

Environmental Assessment of Ogoniland Site Specific Fact Sheets

AABUE-UEKEN- KORORKORO



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	AABUE-UEKEN- KOROKORO
Site Number	qc_008-002
LGA	TAI
Main community	AABUE UEKEN KOROKORO
Surrounding communities	AABUE UEKEN KOROKORO KOROKORO
Investigated area (ha)	4.76
Category	SPDC Operating Site
Eastings (WGS 84, Zone 32N)	312841
Northings (WGS 84, Zone 32N)	523708



<p>Recommendations for risk reduction</p>	<ul style="list-style-type: none"> - 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.
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II - Oilfield Infrastructure Type

Wells	KOROKORO-006 (producing)
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 1996_00004	Incident Date 19960110
Spill reported by community	Yes	

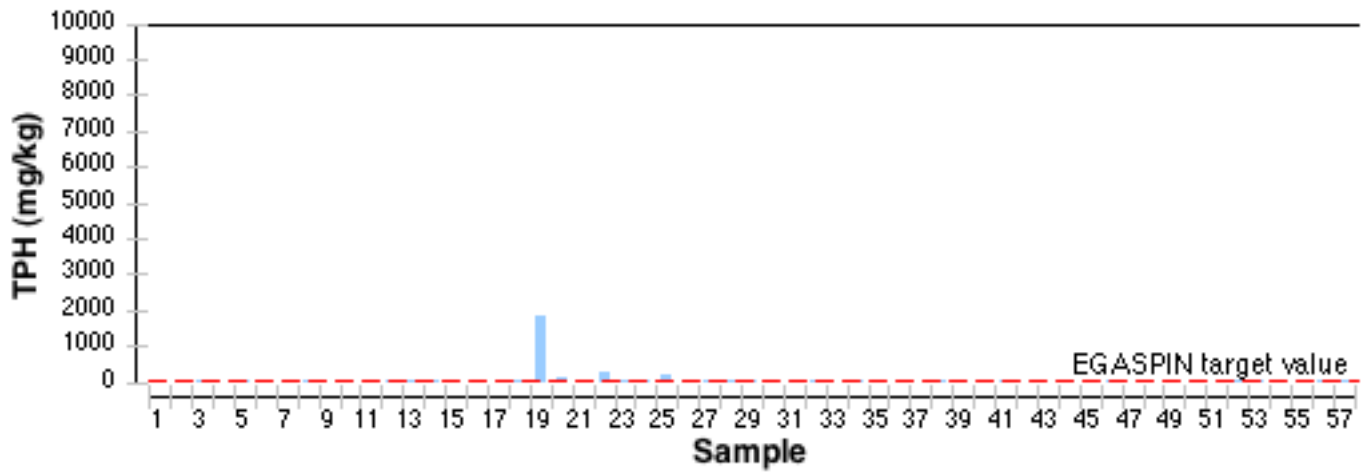
IV - Data Screening

Assessment criteria

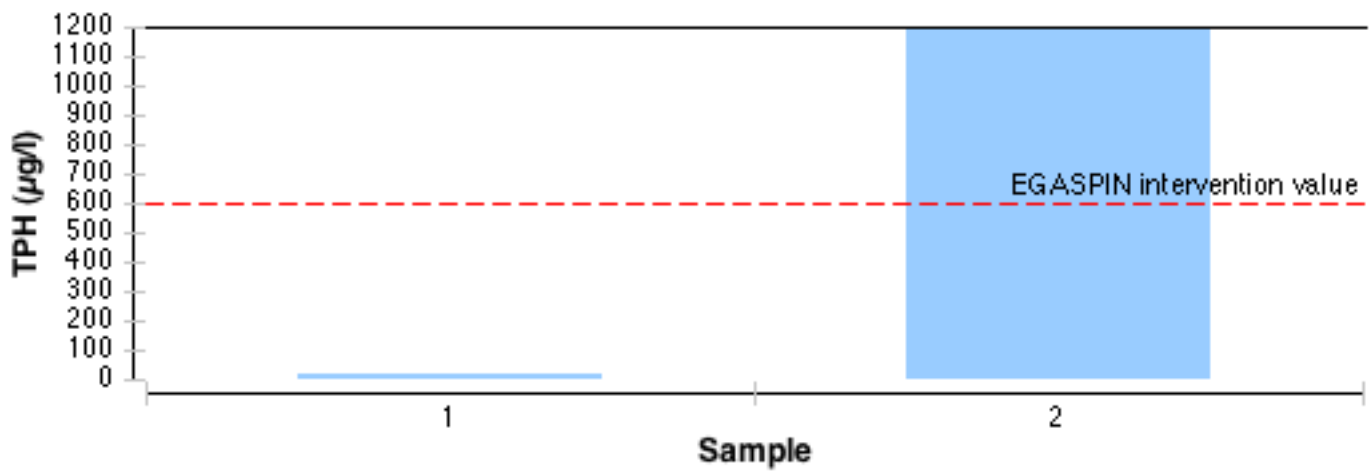
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 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	57
Deepest investigation (m)	5
Maximum soil TPH (mg/kg)	1,880.000
Number of soil measurements greater than EGASPIN intervention value	0
Deepest sample greater than EGASPIN (m)	0
Number of soil measurements below 1m	49
Number of soil measurements below 1m greater than EGASPIN intervention value	0
Number of ground water samples	2
Maximum groundwater TPH (µg/l)	42,800
Number of groundwater measurements greater than EGASPIN intervention value	1
Number of community well samples	8
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

