

Environmental Assessment of Ogoniland Site Specific Fact Sheets

NSIOKEN-AKPAJO



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	NSIOKEN-AKPAJO
Site Number	qc_003-001
LGA	OBIO/AKPOR
Main community	NSIOKEN AKPAJO
Surrounding communities	AKPAJO NSIOKEN AKPAJO
Investigated area (ha)	63.42
Category	SPDC Pipeline ROW
Eastings (WGS 84, Zone 32N)	290848
Northings (WGS 84, Zone 32N)	535742



<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. - 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	No
Flowstations	No
Manifolds	No
Flaresites	No
Oil pipeline in operation	24" NKPOKU TO BOMU TRUNKLINE 36" RUMUEKPE TO NKPOKU TRUNKLINE
NNPC crude line	No
NNPC product line	No

III - Spill History

Spills reported by SPDC	Incident Number 2006_00222	Incident Date 20061112
Spill reported by community	Yes	

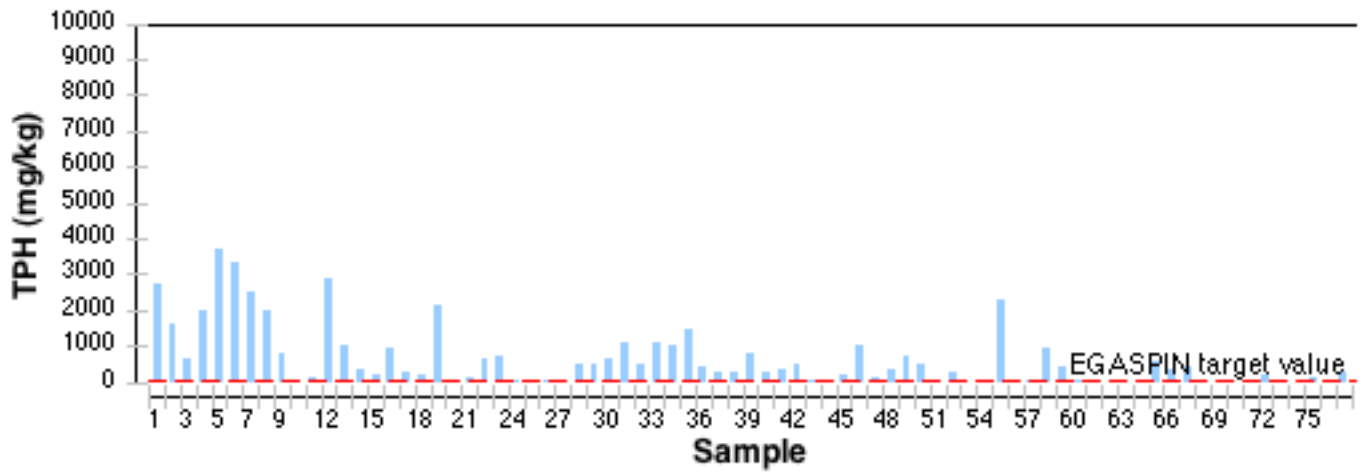
IV - Data Screening

Assessment criteria

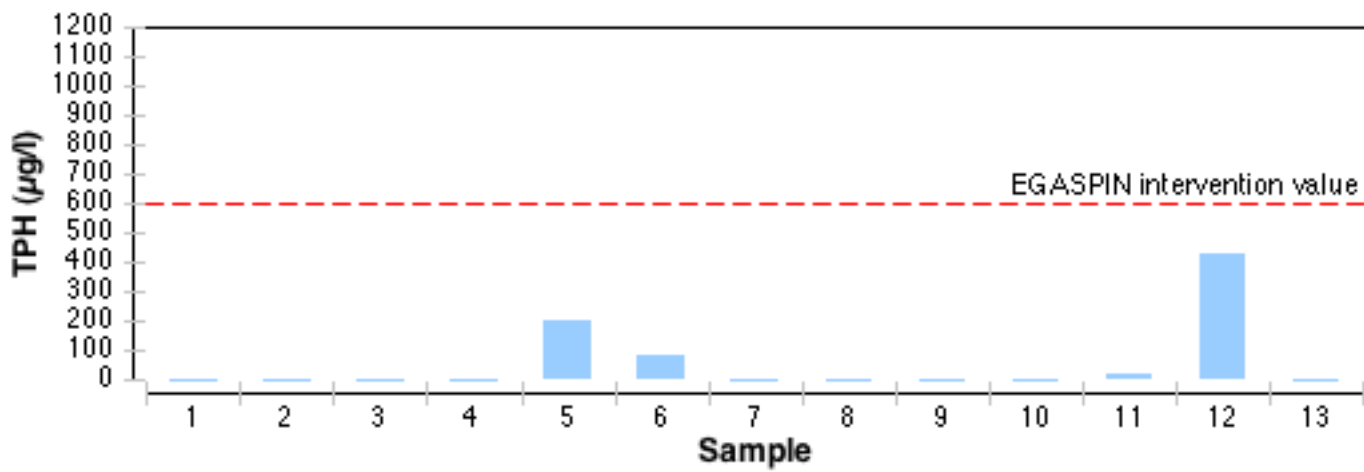
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 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	77
Deepest investigation (m)	8
Maximum soil TPH (mg/kg)	3,680.000
Number of soil measurements greater than EGASPIN intervention value	0
Deepest sample greater than EGASPIN (m)	0
Number of soil measurements below 1m	42
Number of soil measurements below 1m greater than EGASPIN intervention value	0
Number of ground water samples	13
Maximum groundwater TPH (µg/l)	427
Number of groundwater measurements greater than EGASPIN intervention value	0
Number of community well samples	0
Presence of hydrocarbons in community wells	Not applicable
Number of CL sediment samples	1
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

