UNEP

Environmental Assessment of Ogoniland
Site Specific Fact Sheets

OBOOLO

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.

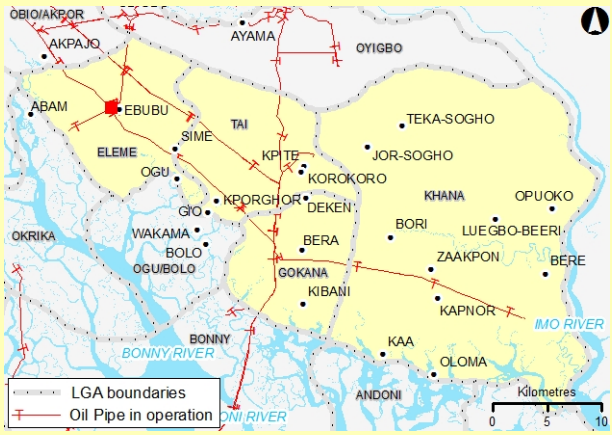
July 2011

Site fact sheet

See Guide to content and terminology on last page.

I - Site Description

Site Name	OBOOLO
Site Number	qc_001-002
LGA	ELEME
Main community	OBOLLO
Surrounding communities	OBOLLO OBOLLO EBUBU
Investigated area (ha)	13.62
Category	SPDC Operating Site
Eastings (WGS 84, Zone 32N)	293953
Northings (WGS 84, Zone 32N)	528662



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. - Impacted swamps and creeks should be demarcated and appropriate signage put in place to indicate that the area is impacted. - Floating oil on the surface, if any, should be collected and treated off site. - 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. - 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	EBUBU-001 (closed in)
Flowstations	No
Manifolds	No
Flaresites	No
Oil pipeline in operation	4" Ebubu F/S to Ebubu M/F Delivery line(DISUSED) 6" Ebubu F/S to Ebubu M/F Delivery line 6" Imo R1 to Ebubu tie-in MF Delivery line(DIUSED) 12" IMOR 1 TO EBUBU TRUNKLINE 12" IMO RIVER TO EBUBU TRUNKLINE 6" Obigbo North F/S to Ebubu M/F Delivery line 36" Nkpoku to New Ebubu(Oghale) Trunkline 20" RUMUEKPE MF to BOMU MF TRUNKLINE(ABANDONED) 28" RUMUEKPE TO BOMU TRUNKLINE 28" RUMUEKPE TO BOMU TRUNKLINE 20" RUMUEKPE MF to BOMU MF TRUNKLINE(ABANDONED) 10" EBUBU MF TO NGC REF(EBUBU TO ALESA) GAS LINE
NNPC crude line	No
NNPC product line	No

III - Spill History

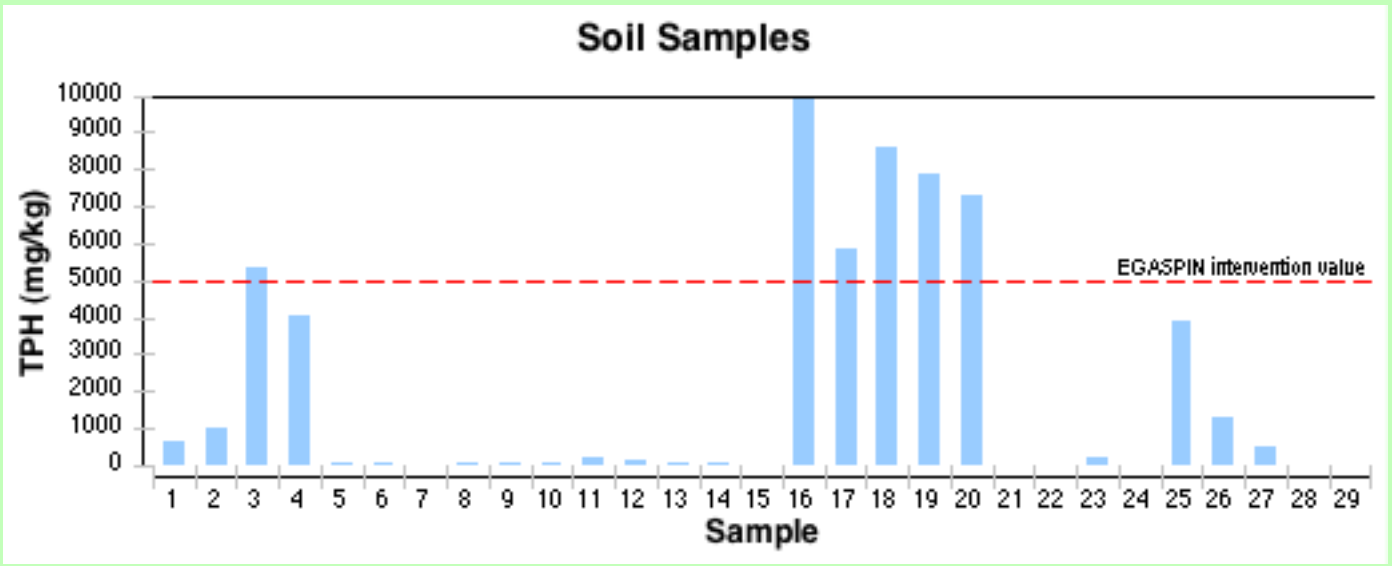
Spills reported by SPDC	Incident Number	Incident Date
	2000_00219	20000904
	2000_00192	20000727
	1999_00309	19991105
	1999_00271	19990912
	1993_00130	19930409
	2008_00185	20080825
Spill reported by community	Yes	