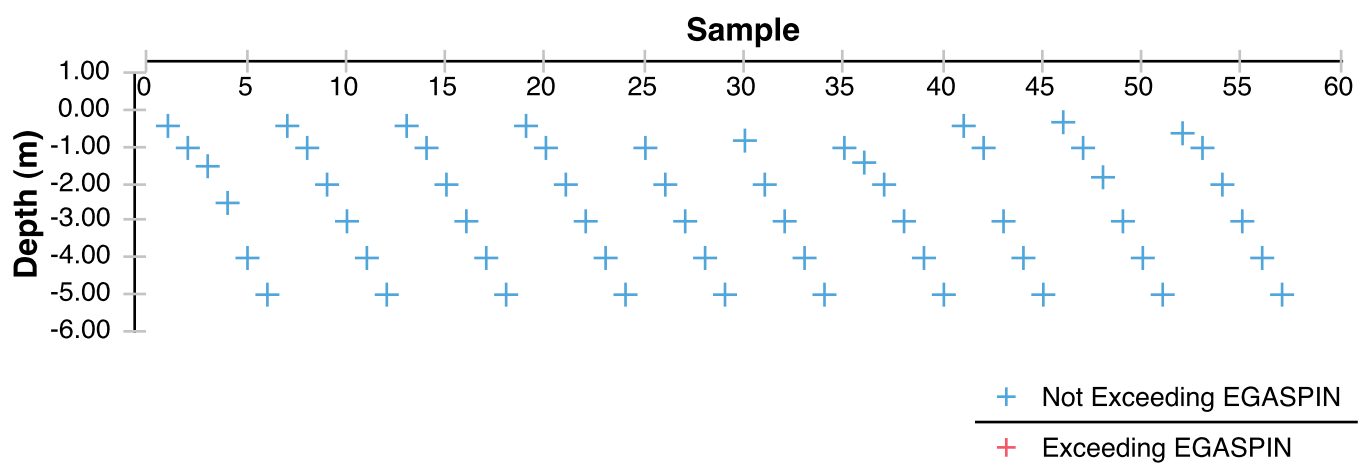
Soil Samples



Groundwater Samples



Soil Samples depth



Satellite image of the site



Metres
0 20
Projection: WGS 84
UTM Zone 32N



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

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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

