

Environmental Assessment of Ogoniland Site Specific Fact Sheets

WIKARAGU- KPEAN



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

I - Site Description

Site Name	WIIKARAGU- KPEAN
Site Number	qc_014-001
LGA	KHANA
Main community	WIIKARAGU KPEAN
Surrounding communities	KPEAN NWIKARA AGU WIIKARAGU WIIKARAGU KPEAN
Investigated area (ha)	14.93
Category	SPDC Operating Site
Eastings (WGS 84, Zone 32N)	327120
Northings (WGS 84, Zone 32N)	508649



<p>Recommendations for risk reduction</p>	<ul style="list-style-type: none"> - Communities should be informed in community meetings about health and safety precautions. - 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.
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II - Oilfield Infrastructure Type

Wells	YORLA-016 (closed in)
Flowstations	No
Manifolds	No
Flaresites	No
Oil pipeline in operation	No
NNPC crude line	No
NNPC product line	No

III - Spill History

Spills reported by SPDC	Incident Number 2003_00032	Incident Date 20030217
Spill reported by community	Yes	

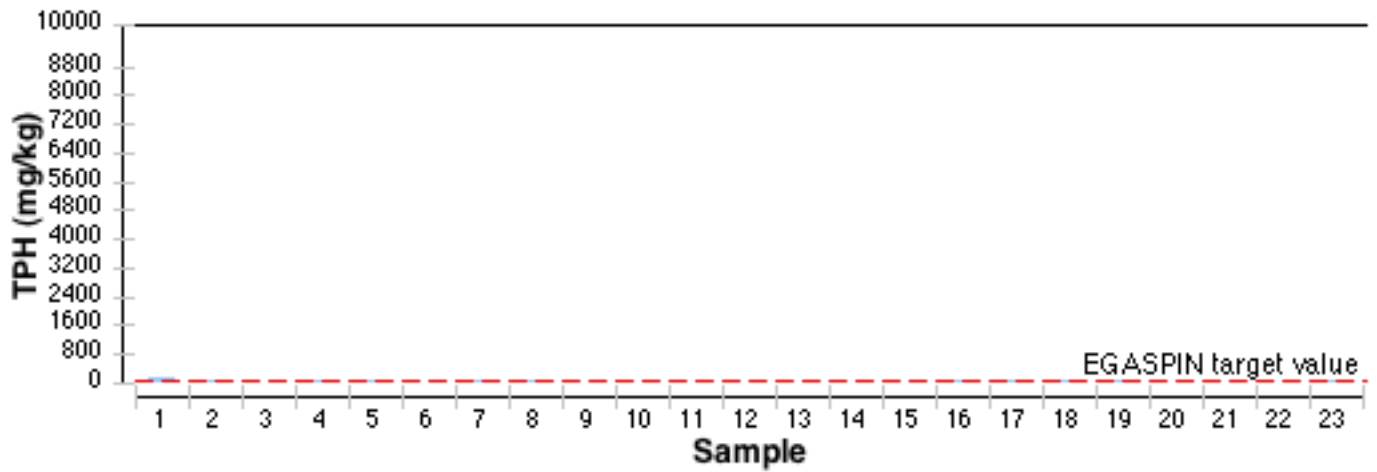
IV - Data Screening

Assessment criteria

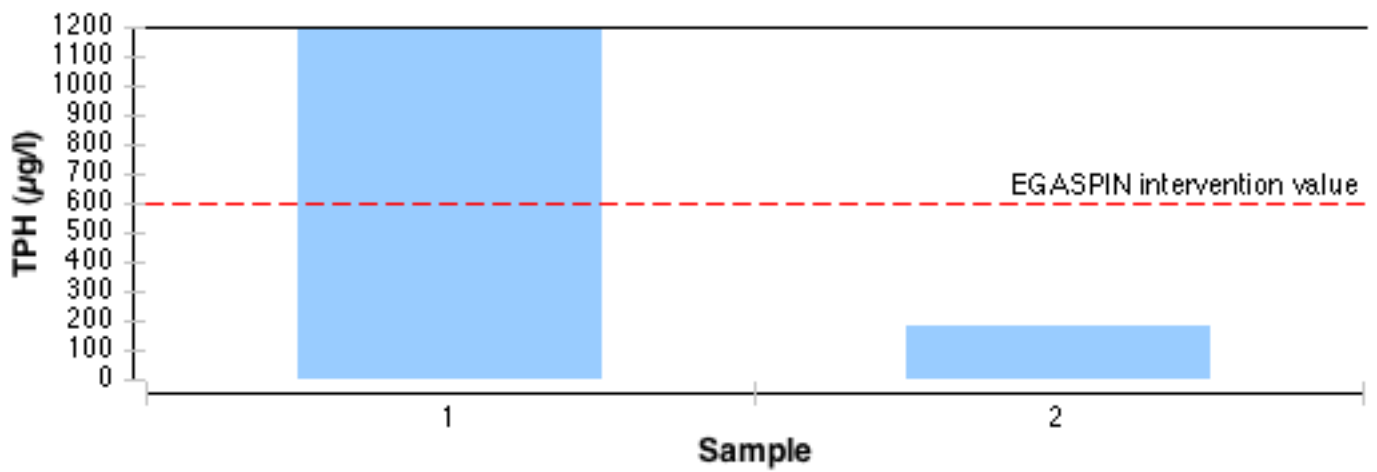
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 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	23
Deepest investigation (m)	2.6
Maximum soil TPH (mg/kg)	157.000
Number of soil measurements greater than EGASPIN intervention value	0
Deepest sample greater than EGASPIN (m)	0
Number of soil measurements below 1m	10
Number of soil measurements below 1m greater than EGASPIN intervention value	0
Number of ground water samples	2
Maximum groundwater TPH (µg/l)	2,140
Number of groundwater measurements greater than EGASPIN intervention value	1
Number of community well samples	1
Presence of hydrocarbons in community wells	Not found
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