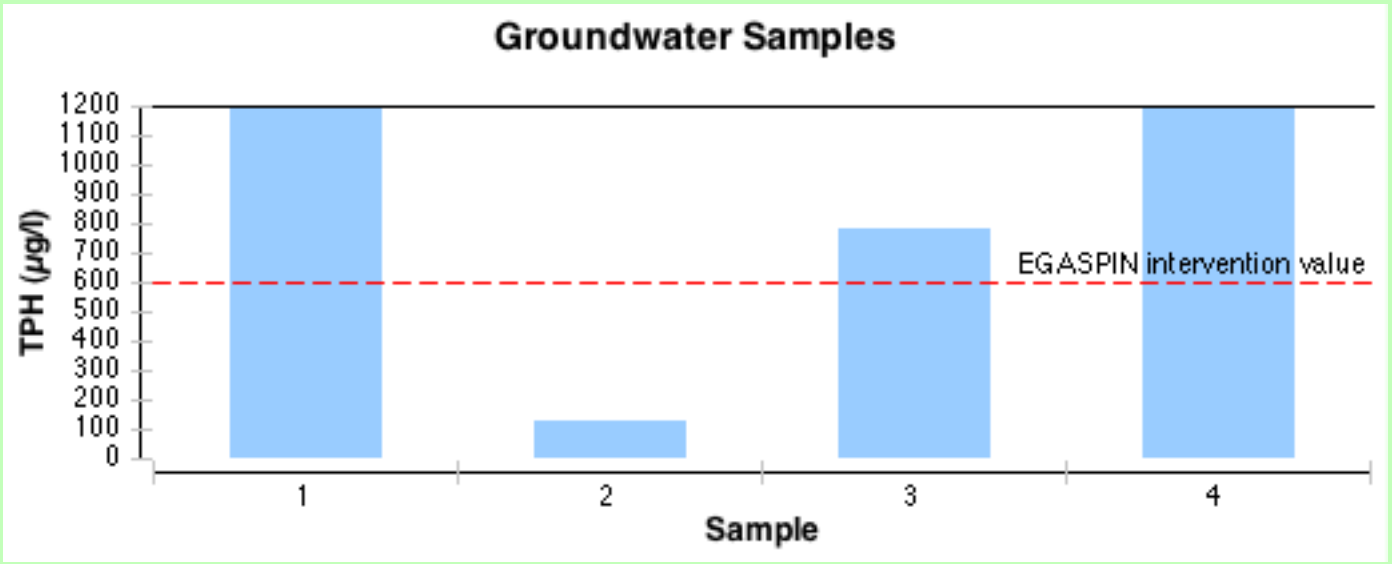
IV - Data Screening

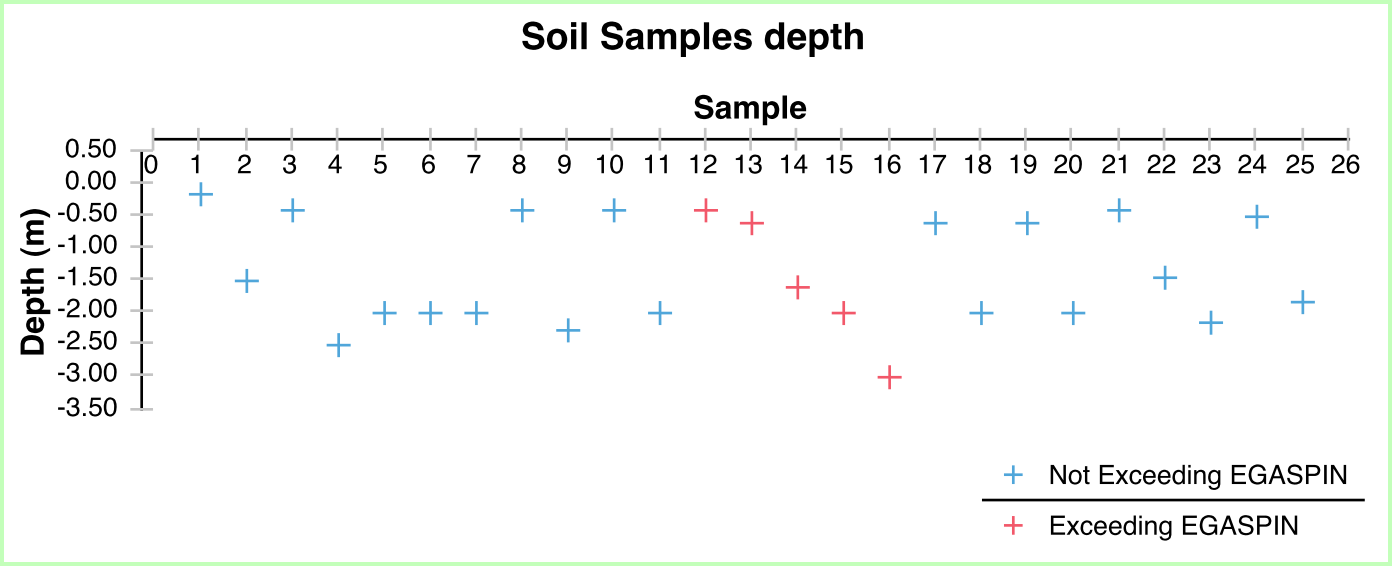
Assessment criteria

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	29
Deepest investigation (m)	3
Maximum soil TPH (mg/kg)	10,400.000
Number of soil measurements greater than EGASPIN intervention value	6
Deepest sample greater than EGASPIN (m)	3
Number of soil measurements below 1m	15
Number of soil measurements below 1m greater than EGASPIN intervention value	3
Number of ground water samples	4
Maximum groundwater TPH (µg/l)	1,980
Number of groundwater measurements greater than EGASPIN intervention value	3
Number of community well samples	3
Presence of hydrocarbons in community wells	Yes
Number of CL sediment samples	1
Maximum CL sediment TPH (mg/kg)	50,000.000
Number of CL sediment measurements greater than EGASPIN intervention value	1
Presence of hydrocarbons in sediment above EGASPIN intervention value	Yes

