

ACCRA METROPOLITAN ASSEMBLY

SECOND URBAN ENVIRONMENTAL SANITATION PROJECT

REHABILITATION, CLOSURE, BID EVALUATION, CONSTRUCTION SUPERVISION AND
CONTRACT MANAGEMENT OF THE OBLOGO No. 1, MALLAM MAIN (No.1 &2) AND
MALLAM SCC DUMPSITES IN ACCRA



FINAL COMPLETION REPORT FOR WORKS ON DUMPSITES ACCRA



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Second Urban Environmental Sanitation Project-(UESP II)
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EXECUTIVE SUMMARY

This report provides a summary of various activities carried out, challenges and lessons learnt during the preconstruction and post construction phases of the Second Urban Environmental Sanitation Project (UESP II), which requires the rehabilitation, closure, bid evaluation, construction supervision and contract management of the Oblogo No. 1, Mallam Main (No.1 & 2) and Mallam SCC dumpsites in the Ga South Municipal Assembly.

The facilities provided are grouped under three working Lots as follows:

Lot 1: Rehabilitation (capping) and Installation of facilities for the closure of Oblogo No.1 dumpsite

Lot 2: Rehabilitation (capping) and Installation of facilities for the closure of Mallam SCC dumpsite

Lot 3: Rehabilitation (capping) and Installation of facilities for the closure of Mallam No.1 & No. 2 dumpsites

Due to the highly participatory approach adopted for the successful completion of the assignment, there were a number of variations to the original project scope bearing in mind the cost implications

Table A: Summary of Cost Details for carrying out the Assignment

Item	Description	Oblogo No. 1	Mallam SCC	Mallam Main No. 1 & No. 2	Total
1	Provisional Contract Sum	GH¢ 532,795.50	GH¢ 193,877.75	GH¢ 578,625.00	GH¢ 1,305,298.25
2	Funding	WORLD BANK (UESP-II)/GOVERNMENT OF GHANA(AMA)			
3	Contractor	Malsons Limited	Zoomlion Ghana Limited	Zoomlion Ghana Limited	
5	Contract Duration (months)	1.2 months	2 months		
6	Works Contract Signed	March 20, 2012	March 9, 2012	March 9, 2012	
7	Commencement	April 20, 2012	March 28, 2012	March 28, 2012	
8	Intended Completion	May 30, 2012	May 28, 2012	May 28, 2012	
9	Actual Completion	2013	2013	2013	
10	Payments	4	3	3	
10.1	No. IPC Presented	4	3	3	
10.2	No. IPC fully Honoured	4	3	3	
10.3	<i>Total Certified Amounts Paid</i>	<i>GH¢571,268.97</i>	<i>GH¢ 208,412.76</i>	<i>GH¢ 621,990.30</i>	<i>GH¢ 1,401,672.03</i>
11	% Elapsed Time	Over 100%	Over 100%	Over 100%	

At the planning stage, the entire assignment which started in March 2012 was envisaged to end in May 2012. Due to challenges and setbacks which are peculiar to projects of this nature, the assignment was practically completed in September, 2013 and handed over in January 2014. The defects liability period elapsed two months after completion of works.

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1.0 INTRODUCTION (Project Brief, Description and Location)

