

Environmental Assessment of Ogoniland Site Specific Fact Sheets

NSISIOKEN- AGBI, OGALE



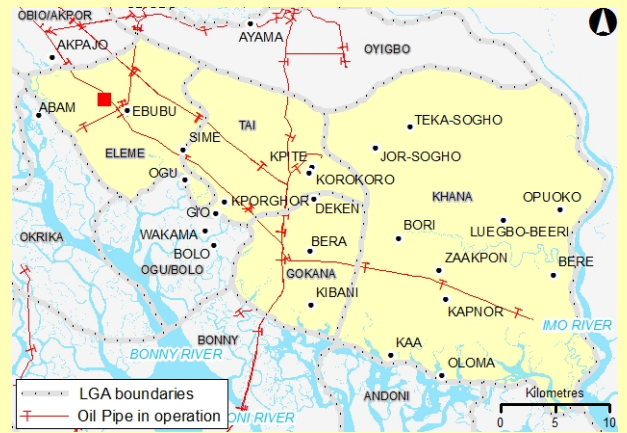
This fact sheet is part of a series prepared as part of the Environmental Assessment of Ogoniland by the United Nations Environment Programme (UNEP). It provides the observations and results from one of the individual sites studied in detail, plus the specific risk reduction measures for follow-up action.

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	NSISIOKEN- AGBI, OGALE
Site Number	qc_001-005
LGA	ELEME
Main community	NSISIOKEN AGBI OGALE
Surrounding communities	AGBI AGBI OGALE NSISIOKEN AGBI NSISIOKEN AGBI OGALE NSISIOKEN OGALE OGALE OGALE NCHIA OGALE NKPEGKPALE OKULUEBU OGALE
Investigated area (ha)	67.21
Category	PPMC Product Pipeline
Eastings (WGS 84, Zone 32N)	292714
Northings (WGS 84, Zone 32N)	529480



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

Wells	No
Flowstations	No
Manifolds	No
Flaresites	No
Oil pipeline in operation	36" Nkpoku to New Ebubu(Oghale) Trunkline 20" RUMUEKPE MF to BOMU MF TRUNKLINE(ABANDONED) 28" RUMUEKPE TO BOMU TRUNKLINE
NNPC crude line	No
NNPC product line	NNPC TRUNKLINE