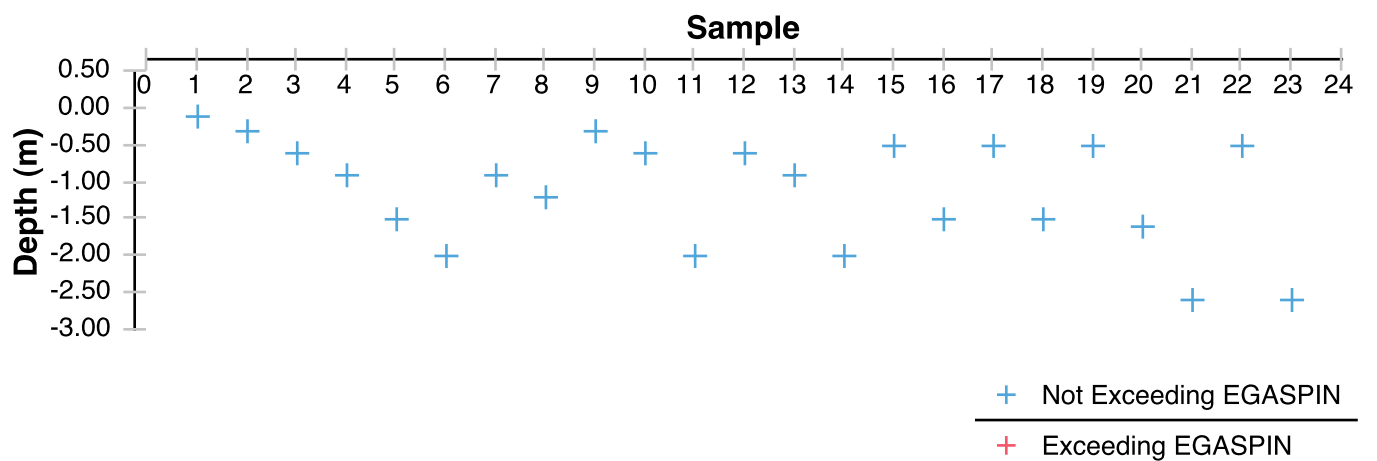
Soil Samples



Groundwater Samples



Soil Samples depth



Satellite image of the site



Sampling location map



Oil Facilities

- SPDC Right of way
- w** Wells
- Manifold
- ▲ FlowStation
- Pipeline**
- NNPC Crude
- NNPC Refined product
- SPDC Oil Pipe in operation

Soil samples

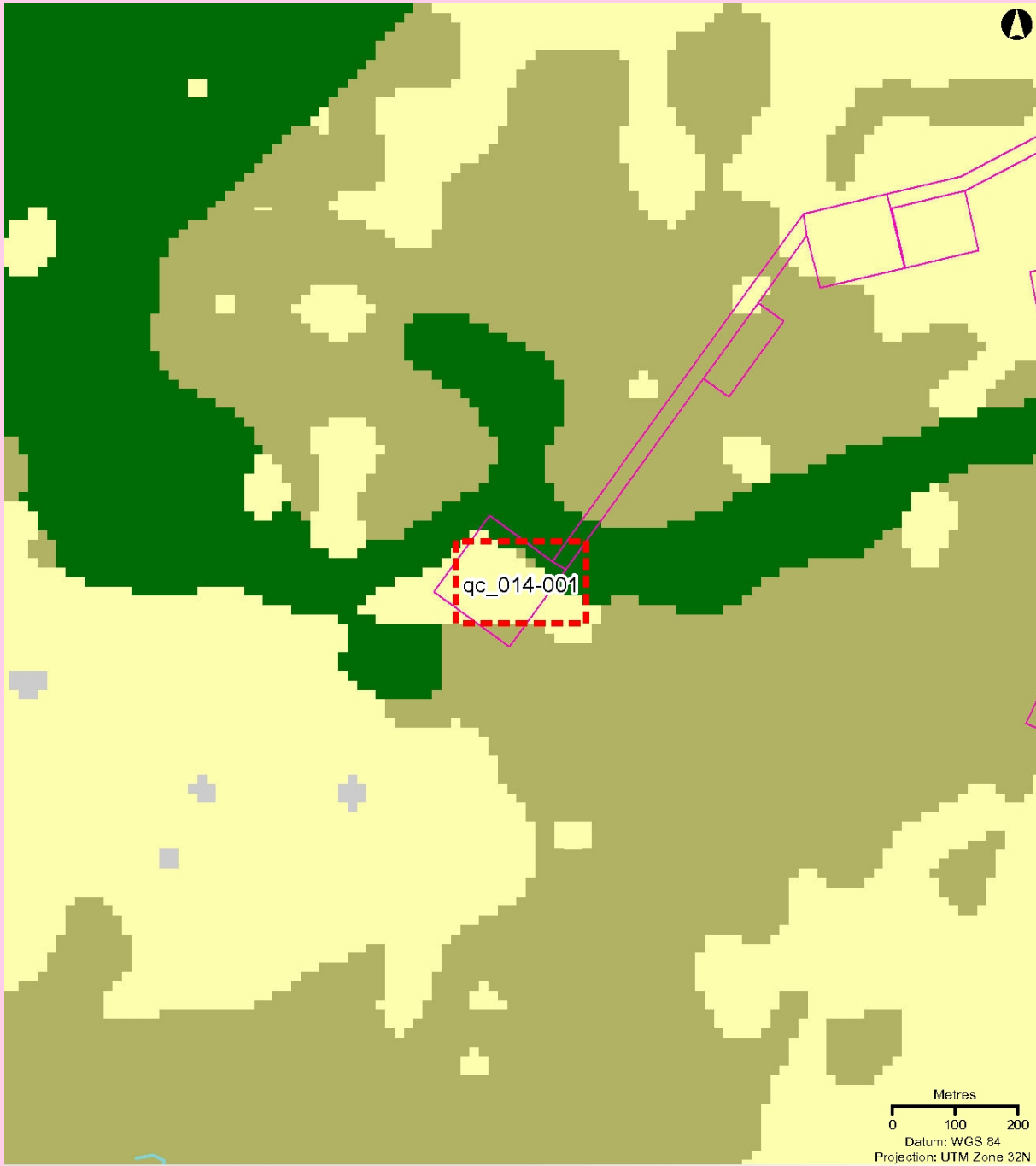
- Grassplot centroid
- Soil samples
- Soil Samples from GW monitoring well
- Grassplot sampling area
- Approximate site investigation area (that area does not correspond to contamination extent).
- Others**
- ▲ Air quality sampling
- Fish tissue sampling
- Sediment samples from Acquatic team
- Water Samples from Acquatic team