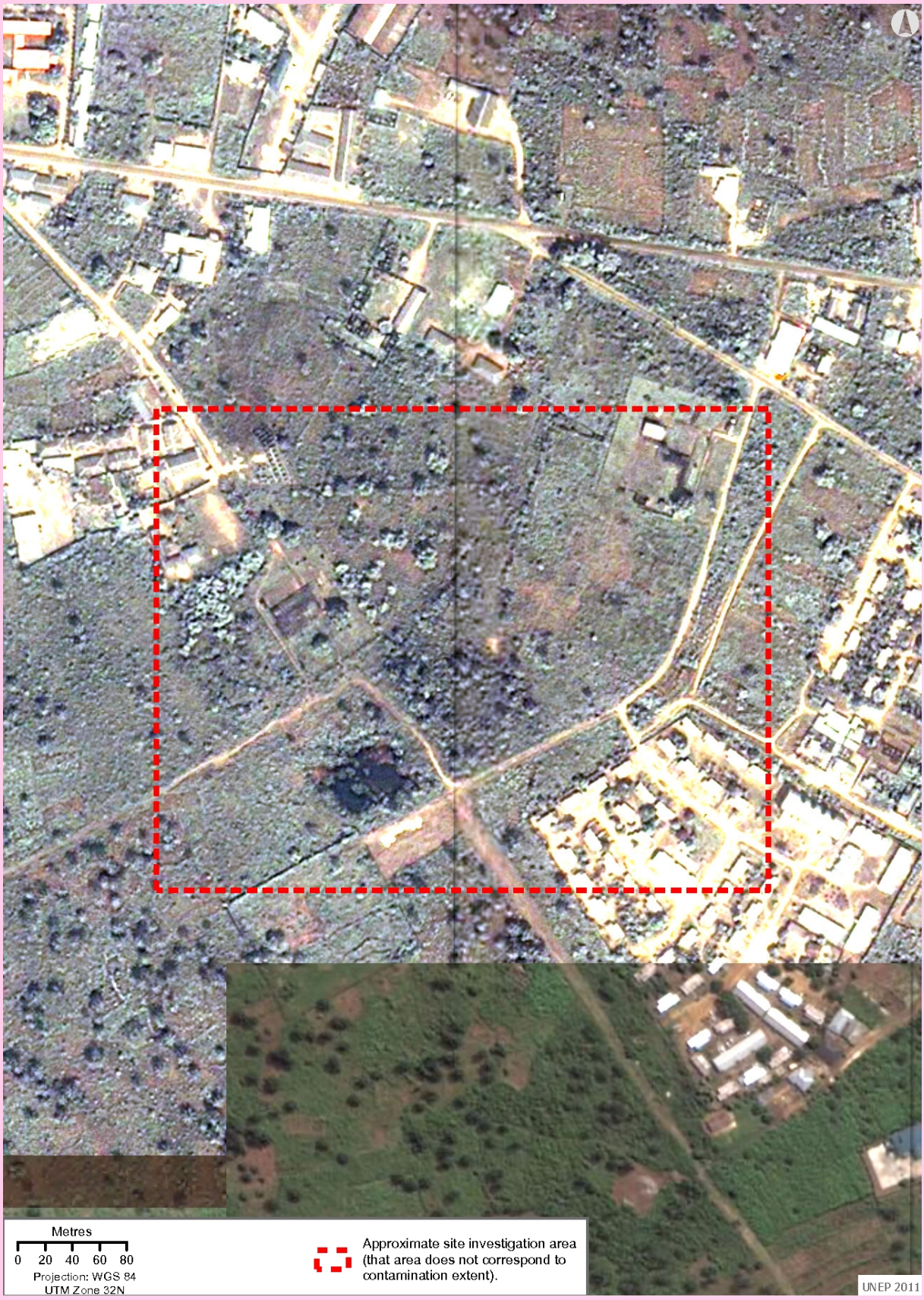

Soil Samples
TPH (mg/kg)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
EGASPIN intervention value
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Sample