III - Spill History

Spills reported by SPDC	No
Spill reported by community	Yes

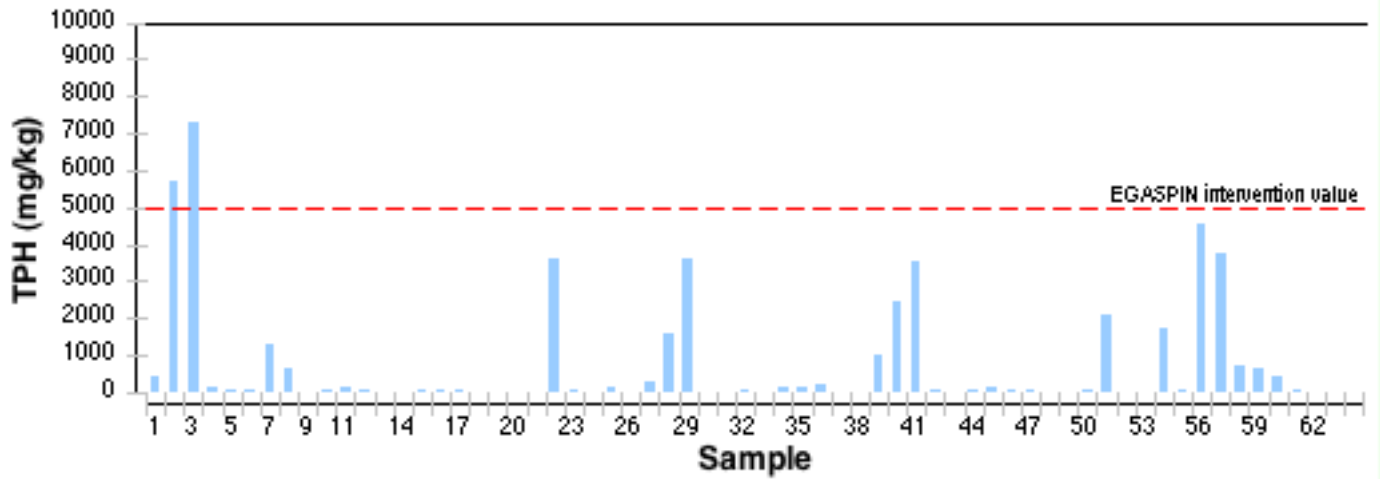
IV - Data Screening

Assessment criteria

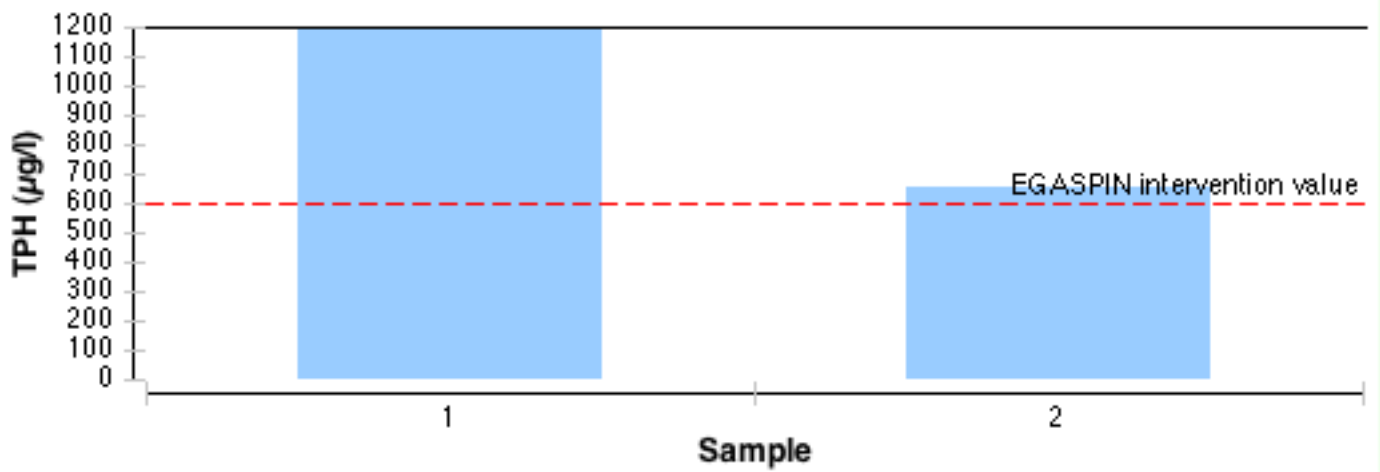
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 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	64
Deepest investigation (m)	6
Maximum soil TPH (mg/kg)	7,310.000
Number of soil measurements greater than EGASPIN intervention value	2
Deepest sample greater than EGASPIN (m)	2
Number of soil measurements below 1m	50
Number of soil measurements below 1m greater than EGASPIN intervention value	2
Number of ground water samples	7
Maximum groundwater TPH (µg/l)	86,100
Number of groundwater measurements greater than EGASPIN intervention value	2
Number of community well samples	20
Presence of hydrocarbons in community wells	Yes
Number of CL sediment samples	2
Maximum CL sediment TPH (mg/kg)	1,950.000
Number of CL sediment measurements greater than EGASPIN intervention value	0
Presence of hydrocarbons in sediment above EGASPIN intervention value	Not found