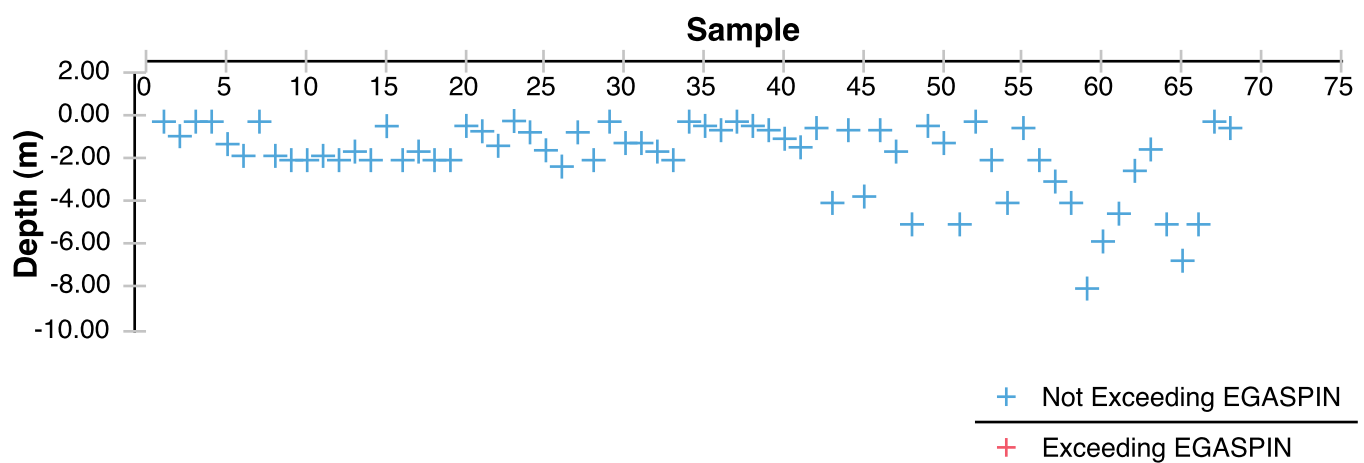
Soil Samples



Groundwater Samples



Soil Samples depth



Satellite image of the site