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

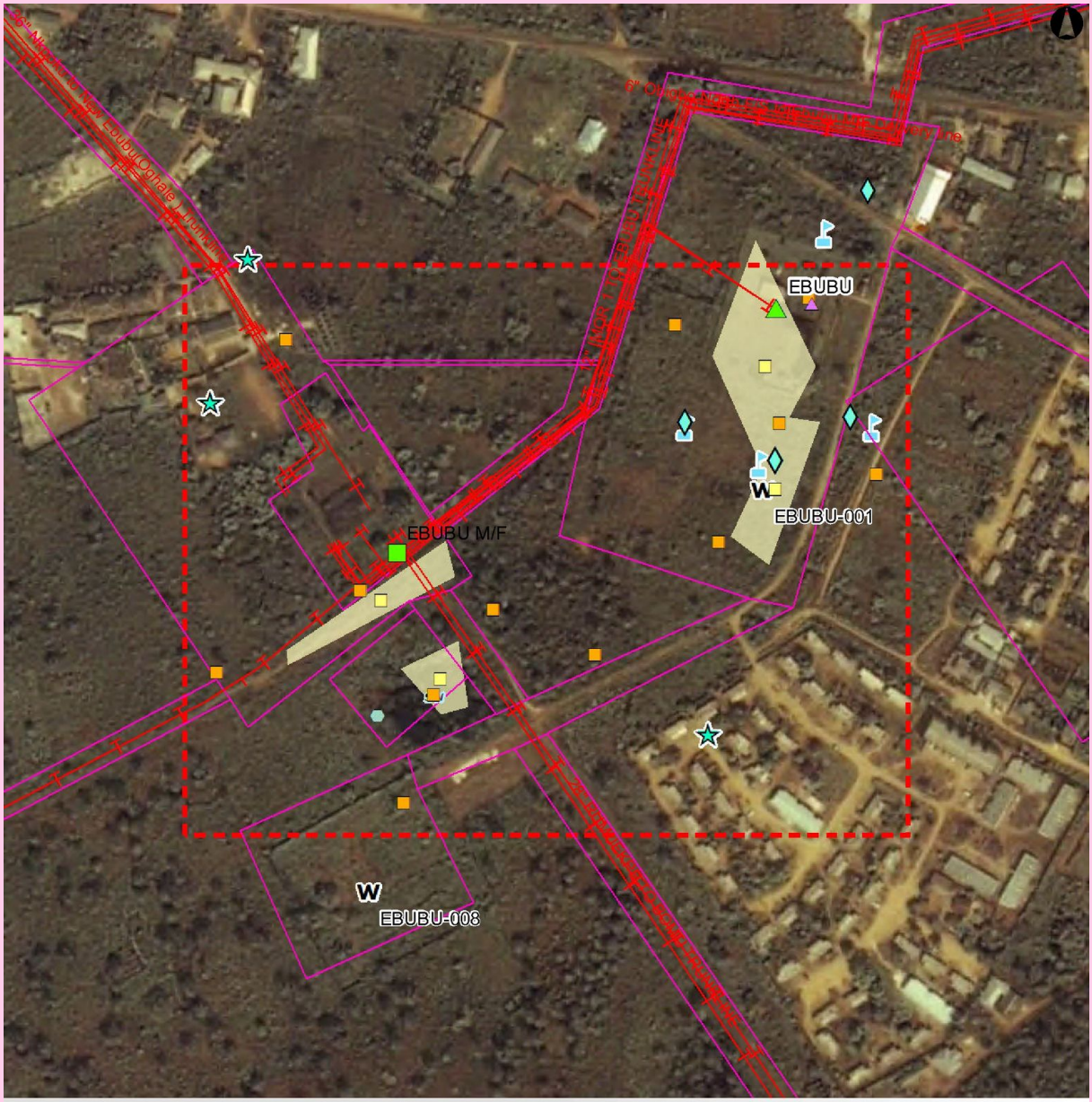

Soil Samples depth
Sample
Depth (m)
0.50
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
-3.50
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Not Exceeding EGASPIN
Exceeding EGASPIN

V - Maps

Satellite image of the site



Sampling location map



Oil Facilities

- SPDC Right of way
- Wells
- Manifold
- FlowStation

Pipeline

- NNPC Crude
- NNPC Refined product
- SPDC Oil Pipe in operation

Soil samples

- Grassplot centroid
- Soil samples
- Soil Samples from GW monitoring well
- Grassplot sampling area
- Approximate site investigation area (that area does not correspond to contamination extent).

Others

- Air quality sampling
- Fish tissue sampling
- Sediment samples from Acquatic team
- Water Samples from Acquatic team

Water samples

- Rainwater samples (Community)
- Bore-well (community)
- Hand-dug well (community)
- Free-Phase samples
- Groundwater sample
- Surface water
- Water sample taken from an oil well
- Drilling well