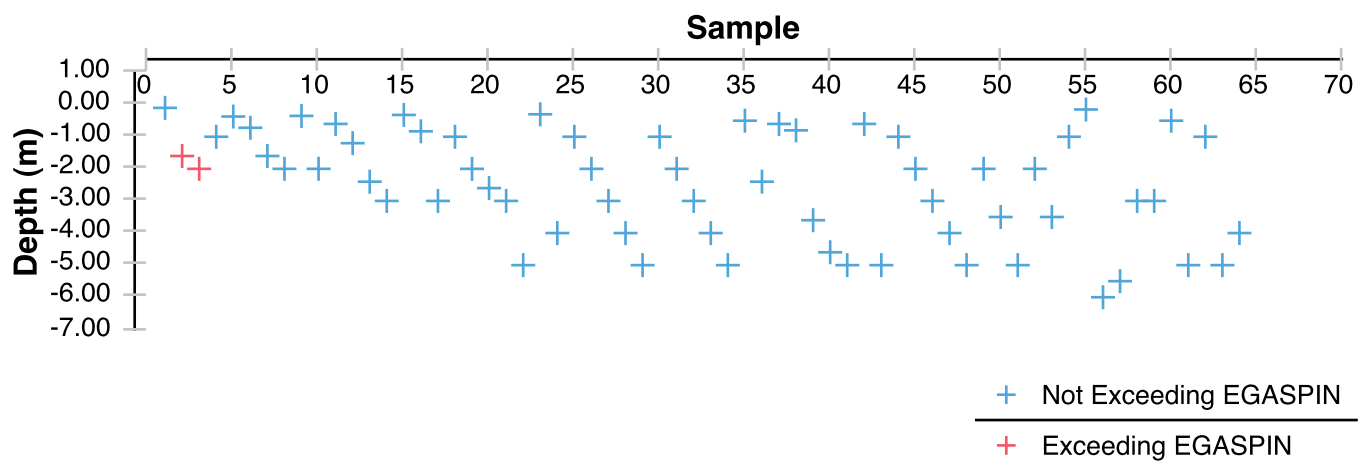
Soil Samples



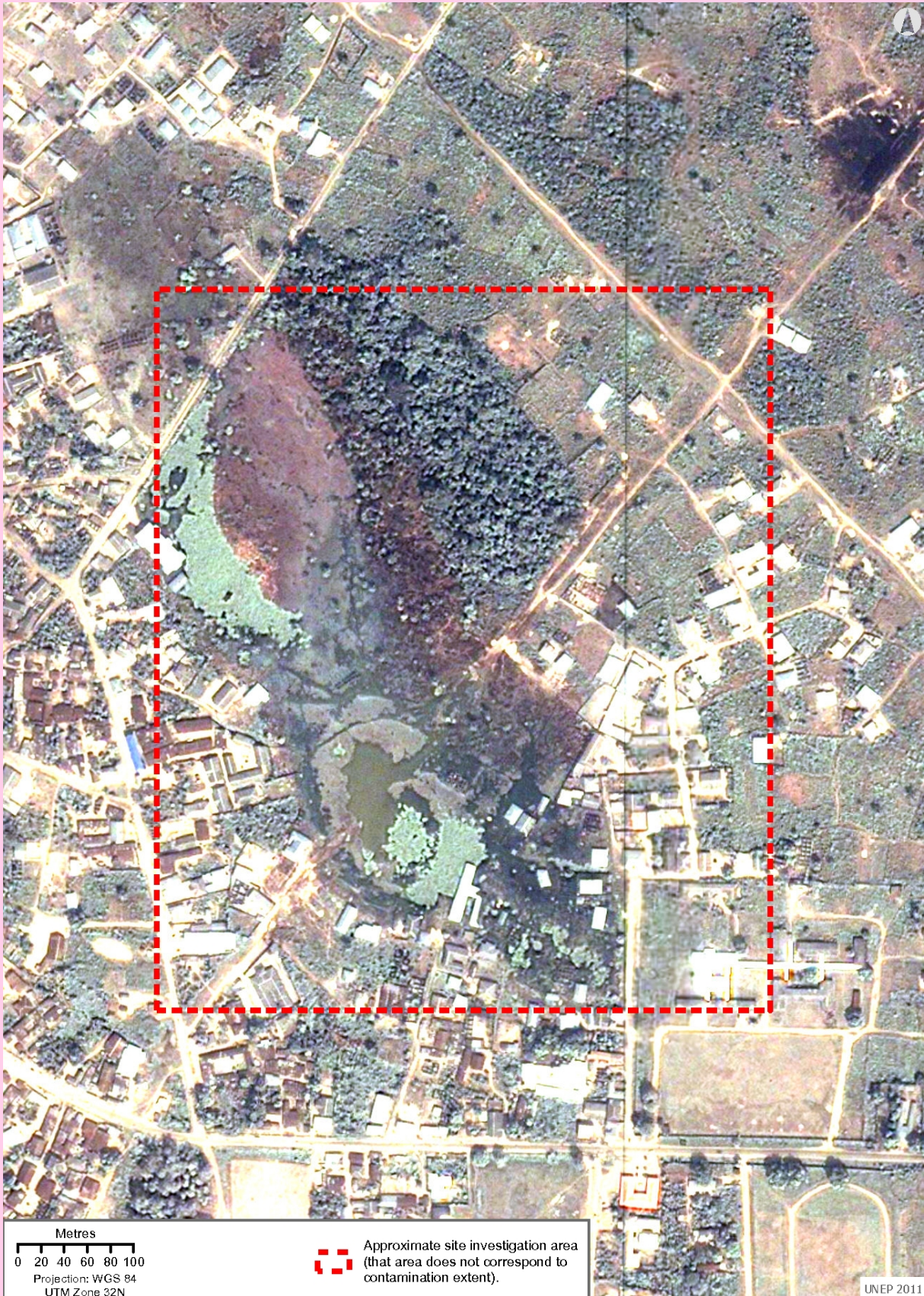
Groundwater Samples



