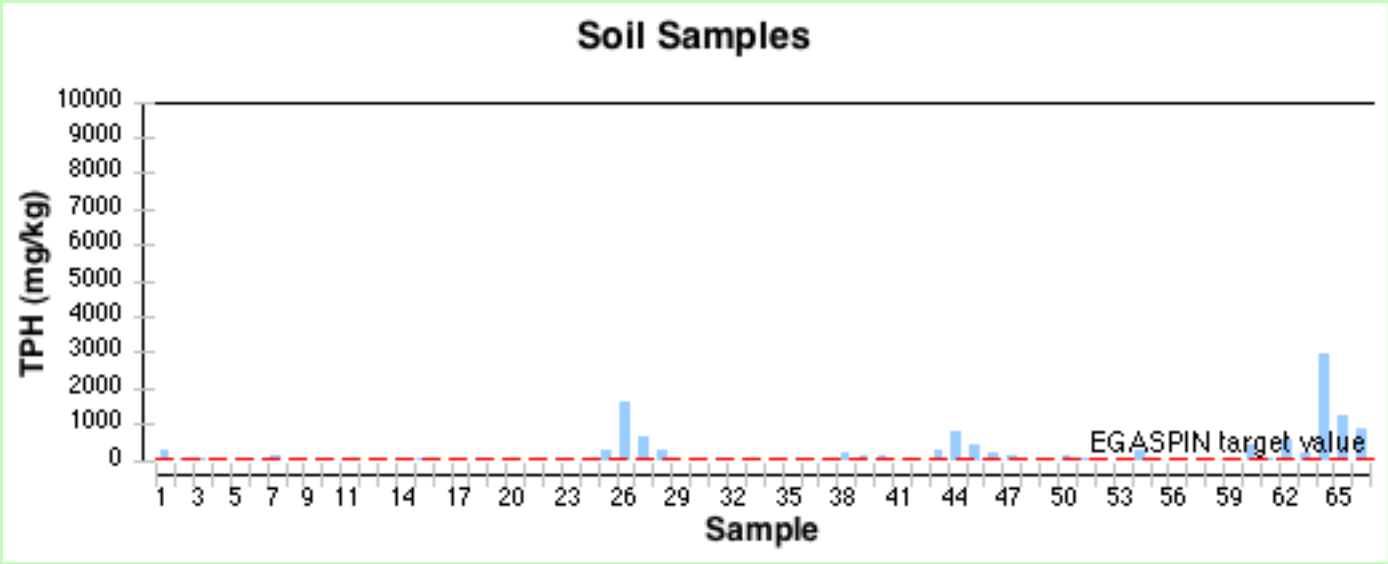
Spills reported by SPDC	No
Spill reported by community	Yes