1.1 General

1. The Accra metropolitan area has faced serious challenges for locating and developing engineered landfills for over two decades. Rapid urbanization of Accra has led to the growth of the city and its contiguous areas which makes the location of solid waste disposal facilities difficult. The City Authority in a bid to overcome the problem of open-dumping operations at un-approved sites acquired land at Kwabenya for the development of an engineered landfill site. As typical of residents' opposition to the siting of disposal facilities within their backyards, the Kwabenya Landfill development project has remained on the drawing board despite the sinking of close to \$2 million in preparatory works including construction of macadam roads to the proposed site.
2. While the City authority (Accra Metropolitan Assembly, AMA) was anxiously pursuing and anticipating resolution of challenges surrounding development of the new landfill site, it has to frantically locate land for disposal operations in order to continuously deal with the increasing waste flows to protect public health and assuage residents complaints of uncollected refuse especially from low-income communities that depend on communal container systems.
3. AMA therefore resorted to controlled open-dumping operations at a number of sites. The siting of such refuse dumps, often, do not follow any planning considerations and lead to odors and flies in the rainy season, continuous smoke from smoldering fires, and a pollution of nearby water bodies. These malodorous effects and adverse impacts contribute to the vehement complaints of communities near such disposal sites and often the entrenched resistance of residents near locations proposed for treatment and disposal sites of any kind – the “NIMBY” effect.
4. The Mallam SCC dumpsite was opened in February, 2009. The site is an abandoned quarry operated in the late 1970's and 80's by the now defunct State Construction Corporation (SCC) hence the name. It served as a temporary relief site to the older Main Mallam (No.1 & 2) dump site which had operated as the main disposal site for the Accra metropolis from July 1991 to September 2001. The Mallam SCC site covers an area of approximately 1.6 hectares and is approximately 15 kilometres from the Central Business District (CBD) of Accra.
5. The Oblogo No.1 dumpsite was opened in the year January 2002 and was until November 2008 the main waste disposal site for the Accra Metropolis. The Oblogo No.1 site covers an area of approximately 5.5 hectares and is approximately 17 kilometers from the CBD area of Accra. The daily tonnage of waste received at the Mallam SCC and Oblogo No.1 disposal sites was approximately 1,096 metric tonnes each.
6. The Mallam No.1 and 2 dumpsites was until the end of the 90's, the main waste disposal site for the Accra Metropolis. The Mallam No.1 covers an approximate area of 4.3 hectares while the Mallam No.2 covers an approximate area of 4.4 hectares.

7. In July 2011, at the peak of the rainy season the flow of leachate from these sites increased substantially and attracted the attention of Ghana's legislature. The Parliamentary Committee on Environment and Social Services visited the sites in early August, 2011 and expressed concerns about the situation.
8. The AMA in mid-August, 2011 engaged the services of a consultant to study options for rehabilitation and closure of the dump sites including putting in place an effective after-care management particularly for the management of leachate.

1.2 Description of sites

1.2.1 Location, size and access

9. All the disposal sites in concern are located in the Ga South Municipality of the Greater Accra Region.

1.2.1.1 Oblogo No.1 Disposal Site

10. The Oblogo No.1 disposal site covers an estimate area of 5.5 hectares (13.59 acres) and was in operation as the main dumpsite of the Accra Metropolis and peri-urban settlements for about 6 years (January 2002-November 2008).
11. The site is located about one (1) kilometre north of the Ga-South Municipal Assembly near Weija Junction. It is accessed by the second branch road on the right of the Weija Junction-Oblogo main road. The road that leads to the site is un-tarred and runs in front of the Oblogo No.2 refuse dumpsite.
12. The site was initially a quarry pit of the Ghana Stone Quarry Limited. Information gathered revealed that some initial work on closure/capping was started (from the western end of the site) by PW Construction Limited but was however abandoned due to lack of funds.
13. Dumping at the site had to be restricted due to the presence of ECG pylons. Leachate from the refuse gradually seeps into an existing reinforced concrete sump built as part of the initial attempt to rehabilitate the site.
14. From site observations, there was an initial plan to sink a submersible pump to re-circulate the leachate. Since this objective was not met, the sump has been broken at a point close to the base of the sump to let out leachate; hence the collected leachate flows out through adjoining earth gullies and the main roadside drains and culverts into the Densu River which is the final outfall.

1.2.1.2 Mallam SCC Disposal Site

15. The site, an abandoned quarry pit of the then State Construction Company (SCC) Limited covers an estimated area of 1.6 hectares (3.84 acres).
16. The site is located within the high residential area in the heart of Mallam SCC near Mallam. It can be accessed by the partly tarred road that turns left about 400m from the main junction of the Mallam-Gbawe road. The same road runs in front of the Mallam main dumpsite to the Mallam SCC site.

