

Environmental Assessment of Ogoniland Site Specific Fact Sheets

NWEEKOL- KEGBARA DERE



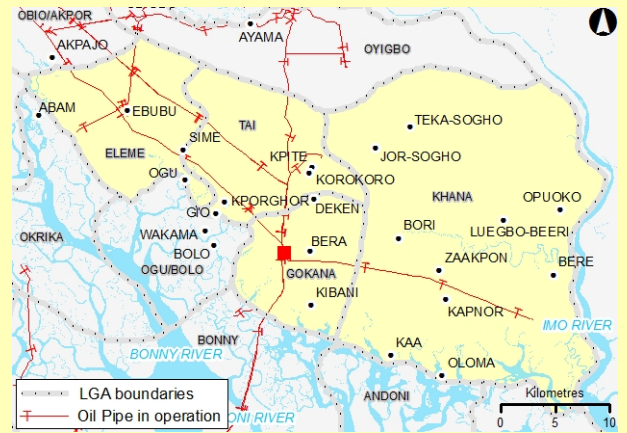
This fact sheet is part of a series prepared as part of the Environmental Assessment of Ogoniland by the United Nations Environment Programme (UNEP). It provides the observations and results from one of the individual sites studied in detail, plus the specific risk reduction measures for follow-up action.

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	NWEEKOL- KEGBARA DERE
Site Number	qc_019-005
LGA	GOKANA
Main community	NWEEKOL DERE
Surrounding communities	BARABEEDOM DERE DERE NWEEKOL DERE NWEEKOL KEGBARA DERE NWEEKOL ZORBUKE DERE
Investigated area (ha)	9.71
Category	SPDC Operating Site
Eastings (WGS 84, Zone 32N)	309018
Northings (WGS 84, Zone 32N)	515567



<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. - Floating oil on the surface, if any, should be collected and treated off site. - 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	10" Bomu FS to Bomu tie-in MF Delivery line(DISUSED). 24" BOMU TO BONNY TRUNKLINE 28" BOMU TO BONNY TRUNKLINE 16" YORLA TO BOMU TRUNKLINE(DISUSED) 24" NKPOKU TO BOMU TRUNKLINE 36" RUMUEKPE TO NKPOKU TRUNKLINE 28" RUMUEKPE TO BOMU TRUNKLINE 20" RUMUEKPE MF to BOMU MF TRUNKLINE(ABANDONED) 12" EGBERU M/F TO BOMU TRUNK LINE
NNPC crude line	No
NNPC product line	No

III - Spill History

Spills reported by SPDC	Incident Number	Incident Date
	2003_00013	20030128
	2001_00050	20010309
	2001_00026	20010210
	2003_00197	20031015
	1990_00144	19901017
	1990_00145	19901017
	1991_00137	19910925
	350359	
Spill reported by community	Yes	

