



INTRODUCTION

Delta Systematics is a scientific consulting firm specializing on providing a full range of environmental consulting services to the commercial, industrial, private and public market sectors. Delta Systematics has successfully completed several projects in the Niger Delta region and around Nigeria as a whole.

Delta Systematics commitment to technical excellence is reflected in the highly qualified team of environmental professionals assembled throughout the company. Delta Systematics multi-disciplined staff of scientists and engineers have first hand experience in addressing some of the toughest problems facing industry today. Our commitment is to provide business solutions to our clients.

We are MDA Federal Inc (former EARTH SATELLITE CORPORATION) NaturalVue Image representatives in Nigeria.

Delta Systematics is a certified **Environmental Systems Research Institute (ESRI)** Business Partner and products reseller for sub Saharan Africa.

Delta Systematics acts as a clearinghouse for various Nigerian University Consultancy Services, thus ensuring that the best consultants are engaged for clients' projects.

Delta Systematics also renders Remote Sensing and digital services like Image Processing, GIS and GPS services. These are used as inputs into our Spatial Data Business Solutions.



Ownership

General Information:

Delta Systematics Ltd. is a private limited liability company that is fully indigenous (100% owned by Nigerians). The Company was incorporated on the 31st of August 1998 and had operated as a registered partnership since the 9th of April, 1986.

Ownership Structure:

Delta Systematics Board of Directors

MR. KINGSLEY A. ACHINIVU	(NIGERIAN)
DR. JOHN ONWUTEAKA	(NIGERIAN)
MR. BASIEKANEM NTE	(NIGERIAN)
MRS. INYANG VICTORIA ACHINIVU	(NIGERIAN)
MRS LINDA SEIGHA ONWUTEAKA	(NIGERIAN)

Head Offices and Branches:

Port Harcourt (Head office):

36 Onne Road G.R.A Phase II

Port Harcourt.

Tel. 084-880984, 08033386435, 08033088811

Abuja:

8 Abriba Close

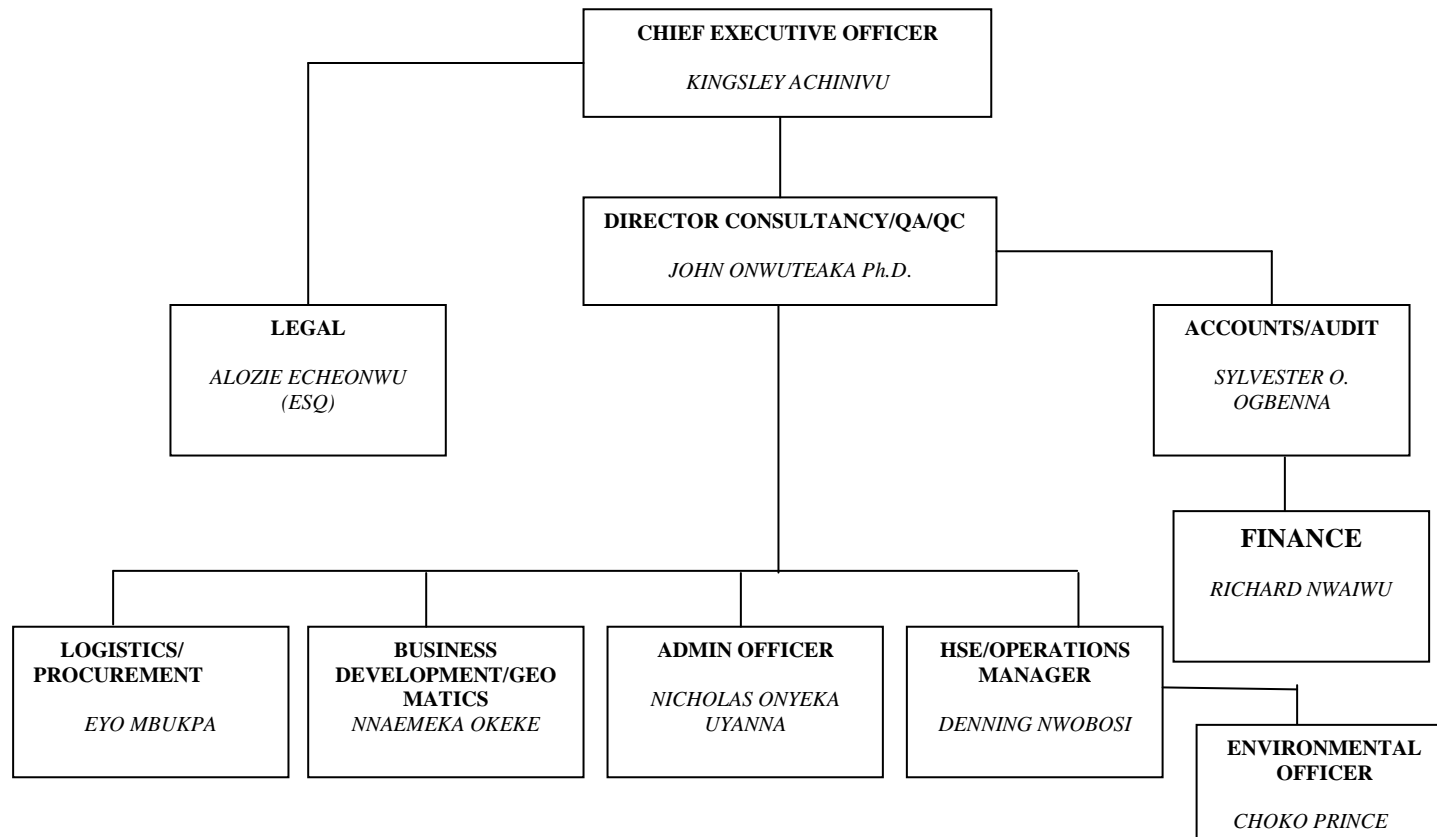
Area 7

Abuja.

Tel. 08034316911



Company Organogram





Personnel

DELTA SYSTEMATICS places a strong emphasis on recruiting the best professionals with the ability to determine the needs of our clients and deliver the required support and personal commitment. This provides DELTA SYSTEMATICS with the ability to supply a mixture of senior staff, supported by mid-level and junior staff as appropriate for each project's technical requirements. This balance allows DELTA SYSTEMATICS to maintain project performance and provide continuity from project commencement to completion.

At DELTA SYSTEMATICS each project is staffed with a mix of technical skills that will achieve the client's objectives in a timely and cost-effective manner. DELTA SYSTEMATICS has the necessary balance of professional skills to support the development of project teams, integrating the following technical disciplines:

- Air Quality Engineers
- Air Quality Scientists
- Auditors
- Biologists
- Chemists
- Environmental Assessors
- Geotechnical Engineers
- Hydrogeologists
- Regulatory Specialists
- Risk Analysts
- Soil Scientists
- Toxicologists

DELTA SYSTEMATICS strongly encourages ongoing interaction between consultants in all geographic locations which provides our clients with the benefits of successful and often innovative technical approaches to problem-solving from across the company.



The majority of DELTA SYSTEMATICS technical staff have professional registrations and other certifications. DELTA SYSTEMATICS also encourages its staff to pursue further educational development and to obtain professional accreditation, as well as, participate, write and present technical papers in technical associations.

DELTA SYSTEMATICS's commitment to technical excellence is reflected in the high quality technical staff we have assembled throughout the company. Important aspects of the DELTA SYSTEMATICS consulting team are:

The strong representation of senior consultants, who have faced and solved virtually every kind of environmental problem likely to be encountered

The mix of experience across all levels to allow projects to be budgeted with competitively priced personnel in all task assignments the diversity of the staff's technical and education backgrounds the strong experience of the firm in all of the key service areas



Services Overview

Acquisition Audits

- ❖ Diligence and property Assessment
- ❖ Baseline Audit
- ❖ Comprehensive Cost Allocations
- ❖ Liability Audits
- ❖ Clear Identification of Risks and Long-term
- ❖ Environmental Liabilities & Costs

Air Quality Management

- ❖ Air permitting
- ❖ Air Quality Control Engineering
- ❖ Air Quality & Meteorological Monitoring
- ❖ Emissions Measurements
- ❖ Air Quality Impact Assessments

Phase I and II site Assessments

- ❖ Identification of Potential Liabilities
- ❖ Due Diligence
- ❖ Investigation Design and Implementation
- ❖ Soil & Groundwater Monitoring

Geotechnical/Geophysical and Hydrological Survey

- ❖ Groundwater Modeling
- ❖ Development of Remedial Action Plans
- ❖ Capital and Operating cost Estimates
- ❖ Design of Appropriate In situ and Ex situ Technology
- ❖ Construction, Operation and Maintenance of Remediation Systems
- ❖ Groundwater Treatment Capitalization Capability
- ❖ Soil Resistivity Study

Environmental Management

- ❖ Development of Environmental Management Systems
- ❖ Environmental Management System Review
- ❖ Long-Term Environmental Planning and Strategies
- ❖ Design and Operation of Industry Stewardship Programs
- ❖ Conduct Industry or facility Waste Audits
- ❖ Prepare and Implement Waste Reduction Strategies
- ❖ Waste Management

Compliance Audits

- ❖ Assess Regulatory Compliance
- ❖ Establish Notification Framework
- ❖ Assess Good-Management-Practices
- ❖ Evaluate Environmental Management Systems .
- ❖ Evaluate Staff Preparedness



Risk Assessment

- ❖ Human Toxicology and Risk Assessment
- ❖ Ecotoxicology and Ecological Risk Assessment
- ❖ Contaminant Fate and Transport Modeling
- ❖ Geostatistics, Statistics and Data Management
- ❖ Radiological Risk Assessments

Storm and Wastewater Treatment

- ❖ Develop Bench-Scale Treatability Studies
- ❖ Design and Evaluation of Treatment Systems
- ❖ System Startup and Operation Support
- ❖ Evaluation of Waste Quantities and Quality
- ❖ Monitoring and Analysis