1.2.1.3 Mallam Main No.1 & 2 Disposal Sites

17. The Mallam No. 1 & 2 disposal site covers a total estimated area of 8.7 hectares (21.4 acres) with Mallam No.1 covering 4.3 hectares (10.6 acres) and Mallam No.2 covering 4.4 hectares (10.8 acres) and was in operation as the main dumpsite of the Accra Metropolis and peri-urban settlements for about a decade (July 1991-September 2001).
18. The site which spans a length of about one (1) kilometre is located a few meters off the Mallam Junction-Gbawe Road. The road that leads to the site is un-tarred and runs in front of the refuse dumpsite.

2.0 PROJECT OUTPUTS

2.1 Planned Interventions

19. After detailed field work and designs have been completed, the following interventions were recommended.
20. The proposed interventions to improve sanitary conditions on the existing dumpsites and enhance aftercare management are presented in table 2.1.

Table 2.1: Proposed interventions to improve sanitary conditions on the existing dumpsites and enhance aftercare management

Item	Construction Site	Project Measure
1	Oblogo No.1 Site	<ul style="list-style-type: none"> ❖ Site clearance, collection and disposal to a depth not exceeding 0.15m ❖ Capping: volume of clay 3,584m³ of 150mm thickness ❖ Capping: volume of laterite 7,000m³ of 75mm thickness ❖ Landscaping: Area of humus rich topsoil 4.6 hectares of 0.1m thickness ❖ Drainage Measure: concrete trapezoidal drain of total length = 250m and cross-section 600mm bottom wide x U600mm depth ❖ 100mm class O uPVC perforated pipes as toe collection pipe backfilled with 19mm chippings ❖ Leachate storage: 3 Rambo 10,000 liters polytanks ❖ Chainlink fencing with gate: 75mm diameter galvanized posts at 3m intervals as fencing posts fixed 3mm plain G.I chainlink mesh tautly fixed on posts complete with fixing welding and accessories. Install 3 rows of barbed wire on the dogleg post. ❖ Two coats of emulsion paint for the rendered R.C gate columns and galvanized metal gates
2	Mallam SCC	<ul style="list-style-type: none"> ❖ Site clearance, collection and disposal to a depth not exceeding 0.15m ❖ Capping: volume of clay 1,046m³ of 150mm thickness ❖ Capping: volume of laterite 2,090m³ of 75mm thickness ❖ Landscaping: Area of humus rich topsoil 1.5 hectares of 0.1m thickness ❖ Stone pitched trapezoidal drain at the periphery of the site. ❖ 100mm class O uPVC perforated pipes as toe collection pipe backfilled with 19mm chippings ❖ Leachate storage: 2 underground Rambo 10,000 liters polytanks and 2 on ground Rambo 10,000 liters polytanks on support platform including plumbing connections. ❖ Chainlink fencing with gate: 75mm diameter galvanized posts at 3m intervals as fencing posts fixed 3mm plain G.I chainlink mesh tautly fixed on posts complete with fixing welding and accessories. Install 3 rows of barbed wire on the dogleg post. ❖ Two coats of emulsion paint for the rendered R.C gate columns and galvanized metal gate

Item	Construction Site	Project Measure
3	Mallam No. 1	<ul style="list-style-type: none"> ❖ Site clearance, collection and disposal to a depth not exceeding 0.15m ❖ Capping: volume of clay 4,845m³ of 150mm thickness ❖ Capping: volume of laterite 2,423m³ of 75mm thickness ❖ Landscaping: Area of humus rich topsoil 32,302m² of 0.1m thickness ❖ 100mm class O uPVC perforated pipes as toe collection pipe backfilled with 19mm chippings ❖ Leachate storage: 2 underground Rambo 10,000 liters polytanks and 2 on ground Rambo 10,000 liters polytanks on support platform including plumbing connections. ❖ Chainlink fencing with gate: 75mm diameter galvanized posts at 3m intervals as fencing posts fixed 3mm plain G.I chainlink mesh tautly fixed on posts complete with fixing welding and accessories. Install 3 rows of barbed wire on the dogleg post. ❖ Two coats of emulsion paint for the rendered R.C gate columns and galvanized metal gates
4	Mallam No. 2	<ul style="list-style-type: none"> ❖ Site clearance, collection and disposal to a depth not exceeding 0.15m ❖ Capping: volume of clay 4,942m³ of 150mm thickness ❖ Capping: volume of laterite 2,472m³ of 75mm thickness ❖ Landscaping: Area of humus rich topsoil 32,948m² of 0.1m thickness ❖ Chainlink fencing with gate: 75mm diameter galvanized posts at 3m intervals as fencing posts fixed 3mm plain G.I chainlink mesh tautly fixed on posts complete with fixing welding and accessories. Install 3 rows of barbed wire on the dogleg post. ❖ Two coats of emulsion paint for the rendered R.C gate columns and galvanized metal gates