Metres
0 10 20

Datum: WGS 84
Projection: UTM Zone 32N

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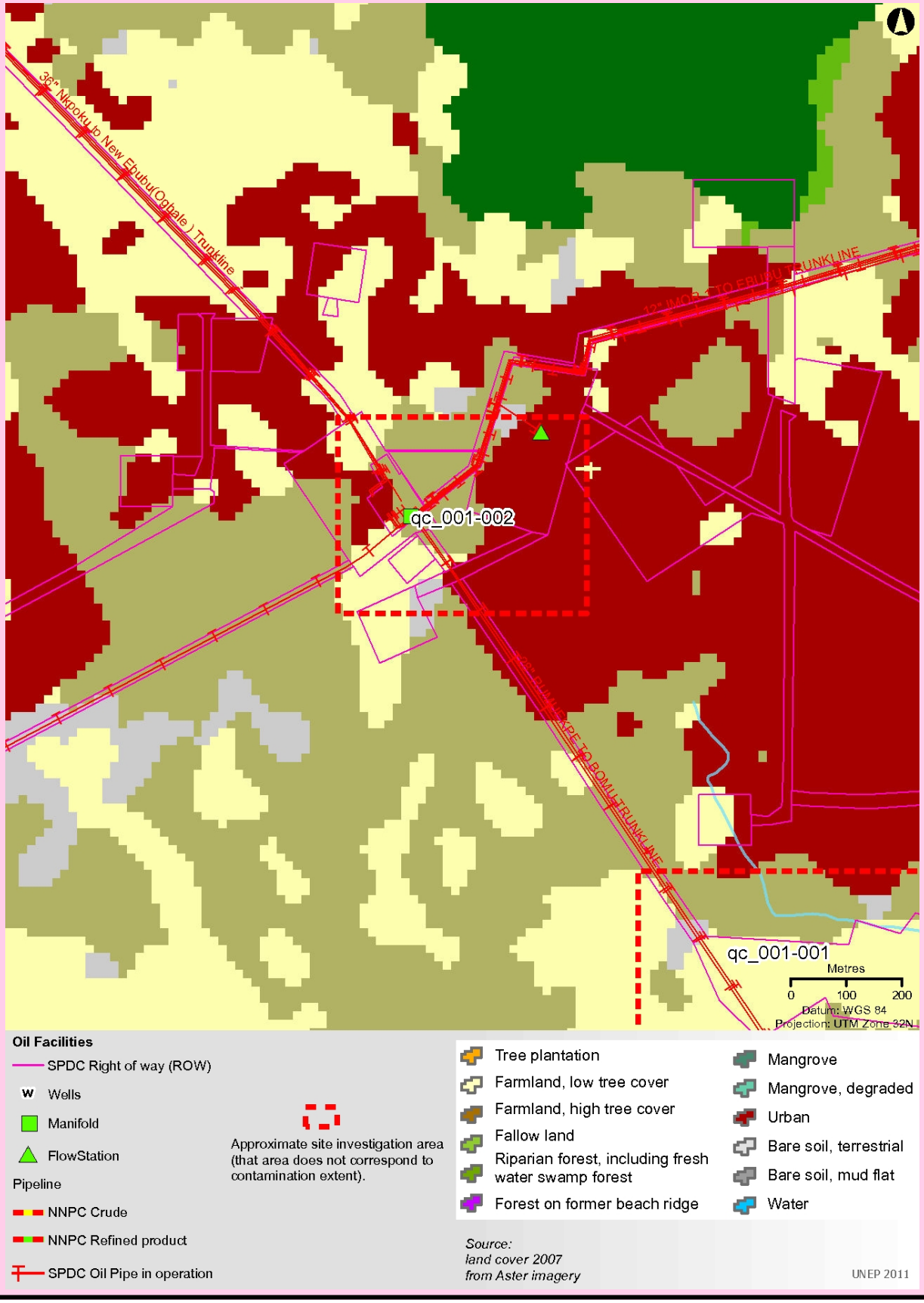