Underground Storage Tank Management

- ❖ Underground Storage Tank Management
- ❖ Site Investigation and Monitoring
- ❖ Remediation Services
- ❖ Project Management
- ❖ Regulatory Liaison

Oil Spill Contingency

- ❖ Cleanup of shoreline and Disposal of oil stained debris
- ❖ Contingency Plan Review and Coordination
- ❖ Drills and exercises
- ❖ Geographic Response Plan development
- ❖ Oil Spill Preparedness training;
- ❖ Table top GIS based Contingency Simulation exercises
 - Pipeline or storage-tank leaks
 - Collision or leaks in tanker operations
 - Loading and unloading operations in tankers
 - Petroleum Storage blow-outs

Services for the Oil & Gas Industry

- ❖ Facility Design and Pre-Development Support
- ❖ Construction and Development Services
- ❖ Facility Operation Support
- ❖ Oil Spill Contingency
- ❖ Site Remediation and Reclamation
- ❖ Flare Pit Reclamation and Closure



Geographic Information Systems Solutions

Delta Systematics offers you the best path of analysis and decision support using the tools of Geographic Information System. At Delta Systematics GIS is used to offer the solutions that enable the client capability to work with spatial information, in ways that are tailored to their work and terminology. By using the ESRI suite of GIS software, we help re-engineer process oriented systems in an organization, and so provide front end improvements in the integration of large amounts of data that need to be collected, processed and housed by the organization's enterprise. The overall benefit is reflected in the saving of money, improved responsiveness, and maintenance of accuracy and quality over time.

The GIS Services include:

- Optimal Route Planning
- Environmental Analysis and Modeling
- Sustainable Development and Planning
- Hydrological mapping
- Transportation Network Planning
- Geodatabase Development

Remote Sensing Services

Delta Systematics provides Remote Sensing turnkey business solution in the use of various remote-sensing techniques to manage the earth. Delta Systematics is involved in the development of strategic applications of remote sensing and measurement techniques for

- Landuse-Landcover
- Agricultural Analysis
- Change Detection
- Mineral Analysis
- Bathymetric Analysis
- Digital Elevation modeling
- Water supply
- Petroleum Exploration
- Intelligence Gathering
- Military operations
- Detection Monitoring Systems



Imagery suites available for sale and application development are as follows
High-Resolution Imagery; Medium-Resolution Imagery and Reliable Low-Cost Imagery

Survey and Mapping

Delta Systematics provides real-time survey performance services with the Trimble product suite of Global Positioning Systems (GPS). Real Time (RTK) and fast static mode surveying techniques are used in multitasking environments to provide:

- Topographic Survey,
- Hydrographic Survey
- Construction Stakeout Survey
- Boundary and Control Point Surveys
- Cadastral Mapping
- Pipeline/Oilfield survey

Geospatial Services

Delta Systematics is a leading company in the use of GIS, Remote sensing, Image processing, GPS and Enterprise Databases like Oracle, DB2 to provide integrated solutions for oil and gas, government and Industry. We implement user needs assessments and work closely with clients to design relevant and efficient information systems. Information is gathered from satellite imagery, aerial photos, digital airborne systems, existing maps, and field (ground truth) investigations. Capture techniques range from digitizing, to scanning, to the development of complex automated image classification algorithms. Our image classification techniques fully exploit the relationships between the variation in remotely sensed data and variation in land cover. Delta Systematics has a reputation for the development of innovative methods for integrating field information, GIS, and remote sensing into image classification. Consequently, capture costs are decreased while maintaining or enhancing information accuracy.

**Environmental Applications:**

Site Characterization, Environmental Modeling, Environmental Planning and Management, Vegetation and Land Use Mapping, Water Resource Management, Waste management Planning, Environmental Compliance and Permit Tracking, Risk Assessment, Environmental Sensitivity Index (ESI) Mapping, Contingency Planning, Post Impact Assessment, Spill Modeling, Environmental and Safety Audits, Health Risk Audit, Spill Modeling Information Systems, Evacuation Planning and Training, Remediation Survey and Planning, Habitat Restoration, Subsurface Analysis for contamination assessment

Utilities

Energy Demand Assessment, Predictive maintenance, Load forecasting and planning, Transmission Line Routing Analysis, Design and Engineering Support, Transmission Asset Management and Information System, Technical and Non-technical loss tracking, Energy Model and Data Surveys, Energy Road Map from Generation to Collection, Feeder Trace and Visualization, Switching Historical Database, Outage Simulation and Energy Restoration Alternatives, Lightning Information System (LIS), Maintenance scheduling and routing

Transportation Planning Services

Delta Systematics uses the tools of Geographical Information Systems (GIS to provide in-depth transportation planning and) Services. Delta Systematics is a leader in transportation planning for metropolitan areas, as well as small urban and large rural areas. We are active in corridor planning, major investment studies, roadway and intersection analysis, accident analysis, and modeling for state and federal routes. Delta Systematics and its affiliates are and will continue to be, a leader in the development and analysis of transportation policies and procedures.

Enterprise Asset Management System

Delta Systematics uses organization alignment, integrated data, information and knowledge management, Risk awareness and acceptance, Life Cycle Cost analysis to provide Geo-enabled asset management of infrastructure. GIS uses an Asset Register, Work Order (Planning and Control), Condition assessment



& monitoring, Performance and Maintenance History Data, to provide an Integrated Asset management regime.

Monitoring and Evaluation, and Investment Targeting

Many organizations are seeking to improve their ability to monitor and evaluate the effectiveness of their programs in the areas in which they are working. They want to track progress against goals, or try to measure the per capita value of their investments. At Delta Systematics we use GIS to make this process easier for program managers, providing a visual tool for the rapid assessment and updating of project status. In addition to providing needed information, this saves money and avoids redundancy.

DS's approach permits organizations to:

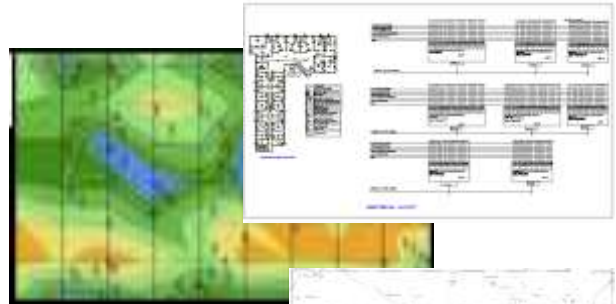
- Determine the exact location of project activities and show the extent of project activities
- Evaluate the project's significance in terms of other co-located projects
- Evaluate the project's effectiveness compared to previous projects in the same area
- View the relationship of the project to factual information, such as population and health; physiography, forestry, and climate; soils and agriculture; availability of water; location of schools, markets, and other significant social constructs; desertification and biodiversity
- See the investment levels of the project in cartographic form and on an annual basis
- See the investment level per capita in the project area
- See the investment level in each sector, e.g., investment per capita/per school by district, by ethnic group
- See change over time and assess the direction of trends
- View statistical criteria in a spatial format to show the value of the investment and the progress of the project
- See overlapping investments
- Understand the historical effects of investments



Data Conversion Services

Scanning Services

- Large Format Scanning
- Aperture Card Scanning
- Document Archiving and Indexing
- Raster to Vector Conversion
- Colour Copies
- Online PlanRoom and Bid Management



Document Management

- Index and Archive
- Internet Enabled Index and Archive
- Workgroup Document Management
- Enterprise Document Management
- Automatic Conversion of 2D to 3D vector drawings

Online Planrooms

Architects, Engineers, Construction, Facility Management, Reprographers, Manufacturing, GIS/LIS



Outsourcing

- Onsite/offsite Data Conversion
- Sale of Hardware/Software
- Leasing of Scanning equipment

As-Built Drawings

- Mechanical
- Structural

Training

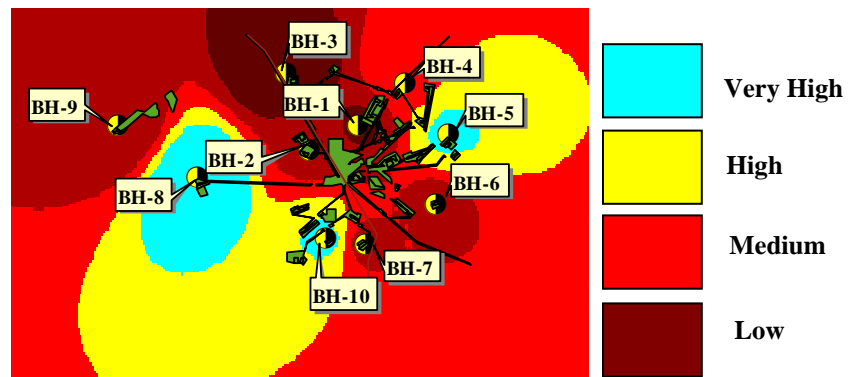
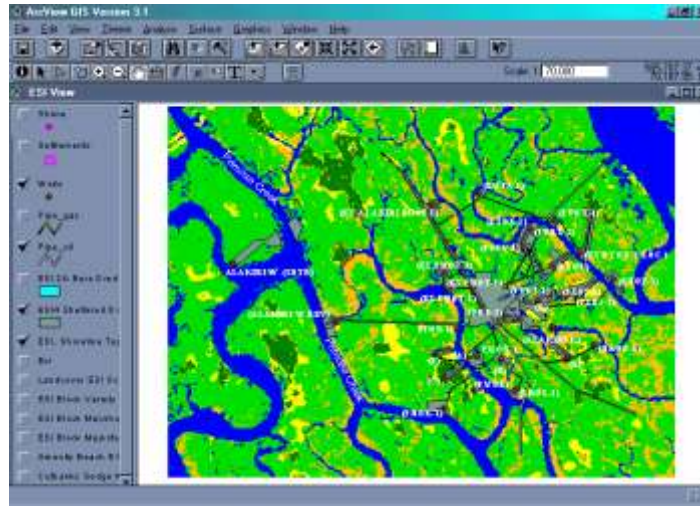
- Geographic Information System (GIS) Certification
- ESRI Virtual University
- Image Processing of Satellite Imagery
- Data Conversion
- Enterprise Wide Database development
- Software System Engineering
- Programming