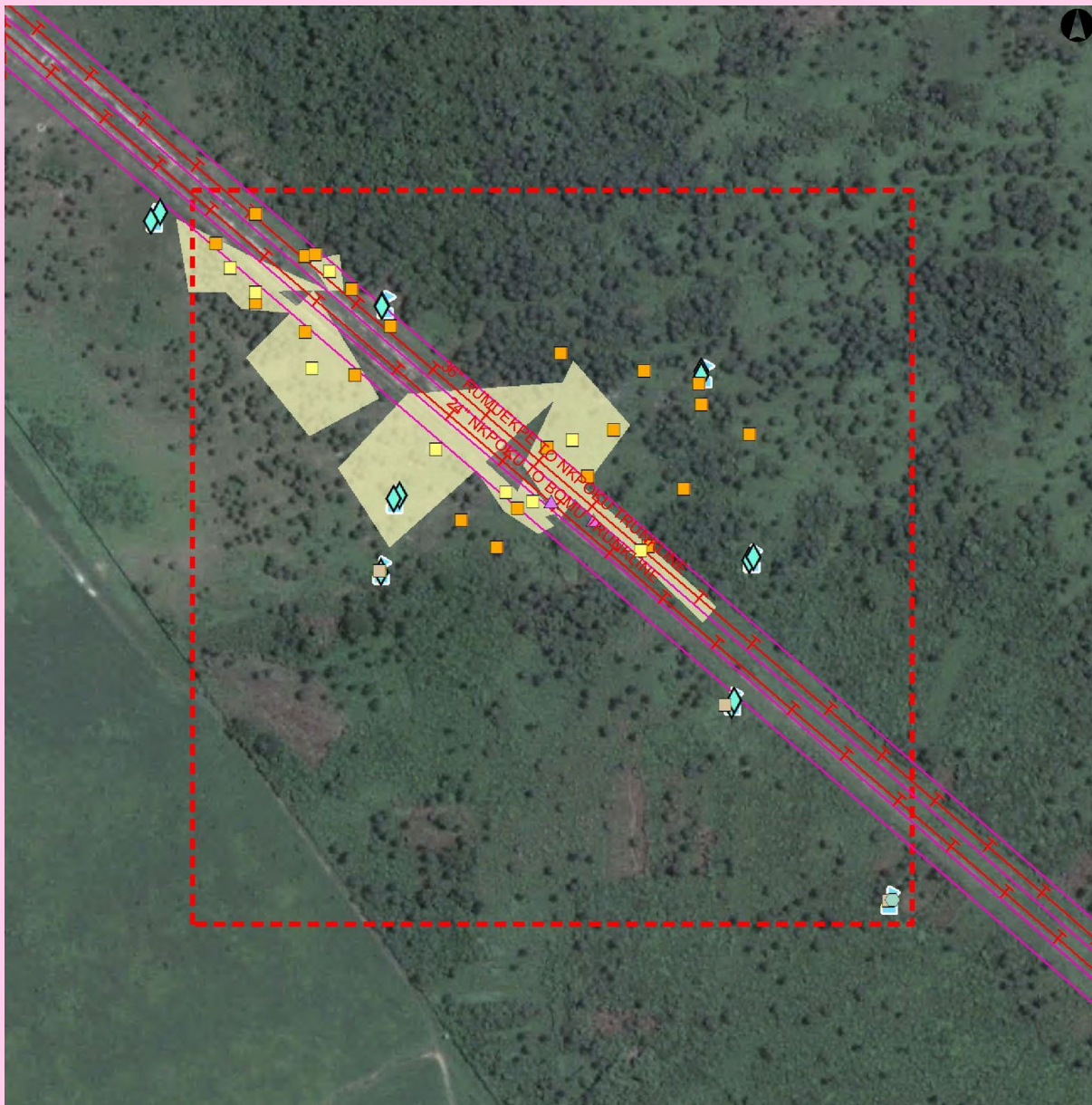
Metres
0 20 40 60 80 100 120
Projection: WGS 84
UTM Zone 32N