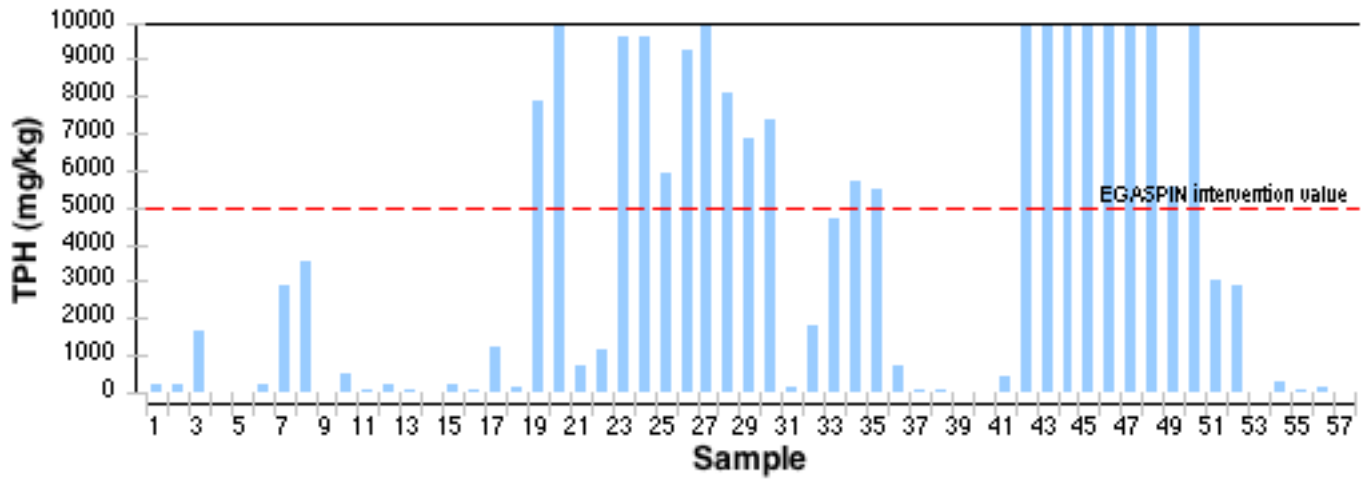
IV - Data Screening

Assessment criteria

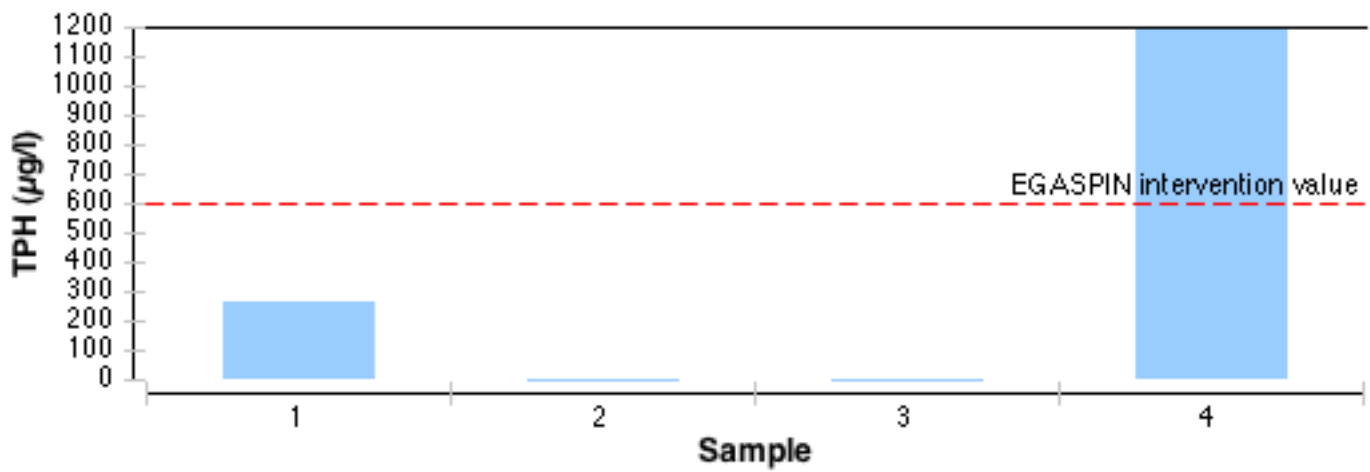
Soil contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 50 mg/kg)
Groundwater contamination	Nigerian standards EGASPIN (intervention value 600 µg/l; target value 50 µg/l)
Sediment contamination	Nigerian standards EGASPIN (intervention value 5000 mg/kg; target value 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)	63,800.000
Number of soil measurements greater than EGASPIN intervention value	21
Deepest sample greater than EGASPIN (m)	5
Number of soil measurements below 1m	39
Number of soil measurements below 1m greater than EGASPIN intervention value	17
Number of ground water samples	5
Maximum groundwater TPH (µg/l)	3,410
Number of groundwater measurements greater than EGASPIN intervention value	1
Number of community well samples	0
Presence of hydrocarbons in community wells	Not applicable
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

