



SETS ENGINEERING SERVICES

Results you can count on...

EFFICIENT WASTE MANAGEMENT FOR URBAN NIGERIA

WASTEWATER AND SOLID WASTE:

A PILOT PROJECT

*World Igbo Environmental Foundation
WIC 12th Annual Convention
Boston, Massachusetts*

August 31 – September 4, 2006



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Delivery by:

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(President/CEO)

SETS ENGINEERING SERVICES

(A DIVISION OF SOIL & ENVIRONMENTAL
TESTING SERVICES, INC.)

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Results you can count on...

In Nigeria, urbanization and industrialization have led to a **waste management crisis**, resulting in widespread air, water, and soil pollution...**improperly constructed landfills** all contribute to serious environmental damage.

U.S. Library of Congress – Federal Research Division



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Results you can count on...

Municipal **solid waste heaps** dot several parts of Nigerian major cities, blocking motorways and making passages along alleys and pavements difficult.

Municipal **waste disposal and sewage problems** are particularly serious in all urban centers.

United Nations Environment Programme



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The burning of electronic goods may pose a health hazard because of materials used in their construction. Plastic casings incorporate chemicals such as flame retardants, while lead is often present in motherboards and monitors.





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Results you can count on...

'There is a growing body of evidence that demonstrates the crucial importance of **water, sanitation and hygiene** not only to human health but also for the **economic and social development** of communities and nations around the world.'*

*Water Supply and Sanitation Collaborative Council, Geneva, 2003



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Results you can count on...

Abuja (central sewerage system): The temporary plant now in use has capacity to serve **only 50,000** people, that is, **25%** of its present population. It is therefore **not able to provide adequate** treatment of the wastewater.

United Nations Environment Programme



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Results you can count on...

Only **5%** of the inhabitants of Lagos Metropolis, Nigeria are connected to water-borne system and associated sewerage treatment plants. The plants do not treat the sewage to **acceptable standards**, and are **poorly maintained** and operated

United Nations Environment Programme



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Results you can count on...

**Electronic
scrap from
Europe and
the United
States is
littering the
streets of
Onitsha
and Aba,
Nigeria**





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In 1995 the total wastewater emptied into Lagos Lagoon was **811,300** m³ per day, of which domestic wastewater accounted for 54%. The volume of wastewater generated is expected to increase to **1,663,090** m³ per day by 2010.

United Nations Environment Programme



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Water and sanitation related illness is a major drain on the health of children and prosperity of nations

*UNICEF



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GENERAL POPULATION MORTALITY RATES*

Unit of Measure	Nigeria	France	United States
Life expectancy at birth (years) males	45.0 (2004)	76.0 (2004)	75.0 (2004)
Life expectancy at birth (years) females	46.0 (2004)	83.0 (2004)	80.0 (2004)
Probability of dying (per 1 000 population) between 15 and 60 years (adult mortality rate) males	513 (2004)	132 (2004)	137 (2004)
Probability of dying (per 1 000 population) between 15 and 60 years (adult mortality rate) females	478 (2004)	60 (2004)	81 (2004)
Probability of dying (per 1 000 population) under five years of age (under-5 mortality rate) males	198 (2004)	5 (2004)	8 (2004)
Probability of dying (per 1 000 population) under five years of age (under-5 mortality rate) females	195 (2004)	4 (2004)	7 (2004)
Deaths among children under five years of age due to malaria (per 1000)	15.7 (2000)	0.0 (2000)	0.0 (2000)
Deaths among children under five years of age due to diarrhoeal diseases (per 1000)	24.1 (2000)	0.9 (2000)	0.1 (2000)
Population (in thousands) total	131,530 (2005)	60,496 (2005)	298,213 (2005)

*W.H.O. World Health Organization



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THE SOLID WASTE LANDFILL: THE ENGINEERED LANDFILL

**SOLID
WASTE TREATMENT**





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THE ENGINEERED LANDFILL

- This is the remedy to the eyesore of litter and dumps of solid wastes in Nigeria's urban centers.
- It will improve the health of all Nigerians by reducing breeding havens for disease carriers, and promote the national economy.
- With proper design and operations management, could last between 10 and 100 years.
- Engineered landfill, a must for Nigeria's urban cities, and a worthwhile investment.



