Environmental Assessment of Ogoniland
Site Specific Fact Sheets

BERA

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.

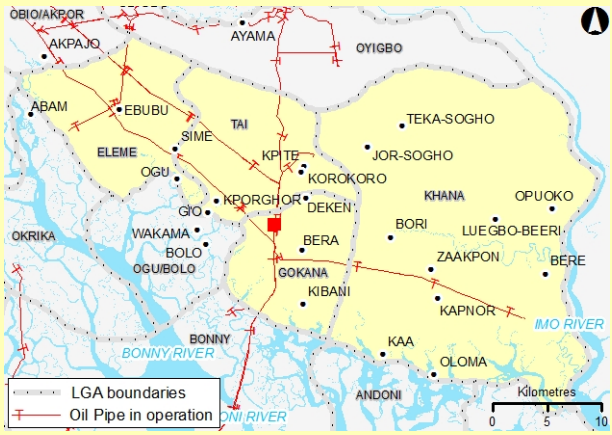
July 2011

Site fact sheet

See Guide to content and terminology on last page.

I - Site Description

Site Name	BERA
Site Number	qc_019-002
LGA	GOKANA
Main community	BERA
Surrounding communities	BERA
Investigated area (ha)	11.01
Category	SPDC Pipeline ROW
Eastings (WGS 84, Zone 32N)	308855
Northings (WGS 84, Zone 32N)	518036



Recommendations for risk reduction	- Communities should be informed in community meetings about health and safety precautions. - A community based security and surveillance system should be put in place so that there is voluntary compliance with the restrictions which are needed to protect public health. - The impacted area should be demarcated and appropriate signage put in place to indicate that the site is impacted. - Highly contaminated core areas should be fenced and guarded until emergency cleanup measures have been carried out. - Floating oil on the surface, if any, should be collected and treated off site. - The site should be remodelled to prevent run off from the contaminated area into the downstream swamps. - Runoff from the area should be monitored and if necessary collected and treated while the cleanup plan is developed and implemented. - 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 detailed plan should be prepared for clean up of the contaminated soil and risk reduction at site. - 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	24" NKPOKU TO BOMU TRUNKLINE 36" RUMUEKPE TO NKPOKU TRUNKLINE 12" EGBERU M/F TO BOMU TRUNK LINE
NNPC crude line	No
NNPC product line	No

III - Spill History

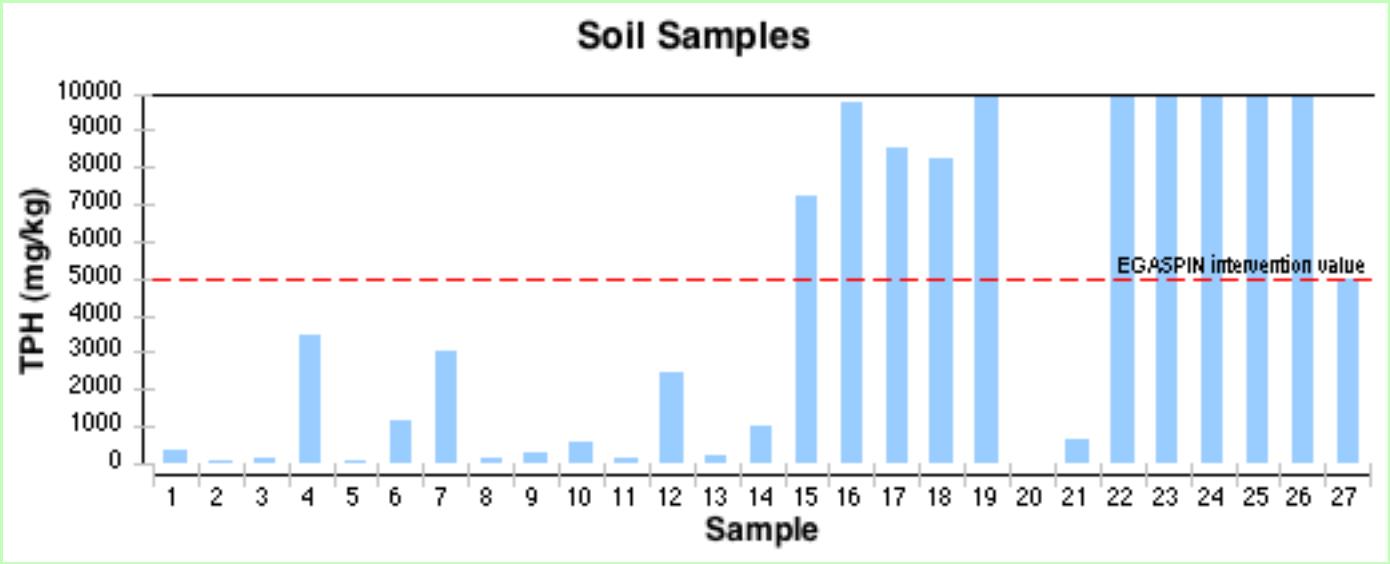
Spills reported by SPDC	Incident Number	Incident Date
	2004_00226	20041005
	2007_00312	20070619
	456207	
	460692	
	468830	
	509437	
Spill reported by community	Yes	