Due to a number of reasons after recommendations made in design report, the scope of works was considerably reviewed.

2.2 Actual Outputs

21. After series of consultations took place on recommendations made in design report, the final scope of works constructed are shown in table 2.3 below.

Table 2.3: Actual Facilities Provided

Item	Construction Site	Project Measure
1	Oblogo No.1 Site	<ul style="list-style-type: none"> ❖ Site capped with drainage layer (Clay) and barrier layer (laterite) ❖ Local shrubs planted at 5X10m grid over the as built area ❖ 100mm class O uPVC perforated pipes as toe collection pipe backfilled with 19mm chippings ❖ Leachate storage: Rambo 10,000 liters polytanks as an attenuation tank ❖ Chainlink fencing with gate: 75mm diameter galvanized posts at 3m intervals as fencing posts fixed 3mm plain G.I chainlink mesh tautly fixed on posts complete with fixing welding and accessories. Install 3 rows of barbed wire on the dogleg post. ❖ Wastecare sub-surface irrigation/re-circulation system (WC-SIRL)
2	Mallam SCC	<ul style="list-style-type: none"> ❖ Site capped with drainage layer (Clay) and barrier layer (laterite) ❖ Local shrubs planted at 5X10m grid over the as built area ❖ 100mm class O uPVC perforated pipes as toe collection pipe backfilled with 19mm chippings ❖ Leachate storage: 10m³ concrete tank as sump and a Rambo 10,000 liters polytanks as an attenuation tank ❖ Chainlink fencing with gate: 75mm diameter galvanized posts at 3m intervals as fencing posts fixed 3mm plain G.I chainlink mesh tautly fixed on posts complete with fixing welding and accessories. Install 3 rows of barbed wire on the dogleg post. ❖ Wastecare sub-surface irrigation/re-circulation system (WC-SIRL)
3	Mallam No. 1	<ul style="list-style-type: none"> ❖ Site capped with drainage layer (Clay) and barrier layer (laterite) ❖ Local shrubs planted at 5X10m grid over the as built area ❖ 100mm class O uPVC perforated pipes as toe collection pipe backfilled with 19mm chippings ❖ Leachate storage: 10m³ concrete tank as sump and a Rambo 10,000 liters polytanks as an attenuation tank ❖ Chainlink fencing with gate: 75mm diameter galvanized posts at 3m intervals as fencing posts fixed 3mm plain G.I chainlink mesh tautly fixed on posts complete with fixing welding and accessories. Install 3 rows of barbed wire on the dogleg post. ❖ Wastecare sub-surface irrigation/re-circulation system (WC-SIRL)
4	Mallam No. 2	<ul style="list-style-type: none"> ❖ Site capped with drainage layer (Clay) and barrier layer (laterite) ❖ Local shrubs planted at 5X10m grid over the as built area ❖ Chainlink fencing with gate: 75mm diameter galvanized posts at 3m intervals as fencing posts fixed 3mm plain G.I chainlink mesh tautly fixed on posts complete with fixing welding and accessories. Install 3 rows of barbed wire on the dogleg post