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

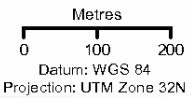
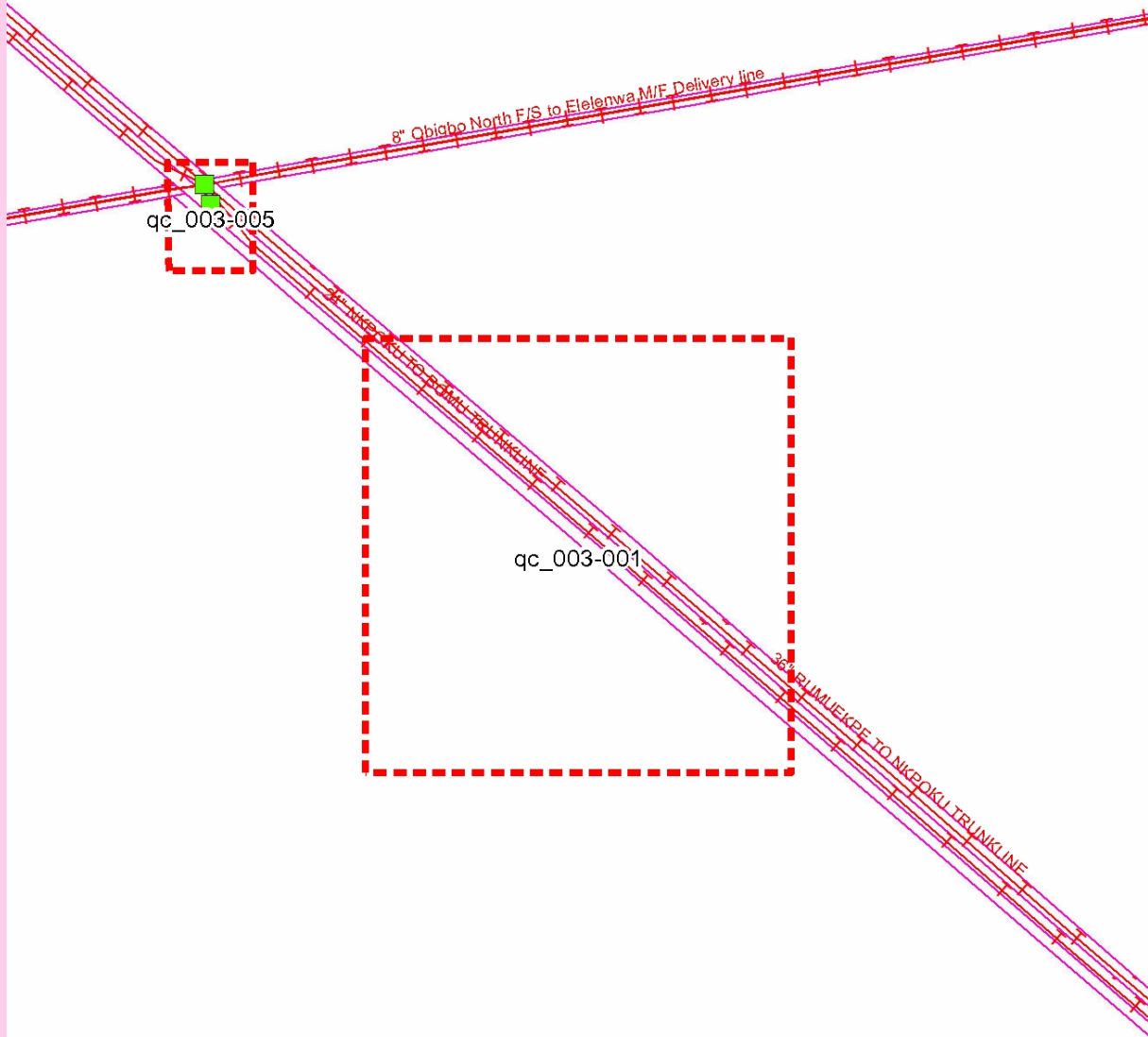
Water samples