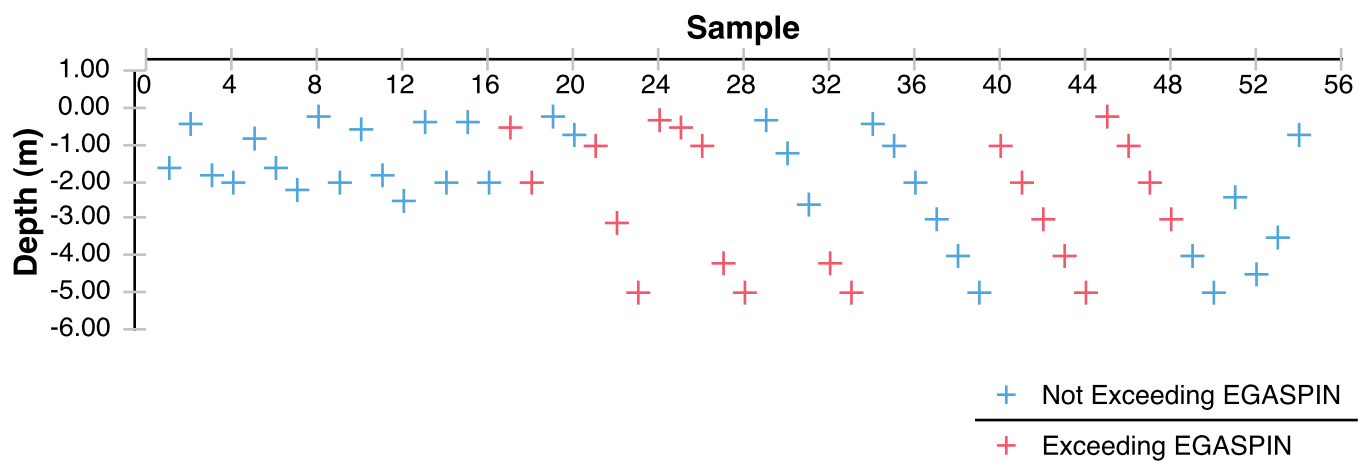
Soil Samples



Groundwater Samples



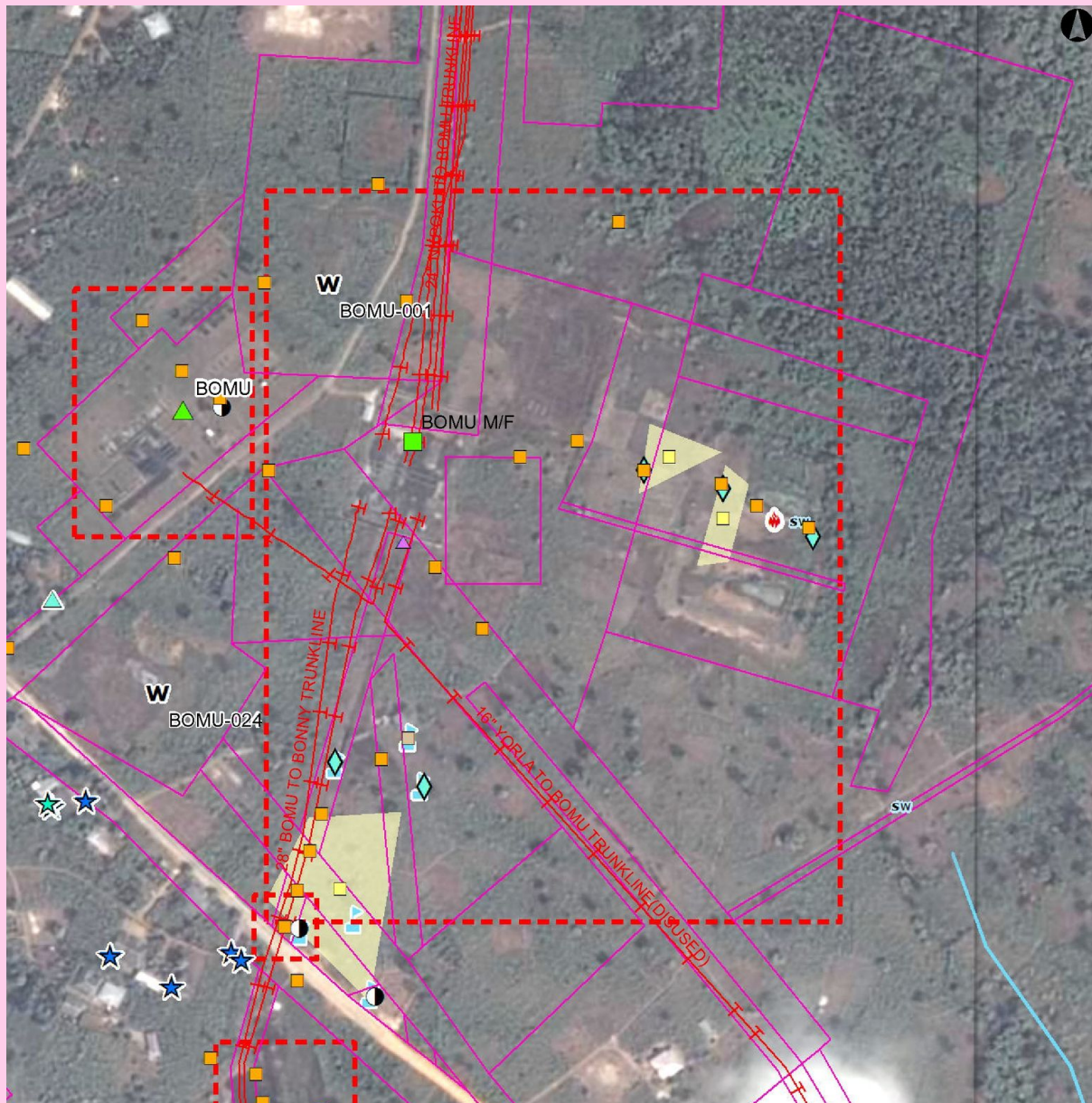
Soil Samples depth



Satellite image of the site



Sampling location map



Oil Facilities

- SPDC Right of way
- w** Wells
- Manifold
- ▲ Flow Station
- 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