3.0 TIME MANAGEMENT

22. This section presents the projected time schedule for the entire project phase

ACTIVITY	ACTIVITY (WORK) SCHEDULE																																		
	WEEKS																																		
PHASE 1: PRELIMINARY PLANNING AND DESIGN STUDIES																																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
ACTIVITY 1: GENERAL PROJECT MANAGEMENT AND QA, REVIEW AND REPORTING																																			
ACTIVITY 2: RECONNAISSANCE, SCOPING SURVEYS, DESK REVIEWS AND CONSULTATIONS																																			
ACTIVITY 3: FIELD INVESTIGATIONS AND ENGINEERING STUDIES ANALYSIS																																			
ACTIVITY 4: FACILITIES DESIGN AND ENGINEERING DRAWINGS																																			
ACTIVITY 5: PREPARATION AND SUBMISSION OF COST AND FINANCIAL PACKAGES																																			
ACTIVITY 6: TECHNICAL ASSISTANCE AND TENDERING AND BIDDING PROCESS																																			
PHASE 2: CONSTRUCTION SUPERVISION																																			
ACTIVITY 7: CONSTRUCTION SUPERVISION																																			
ACTIVITY 8: POST CONSTRUCTION SERVICES, DEFECT LIABILITY PERIOD, AS BUILT DRAWINGS AND COSTS, PRACTICAL AND FINAL COMPLETION REPORTS, FINAL FACILITIES MANAGEMENT																																			

The Tables below show the construction works schedule for the three Lots from the start date of construction to 100% completion of the entire work done

LOT 1: OBLOGO No. 1

Works Item	Progress									Projected up-to
										30/03/2013
	05/06/13	16/19/13	03/07/13	17/7/13	31/07/13	14/08/13	28/08/13	11/09/13	18/09/13	
Completion of initial capping (1 st Layer) with clay	99%	99%	99%	99%	99%	99%	99%	99%	99%	To be Completed (100%)
Completion of second capping (2 nd Layer) with laterite	98%	98%	98%	98%	98%	98%	98%	98%	98%	To be Completed (100%)
Construction and installation of WC-SIRL system, attenuation tank and ancillaries (incl. fencing)	100%	100%	100%	100%	100%	100%	100%	100%	100%	To be Completed (100%)
Completion of Pipe laying for leachate recirculation – Toe pipe	98%	100%	100%	100%	100%	100%	100%	100%	100%	To be Completed (100%)
Construction of Sump for leachate storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	To be Completed (100%)
Planting of local shrub 5m x 10m c/c	40%	60%	95%	95%	95%	95%	95%	95%	95%	To be Completed (100%)
Commencement of stone pitching and drainage works	100%	100%	100%	100%	100%	100%	100%	100%	100%	To be Completed (100%)
Fencing of site	100%	100%	100%	100%	100%	100%	100%	100%	100%	To be Completed (100%)

LOT 2: MALLAM SCC

Works Item	Progress									Projected – up to
										30/03/2013
	05/06/13	19/06/13	03/06/13	17/7/13	31/07/13	14/08/13	28/08/13	11/09/13	18/09/13	
Completion of initial capping (1 st Layer) with clay	99%	99%	99%	99%	99%	99%	99%	99%	99%	To be Completed (100%)
Completion of second capping (2 nd Layer) with laterite	70%	70%	70%	70%	70%	80%	90%	93%	96%	To be Completed (100%)
Completion of Pipe laying for leachate recirculation – Toe pipe	70%	70%	70%	70%	70%	85%	85%	95%	99%	To be Completed (100%)
Construction of Sump for leachate storage	45%	45%	45%	60%	75%	90%	100%	100%	100%	To be Completed (100%)
Construction and installation of WC-SIRL system, attenuation tank and ancillaries (incl. fencing)	100%	100%	100%	100%	100%	100%	100%	100%	100%	To be Completed (100%)
Planting of local shrub 5m x 10m c/c	50%	50%	50%	50%	50%	50%	60%	60%	60%	To be Completed (100%)
Commencement of stone pitching, drainage	65%	65%	65%	65%	65%	80%	90%	95%	99%	To be Completed (100%)
Fencing of dumpsite	75%	75%	75%	75%	75%	90%	95%	96%	99%	To be Completed (100%)