ESI is carried out at Alakiri with base maps from satellite imagery and analysed with GIS software



Selected Project Experience

Environmental Sensitivity Index (ESI) Mapping

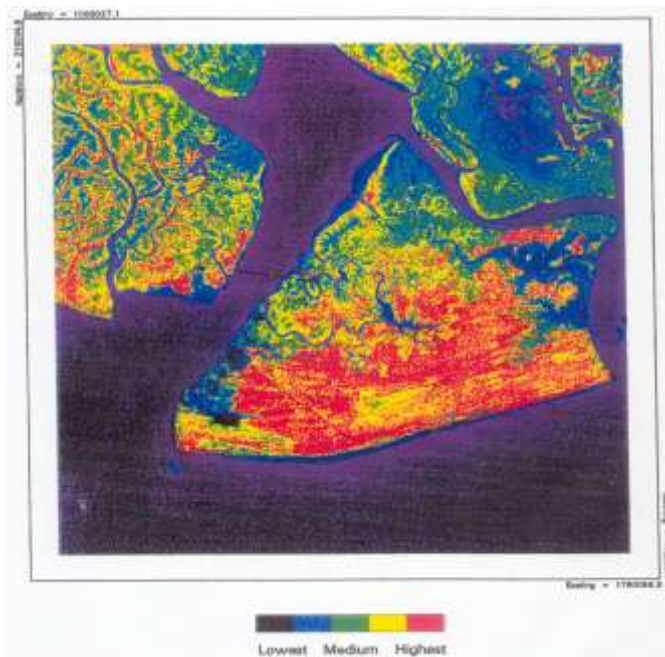
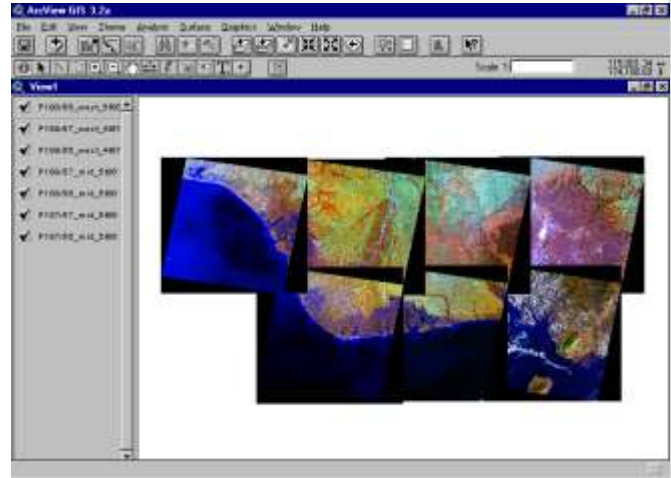


ESI is used to determine the Vulnerability of nearby environment to existing oil facilities in the Alakiri area



Land use mapping and Resource Assessments

Land use mapping by satellite Imagery was used to measure the quantity and quality of habitats in a regional survey project of the Niger Delta.

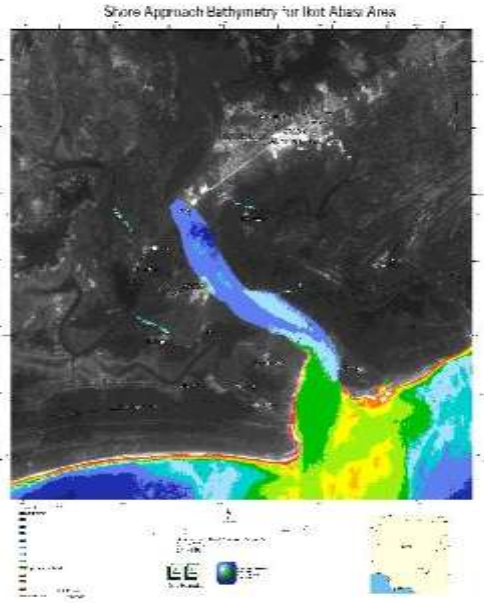


Satellite imagery was used to derive a biomass index in order to support environmental sensitivity decision in an Environmental Impact Assessment



Bathymetric Analysis

Satellite imagery was used to determine the bathymetric profile of the mouth of Imo River in order to support Pipeline Engineering planning



Satellite imagery was used to determine the bathymetric profile (20m) of the mouth of Bonny River in order to support environmental decision in an Environmental Impact Assessment

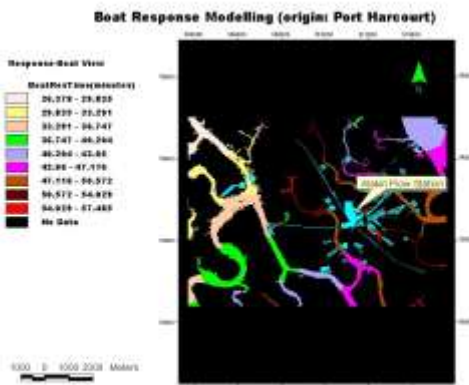
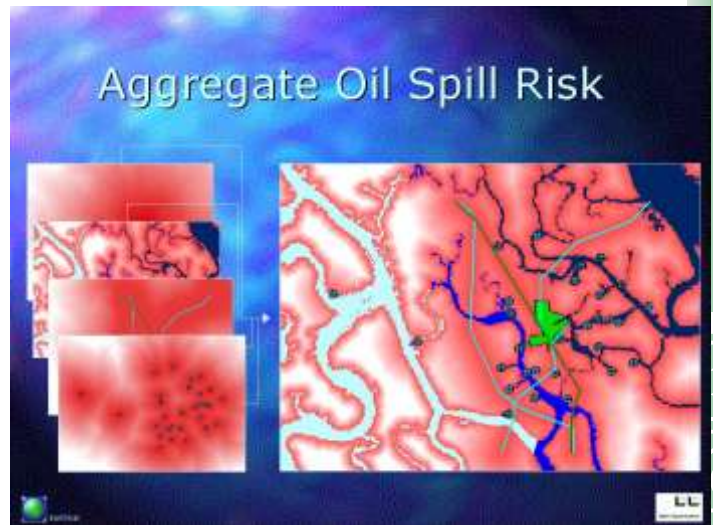


Contingency Plan/Risk Management Operations

The risk of oil spill and transport across the landscape was modeled using imagery and GIS software.

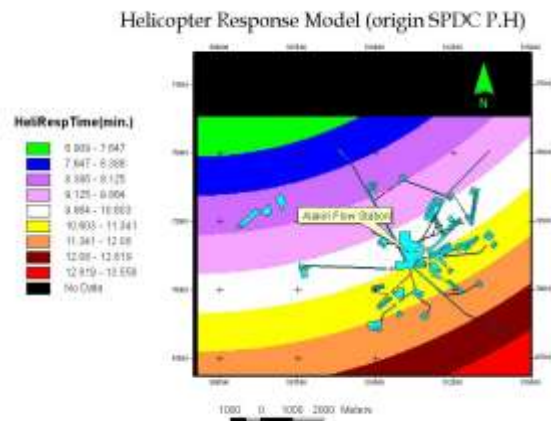
The objective was to predict the time of transport of oil to impact various sensitive habitats. Risk modeled as a function of transport of oil across the landscape from oil wellheads.

Uses land cover and planimetry information to determine impedance to oil transport across landscape. Identifies for each cell the weighted accumulative cost of transport of oil across the landscape from the nearest source wellhead.



Travel time by water was modeled using ESRI GIS software to predict minimum travel time to an oil spill

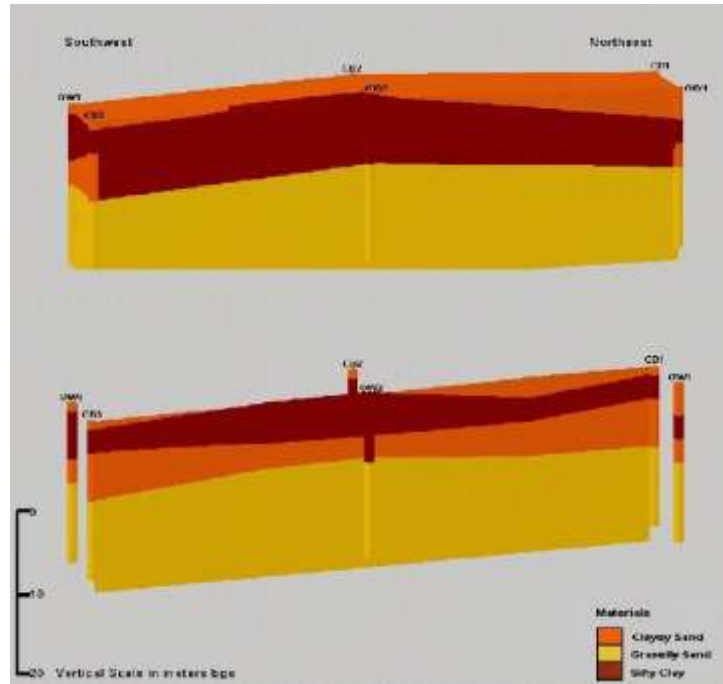
Helicopter Response Time was modeled using GIS software to predict minimum response time to an oil spill



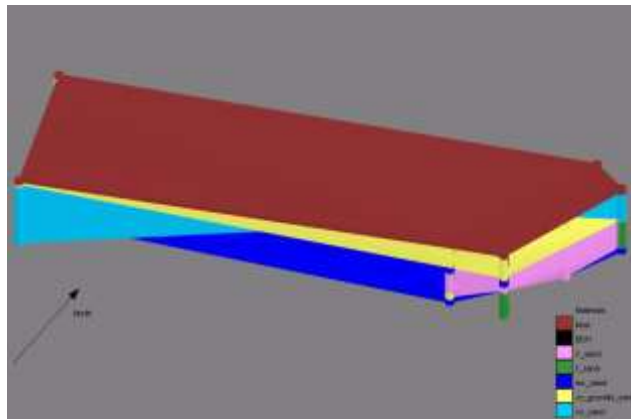


Subsurface Analysis

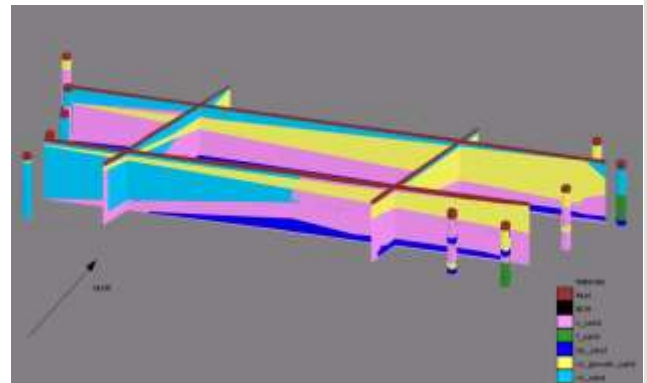
The Lithology of subsurface areas of potentially polluted sites is modeled using GMS software to show the volumetric view and cross sectional areas. The visualization soil horizons provide aid in making better decisions and plans for remediation.