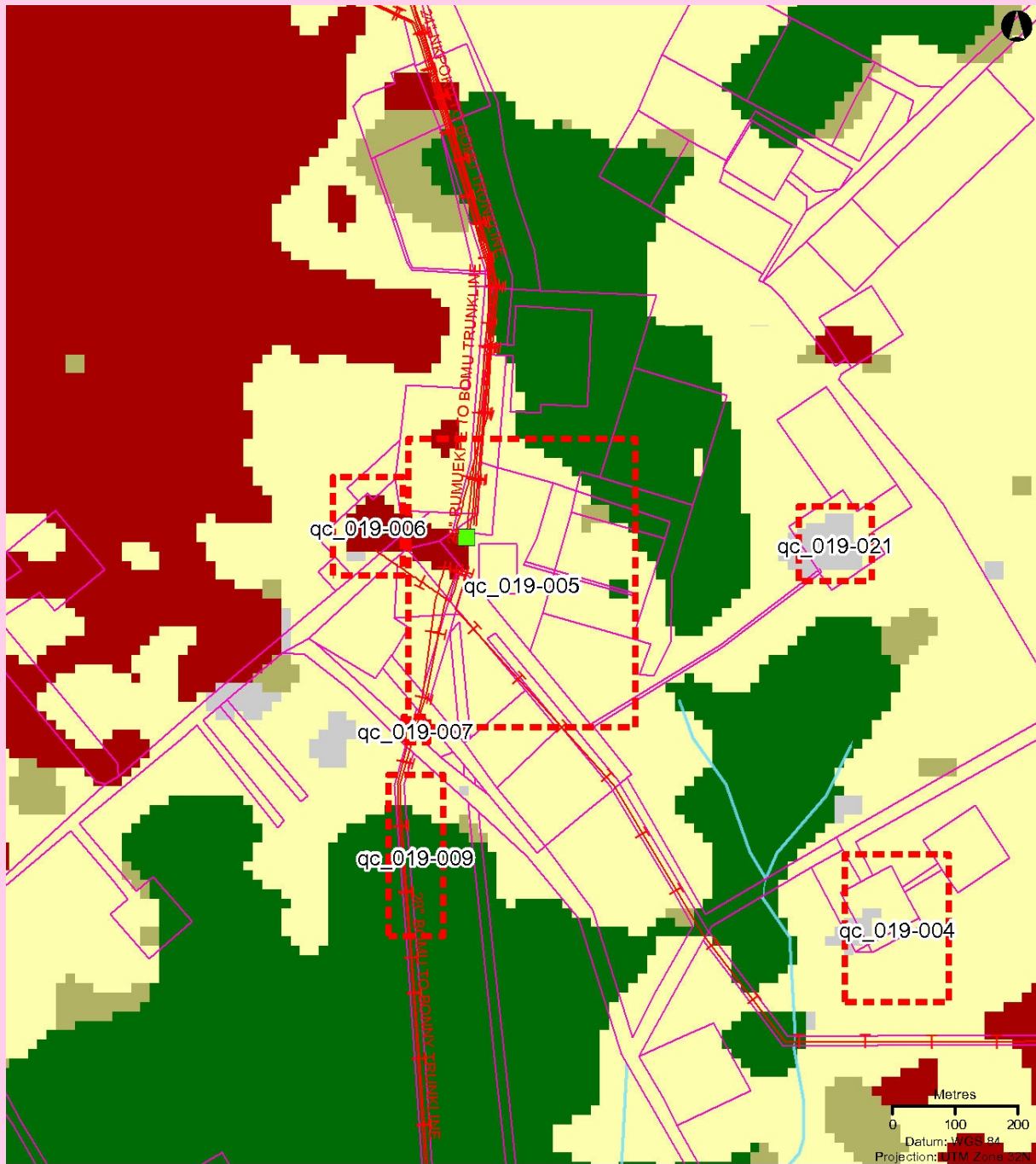
Water samples

- ▲ 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 1020

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