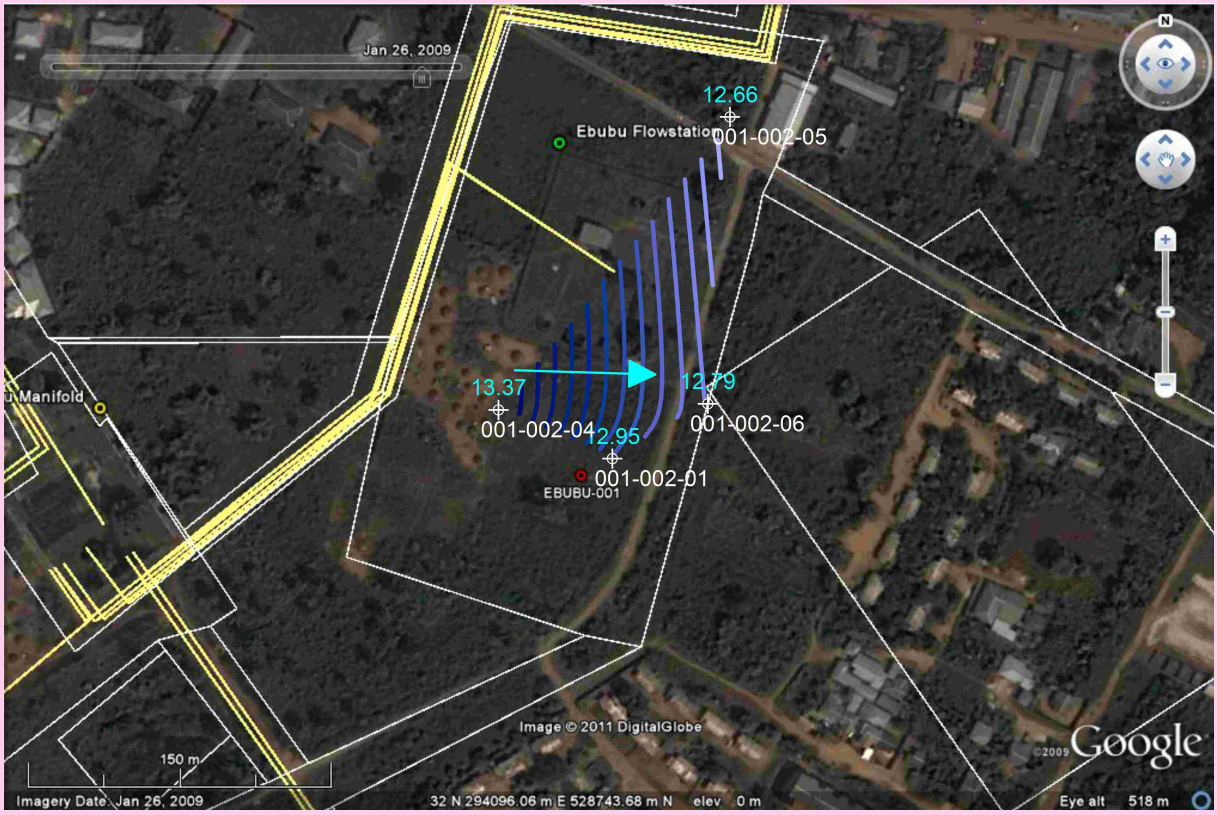
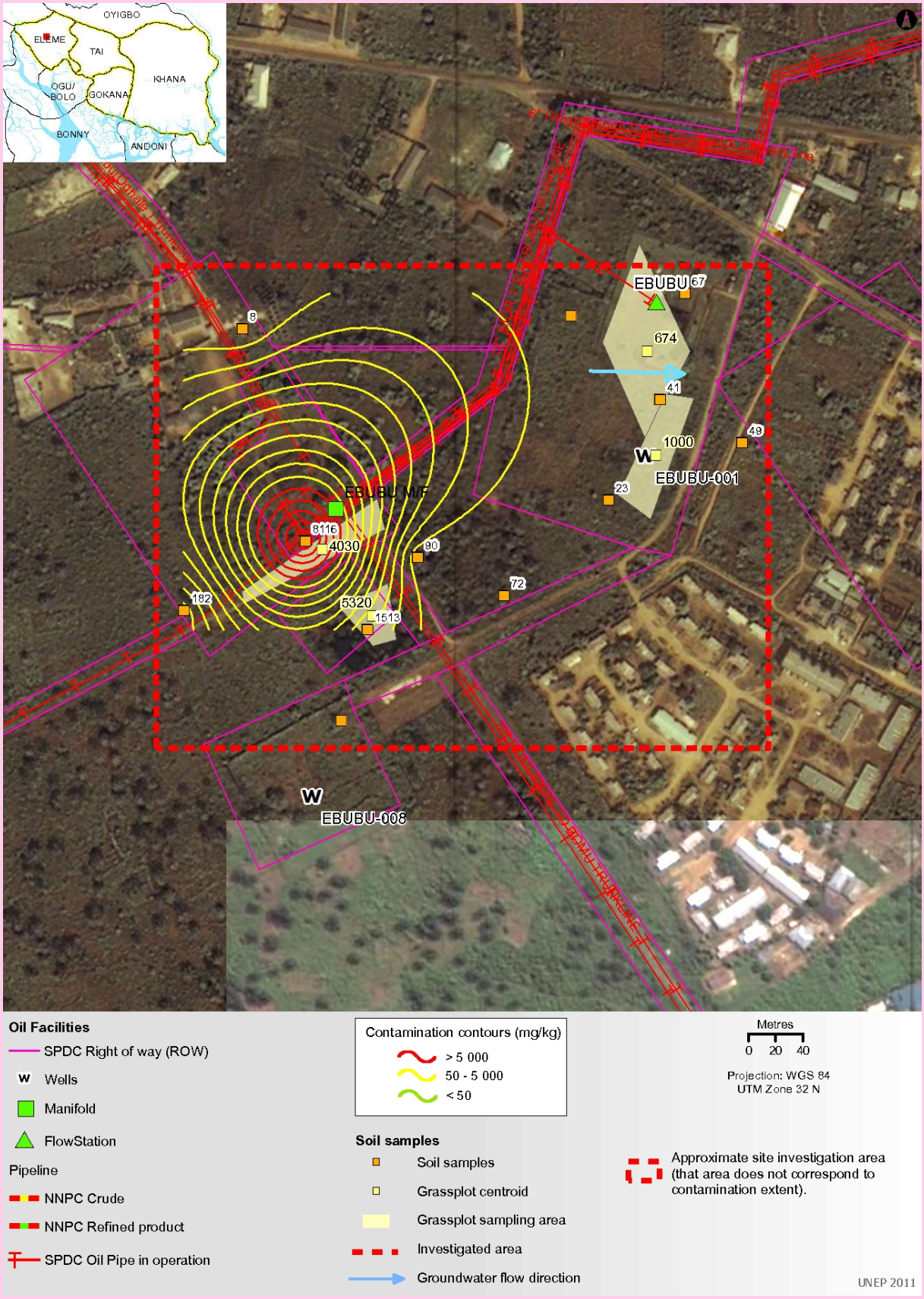
Landcover 2007