Volumetric Modeling

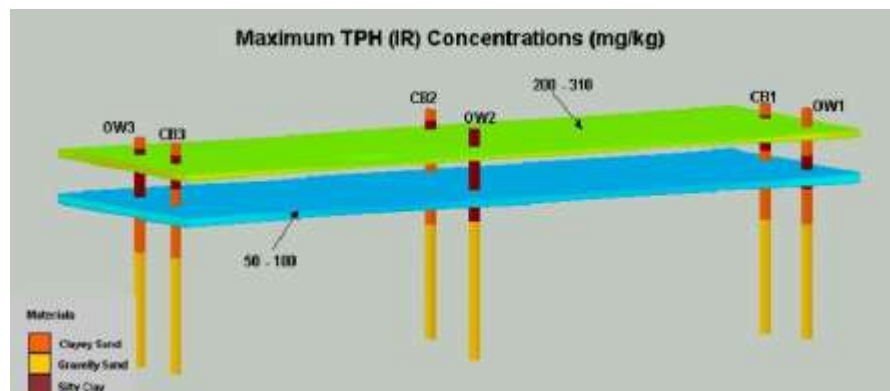
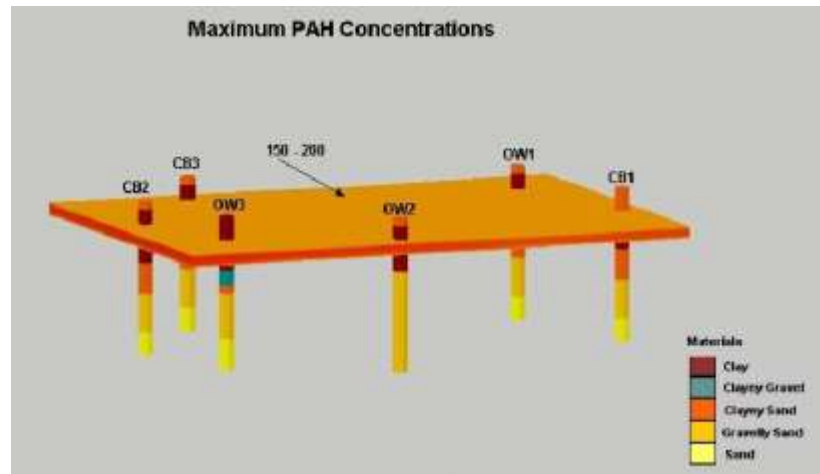


Volumetric modeling is performed with the GMS software to calculate the volume and type of soil horizon immediately beneath a borrow pit used as a waste site in Elelenwo.





Potentially Polluted Site Analysis



Subsurface contamination plume assessment conducted with Groundwater Modeling System (GMS) to show plume levels and direction with overlay on the geology of the area.



Waste Management

Reclamation of waste pit at client flow station facility after soil, water and sediment investigation was done. To determine the extent of pollution. Investigation lead to excavation of approximately 5,020 cubic metres of contaminated soil which was carted away to approved disposal site and subsequent refill of pit with approximately 17,893 cubic metres good soil material and re-vegetation of the site.

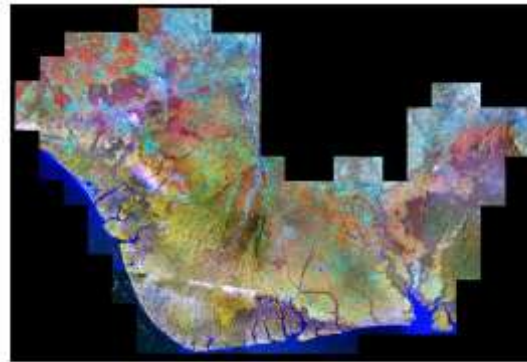




Regional Geodatabase Development

Remote sensed imagery and ESRI suite of software (ARCINFO and ARCSDE) is being combined with Oracle 9i to setup landuse datasets and capture data from 23 sectors of the NDDC region into a geographically enhanced database.

Eleven scenes of Landsat 7 ETM used to produce image base maps



GIS data layers from 24 sectors of the NDDC region

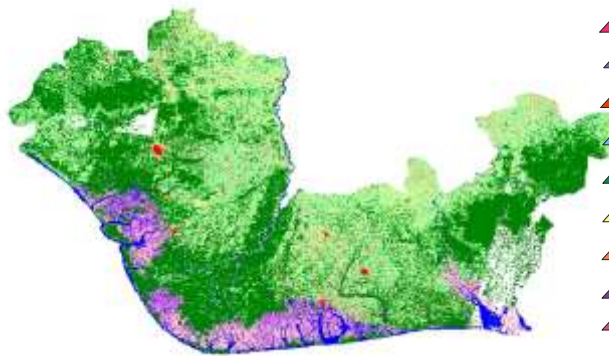
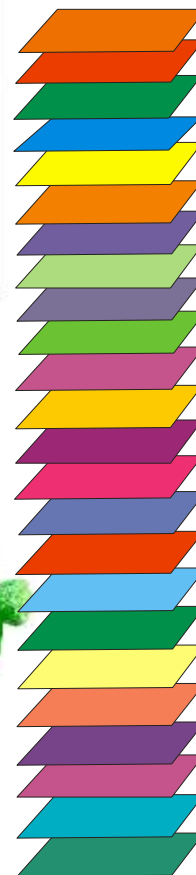
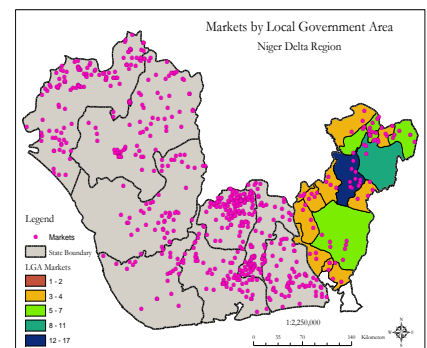
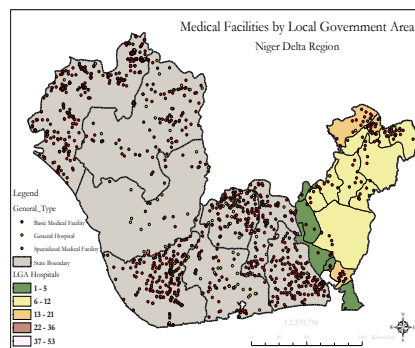
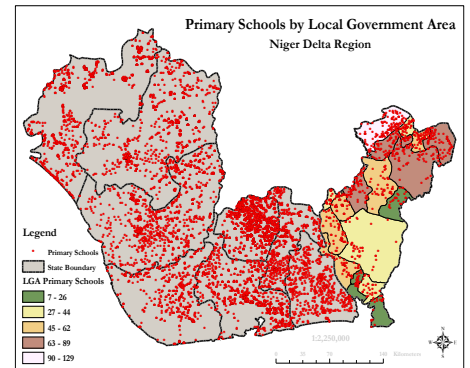
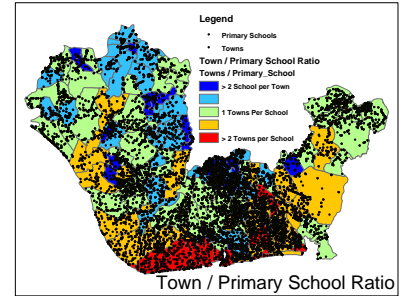
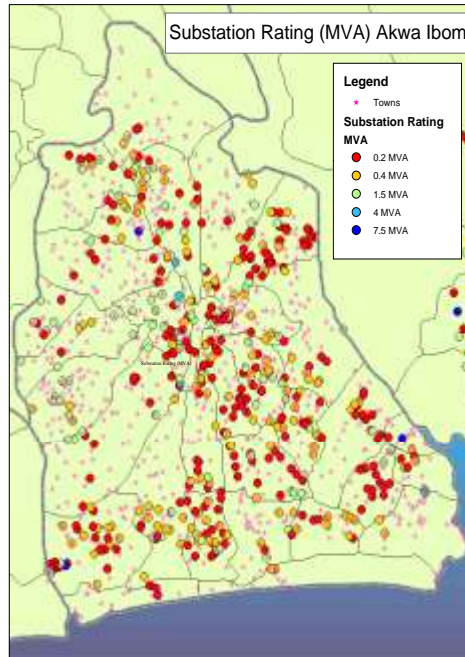