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ACTIVE LANDFILL SYSTEM

1. Final Cover Cap
2. Daily Cover Soil
3. Active Landfill Area
4. Daily Waste Cells
5. Leachate Drainage Layer
6. Composite Clay & Plastic Liner
7. Leachate Collection Pipe
8. Landfill Gas Collection Pipe
9. Methane gas Migration Monitoring Well
10. Ground Water Monitoring Well
11. Storm Water Runoff Ditch

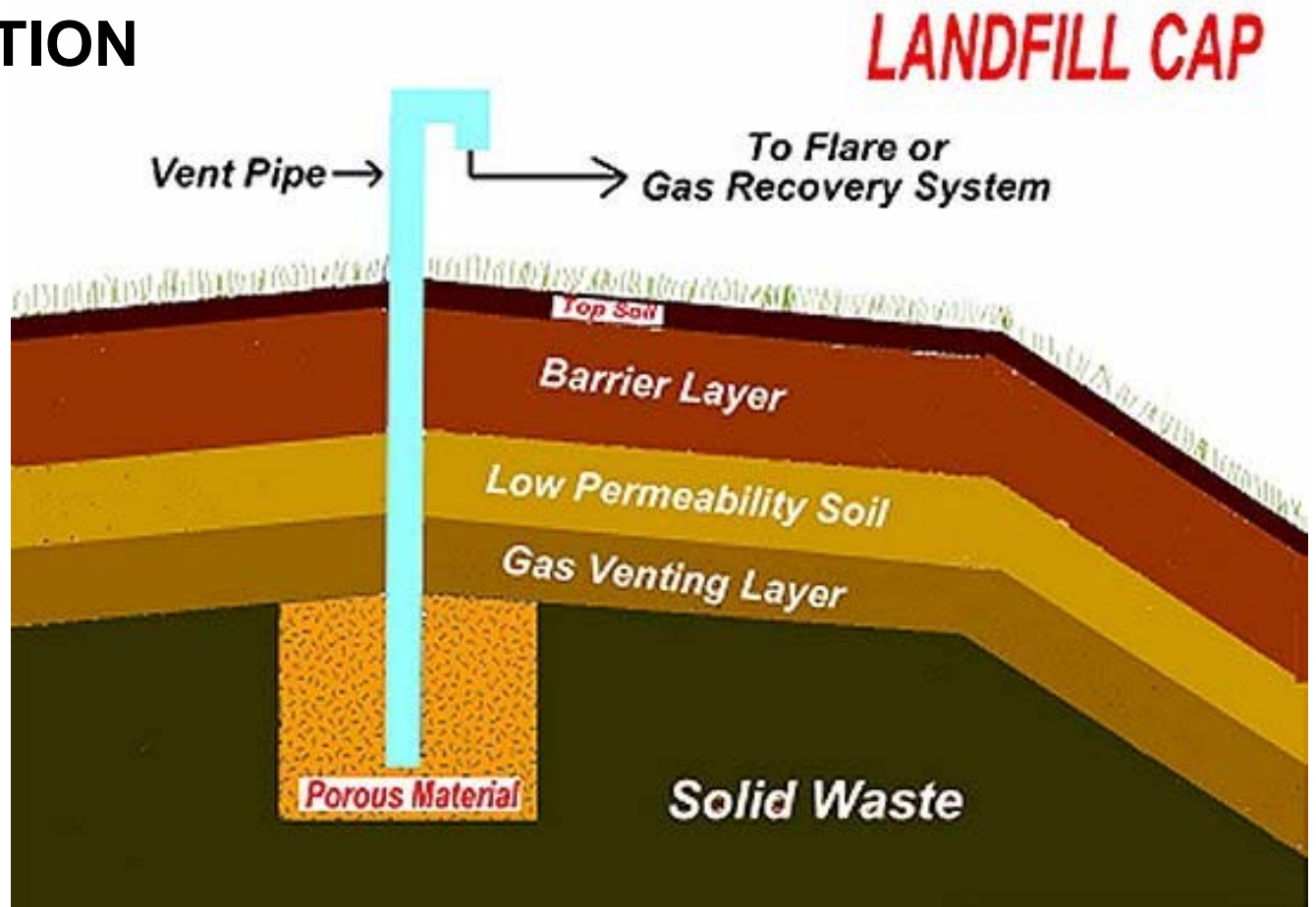




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LANDFILL CROSSECTION



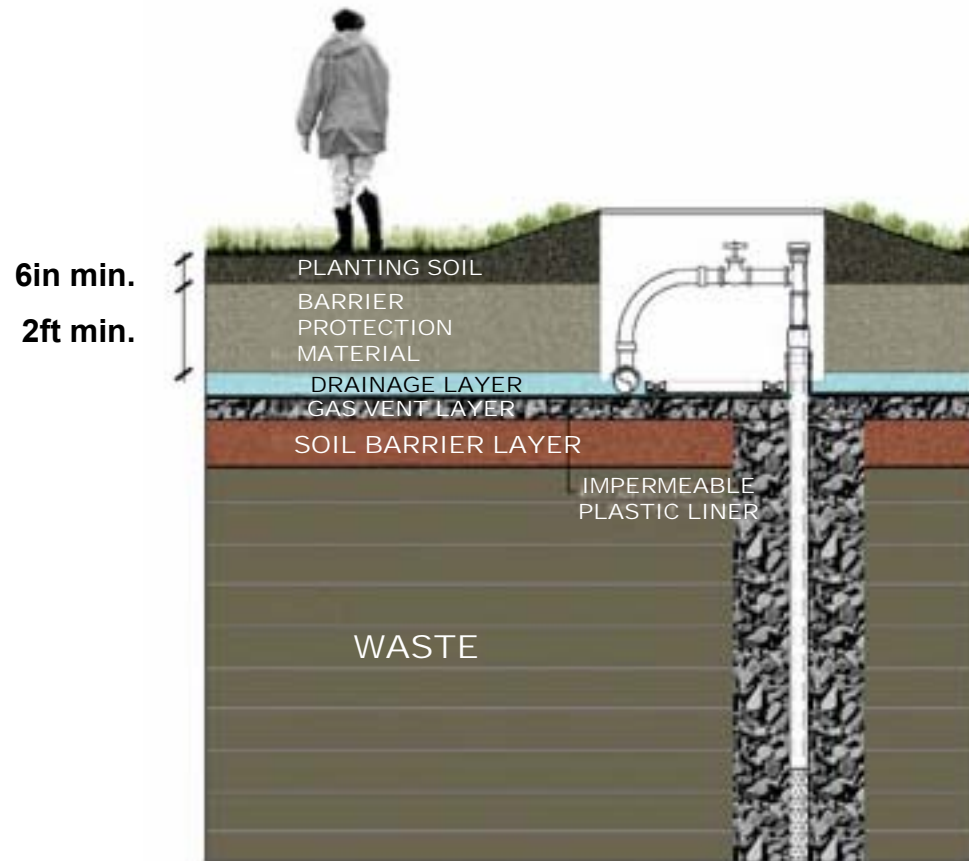


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Results you can count on...