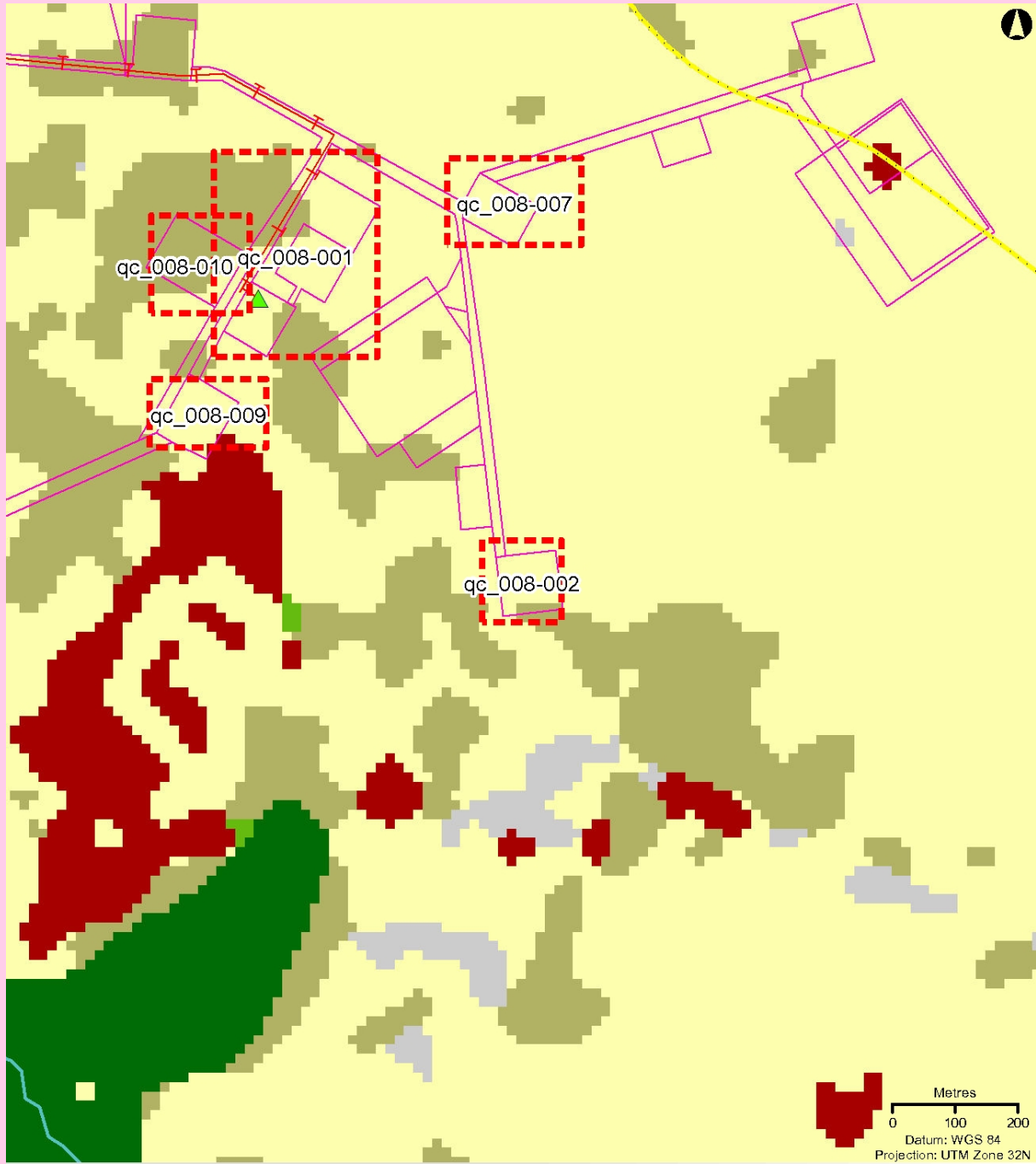
Water samples

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









Datum: WGS 84
Projection: UTM Zone 32N

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Oil Facilities

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

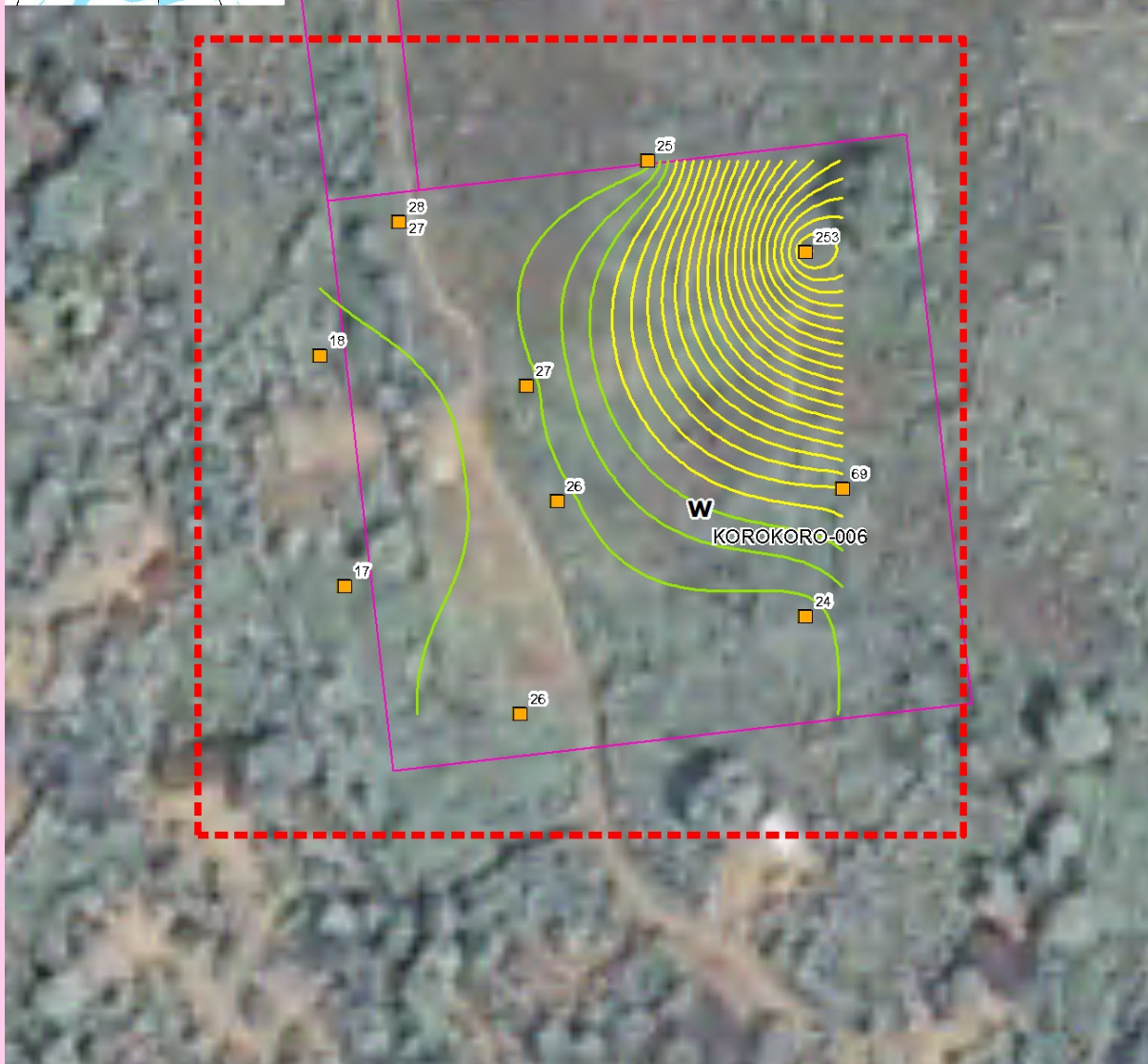
 Approximate site investigation area (that area does not correspond to contamination extent).