Image basemaps groundtrunthed into landuse landcover datasets

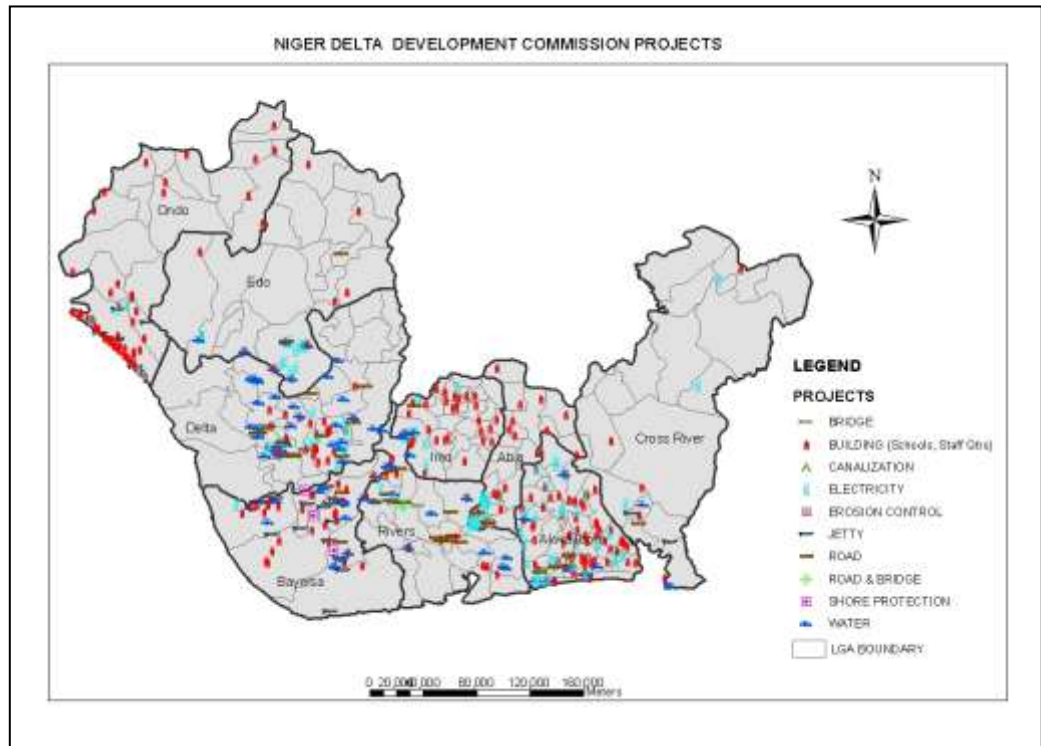


Infrastructure/Assets GIS





Monitoring and Evaluation GIS





LISTS OF MAJOR CLIENTS

- Addax Petroleum Development Company
- Anambra State Government
- Anardarko
- Brass LNG Limited
- Chevron Texaco
- Exxon Mobil
- Federal Ministry of Works and Housing (.Federal Surveys Department)
- Federal Ministry of Power and Steel
- MacDonald Engineering Group (MEG), Canada.
- Niger Delta Development Commission (NDDC)
- Pipeline and Products Marketing Company. (PPMC)
- Shell Petroleum Development Corporation
- TotalFina Elf
- National Maritime Authority
- Federal Ministry of Power and Steel
- Ministry of Solid Mineral Development
- Nigeria Communications Commission



SELECTED ENVIRONMENTAL ASSESSMENT PROJECTS

Firm's Name:	DELTA SYSTEMATICS LTD.
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Assignment Name:
POST IMPACT ASSESSMENT OF OML 58 GAS RESURGENCE INCIDENT

Country: Nigeria Location within The Country: Omoku, Rivers State	Status: Ongoing
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Name of Client: Total E&P Nigeria Limited	
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State Date (Sept 2012)	Completion Date Till date	
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Narrative Description of project:

The study design is based on the intensive monitoring of over 6,000 air and water samples from the surge area and surroundings during and after the gas resurgence incident. An inventory of locations where these samples were taken was geo-tagged to indicate their coordinates




In-situ measurement of ground water samples

OB 129 PILOT HOLE ENVIRONMENTAL SAMPLING AND SCREENING

Authorised Signature:	
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Firm's Name:	DELTA SYSTEMATICS LTD.	
Assignment Name:	OB 129 PILOT HOLE ENVIRONMENTAL SAMPLING AND SCREENING	
Country: Nigeria Location within The Country: Omoku, Rivers State.	Status: Completed	
Name of Client: Total E&P Nigeria Limited.		
State Date (Aug 2013)	Completion Date (Dec 2013)	
Narrative Description of project: Gas samples were collected at pre-designated depth intervals of 10m from 0-580m and at intervals of 5m from 580m to 700m using hermetically-sealed vacutainers.		
Authorised Signature:		

ENVIRONMENTAL SAMPLING AND MONITORING OF AIR AND WATER QUALITY ON OML 58.



Firm's Name:	DELTA SYSTEMATICS LTD.
--------------	------------------------

Assignment Name: ENVIRONMENTAL SAMPLING AND MONITORING OF AIR AND WATER QUALITY ON OML 58.
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Country: Nigeria Location within The Country: Omoku, Rivers State.	Status: On-going
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Name of Client: Total E&P Nigeria Limited.	
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State Date (April 2012)	Completion Date Till date	
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Narrative Description of project:
 Based on the objectives of this project, field personnel carried out field sampling using different air monitoring equipment to capture the air quality values at the sampling points. Measurements were classified into ambient air measurement and headspace measurement within the sample point.



Air quality measurement being carried out

Authorised Signature:	
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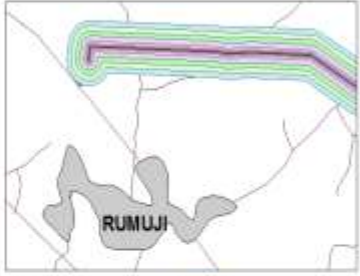
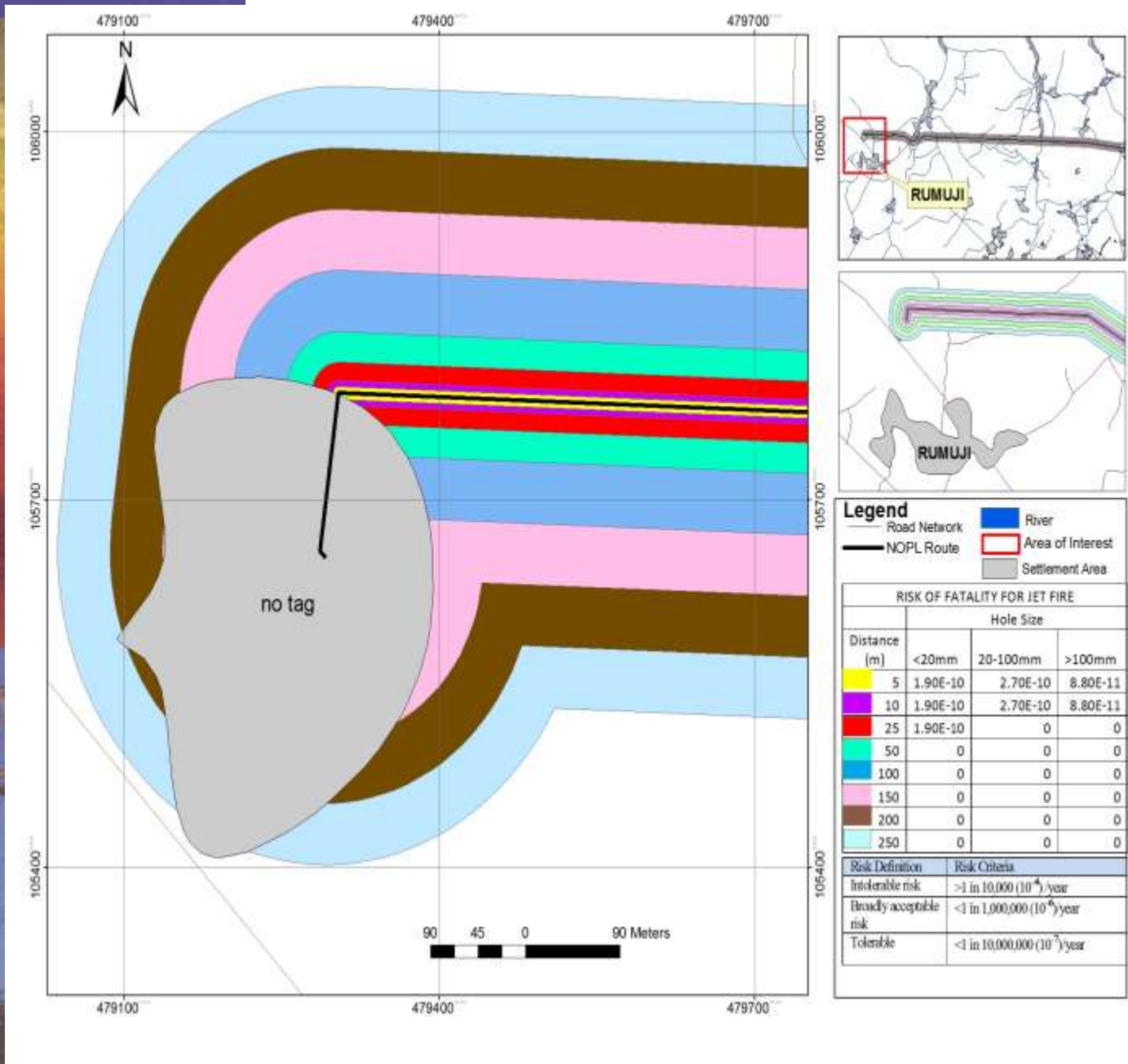