LOT 3:

MALLAM No. 1

Works Item	Progress									Projected – up to
										30/08/13
	05/06/13	19/06/13	03/07/13	17/7/13	31/7/13	14/08/13	28/08/13	11/09/13	18/09/13	
Completion of initial capping (1 st Layer) with clay	94%	94%	94%	94%	94%	94%	96%	97%	100%	To be Completed (100%)
Completion of second capping (2 nd Layer) with laterite	60%	60%	60%	60%	70%	85%	95%	95%	100%	To be Completed (100%)
Completion of Pipe laying for leachate recirculation – Toe pipe	70%	70%	70%	75%	75%	75%	80%	89%	99%	To be Completed (100%)
Construction of Sump for leachate storage	50%	50%	50%	75%	90%	100%	100%	100%	100%	To be Completed (100%)
Construction and installation of WC-SIRL system, attenuation tank and ancillaries (incl. fencing)	100%	100%	100%	100%	100%	100%	100%	100%	100%	To be Completed (100%)
Planting of local shrub 5m x 10m c/c	10%	40%	40%	40%	40%	60%	60%	60%	60%	To be Completed (100%)
Commencement of drainage works and pipe laying	65%	70%	70%	75%	75%	85%	88%	92%	98%	To be Completed (100%)
Fencing of dumpsite	65%	65%	65%	85%	90%	95%	95%	95%	100%	To be Completed (100%)

MALLAM No. 2

Works Item	Progress									Projected – up to
										30/03/2013
	05/06/13	19/06/13	03/07/13	17/7/13	31/07/13	14/08/13	28/08/13	11/09/13	18/09/13	
Completion of initial capping (1 st Layer) with clay	90%	90%	96%	96%	96%	96%	97%	97%	100%	To be Completed (100%)
Completion of second capping (2 nd Layer) with laterite	40%	40%	40%	60%	80%	85%	90%	90%	100%	To be Completed (100%)
Planting of local shrub 5m x 10m c/c	5%	40%	40%	40%	40%	50%	50%	50%	50%	To be Completed (100%)
Commencement of drainage works and pipe laying	0%	0%	0%	0%	0%	0%	0%	0%	0%	To be Completed (100%)
Fencing of dumpsite	70%	80%	80%	80%	95%	98%	98%	98%	100%	To be Completed (100%)

4.0 FINANCIAL MANAGEMENT

4.1 Actual Cost of Construction Works

23. This section gives a brief the contract amount (Budgeted cost) and the Actual certified value of works for the respective projects lots.

Table 4.2: Summary of Cost Analysis for Contractors

	A	B	C	D	E	F = C- B
	Tender Price (GH¢)	Contract Sum (GH¢)	Value of Works Certified (GH¢)	Fluctuation (GH¢)	Estimated Value of Outstanding payments	Variation amount (GH¢)
LOT 1 (Oblogo No. 1)	586,075.05	532,795.50	571,286.97	0	0	38,491.47
LOT 2 (Mallam SCC)	193,865.38	193,877.75	208,412.76	0	0	10,535.01
LOT 3 (Mallam No.1 & 2)	578,652.80	578,652	621,990.30	0	0	43,338.30

Table 4.2: Summary of Cost Analysis for Consultant

SCHEDULE OF PAYMENT	OBLOGO No.1 & MALLAM SCC	MALLAM MAIN (No.1 & 2)	TOTAL
Phase I – Output Based			
a) Submission of Inception Report	5,000.00		5,000.00
b) Draft Design Report including Drawings and BoQ	10,000.00	12,000.00	22,000.00
Phase II			
c) Contract Packaging and Bid Documents	5,500.00	3,500.00	9,000.00
d) Preparation of Bid Evaluation Report and Contract Documents	2,000.00	2,000.00	4,000.00
Phase III – Construction Supervision			
3 months @ US\$ 10,000 per month (All Sites)	17,500.00	12,500.00	30,000.00
Total			US\$ 70,000.00

5.0 HANDING OVER

5.1 Handing Over of Sites for Commencement of Construction:

24. Following successful tendering, evaluation and award of contract for the rehabilitation (capping) and installation of facilities for closure of Mallam SCC, Mallam No.1 & 2, and Oblogo No.1 dumpsites under the UESP II project, the Accra Metropolitan Assembly (AMA) finally handed over the concerned sites on Friday 9th March, 2012 to the contractors.