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

Metres
0 20 40

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

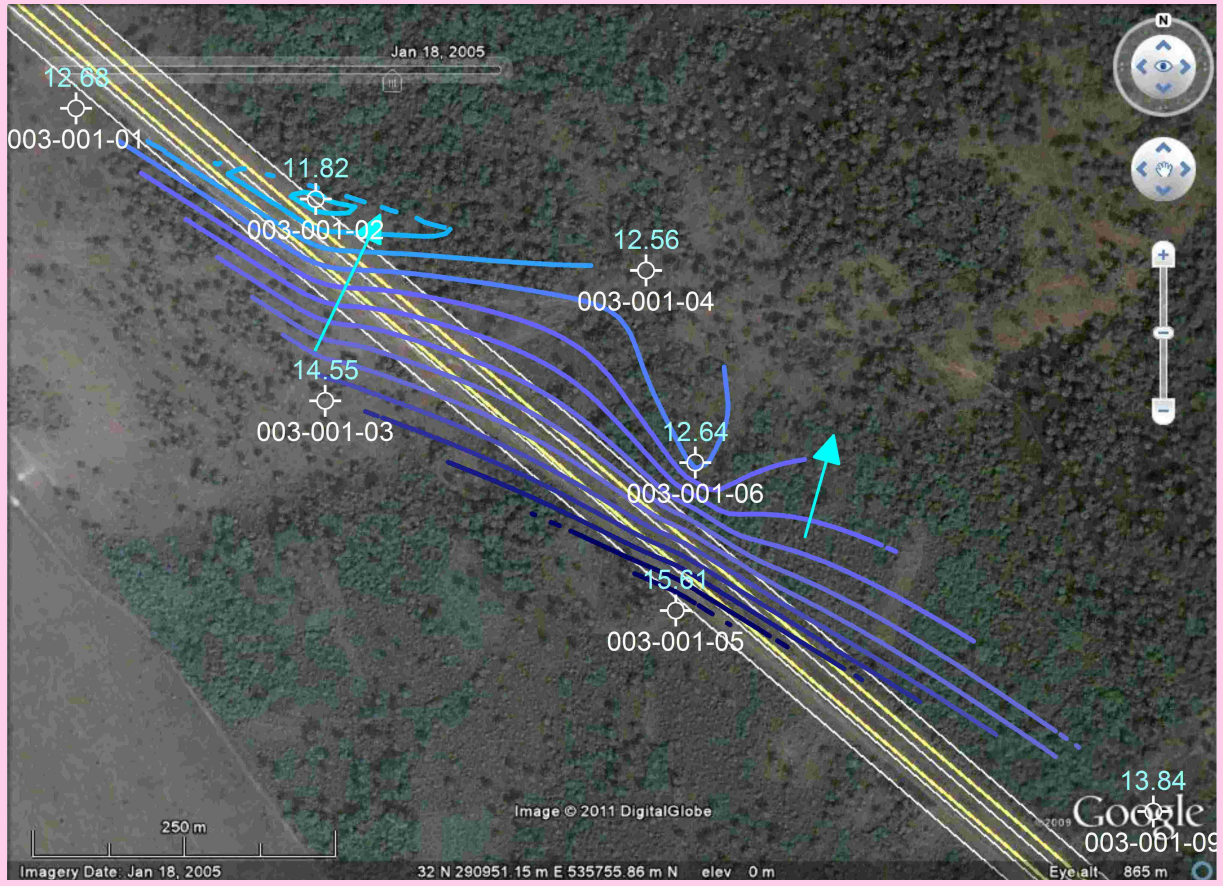
Approximate site investigation area (that area does not correspond to contamination extent).