NORTHERN OPTION GAS PIPELINE (NOPL) AIR DISPERSION MODELLING

Assignment Name: NORTHERN OPTION GAS PIPELINE (NOPL) AIR DISPERSION MODELLING.		
Country: Nigeria Location within The Country: 36 States of the Federation		Status: Completed
Name of Client: Total E&P Nigeria Limited.		
State Date (Dec 2011)	Completion Date (Dec 2012)	
Narrative Description of project: The Northern Option Pipeline (NOPL) is a gas pipeline intended to transport gas from Total Exploration and Production Nigeria Limited (TEPNG) operations to the Alaoji Power Plant and for distribution to other customers in the Eastern Domestic Gas (DOMGAS) Market network. Because of the potentially hazardous nature of natural gas, associated pipelines are classified as potentially hazardous. The aim of this Quantitative Risk Assessment (QRA) is to ensure that there is no constraint, from a risk point of view, to the location of the new 24" pipeline. The objective of this QRA is to present hazards and risks associated with the natural gas pipeline from the point where the pipeline leaves the Rumuji Node to the point where the pipeline intersects the Imo River.		
Authorised Signature:		



NORTHERN OPTION GAS PIPELINE (NOPL) AIR DISPERSION MODELLING



Legend


- Road Network
- River
- Area of Interest
- Settlement Area
- NOPL Route

RISK OF FATALITY FOR JET FIRE				
Distance (m)	Hole Size			
	<20mm	20-100mm	>100mm	
5	1.90E-10	2.70E-10	8.80E-11	
10	1.90E-10	2.70E-10	8.80E-11	
25	1.90E-10	0	0	
50	0	0	0	
100	0	0	0	
150	0	0	0	
200	0	0	0	
250	0	0	0	

Risk Definition	Risk Criteria
Intolerable risk	>1 in 10,000 (10 ⁻⁴)/year
Broadly acceptable risk	<1 in 1,000,000 (10 ⁻⁶)/year
Tolerable	<1 in 10,000,000 (10 ⁻⁷)/year

AIR DISPERSION MODELLING FOR THE PORT HARCOURT OFFICE COMPLEX



Firm's Name:	DELTA SYSTEMATICS LTD.		
Assignment Name: AIR DISPERSION MODELLING FOR THE PORT HARCOURT OFFICE COMPLEX.			
Country: Nigeria		Status: Completed	
Location within The Country: Trans Amadi, Port Harcourt.			
Name of Client: Total E&P Nigeria Limited.			
State Date (July 2011)	Completion Date (Jan 2012)		
Narrative Description of project: This was to determine the amount of gas contaminant in the atmosphere around the office complex before the installation of a gas turbine.			
Authorised Signature:			





**ENVIRONMENTAL IMPACT ASSESSMENT OF URUA AKPAN
JUNCTION, OKON-IKOT OSUKPONG-URUA INYAN ROAD (16km)
AKWA IBOM STATE.**

Firm's Name:	DELTA SYSTEMATICS LTD.	
Authorised Signature:		
Assignment Name:	ENVIRONMENTAL IMPACT ASSESSMENT OF URUA AKPAN JUNCTION, OKON- IKOT OSUKPONG-URUA INYAN ROAD (16km) AKWA IBOM STATE.	
Country: Nigeria Location within The Country: Akwa Ibom State.	Status: On-going	
Name of Client: Niger Delta Development Commission.		
State Date (April 2011)	Completion Date Till date	
Narrative Description of project: Based on the objectives of this project, field workforces carried out biodiversity assessment, community health survey, air quality assessment, surface water quality assessment, vegetation assessment, aquatic life study, land use survey, socio-economic survey and waste inventory of the prosed site.		

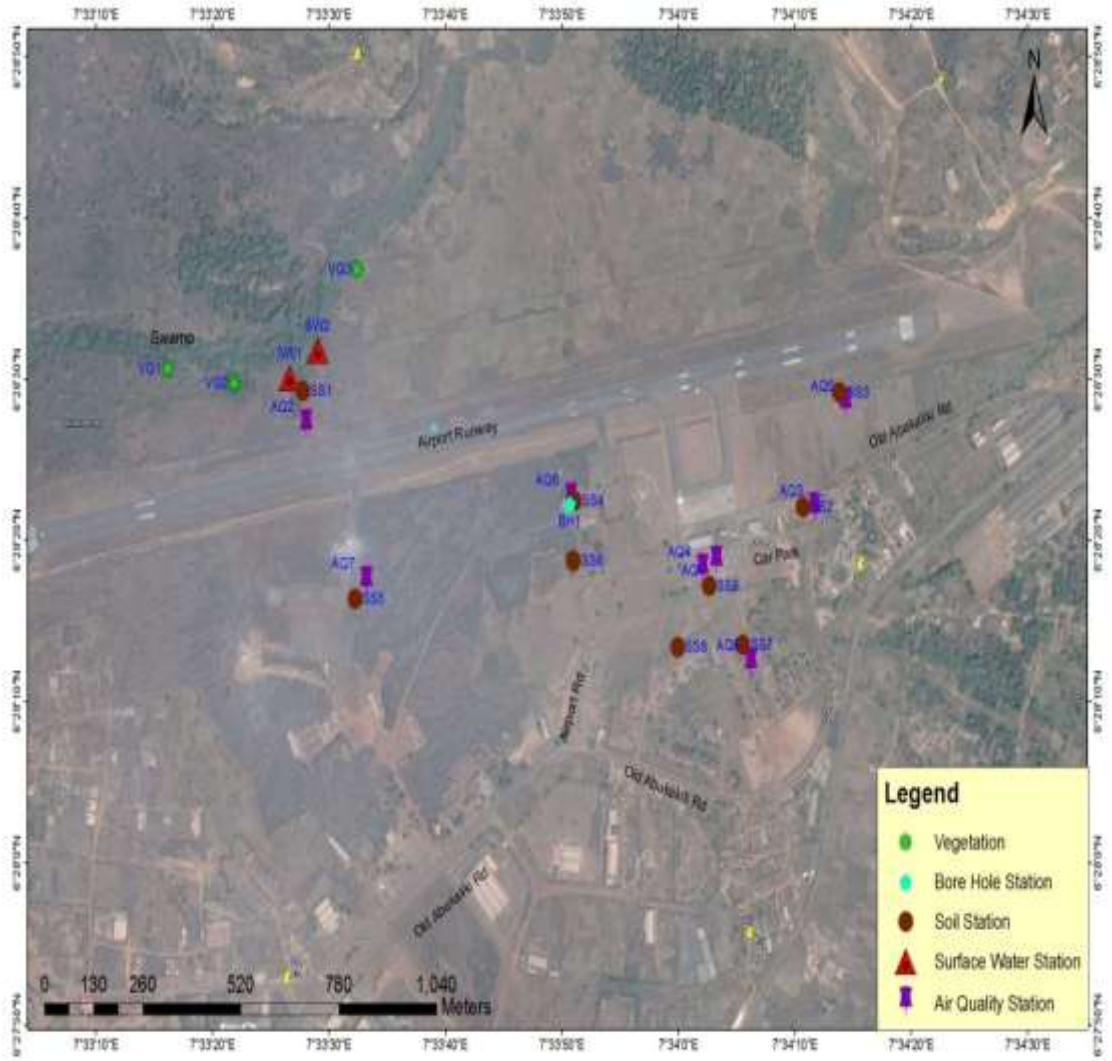


ENVIRONMENTAL EVALUATION STUDY (EER) OF ENUGU AIRPORT.

Authorised Signature:		
Assignment Name: ENVIRONMENTAL EVALUATION STUDY (EER) OF ENUGU AIRPORT.		
Country: Nigeria Location within The Country: Enugu State.	Status: Completed	
Name of Client: Federal Airport Authority of Nigeria (FAAN).		
State Date (Feb 2011)	Completion Date (2013)	
Narrative Description of project: The project is for the Environmental Evaluation Report (EER) on Akanu Ibiam International Airport, Enugu, Enugu East Local Government Area of Enugu State, South-Eastern Nigeria. The field programme was designed to cover the Akanu Ibiam Airport Enugu operational areas and to capture baseline data from the different possible point source of pollution. Data collected under the programme include Water, Soil, Sediment, Air Quality and Noise. Also the field programme was designed to cover adjoining areas of fresh water swamp forest and other landuse resources.		
		
Air Quality Equipment being used at the Enugu airport		



ENVIRONMENTAL EVALUATION STUDY (EER) OF ENUGU AIRPORT



ENVIRONMENTAL IMPACT ASSESSMENT OF MFAMOSING- ODUKPANI EVACUATION ROAD, CROSS RIVER STATE.



Firm's Name:	DELTA SYSTEMATICS LTD.
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Assignment Name: ENVIRONMENTAL IMPACT ASSESSMENT OF MFAMOSING-ODUKPANI EVACUATION ROAD, CROSS RIVER STATE.

Country: Nigeria Location within The Country: Cross River State.	Status: On-going
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Name of Client: UNICEM, Calabar.	
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State Date (Aug 2010)	Completion Date Till date	
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Narrative Description of project:
 The primary purpose of baseline description was to address possible environmental concerns that would arise from a development project involving the Mfamosing - Odukpani Evacuation 25km road construction project. The primary environmental concerns focused on Physical, Chemical, Biological, Socio-economic and Health components of the environment. The field programme was designed to cover the area proposed for the development of the evacuation road in addition to adjoining areas of swamp forest and other landuse resources.