LANDFILL SYSTEMS

- Final Cap
- Landfill gas control collection
- Leachate control collection and cleaning
- Stormwater basins
- monitoring systems

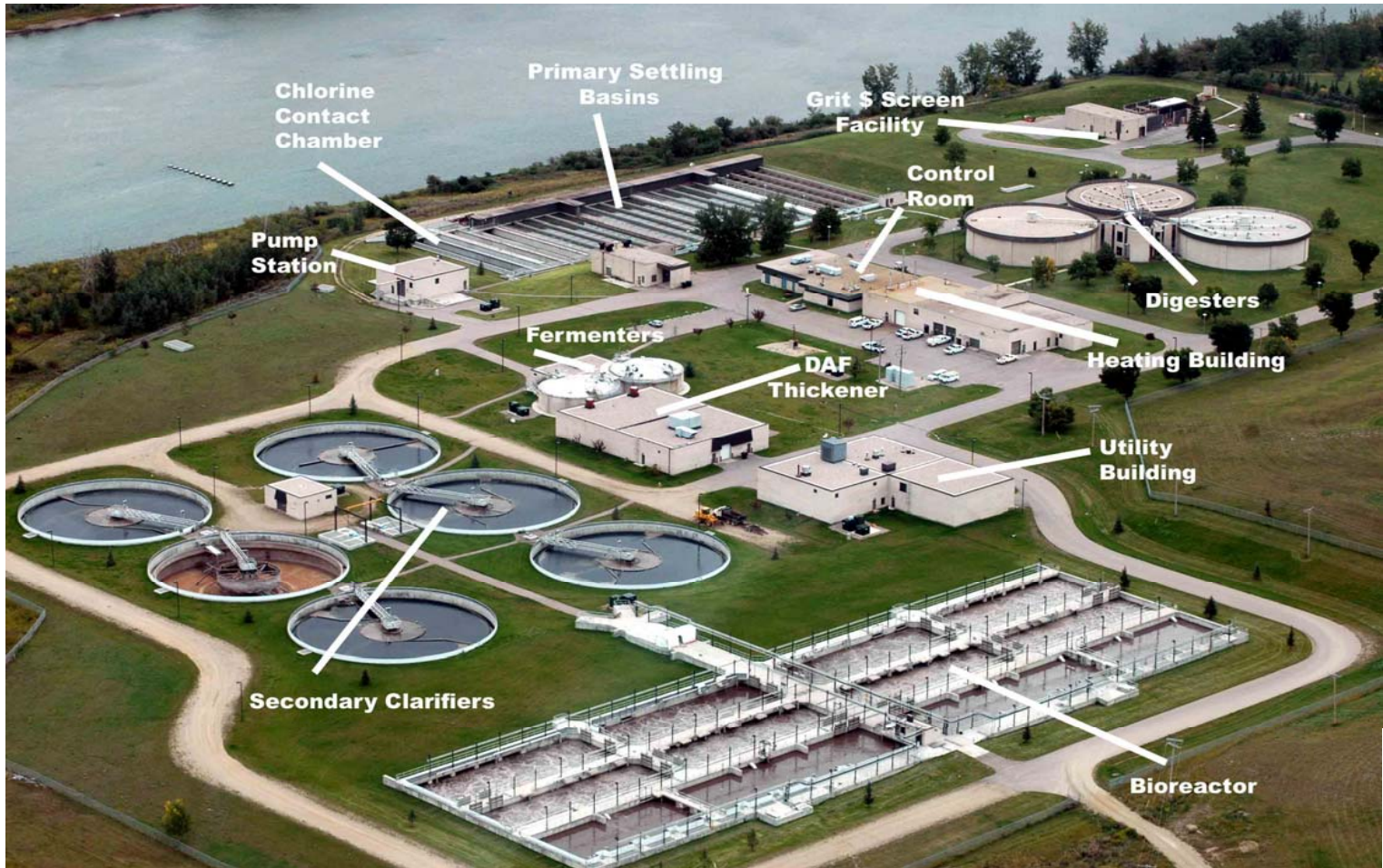




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WASTEWATER MANAGEMENT

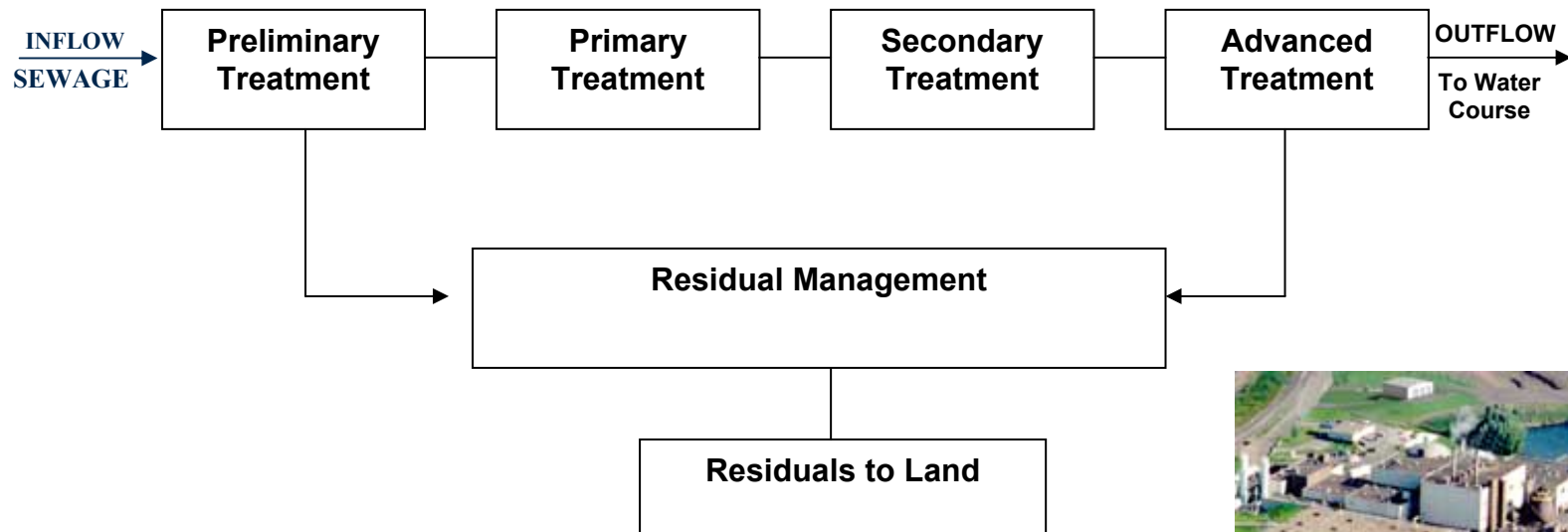




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Arrangement of a Typical Wastewater Treatment Facility





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(A Division of Soil & Environmental Testing Services, Inc.)

COMPANY OVERVIEW

- ✦ **Founded in 1988**
- ✦ **Multi-disciplined**
- ✦ **Client – Private and Public Sector**
- ✦ **Successfully completed all projects to date**





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CORE SERVICES



**CIVIL ENGINEERING AND
CONSTRUCTION MANAGEMENT**



**ENVIRONMENTAL CONSULTING
SERVICES**



MATERIALS TESTING



GEO-TECHNICAL SERVICES



LABORATORY SERVICES



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KEY TECHNICAL STAFF

JOE N. ETO, P.G (GA, AL)

- M.S. ENGINEERING GEOLOGY
- M.S. – MINERALOGY
- 25+ YEARS INDUSTRY EXPERIENCE
- BUDGETING, FUNDING, PROGRAM MANAGEMENT

WILLARD NORTON, P.G (GA)

- M.S. - GEOLOGY
- B.S. – PETROLEUM ENGINEERING
- 28+ YEARS INDUSTRY EXPERIENCE
- SITE ASSESSMENTS
- REMEDIAL INVESTIGATIONS
- WELL INSTALLATIONS AND MONITORING
- EXPERIENCED PROJECT MANAGER

GINA KELLY MONTGOMERY (REM, CIPS)