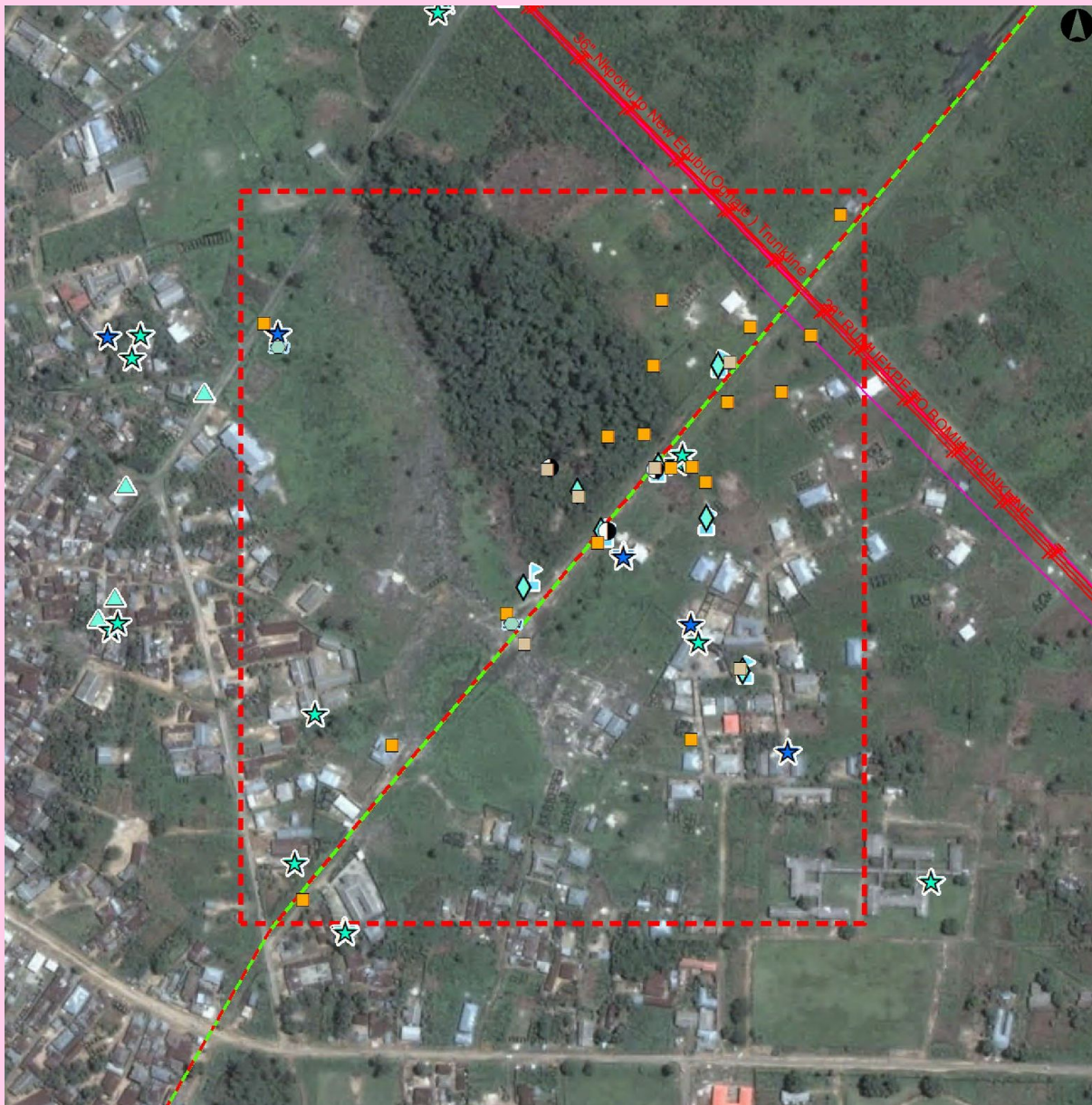
Soil Samples depth



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

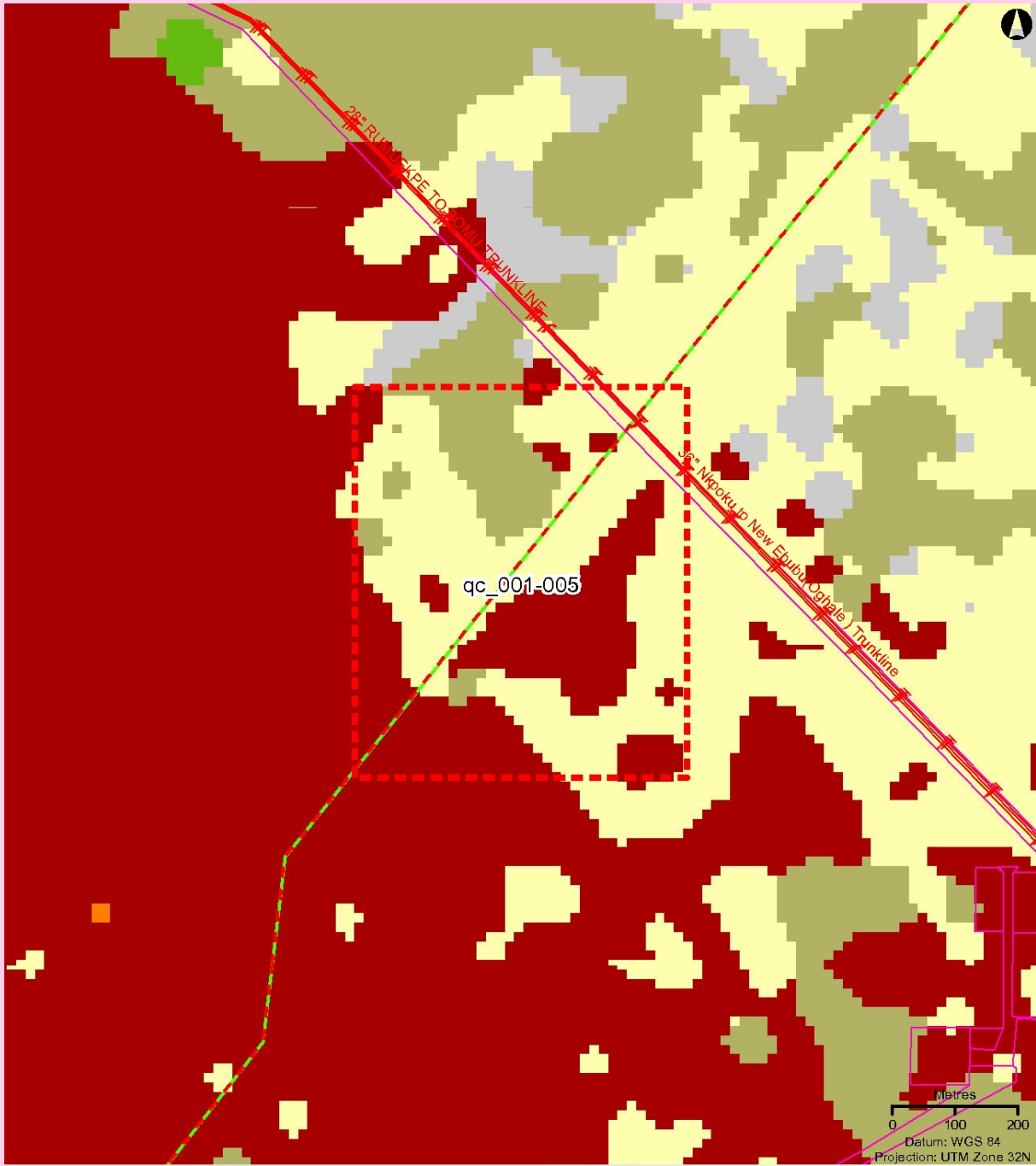