Plankton collection using net



Soil Sampling using hand Auger

Authorised Signature:	
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BRASS LNG DREDGING AND SAND WINNING EIA

Firm's Name:	DELTA SYSTEMATICS LTD.
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Assignment Name: BRASS LNG DREDGING AND SAND WINNING EIA

Country: Nigeria Location within The Country: Brass Island, Bayelsa State.	Status: Completed
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Name of Client: Brass LNG Nigeria Limited.	
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State Date (Dec 2005)	Completion Date (2008)	
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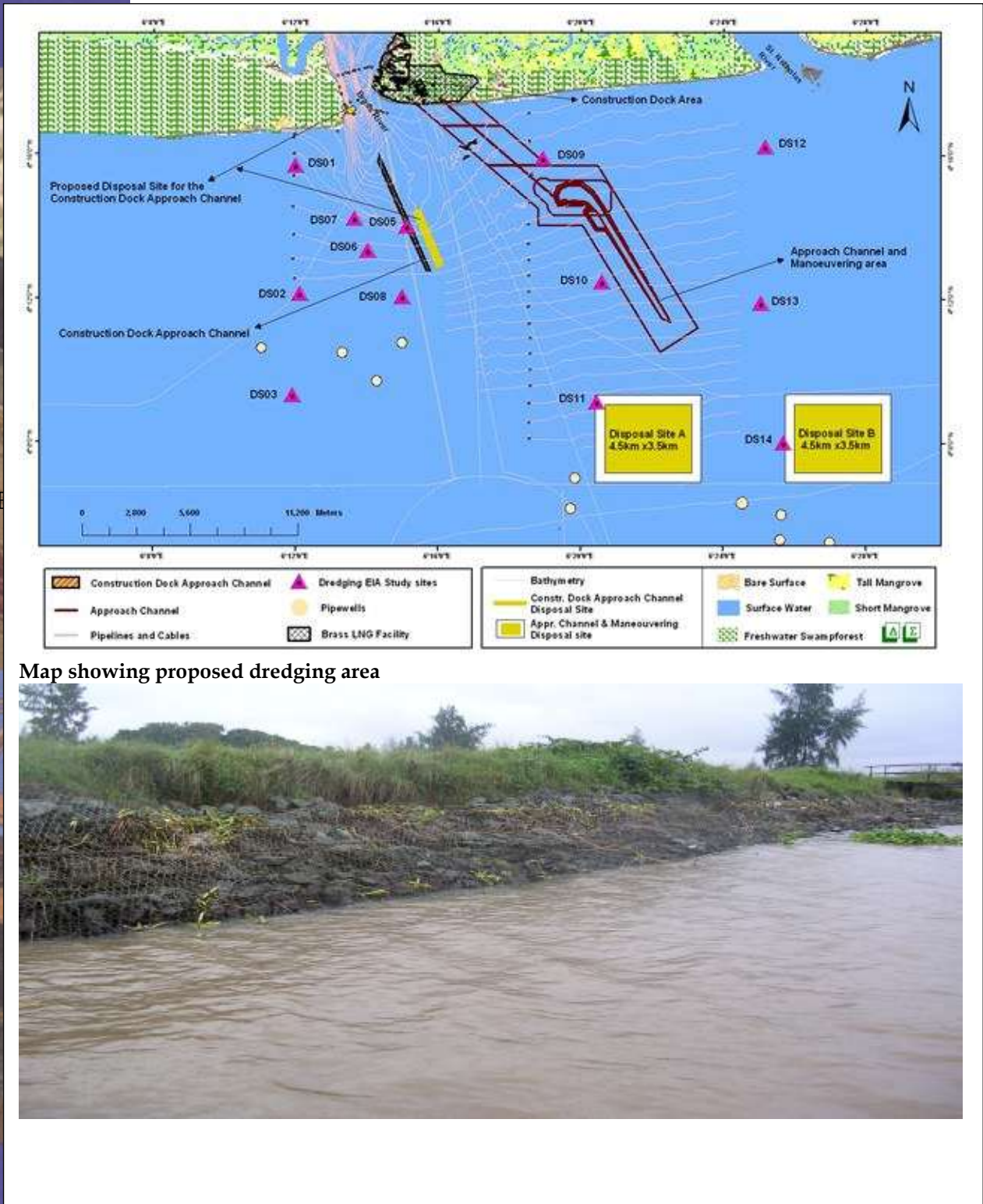
Narrative Description of project:
 The dredging EIA was initiated by Brass LNG based on the anticipated large extent of the proposed dredging activities that will be associated with the Brass LNG Project, including the potential effects of such dredging operation. The Dredging EIA addressed specific impacts that may arise from various multiple dredging, disposal and maintenance operations associated with the offshore component of the overall Brass LNG Project. The areas of the project sites surveyed included the offshore and coastal areas of the Brass Island especially the proposed Construction Dock Areas, the river mouth and the lower estuary within a 30 kilometre radius from the proposed onshore plant site. In general, datasets were collected for sediment quality, water quality, soil, vegetation, fisheries, geomorphology, socioeconomics and environmental sensitivity.



Authorised Signature:	
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BRASS LNG DREDGING AND SAND WINNING EIA





Firm's Name:	DELTA SYSTEMATICS LTD.
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Assignment Name: ENVIRONMENTAL IMPACT ASSESSMENT OF PROPOSED AGBARA GAS RECOVERY PROJECT (OFFSHORE BRASS AND ONSHORE).

Country: Nigeria Location within The Country: Brass Island and Offshore Brass.	Status: On-going
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Name of Client: Agip Energy and Natural Resources Nigeria Limited.	
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State Date (April 2008)	Completion Date Till date	
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Narrative Description of project: The team is carrying out a socioeconomic and health impact study that has to do with identifying communities at risk, identifying impacts associated with the project risk and hazard, identifying comprehensively the boundary of the socioeconomic geography to be impacted socially, economically, physically and culturally, and assessment of the health impact of the proposed project activity.

Authorised Signature:	
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ENVIRONMENTAL ASSESSMENT PROJECTS

1. Project: Capital City Developmental Planning using Satellite Imagery
Client: Anambra State Government
Date: 1985
2. Project: Environmental Sensitivity Mapping of OML 57
Client: Elf Petroleum Nig. Ltd.
Date: 1991
3. Project: Environmental Impact Assessment of the Inda Development Pipeline project.
Client: Chevron Nigeria Limited
Date: 1992
4. Project: Treatment and Restoration of Uganga and Ogariki Mud pits
Client: Chevron Nigeria limited
Date: 1992
5. Project: Environmental Sensitivity Mapping of OML 58
Client: Elf Petroleum Nig. Ltd.
Date: 1992
6. Project: Environmental Impact Assessment of the Abiteye Opuekeba pipeline project.
Client: Chevron Nigeria Limited
Date: 1992 - 1993
7. Project: Environmental Baseline data collection for O.M.L. 100 concession.
Client: Elf Petroleum Nig. Ltd.
Date: 1992 - 1993
8. Project: Environmental Mapping using seven scenes of Landsat Imagery.
Client: Oil Mineral Producing Area Development Commission (OMPADEC), Nigeria
Date: 1993
9. Project: Environmental Impact Assessment (EIA) of the NGL Recovery Project.
Client: Mobil Producing Nigeria Unlimited
Date: 1993 - 1994



10. Project: Environmental Impact Assessment of the Calabar Export Processing Zone (EPZ)
Client: Ministry of Commerce Abuja
Date: 1995 – 1996.
11. Project: Environmental monitoring of the Construction Phase of Mobil NGL Recovery Project.
Client: Mobil Producing Nigeria Unlimited.
Date: Nov. 1995 – 1996.
12. Project: Environmental Impact Assessment (EIA) of the Mobil Airstrip Project.
Client: Mobil Producing Nigeria Unlimited
Date: Nov. 1996 – 1997
13. Project: Site Investigation/Assessment of Obigbo North Water Injection Borrow Pit, and Otamiri Wells 1,7, & 8 Waste Pit.
Client: Shell Petroleum Development Company of Nigeria (East.)
Date: 1998 – February, 1999.
14. Project: Environmental Sensitivity Mapping of Alakiri Field
Client: Shell Petroleum Development Company of Nigeria (East).
Date: August 1998 – February, 1999.
15. Project: Soil and groundwater Investigation of Alakiri field
Client: Shell Petroleum Development Company of Nigeria (East).
Date: 1998 – February, 1999.
16. Project; Environmental Impact Assessment of Independent Thermal Power Plant
Client: Mobil Producing Nigeria Unlimited
Date: 1998
17. Project: Sand Search and Bathymetric Profiling of the Eleme River
Client: Mobil Producing Nigeria Unlimited.
Date: 1998



18. Project: Environmental Impact Assessment of Independent Thermal Power Plant (IPP).
Client: Mobil Producing Nigeria Unlimited
Date: 1998
19. Project: Field Survey Design, QA/QC, Database Management and GIS Mapping, Report Collation and Production of the Post Impact Assessment of the Idoho 24in Pipeline oil spill of January 12 1998
Client: Mobil Producing Nigeria Unlimited
Date: March 1998 –September 1999
20. Project Post Impact Assessment of the Finima-Bonny Airstrip Operations
Client: Mobil Producing Nigeria Unlimited
Date: December 1998-November 1999
21. Project: Ecological Baseline Mapping of Izombe field (OML 118)
Client: Addax Petroleum Development (Nig) Ltd.
Date: May – July 2000
22. Project: Reclamation of Warehouse Pit at Izombe Flowstation
Client: Addax Petroleum Development (Nig) Ltd.
Date: June – November 2001
23. Project: Environmental Sensivity Index (ESI) of Izombe field (OML 118)
Client: Addax Petroleum Development (Nig) Ltd.
Date: August 2001 – November, 2002
24. Project: Remote Sensing Imagery Mapping and Ancillary Services for the NDDC Masterplan
Client: Niger Delta Development Commission.
Date: September 2001 – November, 2002
25. Project: Brass LNG Marine Environmental Study
Client: Brass LNG Nig. Ltd.
Date: June – November 2004



26. Project: Brass LNG Siltation Study
Client: Brass LNG Nig. Ltd.
Date: September – December 2004
27. Project: Environmental Evaluation Study of MPN
Operational Areas Effluent Discharges at Various
Locations
Client: Mobil Producing Nig. Ultd.
Date: September 2004 – Date
28. Project: Field Survey Design, QA/QC, Database
Management and GIS Mapping, Report Collation
and Production of the Long Term Post Impact
Assessment of the November 22, 2003 QIT
Liquid Release Incident
Client: Mobil Producing Nigeria Unlimited
Date: November 2004 – July 2005
29. Project: Ecological Studies along proposed access path for
G+G activities.
Client: Brass LNG Ltd.
Date: February – May 2005.
30. Project: Nitrogen Dioxide (NO₂) Air Quality Modeling
and Training
Client: Mobil Producing Nig. Ultd.
Date: March – July 2005.
31. Project: LNG IPP Air Quality Modeling at Bonny &
Finima
Client: Mobil Producing Nig. Ultd.
Date: October 2005 – Date
32. Project: Brass LNG Dredging and Sand Winning EIA
Client: Brass LNG Nig. Ltd.
Date: December 2005 – 2008
33. Project: EIA of Proposed 451MW Sapele Power Plant
Client : Federal Ministry of Power & Steel.
Date: April 2006