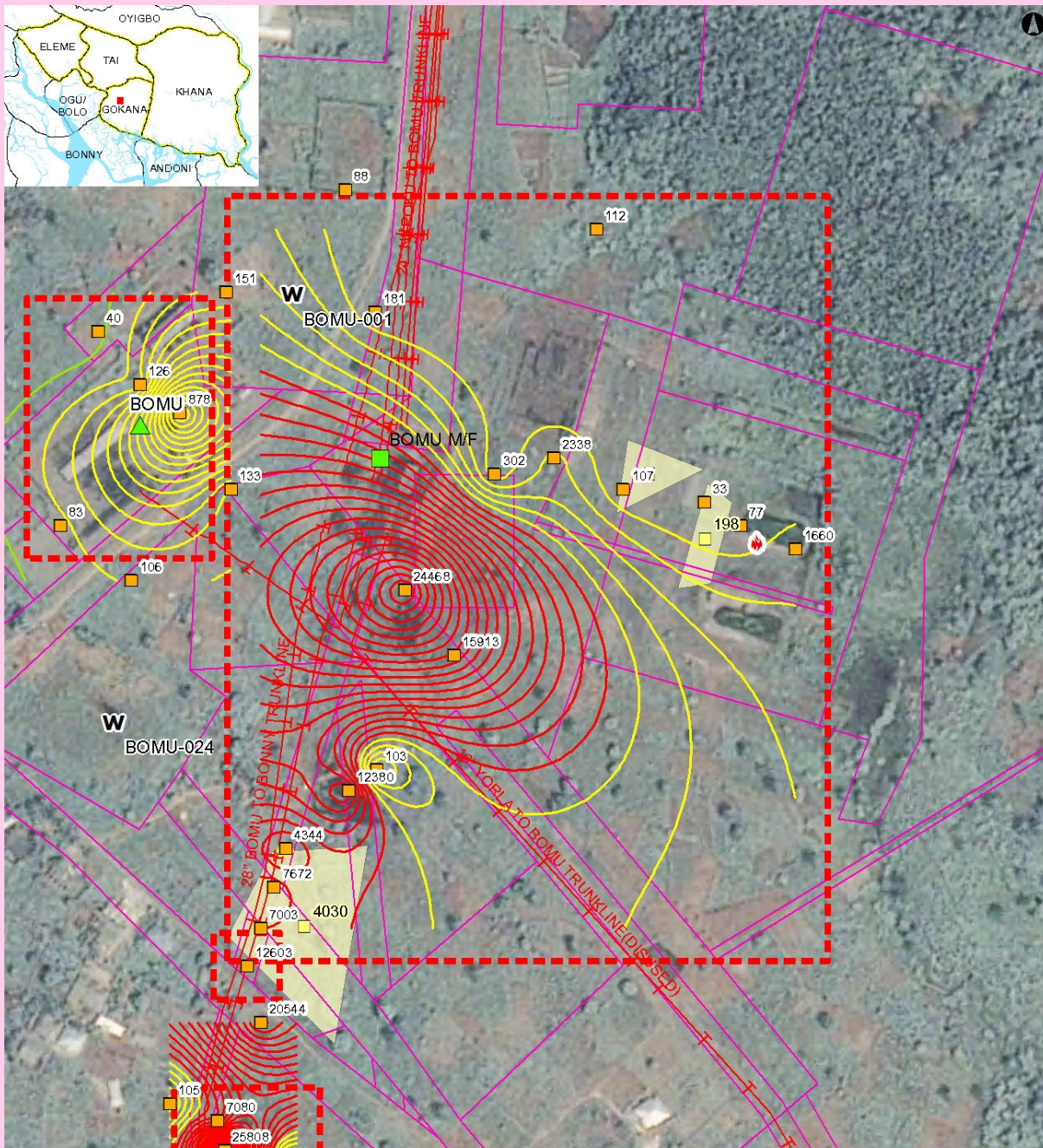
Approximate site investigation area (that area does not correspond to contamination extent).