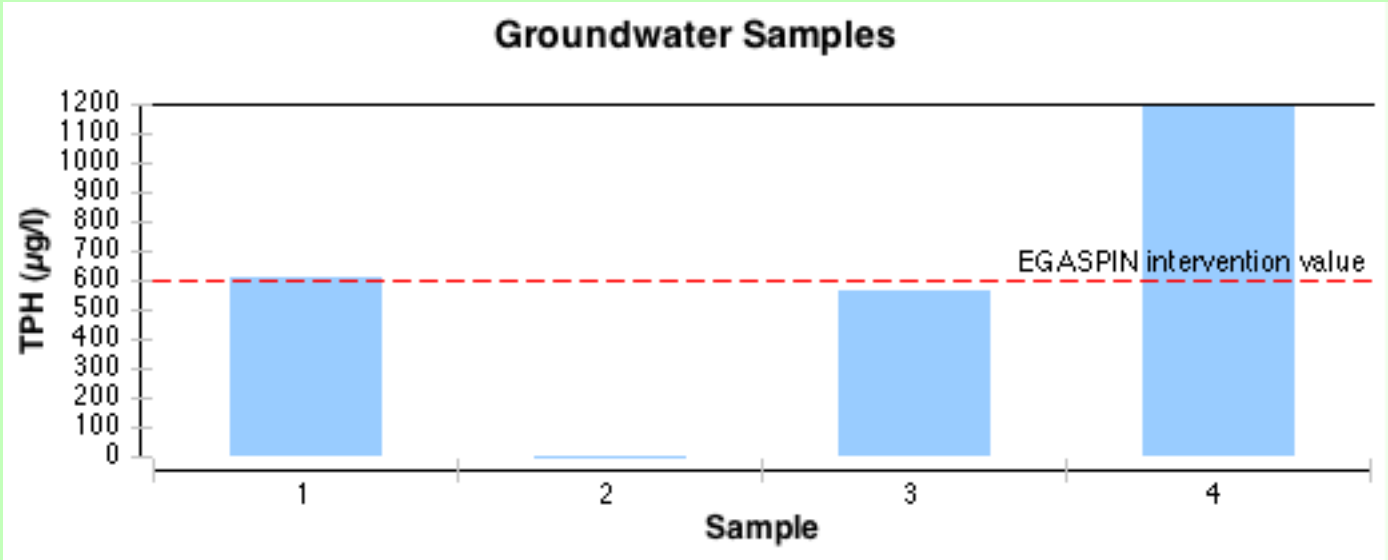
IV - Data Screening

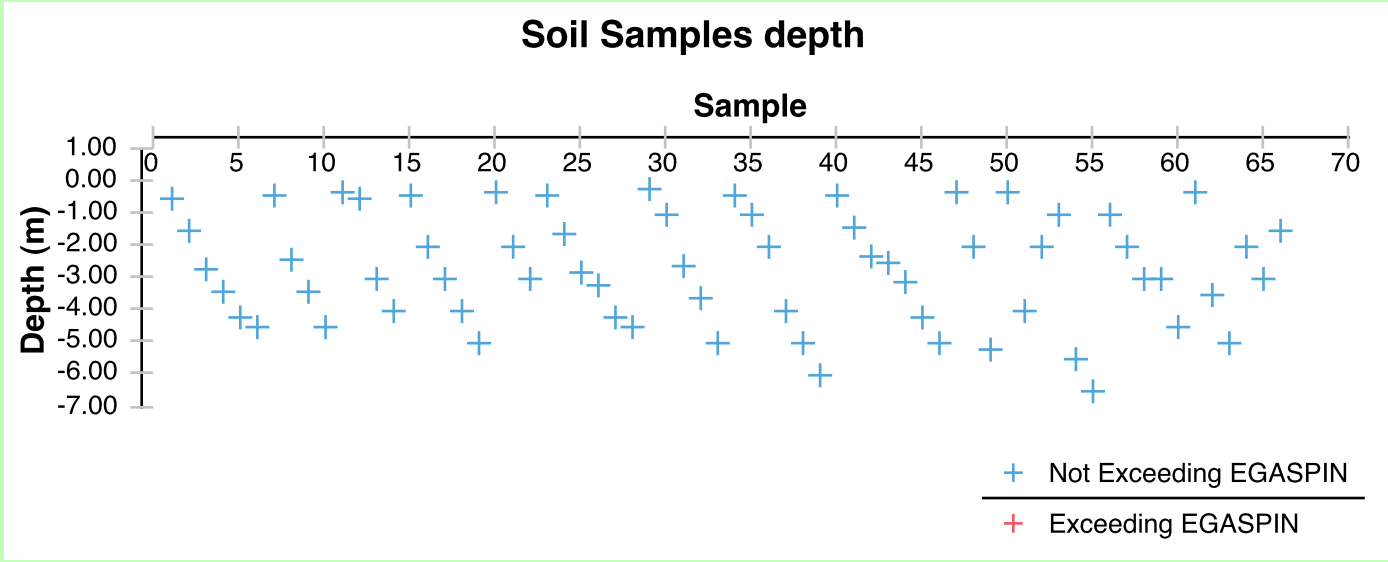
Assessment criteria

Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Drinking water contamination	WHO guidelines (benzene: 10 µg/l) Nigerian drinking water standards (mineral oils: 3 µg/l)

Number of soil samples	66
Deepest investigation (m)	6.5
Maximum soil TPH (mg/kg)	2,930.000
Number of soil measurements greater than EGASPIN intervention value	0
Deepest sample greater than EGASPIN (m)	0
Number of soil measurements below 1m	53
Number of soil measurements below 1m greater than EGASPIN intervention value	0
Number of ground water samples	5
Maximum groundwater TPH (µg/l)	26,900
Number of groundwater measurements greater than EGASPIN intervention value	2
Number of community well samples	7
Presence of hydrocarbons in community wells	Yes
Number of CL sediment samples	0
Maximum CL sediment TPH (mg/kg)	Not applicable
Number of CL sediment measurements greater than EGASPIN intervention value	0
Presence of hydrocarbons in sediment above EGASPIN intervention value	Not applicable