34. Project: EIA of Proposed 286KM Markudi – Jos 330KV Transmission Line Project
Client : Federal Ministry of Power & Steel.
Date: April 2006.
35. Project: Fate and Effect of produced Water at Various Locations offshore
Client : Chevron Nigeria Limited.
Date: Feb 2008 – Date.
36. Project: Environmental Impact Assessment of Proposed Agbara Gas Recovery Project (Offshore Brass & Onshore)
Client : Agip Energy and Natural resources (Nig.) Ltd.
Date: April 2008 – Date.
37. Project: Environmental Impact Assessment of Erosion Control in Ibiono Ibom, Akwa Ibom State.
Client : Niger Delta Development Commission (NDDC).
Date: May 2010 – Date.
38. Project: Environmental Impact Assessment of Mfamosing - Odukpani Evacuation Road, Cross River State.
Client : UNICEM Calabar.
Date: August 2010 – Date.
39. Project: Environmental Evaluation Study (EER) of Enugu Airport.
Client : Federal Airport Authority of Nigeria (FAAN).
Date: Feb 2011– 20013.
40. Project: Environmental Impact Assessment of Urua Akpan Junction, Okon Ikot-Osukpong-Urua Inyan road (16km) Akwa Ibom State
Client : Niger Delta Development Commission (NDDC).
Date: April 2011 – Date.
41. Project: Air Dispersion Modelling for the Port Harcourt Office Complex
Client : Total E&P Nigeria Ltd.
Date: July 2011 – January 2012
42. Project: Northern Option Gas Pipeline (NOPL) Air Dispersion Modelling.
Client : Total E&P Nigeria Ltd.
Date: December 2011 – 2012.



- 43. Project: Environmental Sampling and Monitoring of Air and Water Quality on OML 58.
Client: Total E&P Nigeria Ltd.
Date: April 2012 – Date.
- 44. Project: OB 129 Pilot Hole Environmental Sampling and Screening.
Client: Total E&P Nigeria Ltd.
Date: August 2013.
- 45. Project: PIA of Ibewa Gas Resurgence Incidence
Client: Total E&P Nigeria Ltd.
Date: September 2012 - Date.



SELECTED PROJECTS ON REMOTE SENSING AND GIS

1. Project: GIS data capture and mapping of Environmental Sensitivity Index of OML 57 using Satellite Imagery.
Client Elf Nigeria 1991.
2. Project: GIS data capture and mapping of Environmental Sensitivity Index of OML 58 using Satellite Imagery.
Client Elf Nigeria 1992.
3. Project: Planning and design of the Capital City Awka, Anambra State using GIS analysis of satellite imagery.
Client: Anambra State Government. 1992-1993
4. Project: Data Conversion of Topographic Maps; Pilot GIS development of the Lagos Area, and Capacity Building of the Surveys department.
Client: Federal Surveys Department, Federal Ministry of Works 1994.
5. Project: Procurement, installation, and customising of AUTOCAD for the Engineering Department.
Client: Shell Petroleum Development Corporation (East). 1994
6. Project: Environmental Mapping of the OMPADEC areas using 9 Thematic Mapper and four SPOT scenes of Satellite imagery. Production of 138 image maps at 1:50000. Production of TM/SPOT PAN merge at 1:25000. Development of GIS database of environmental features. Introductory GIS and database training of environmental department staff .
Client OMPADEC 1994 –NNDC 2001.
7. Project: GIS based Data Capture, Database design and Map production services in the Environmental Impact Assessment of the Bonny Terminal Integrated Project (BTIP).
Client: MacDonal Engineering Group (MEG), Canada. 1997-1999
8. Project: GIS data capture and analysis of Groundwater and Soil Contamination of Obigbo North and Otamiri waste pits.
Client: Shell Petroleum Development Corporation. 1998



9. Project: GIS data capture and risk analysis of groundwater and Soil Contamination of Alakiri Field.
Client: Shell Petroleum Development Corporation. 1998
10. Project: Contingency Planning: Helicopter and Boat Response modeling for Alakiri Field
Client: Shell Petroleum Development Corporation. 1998
11. Project: Data Management and GIS mapping for the Post Impact Assessment of the Idoho January 12 1998 oil spill.
Client: Mobil Producing Nigeria Unlimited. 1998-1999.
12. Project: GIS data capture and Mapping of Environmental Sensitivity Index of Alakiri Field (OML 18) using Satellite Imagery.
Client: Elf Nigeria 1998 –1999.
13. Project: Introductory training in ARCVIEW, for the Environmental Affairs Department, Mobil Producing Nigeria Unlimited..
Client: Environmental and Loss Prevention, Mobil Producing Nigeria Unlimited. September 8-11. 1998
14. Project: Data Conversion and environmental feature extraction of Pipeline Network belonging to Pipeline and Products Marketing Company.
Client: Pipeline and Products Marketing Company. (PPMC) April 2000
15. Project: GIS data capture of environmental data and transmission line route planning from Bonny to Afam for the proposed Independent Power Plant project.
Client: Exxon-Mobil 1998-2000
16. Project: GIS based Environmental Sensitivity Index Mapping of Izombe Field (OML 118) using Imagery.
Client: Addax Petroleum Development Corporation 2001-2002



17. Project: Route Planning of Pipeline transmission of Gas from offshore waters of Oso field to onshore Aluminum smelting Plant in Akwa-Ibom.
Client: Exxon-Mobil Producing Nigeria Unlimited. September 2000.
18. Project: GIS–based survey computations and adjustments of lease boundaries between NNPC and Exxon-Mobil in Finima-Bonny Nigeria.
Client: Exxon-Mobil. January 2002.
19. Project: Data conversion, Digital layers extraction and development of a seamless GIS database of 400 topographic maps for NE region of Nigeria.
Client: Department of Survey, Federal Ministry of Works 2001-2002
20. Project: Design and Implementation of a multisectoral Geographic Information Systems to capture and integrate data from 25 sectors of intervention portfolios by the Niger Delta Development Commission.
Client: Niger Delta Development Commission. April 2003-2004
21. Project: Nigeria ARC/View GIS Training Course
Description: Delta Systematics prepared ARC View Training Course Material for a two week course
Client: Niger Delta Development Commission (NDDC). September 2004.
22. Project: The NDDC Environmental Information Management System (EIMS) and GIS Training:
Description: Design and set up a computerized database, determine hardware and software needs, networking structure, and maintenance requirements of the EIMS The environmental information management system (EIMS) was designed to provide a framework that would accept graphical, non-graphical; spatial and non-spatial data sets. Provided GIS training for 16nos staff of NDDC from different Directorates.
Client: Bryjarck Nigeria for Niger Delta Development Commission (NDDC). January 2006 – May 2007



- 23 Project: Design and Implementation of GIS for EGI Community, Rivers State

Description: Design and Implementation of GIS based decision support system for EGI community development strategy project. Target areas are Umu-Obor Zone, Egi-Etiti Zone, Ihiahu Zone and Uso-Ozimini Zone.

Client: Client Elf Petroleum Nigeria Ltd.

January 2007 – 2008.

- 24 Project: GIS Inventory for Distribution and Marketing of PHCN facilities for EDO state under FGN 2009 Capital Projects.

Description: Design and implementation of GIS for distribution inventory (transformers, poles, conductors, cable cross arms, etc to be carried out feeder by feeders by transformers by injection substations by business units and production of network digital maps. Design and implementation of GIS for consumer enumeration linked to transformer to feeder to injection substations and route sequencing. Production of reports from database generated.

Client: PHCN Edo state.

August 2009 – March 2010.


- 25 Project: GIS Inventory for Distribution and Marketing of PHCN facilities for Ilorin (Challenge Business Unit) under FGN 2009 Capital Projects.

Description: Design and implementation of GIS for distribution inventory (transformers, poles, conductors, cable cross arms, etc to be carried out feeder by feeders by transformers by injection substations by undertakings. Geometric modeling of network and production of digital maps. Design and implementation of GIS for consumer enumeration linked to transformer to feeder to injection substations and route sequencing. Production of reports from database generated.

Client: PHCN Oyo State

August 2009 – March 2010.



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- 26 Project: Technical assistance Services for the Implementation of the Revision of Geodetic Network and Cartographic Coverage of Nigeria.

Description: Acquisition of satellite images, field campaign to collect ground control points for georeferencing and processing which will aid in map production.

*Client: Ministry of Mines and Steel Development (MMSD).
May 2008 – April 2013*

- 27 Project: GIS for Security Division: Data Acquisition and Customization.

Description: Design, database development and implementation of GIS for Security department of TEPNG for Staff residence, Police stations/police posts, TEPNG retainership hospitals/clinics, hotels, stores, etc. in Port Harcourt.

*Client: Total E&P Nigeria Ltd.
Dec 2011 – July 2012*

- 28 Project: GIS Mapping of All Ducts and Dark Fibre Networks in Nigeria for the South East and North West Geopolitical Zone of Nigeria.

Description: GPS mapping and verification of all ducts and dark fibre networks for Glo, Airtel, MTN and Suburban. Geodatabase development and reporting of all derived and validated data showing coordinates and covered areas in GIS format. Conversion of the sourced data into ESRI GIS Format and development of GIS network model for the coverage areas.

*Client: National Communications Commission (NCC)
March 2012 – August 2013.*