Water samples

- ▲ 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







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

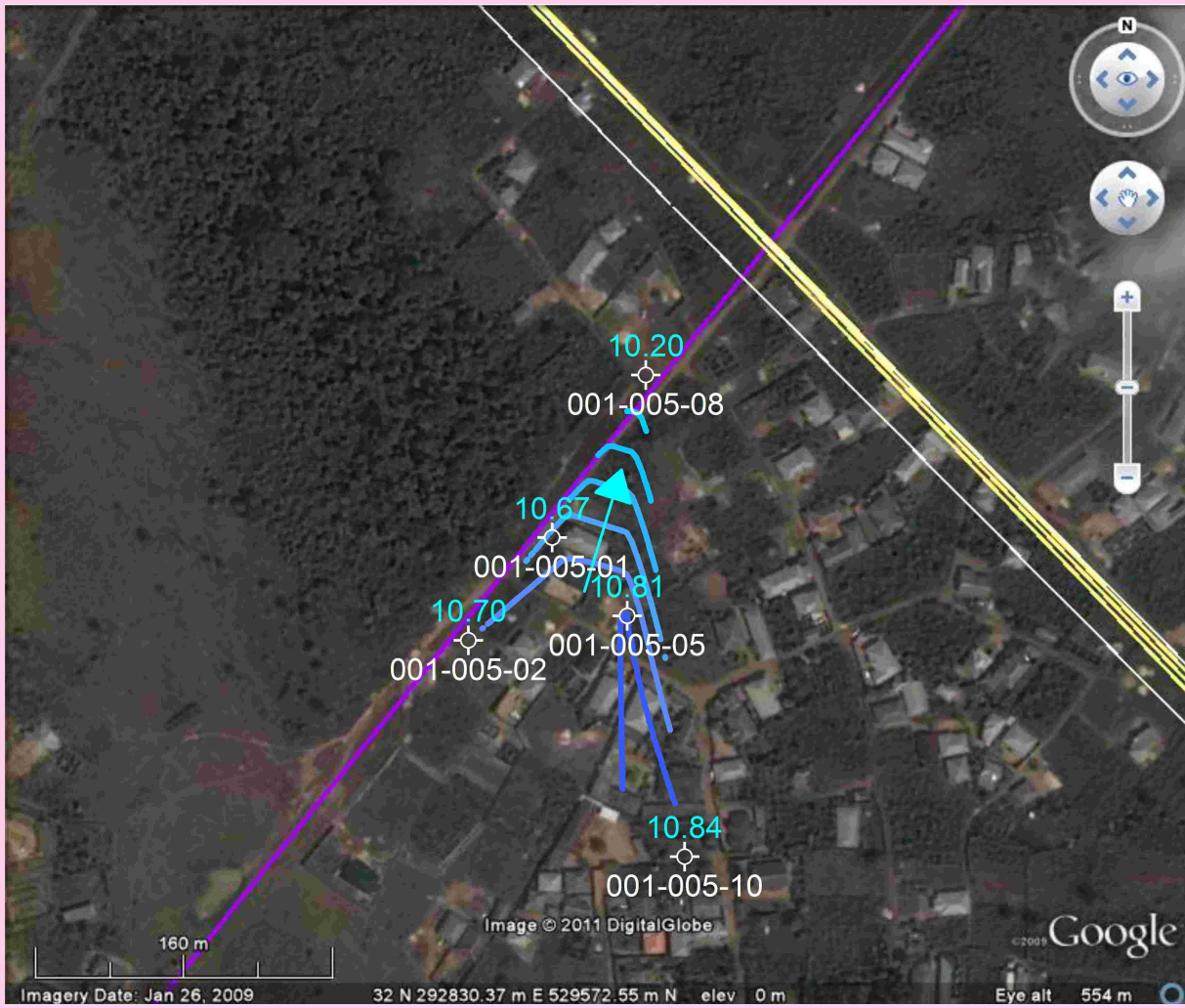
 Approximate site investigation area (that area does not correspond to contamination extent).