- B.S. - CHEMISTRY
- REGISTERED ENVIRONMENTAL MANAGER
- REGISTERED CERTIFIED INFRASTRUCTURE PREPAREDNESS SPECIALIST
- 15+ YEAR EXPERIENCE - INDUSTRY
- EXPERT HUMAN HEALTH RISK ASSESSOR
- US EPA EXPERIENCE – MULTI – SUPER FUND SITE MANAGEMENT EXPERIENCE
- HIGHLY TRAINED RISK ASSESSOR
- HOMELAND SECURITY EVALUATIONS



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KEY TECHNICAL STAFF

EKURE TAWO, Ph.D

- Ph.D – MINING STATISTICS/ENGINEERING
- P.E. – UNITED KINGDOM
- M.Sc. – MINING ENGINEERING
- B.S. - GEOLOGY
- 26+ YEARS INDUSTRY EXPERIENCE
- EXPERIENCED GEO-TECHNICAL ENGINEER
- EXPERIENCED DEEP ROCK STRUCTURAL ANALYST
- GEO-LOGICAL MAPPING
- TUNNEL DESIGN EXPERT

CHARLES GEORGE

- M.S. – GEO-TECHNICAL & ENVIRONMENTAL ENGINEERING
- M.S. – GEO-PHYSICS
- B.S. - PHYSICS
- 5+ YEARS INDUSTRY EXPERIENCE
- EXPERIENCE IN SUBSURFACE INVESTIGATIONS
- DRILLING OVERSIGHT AND CORE ANALYSIS
- WELL INSTALLATIONS AND MONITORING
- TUNNEL EXPERIENCE

CHRIS OJI, P.E (GA)

- Ph.D – STRUCTURAL ENGINEERING
- M.S. – STRUCTURAL ENGINEERING
- B.S. – CIVIL ENGINEERING
- 20+ YEARS INDUSTRY EXPERIENCE
- VERY STRONG BRIDGE DESIGN EXPERIENCE
- EXPERT STRUCTURAL DESIGN ENGINEER
- D.O.T. EXPERIENCE
- AIRPORT STRUCTURES EXPERIENCE

WAYNE WILSON, P.G (GA, AL)

- B.S. – CIVIL ENGINEERING
- 30+ YEARS EXPERIENCE
- TRANSPORT ENGINEERING
- ROAD AND HIGHWAY/UTILITY DESIGN
- STORM DRAINAGE
- HYDROLOGY AND HYDRAULICS DESIGN
- FACILITIES AND SITE DEVELOPMENT DESIGN FOR SEVERAL AIRPORTS
- VERY EXPERIENCED PROGRAM MANAGER



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SAMPLE PROJECT EXPERIENCE

WASTE WATER CONSTRUCTION



Client:
City of Atlanta

Prime Contractor:
J J & G

Sub Contractor:
SETS

**Design/Build of Nancy Creek Trunk
Sewer Capacity Management
Facility, Atlanta, Georgia**

Contract Sum:
\$8M (design phase)
\$205 mil (construction phase)



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SAMPLE PROJECT EXPERIENCE

West CSO Groundwater Monitoring



Client:
City of Atlanta

Prime Contractor:
J J & G

Subcontractor: SETS



Contract Sum:
\$10M (design phase)
\$265M (construction phase)



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SAMPLE PROJECT EXPERIENCE

Tenth Ward Trunk Sewer Project in Southeast Atlanta



Client: City of Atlanta
Contract Sum: \$1.75M

Prime Contractor:
SETS



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SAMPLE PROJECT EXPERIENCE

Key Road, and
Cascade Road
Landfills.

- Atlanta, Georgia

Client:

City of Atlanta

Prime Contractor:

CH2MHill

Sub Contractor: SETS

Contract Sum:

\$4.5mil (design phase)





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National Environment Outlook

Objective:

To achieve not less than 80 per cent effective management in the volume of municipal solid waste generated at all levels and ensure environmentally sound disposal.



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It is by acts and
not by ideas that people live.

--Anatole France



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