- 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

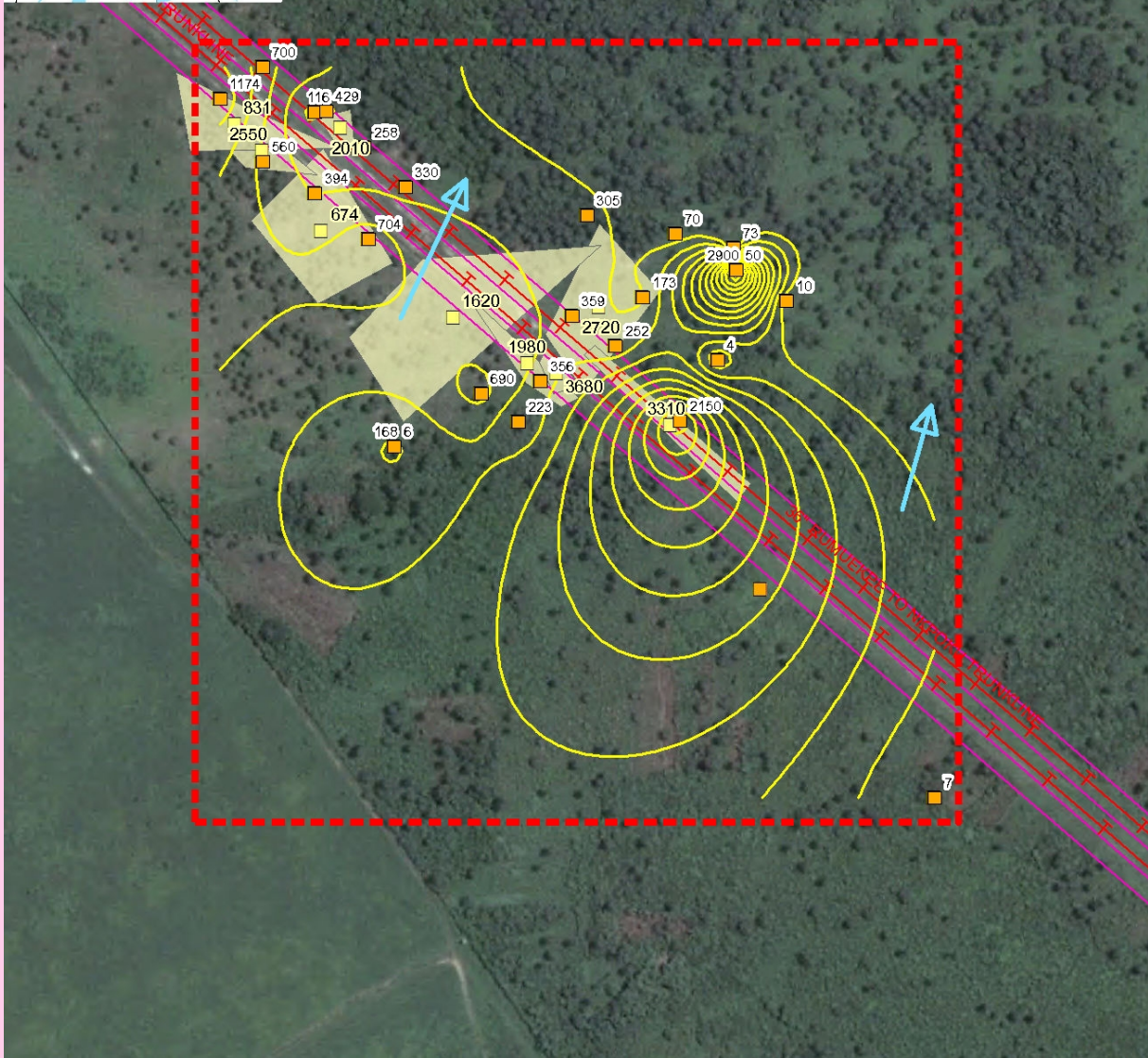
Source:
land cover 2007
from Aster imagery

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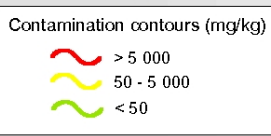
Ground Water Elevation Map