-  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

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Soil Contamination Map



Oil Facilities

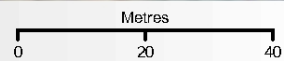
- SPDC Right of way (ROW)
- w** Wells
- Manifold
- ▲ FlowStation
- Pipeline
 - NNPC Crude
 - NNPC Refined product
 - ⊥ SPDC Oil Pipe in operation

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
2463043	95.900	1.00	312878	523738
2463064	56.900	2.00	312878	523738
2463081	289.000	3.00	312878	523738
2463108	1,880.000	0.40	312878	523738
2463118	60.300	4.00	312878	523738
2463132	49.700	5.00	312878	523738
2463212	64.700	0.30	312798	523721
2463227	12.900	1.00	312798	523721
2463252	2.630	1.80	312798	523721
2463274	8.240	3.00	312798	523721
2463281	33.200	4.00	312798	523721
2463289	14.400	5.00	312798	523721
2463458	5.220	2.00	312831	523662
2463491	22.800	1.00	312811	523743
2463523	38.000	2.00	312884	523699
2463575	34.000	5.00	312831	523662
2463591	2.340	5.00	312802	523683
2463701	2.870	4.00	312852	523753
2463743	17.900	2.00	312852	523753
2463778	32.700	1.00	312832	523716
2463824	30.700	0.80	312878	523678
2463874	28.900	0.40	312832	523716
2463927	28.400	3.00	312831	523662
2463957	34.500	4.00	312802	523683
2463974	55.500	0.40	312852	523753
2463993	28.500	4.00	312884	523699
2464008	16.400	2.00	312832	523716
2464117	26.300	3.00	312878	523678
2464136	37.500	1.00	312837	523697
2464158	34.100	5.00	312852	523753
2464198	18.400	1.00	312802	523683
2464212	33.900	5.00	312837	523697
2464230	22.000	0.40	312802	523683
2464360	27.000	2.00	312811	523743
2464373	10.900	3.00	312802	523683
2464403	7.020	1.40	312831	523662
2464418	38.400	1.00	312831	523662
2464431	23.900	4.00	312831	523662
2464453	28.800	3.00	312852	523753
2464484	27.900	0.60	312811	523743

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2464491	20.500	5.00	312811	523743
2464503	37.400	4.00	312811	523743
2464512	37.900	5.00	312884	523699
2464532	209.000	1.00	312884	523699
2464538	30.600	3.00	312884	523699
2464555	21.200	1.50	312837	523697
2464573	31.000	4.00	312837	523697
2464583	30.700	3.00	312832	523716
2464605	41.100	5.00	312832	523716
2464618	13.400	4.00	312878	523678
2464623	33.000	5.00	312878	523678
2464628	18.700	2.00	312878	523678
2464635	14.200	4.00	312832	523716
2464649	33.700	1.00	312852	523753
2464653	8.330	2.50	312837	523697
2464657	25.900	0.40	312837	523697
2464668	29.700	3.00	312811	523743

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2689696	13	312818	523675
2689734	42,800	312880	523704

Community well sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1854328	59.400	312760	524379
2689516	14.000	312795	523698
2689555	BDL	312836	523591
2689573	12.000	312798	523604
2689594	12.000	312747	523599
2689624	11.000	312871	523654
2689648	11.000	312771	523635
2689663	13.000	312779	523475

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