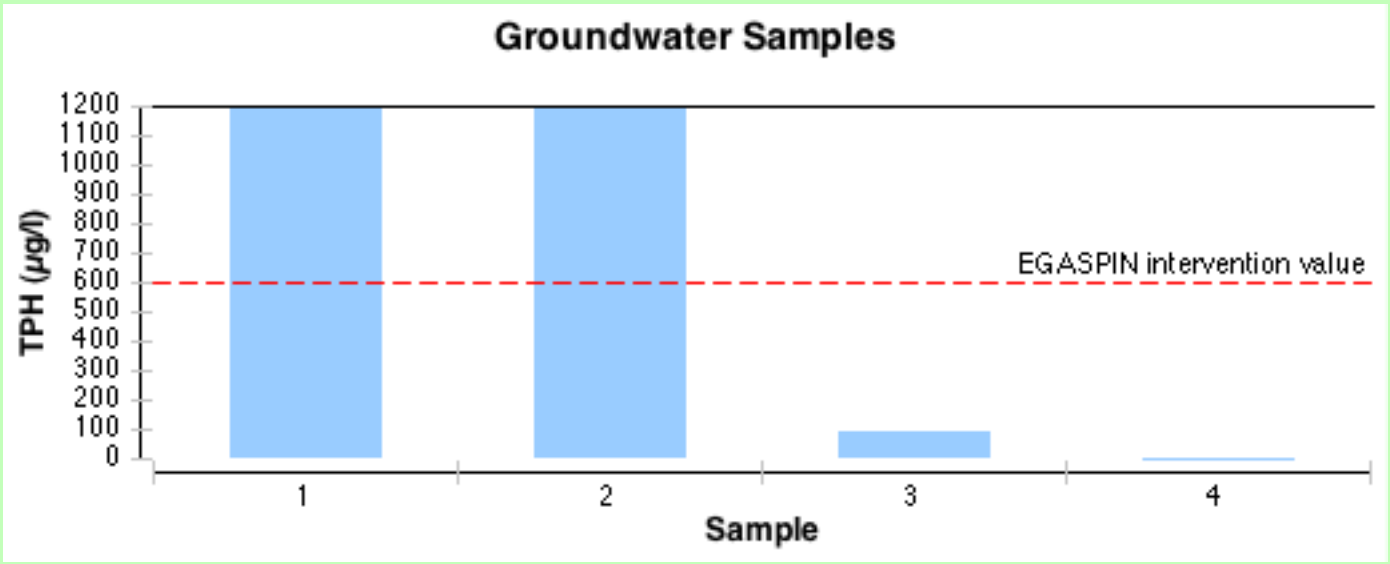
IV - Data Screening

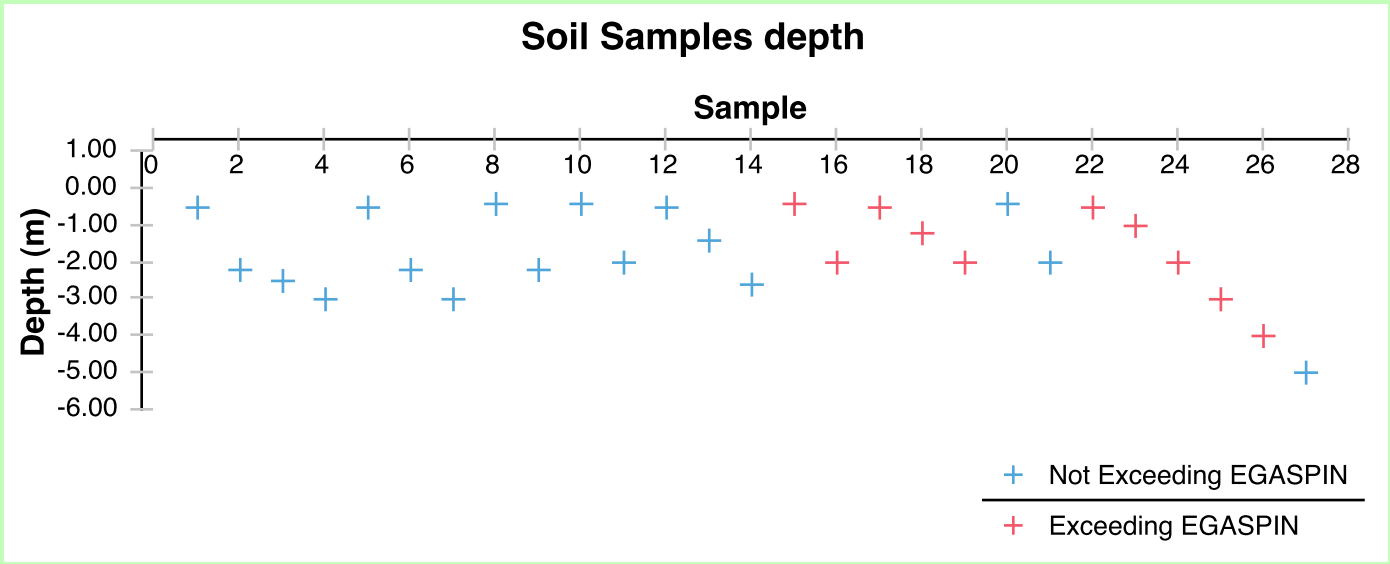
Assessment criteria

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	27
Deepest investigation (m)	5
Maximum soil TPH (mg/kg)	34,500.000
Number of soil measurements greater than EGASPIN intervention value	10
Deepest sample greater than EGASPIN (m)	4
Number of soil measurements below 1m	18
Number of soil measurements below 1m greater than EGASPIN intervention value	7
Number of ground water samples	4
Maximum groundwater TPH (µg/l)	32,000
Number of groundwater measurements greater than EGASPIN intervention value	2
Number of community well samples	0
Presence of hydrocarbons in community wells	Not applicable
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 intervention value
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Sample