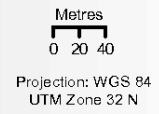
Soil Contamination Map



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



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



- - - 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
1664678	not analyzed for TPH	8.00	290995	535615
1693522	66.400	0.20	290973	535890
1693552	157.000	0.88	290973	535890
1693812	2,150.000	2.00	290930	535751
1693849	3,310.000	-	290923	535747
1693881	2,900.000	0.20	290975	535872
1693917	99.700	2.00	290926	535901
1693975	503.000	2.00	290878	535811
1694003	2,720.000	-	290865	535842
1694031	1,980.000	-	290808	535797
1694052	308.000	1.80	290818	535783
1694090	916.000	0.20	290818	535783
1694137	674.000	-	290642	535903
1694153	682.000	1.60	290770	535773
1694369	175.000	2.00	290818	535783
1694382	65.800	1.80	290926	535901
1694398	183.000	1.80	290843	535835
1694415	3,680.000	-	290831	535789
1694500	720.000	2.00	290770	535773
1694521	48.000	2.00	290973	535890
1694543	1,620.000	-	290748	535834
1694569	317.000	1.25	290843	535835
1694595	989.000	0.20	290843	535835
1694610	50.100	1.60	290975	535872
1694631	not analyzed for TPH	2.00	290878	535811
1694730	20.700	0.41	290973	535890
1696054	831.000	-	290572	535989
1696109	2,010.000	-	290657	535986
1696135	2,550.000	-	290594	535968
1696310	515.000	1.40	290594	535959
1696327	334.000	0.60	290594	535959
1696346	693.000	1.00	290594	535959
1696371	80.700	0.40	290636	535999
1696407	148.000	0.40	290594	535959
1696461	1,020.000	0.20	290594	535959
1696481	237.000	0.60	290636	535999
1696510	30.700	0.20	290636	535999
1696530	261.000	2.00	290709	535939
1696546	786.000	1.20	290679	535897
1696573	291.000	0.20	290679	535897

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
1696709	372.000	1.60	290636	535934
1696807	459.000	0.70	290709	535939
1696844	483.000	2.00	290636	535934
1696873	258.000	1.20	290676	535971
1697007	1,500.000	2.30	290560	536010
1697018	1,090.000	1.33	290594	536035
1697122	516.000	0.40	290594	536035
1697138	1,060.000	1.54	290560	536010
1697157	1,100.000	0.70	290560	536010
1697199	636.000	0.65	290594	536035
1697218	507.000	0.17	290560	536010
2181153	45.000	5.00	290900	535850
2181175	2.060	3.70	290960	535800
2181218	3.500	5.80	291135	535448
2181262	16.200	0.60	290960	535800
2181311	28.500	0.50	290800	535750
2181351	0.633	4.50	290700	535730
2181476	924.000	0.40	290900	535850
2181508	447.000	4.00	290645	536000
2182371	251.000	4.00	290800	535750
2182399	55.800	0.20	291016	535847
2182453	11.200	2.50	290700	535730
2182482	87.800	0.50	290645	536000
2182542	2,290.000	0.60	290855	535916
2182803	15.200	2.00	291016	535847
2182852	212.000	1.50	290700	535730
2182884	6.480	5.00	290700	535730
2182929	17.100	6.70	291135	535448
2182967	22.300	5.00	290855	535916
2182992	556.000	2.00	290645	536000
2183021	139.000	5.00	290700	535730
2183061	391.000	3.00	290645	536000
2183112	405.000	1.20	290900	535850
2183148	50.700	0.20	291135	535448
2183173	286.000	0.50	290700	535730
2183212	0.289	4.00	291016	535847
2183255	77.500	1.60	290855	535916

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1853147	BDL	290975	535901
1853151	76	291016	535739
1853158	199	291001	535615
1853172	BDL	290702	535958
1853183	BDL	290717	535795
1853196	BDL	290512	536037
2609651	BDL	290504	536029
2609653	BDL	290701	535729
2609658	BDL	290702	535956
2609660	BDL	290975	535897
2609661	BDL	290712	535792
2609662	427	291020	535742
2609663	14	291003	535620

Sediment sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Easting	Northing
2609666	not analyzed for TPH	291139	535449

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