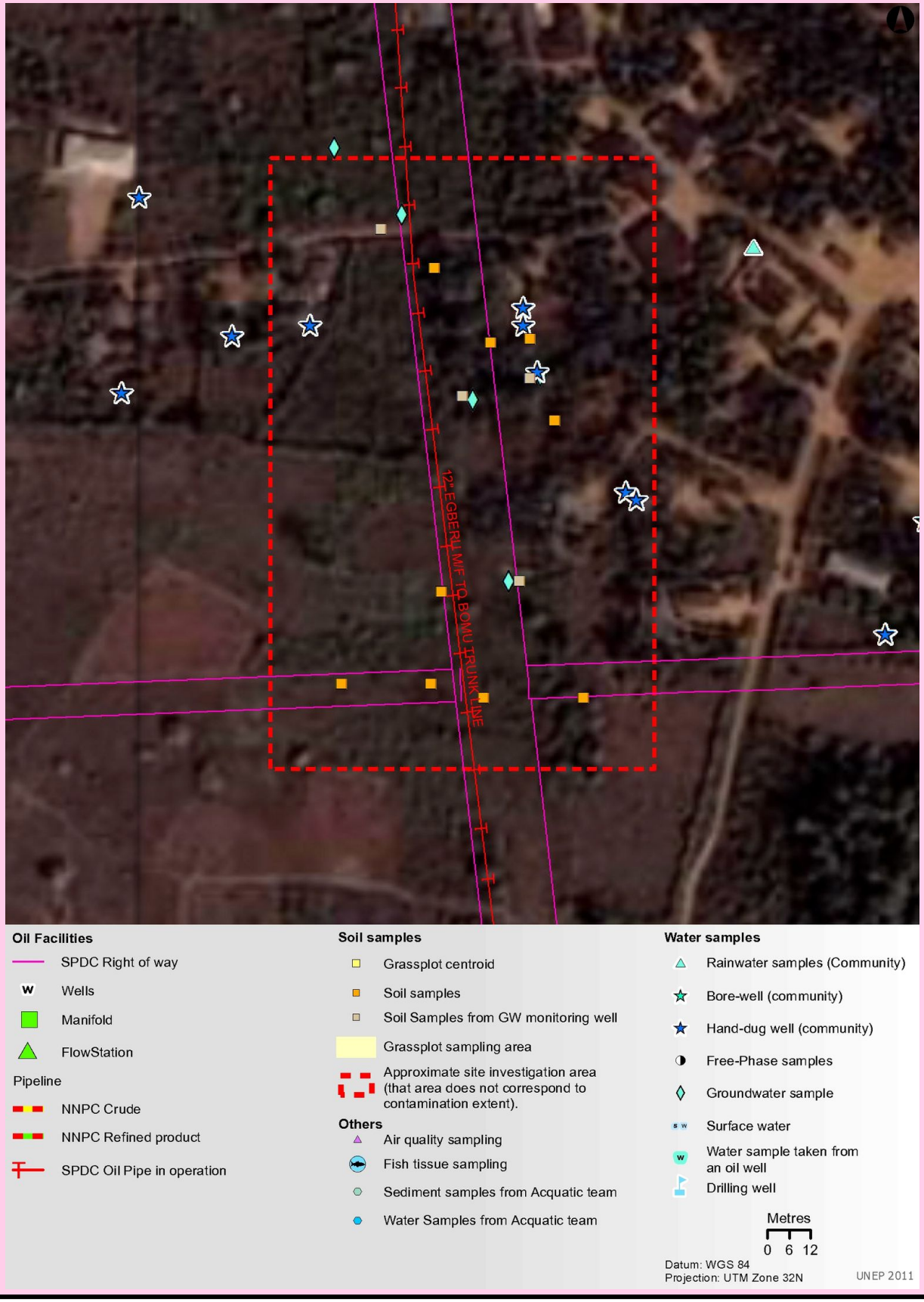

Soil Samples
TPH (mg/kg)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
EGASPIN target value
1 3 5 7 9 11 14 17 20 23 26 29 32 35 38 41 44 47 50 53 56 59 62 65
Sample


Groundwater Samples
TPH (µg/l)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
EGASPIN intervention value
1
2
3
4
Sample