- 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

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.

Aerial photograph



Ground photograph



VII - Sample List

Soil sample list

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2007744	14.000	2.50	309146	515599
2007756	45.200	1.80	309146	515599
2007773	109.000	2.00	308997	515630
2007800	28.600	0.40	309124	515613
2007821	6.350	1.80	309124	515613
2007832	230.000	0.55	309146	515599
2007848	7,850.000	0.50	308973	515521
2007858	223.000	0.35	309075	515621
2007868	18,600.000	2.00	308973	515521
2007876	65.500	2.00	309059	515778
2007886	1,660.000	1.60	309179	515585
2007902	2,910.000	0.80	309033	515640
2007925	528.000	0.20	309059	515778
2007945	198.000	-	309125	515591
2007965	82.100	2.00	309075	515621
2007981	1,210.000	0.35	308997	515630
2008020	209.000	-	309091	515630
2008063	3,520.000	1.60	309033	515640
2008145	not analyzed for TPH	2.20	309033	515640
2008168	225.000	2.00	309124	515613
2229939	1,770.000	1.20	308871	515404
2229970	9,590.000	1.00	308856	515356
2230064	8,090.000	1.00	308864	515381
2230085	2.600	2.40	308926	515452
2230144	1,190.000	0.70	308856	515356
2230169	301.000	4.50	308926	515452
2230274	5,740.000	4.20	308871	515404
2230297	117.000	0.30	308871	515404
2230315	7,390.000	5.00	308864	515381
2230337	9,570.000	3.10	308856	515356
2230362	4,670.000	2.60	308871	515404
2230404	6,840.000	4.20	308864	515381
2230466	704.000	0.20	308856	515356
2230488	51.900	3.50	308926	515452
2230502	9,260.000	0.30	308864	515381
2230553	5,460.000	5.00	308871	515404
2230586	142.000	0.70	308926	515452
2230608	5,950.000	5.00	308856	515356
2257270	18,900.000	0.50	308864	515381
2549197	756.000	0.40	308925	515728

Sample Identifier	Total petroleum hydrocarbon (mg/kg)	Depth (m)	Easting	Northing
2549198	61.000	1.00	308925	515728
2549200	75.800	2.00	308925	515728
2549201	33.100	3.00	308925	515728
2549202	27.200	4.00	308925	515728
2549203	430.000	5.00	308925	515728
2549238	63,800.000	0.20	308909	515439
2549239	25,300.000	1.00	308909	515439
2549242	5,590.000	2.00	308909	515439
2549244	17,400.000	3.00	308909	515439
2549247	3,010.000	4.00	308909	515439
2549248	2,900.000	5.00	308909	515439
2549249	33,900.000	1.00	308943	515560
2549250	31,400.000	2.00	308943	515560
2549251	22,500.000	3.00	308943	515560
2549252	20,900.000	4.00	308943	515560
2549253	19,300.000	5.00	308943	515560
2549266	not analyzed for TPH	-	308926	515452

Groundwater sample list

Sample Identifier	Total petroleum hydrocarbon (µg/l)	Easting	Northing
2008226	BDL	309125	515610
2008289	BDL	309075	515622
2008354	262	309182	515580
2555484	not analyzed for TPH	308880	515437
2555485	3,410	308936	515422

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