-  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

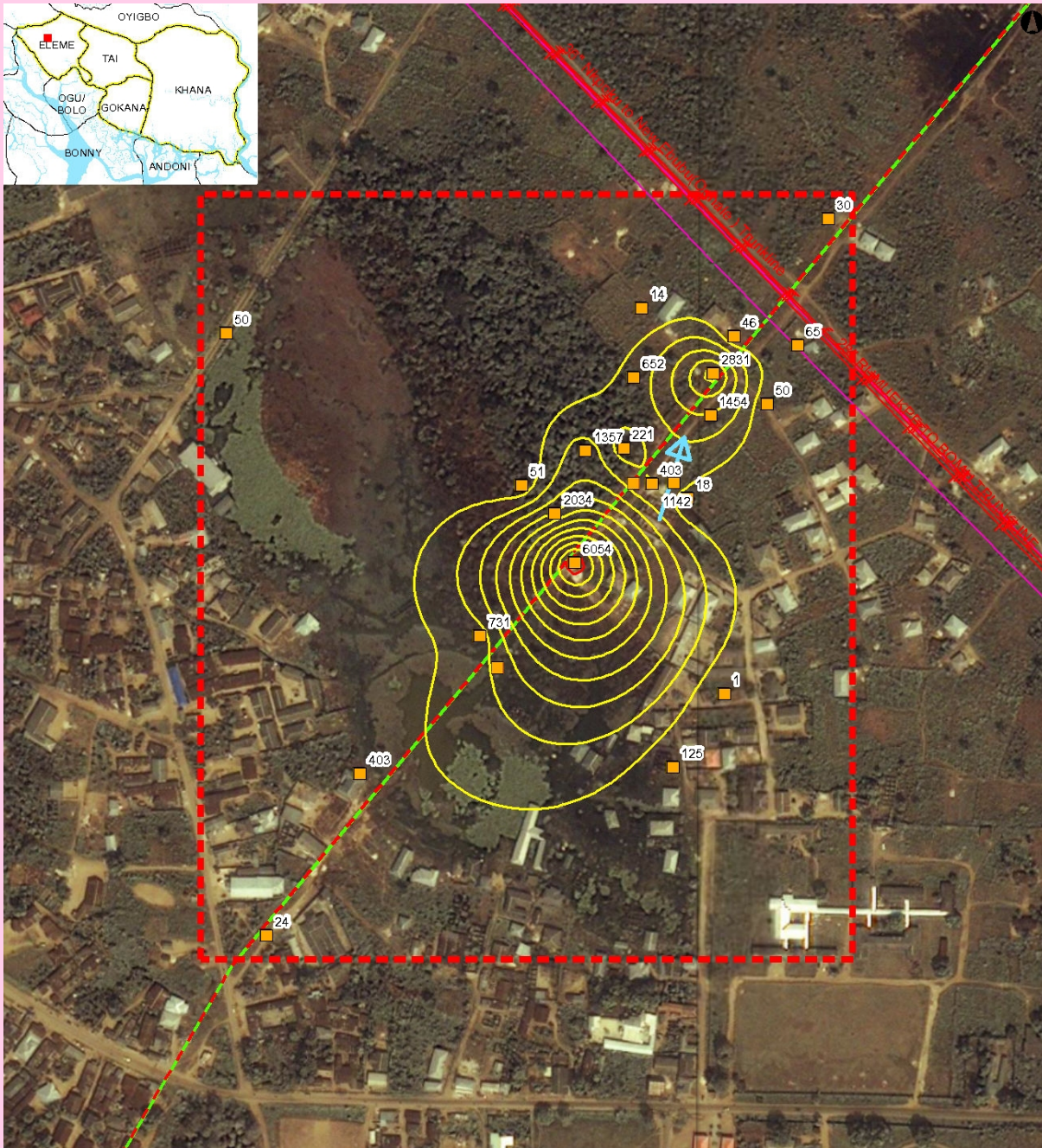
Source:
land cover 2007
from Aster imagery

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Ground Water Elevation Map



Soil Contamination Map



Oil Facilities

- SPDC Right of way (ROW)
- 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