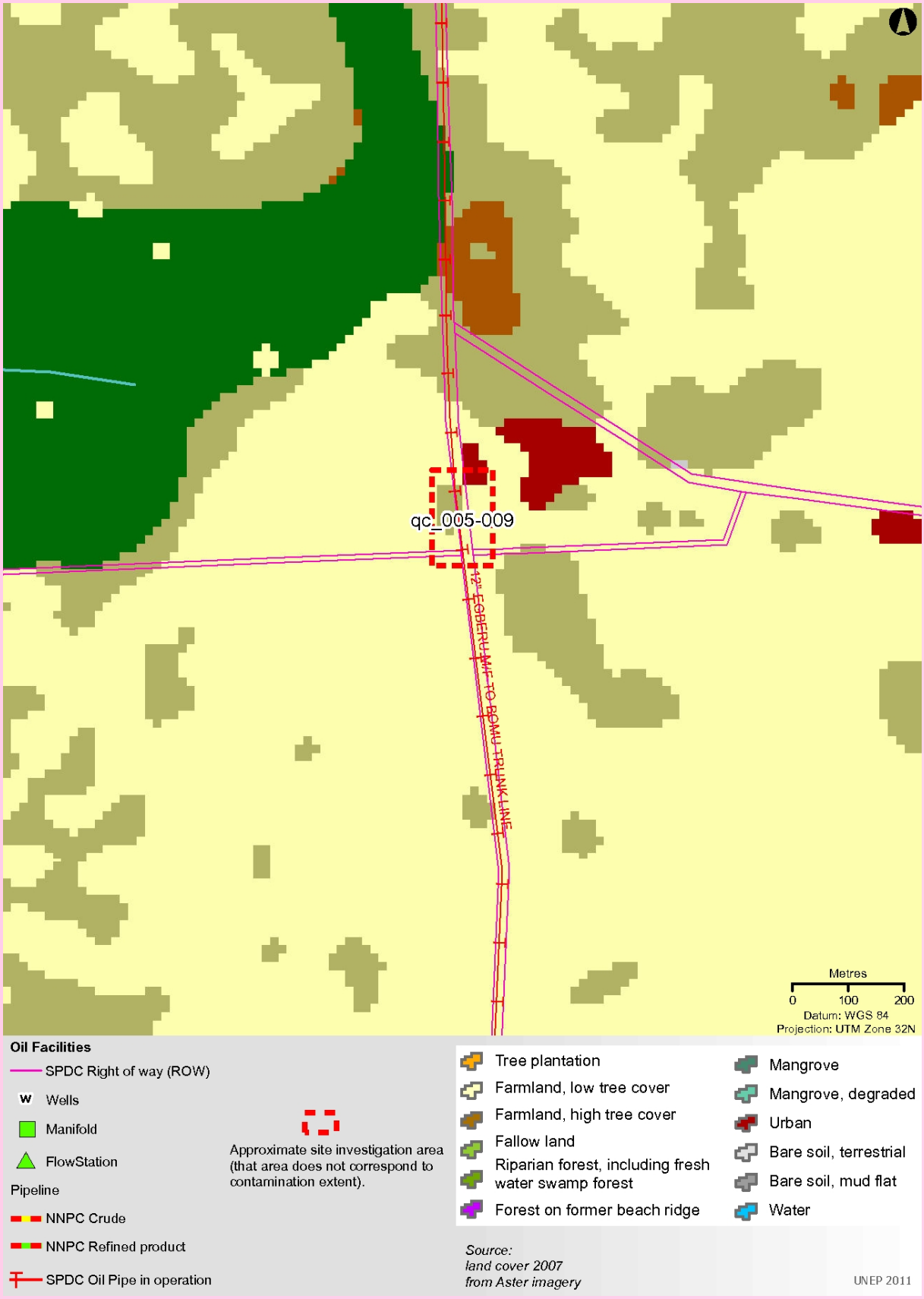

Soil Samples depth
Sample
Depth (m)
1.00
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
-6.00
-7.00
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
Not Exceeding EGASPIN
Exceeding EGASPIN