Ground Water Elevation Map



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.

Ground photograph

VII - Sample List

Soil sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
1753204	170.000	0.40	294116	528819
1753218	55.100	2.00	293864	528505
1753233	35.900	2.00	294158	528709
1753322	BDL	1.83	293791	528793
1753336	182.000	2.00	293748	528586
1753350	44.900	2.27	294116	528819
1753387	28.100	0.50	293791	528793
1753406	40.100	1.50	294098	528741
1753462	30.300	0.60	294060	528667
1753484	5,830.000	0.60	293837	528637
1753507	3,880.000	0.40	293883	528572
1753529	89.800	2.00	293920	528625
1753551	10,400.000	0.40	293837	528637
1753564	220.000	0.60	293983	528597
1753599	7,880.000	2.00	293837	528637
1753618	102.000	0.40	294158	528709
1753634	8,570.000	1.60	293837	528637
1753650	7,300.000	3.00	293837	528637
1753673	1,000.000	-	294095	528700
1753741	81.600	2.50	294033	528802
1753762	48.000	0.15	294098	528741
1753774	4,030.000	-	293850	528631
1753793	8.630	2.00	293983	528597
1753808	27.700	0.40	294033	528802
1753824	5,320.000	-	293887	528582
1753842	20.400	2.00	294060	528667
1753858	480.000	2.15	293883	528572
1753875	674.000	-	294089	528776
1753897	1,300.000	1.45	293883	528572

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1907570	780	294153	528886
1907583	1,240	294095	528718
1907595	1,980	294142	528745
1907621	127	294039	528742

Sediment sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Easting	Northing
1753249	50,000.000	293848	528559

Community well sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1907758	BDL	293767	528843
1907795	642.000	294053	528548
1907843	BDL	293443	529139

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