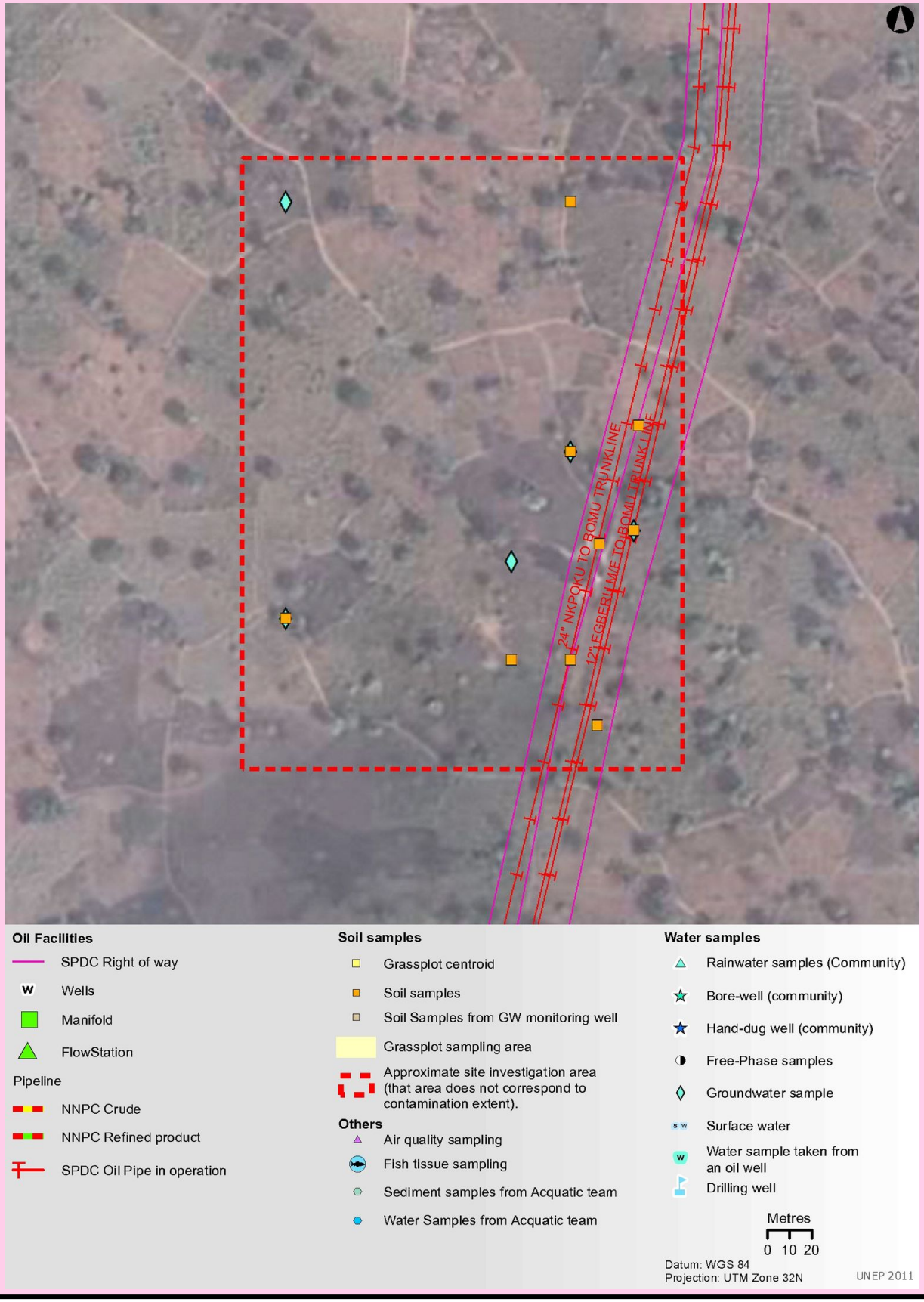

Groundwater Samples
TPH (µg/l)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
EGASPIN intervention value
1 2 3 4
Sample


Soil Samples depth
Sample
Depth (m)
1.00
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
-6.00
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
Not Exceeding EGASPIN
Exceeding EGASPIN