Satellite image of the site

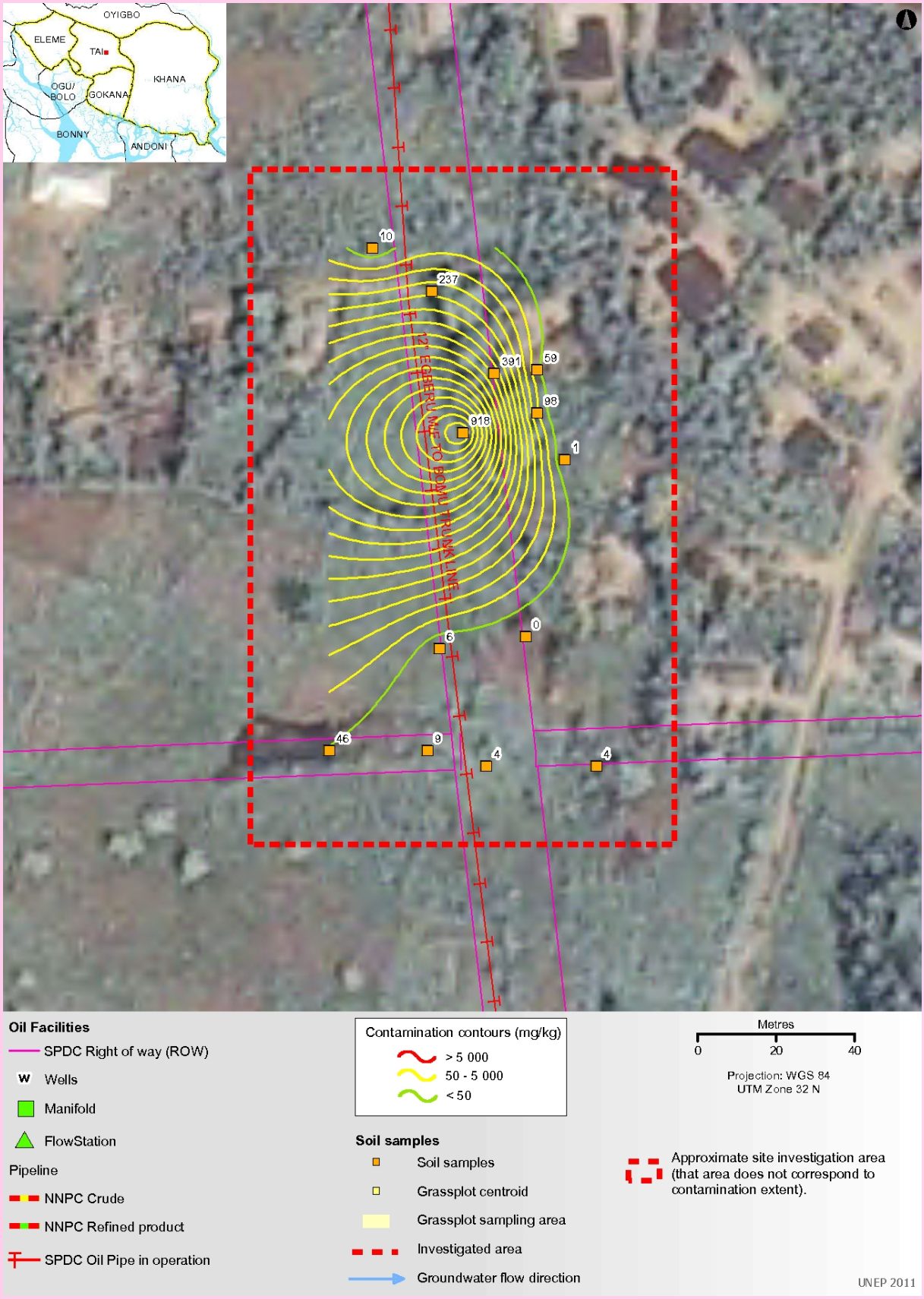
Sampling location map



Landcover 2007



Soil Contamination Map



The values shown next to soil sample points represent the average TPH value for all samples taken from the borehole at that location.

VI - Photos

Ground photograph

VII - Sample List

Soil sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2304437	7.170	4.50	309364	524422
2304471	273.000	0.50	309364	524422
2304643	27.700	1.50	309364	524422
2304755	4.430	5.00	309432	524418
2304778	32.900	0.40	309432	524418
2304817	99.200	0.40	309389	524422
2304841	35.500	2.70	309364	524422
2304900	1.040	4.00	309404	524418
2304918	BDL	4.50	309389	524422
2304937	BDL	3.00	309432	524418
2304951	BDL	2.40	309389	524422
2304961	0.242	3.40	309389	524422
2304982	BDL	2.00	309432	524418
2304987	49.800	0.30	309404	524418
2305060	BDL	3.00	309404	524418
2305074	2.620	0.50	309404	524418
2305086	BDL	4.20	309364	524422
2305149	BDL	4.00	309432	524418
2305172	BDL	3.40	309364	524422
2326906	145.000	0.30	309375	524550
2327101	3.920	2.00	309375	524550
2330871	262.000	4.50	309406	524518
2330898	18.000	1.60	309406	524518
2330930	670.000	4.20	309406	524518
2330948	286.000	2.80	309406	524518
2330966	12.700	0.40	309406	524518
2330992	1,600.000	3.20	309406	524518
2331009	0.203	4.00	309417	524519
2331026	3.260	2.00	309417	524519
2331041	0.349	0.40	309417	524519
2331071	101.000	6.00	309417	524519
2331087	189.000	5.00	309417	524519
2331113	0.473	1.00	309417	524519
2331136	24.000	0.30	309392	524448
2331146	1.820	3.00	309392	524448
2331166	5.860	2.00	309392	524448
2331178	0.353	3.60	309424	524496
2331189	0.288	1.00	309424	524496
2331205	1.420	2.60	309424	524496
2331219	BDL	5.00	309424	524496