Water samples

- ▲ Rainwater samples (Community)
- ★ Bore-well (community)
- ★ Hand-dug well (community)
- Free-Phase samples
- ◇ Groundwater sample
- s w Surface water
- w Water sample taken from an oil well
- ⚙ Drilling well



Datum: WGS 84
 Projection: UTM Zone 32N
 UNEP 2011



Oil Facilities

- SPDC Right of way (ROW)
- w** Wells
- Manifold
- ▲ FlowStation
- Pipeline
- NNPC Crude
- NNPC Refined product
- SPDC Oil Pipe in operation

- - - Approximate site investigation area (that area does not correspond to contamination extent).

- Tree plantation
 - Farmland, low tree cover
 - Farmland, high tree cover
 - Fallow land
 - Riparian forest, including fresh water swamp forest
 - Forest on former beach ridge
- Mangrove
 - Mangrove, degraded
 - Urban
 - Bare soil, terrestrial
 - Bare soil, mud flat
 - Water

Source:
land cover 2007
from Aster imagery

UNEP 2011

Soil Contamination Map



Oil Facilities

- SPDC Right of way (ROW)
- Wells
- Manifold
- FlowStation
- Pipeline**
- NNPC Crude
- NNPC Refined product
- SPDC Oil Pipe in operation

Contamination contours (mg/kg)

- > 5 000
- 50 - 5 000
- < 50

Soil samples

- Soil samples
- Grassplot centroid
- Grassplot sampling area
- Investigated area
- Groundwater flow direction



Projection: WGS 84
UTM Zone 32 N

Approximate site investigation area (that area does not correspond to contamination extent).

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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
1822250	49.400	1.50	327101	508683
1822266	21.800	1.50	327065	508619
1822285	BDL	2.00	327075	508639
1822303	0.365	0.60	327101	508683
1822320	3.450	0.30	327075	508639
1822334	14.800	0.90	327128	508604
1822423	20.800	1.50	327035	508609
1822456	9.120	2.00	327101	508683
1822478	157.000	0.10	327101	508683
1822501	28.300	2.60	327175	508658
1822569	24.200	0.50	327035	508609
1822596	14.300	1.60	327052	508653
1822641	32.400	0.30	327101	508683
1822673	31.500	0.90	327101	508683
1822724	8.750	2.00	327128	508604
1822735	BDL	2.60	327052	508653
1822760	3.250	0.50	327175	508658
1822778	16.700	0.50	327065	508619
1822802	8.300	0.60	327075	508639
1822853	27.200	1.20	327204	508694
1822866	16.800	0.60	327128	508604
1822884	28.900	0.50	327052	508653
1822976	20.900	0.90	327204	508694

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1823013	178	327176	508648
1823025	2,140	327100	508685

Community well sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2390635	BDL	328504	509806

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 exceedences 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