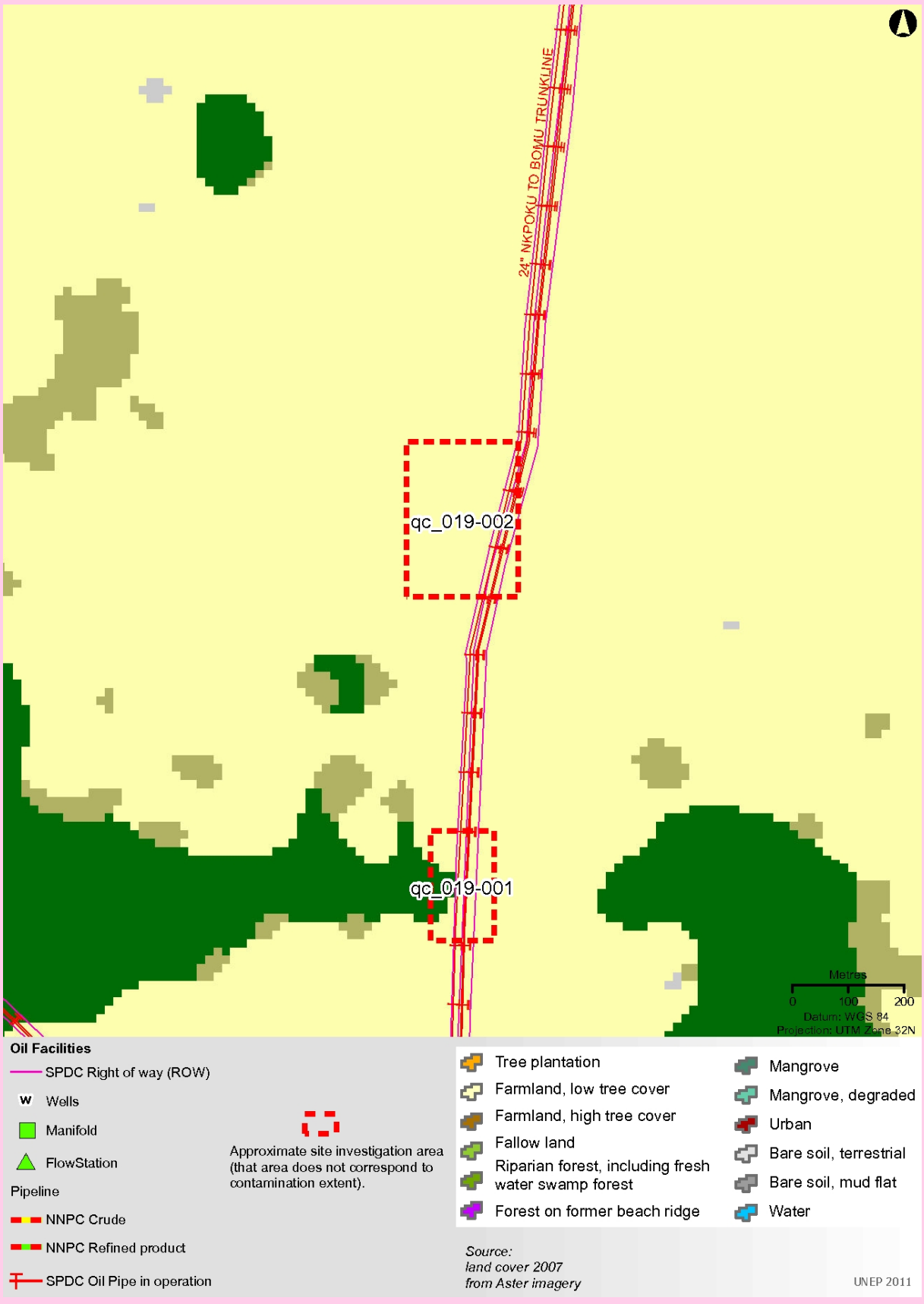
V - Maps

Satellite image of the site

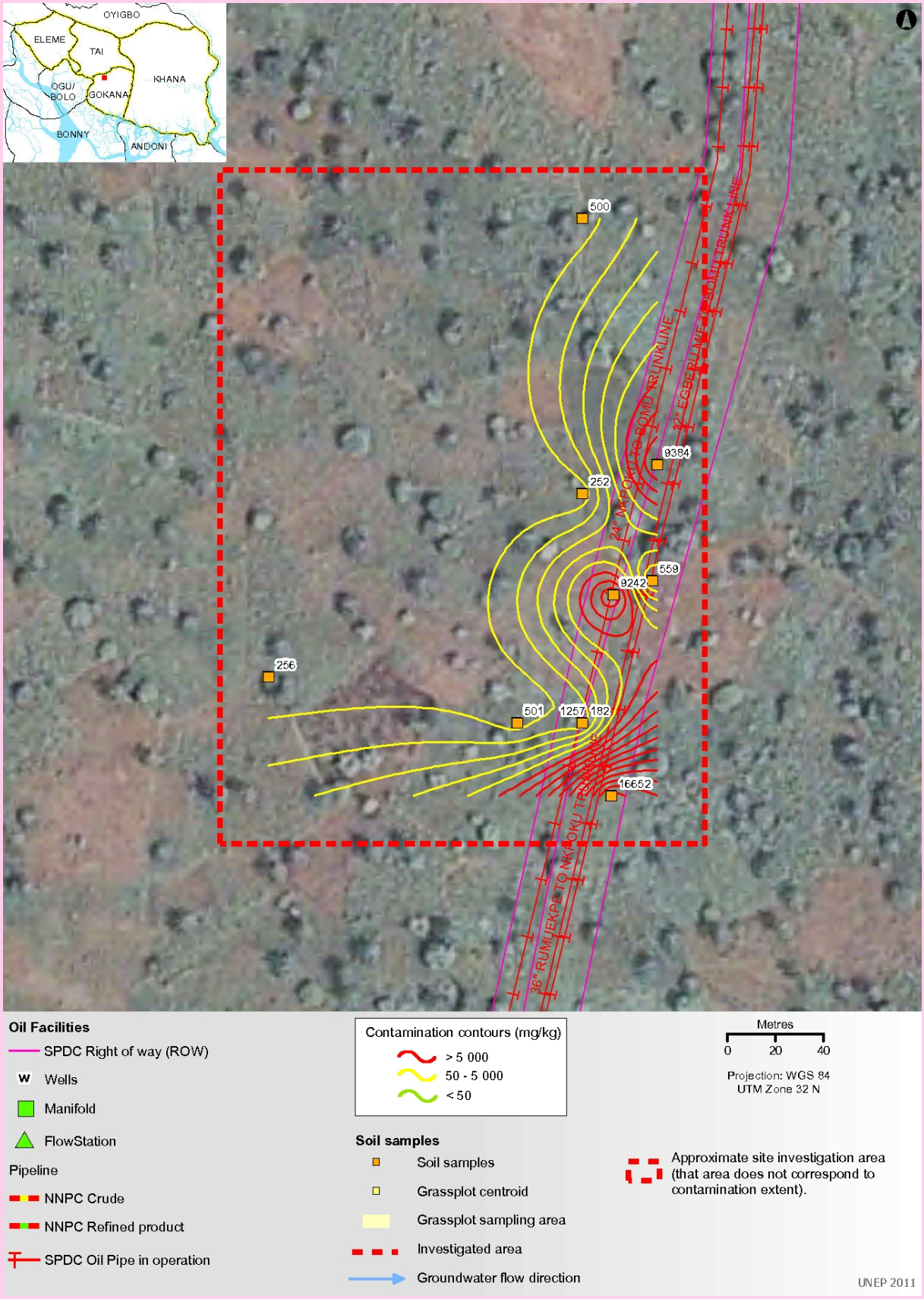
Sampling location map



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
1996734	1,130.000	2.20	308933	518005
1996805	356.000	0.50	308877	517946
1996844	177.000	2.50	308877	517946
1996889	174.000	0.40	308904	518041
1997008	182.000	1.40	308904	517946
1997045	34.100	0.40	308904	518155
1997081	562.000	0.40	308774	517965
1997116	7,250.000	0.40	308917	517999
1997168	2,430.000	0.50	308904	517946
1997397	9,740.000	2.00	308917	517999
1997621	3,010.000	3.00	308933	518005
1997656	616.000	2.00	308904	518155
1997676	8,260.000	1.20	308935	518053
1997712	10,900.000	2.00	308935	518053
1997862	978.000	2.60	308904	517946
1997885	68.500	2.20	308877	517946
1997923	88.600	0.50	308933	518005
1997959	3,480.000	3.00	308877	517946
1997983	8,530.000	0.50	308935	518053
1998006	179.000	2.00	308774	517965
1998042	269.000	2.20	308904	518041
2574042	16,900.000	1.00	308916	517916
2574045	11,300.000	4.00	308916	517916
2574046	19,600.000	3.00	308916	517916
2574047	34,500.000	0.50	308916	517916
2574049	21,700.000	2.00	308916	517916
2574051	4,960.000	5.00	308916	517916

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1998528	5,540	308877	517991
1998639	32,000	308904	518041
1998656	93	308774	517965
2048452	BDL	308774	518155

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