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2331253	0.923	0.20	309424	524496
2331267	1.080	2.30	309390	524539
2331277	0.839	1.40	309390	524539
2331292	282.000	2.50	309390	524539
2331302	121.000	0.40	309390	524539
2331312	225.000	5.00	309390	524539
2331323	776.000	3.10	309390	524539
2331335	392.000	4.20	309390	524539
2331519	104.000	0.30	309417	524508
2331543	72.700	4.00	309417	524508
2331557	4.820	2.00	309417	524508
2331575	41.300	1.00	309417	524508
2331595	282.000	5.50	309417	524508
2331618	1.030	6.50	309417	524508
2331645	BDL	1.00	309414	524451
2331668	BDL	2.00	309414	524451
2331681	BDL	3.00	309414	524451
2331699	BDL	3.00	309375	524550
2331717	415.000	4.50	309398	524503
2331726	73.500	0.30	309398	524503
2331736	582.000	3.50	309398	524503
2331743	225.000	5.00	309398	524503
2331758	2,930.000	2.00	309398	524503
2331771	1,250.000	3.00	309398	524503
2331780	864.000	1.50	309398	524503

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2697521	BDL	309411	524451
2697522	610	309420	524509
2697523	563	309362	524573
2697524	26,900	309401	524502
2697525	not analyzed for TPH	309381	524554

Community well sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2303943	BDL	309415	524528
2303971	BDL	309528	524468
2303987	BDL	309419	524510
2697516	BDL	309415	524523
2697518	53.000	309444	524476
2697519	BDL	309554	524452
2697520	BDL	309333	524520

Guide to content

The Site Fact Sheets present more detailed data from UNEP's environmental assessment of Ogoniland on a site-by-site basis. Note that all data is based on the analysis of samples taken during the fieldwork period. The period of most intensive fieldwork ran from April to December 2010. The final sampling visit was completed in January 2011.

Here is a guide to the terms and abbreviations used. Please refer to the Environmental Assessment of Ogoniland report for details of EGASPIN target and intervention values.

Terminology

Site number	Reference number allocated by UNEP to identify a study site
Area (ha)	Estimated surface area (in hectares) of a given study site
Well	Oil well, also referred to as a production well
Fugro well	New well installed by Fugro at UNEP's request to enable scientific sampling and monitoring
Community well	Wells belonging to communities which are used to collect water for drinking and sanitation needs
Contamination contour	Maps that display the geographical distribution of oil contamination concentrations in an analyzed receptor
Flare site	Indicates whether the burning of unwanted gas through a pipe (or flare) takes place at a given site
Flow station	Separation facilities (also called gathering centres) which separate natural gas and water from crude oil extracted from production wells
Incident number	Numbers as supplied from the SPDC oil spills database
Manifold	An arrangement of piping or valves designed to control, distribute and often monitor fluid flow

Abbreviations

BDL	Below Detection Limit
CL	Contaminated Land
EGASPIN	Environmental Guidelines and Standards for Petroleum Industries in Nigeria
GW	groundwater
LGA	Local Government Area
mbgs	metre/s below ground surface
NNPC	Nigerian National Petroleum Corporation
SPDC	Shell Petroleum Development Company of Nigeria
TPH	total petroleum hydrocarbons
UNEP	United Nations Environment Programme

Explanatory Note

1. The recommendations given are for initial risk reduction. Final clean up would need significant additional site specific engineering as well as consultation work.
2. Spill reported by SPDC has the date format YYYYMMDD
3. Assessment is done based on a screening of the measured value against a Nigerian or international standard
4. In the soil sample maps, the highest value has been cut-off to 2 times the intervention value. This was done to visually express the excedences above intervention values. Actual values are given in the sample tables.
5. The values of soil contamination listed in the Soil Contamination Maps are average values of all samples taken at that sampling location