Metres
0 20 40

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
1664625	not analyzed for TPH	2.00	292801	529556
1664633	not analyzed for TPH	3.50	292690	529406
1708306	675.000	2.00	292577	529320
1708551	7,310.000	2.00	292752	529492
1708582	5,740.000	1.60	292752	529492
1708633	1,270.000	1.60	292675	529432
1709146	403.000	0.10	292815	529556
1709215	107.000	0.72	292675	529432
1709247	40.400	0.37	292675	529432
1710832	131.000	1.00	292577	529320
1738977	99.700	3.00	292832	529325
1739011	48.800	0.83	292832	529325
1739261	175.000	0.60	292468	529679
1739292	65.500	0.32	292832	529325
1739304	BDL	3.00	292468	529679
1739325	11.700	2.40	292468	529679
1739341	22.000	0.35	292882	529676
1739366	52.700	1.20	292468	529679
1739846	51.100	2.00	292882	529676
1739938	25.900	1.00	292501	529188
1740091	21.100	2.00	292501	529188
2181380	11.600	4.00	292909	529621
2181531	30.500	1.00	292909	529621
2181548	158.000	5.00	292909	529621
2181569	47.100	3.00	292909	529621
2181599	3,630.000	5.00	292863	529612
2181617	308.000	3.00	292833	529557
2181634	3,610.000	5.00	292833	529557
2181654	170.000	1.00	292833	529557
2181672	1,600.000	4.00	292833	529557
2181720	29.800	0.60	292959	529772
2181752	235.000	2.40	292792	529585
2181777	2.800	2.60	292863	529612
2181840	11.600	3.00	292863	529612
2181867	167.000	0.50	292792	529585
2181894	46.100	0.30	292807	529699
2181926	3.640	2.00	292909	529621
2181955	21.500	2.00	292833	529557
2182064	1,750.000	1.00	292865	529646
2182109	7.630	4.00	292807	529699

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2182151	101.000	0.15	292709	529555
2182201	4,580.000	6.00	292865	529646
2182243	3,770.000	5.50	292736	529532
2182271	747.000	3.00	292865	529646
2182289	620.000	3.00	292736	529532
2182318	420.000	0.50	292736	529532
2182434	49.300	5.00	292709	529555
2205909	2,490.000	4.60	292761	529583
2205933	7.050	5.00	292934	529669
2205989	2.740	1.00	292874	529385
2206048	2.030	5.00	292874	529385
2206124	3.120	2.00	292800	529643
2206262	94.900	4.00	292934	529669
2207930	11.400	0.80	292761	529583
2207957	0.273	4.00	292874	529385
2207981	9.480	5.00	292844	529544
2208036	3,570.000	5.00	292761	529583
2208087	56.700	1.00	292934	529669
2208117	2,110.000	5.00	292800	529643
2208139	58.200	3.50	292800	529643
2208151	42.500	3.00	292934	529669
2208167	1,020.000	3.60	292761	529583
2208196	125.000	2.00	292934	529669
2208237	45.700	0.60	292844	529544

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1913144	not analyzed for TPH	292804	529558
1913567	not analyzed for TPH	292689	529455
1918092	86,100	292755	529503
2538176	not analyzed for TPH	292855	529644
2538233	not analyzed for TPH	292735	529537
2556936	649	292876	529384
2631688	not analyzed for TPH	292801	529555

Sediment sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Easting	Northing
1708614	1,950.000	292679	529423
1739822	410.000	292480	529659

Community well sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
1739589	BDL	292536	529163
1739615	20,300.000	292479	529671
1739684	BDL	292831	529423
1739716	BDL	292774	529483
1739744	BDL	292774	529481
1913170	BDL	292838	529408
1913200	1,320.000	292494	529220
1913236	233.000	292537	529161
1913611	39.300	292914	529315
1913702	42,200.000	292824	529568
1913724	20,200.000	292343	529425
2294277	299.000	292355	529650
2294296	BDL	292616	529945
2294850	19,900.000	292337	529419
2556930	BDL	292334	529668
2556931	BDL	292820	529561
2556932	4,280.000	293036	529204
2556933	10.000	292362	529670
2556934	317.000	292622	529954
2778773	10.000	292511	529347

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