25. After procuring Messrs Zoomlion (GH) Limited to carry out works for Lot 2 & 3 and Messrs Malsons limited for Lot 1, letter for commencement of work was issued for works to begin on Wednesday, 28th March, 2012.

5.2 Handing Over of Site after Completion of Rehabilitation Works

26. After successfully carrying out of designed works for the rehabilitation and installation of facilities for the closure of the above sites, final handing over of the sites to the Ga South Municipal Assembly by the Accra Metropolitan Assembly was done on the 17th of January, 2014

6.0 CHALLENGES AND CONSTRAINTS

- Continuous dumping on capped sites by community member
- Open defecating in peripheral drain by community members
- Destroying of planted local shrubs by domestic animals (mainly goats)
- Delay in the execution of works due to difficulty in processing/payment of claims/valuation certificates presented by contractors.
- Interruption of works by interest groups such as Land guards during site clearance and demolishing of encroached structures on project site.

7.0 RECOMMENDATIONS

- Community members should be informed and educated (sensitised) about proposed projects for better co-operation and support.
- In other not to incur any fluctuations and extra charges due to project delay, adequate measures should be taken to prevent unnecessary delay in the progress of works on site.
- As project sites have potential risks, ideally, project staff should be insured
- All to the sites by community members should be restricted as some sites are prone to gas explosion

8.0 ANNEXES

Annex 1: List of Reports Prepared at Various Stages of the project

Item	Name of Report	Date of Issue
1.	Inception Report	August, 2011
2.	Final Design Report	January, 2012
3.	Procurement Documents	September, 2011
4.	Tender Evaluation Report	February, 2012
5.	Contract document	February, 2012
6.	Monthly Progress Reports	May, 2012
7.	Facility Operation and Maintenance Manual	December, 2013
8.	Practical Completion Report	December, 2013
9.	As-Built Drawings	April, 2013

Annex 2: Photo Gallery on Progress of Works

LOT 1: OBLOGO No. 1



Plate 1: Oblogo No.1 refuse dumpsite showing the ECG pylons on the site



Plate 2: Levelling and compaction of refuse



Plate 3: Placement and spreading of Clay – first layer



Plate 4: Final compacted surface after capping of the site



Plate 5: Peripheral drain for conveying surface run-offs from site into existing drainage systems in community



Plate 6: Attenuation tank in a protective fence. WC-SIRL system installed

LOT 2: MALLAM SCC



Plate 7: Mallam SCC refuse dumpsite



Plate 8: Levelling and compaction of refuse



Plate 9: Grading to form slopes and berms



Plate 10: Final compacted surface after capping with laterite



Plate 11: Stone pitched peripheral drain for conveyance of surface run-offs



Plate 12: 10m³ Concrete sump for leachate storage WC-SIRL system installed.

LOT 3: MALLAM No.1 & 2

MALLAM No.1



Plate 13: Mallam No.1 dumpsite



Plate 14: Demarcation of the sub-surface irrigation/recirculation system on site



Plate 15: Final compacted surface of Mallam No.1 after placement of laterite layer



Plate 16: Installation of Mallam No.1 site fencing



Plate 17: Completed slope surface with planted local shrubs



Plate 18: Attenuation tank in a protective fence on the completed capped surface

MALLAM No.2



Plate 19: Mallam No.2 refuse dumpsite



Plate 20: Formation of slopes and berms of Mallam No. 2



Plate 21: Completed Eastern side slopes of Mallam No.2 dumpsite.



Plate 22: Placement and leveling of clay layer



Plate 22: Final compacted surface of after placement of laterite layer



Plate 23: Fenced Mallam No.2 rehabilitated site

Annex 3: Topographic Maps of Sites

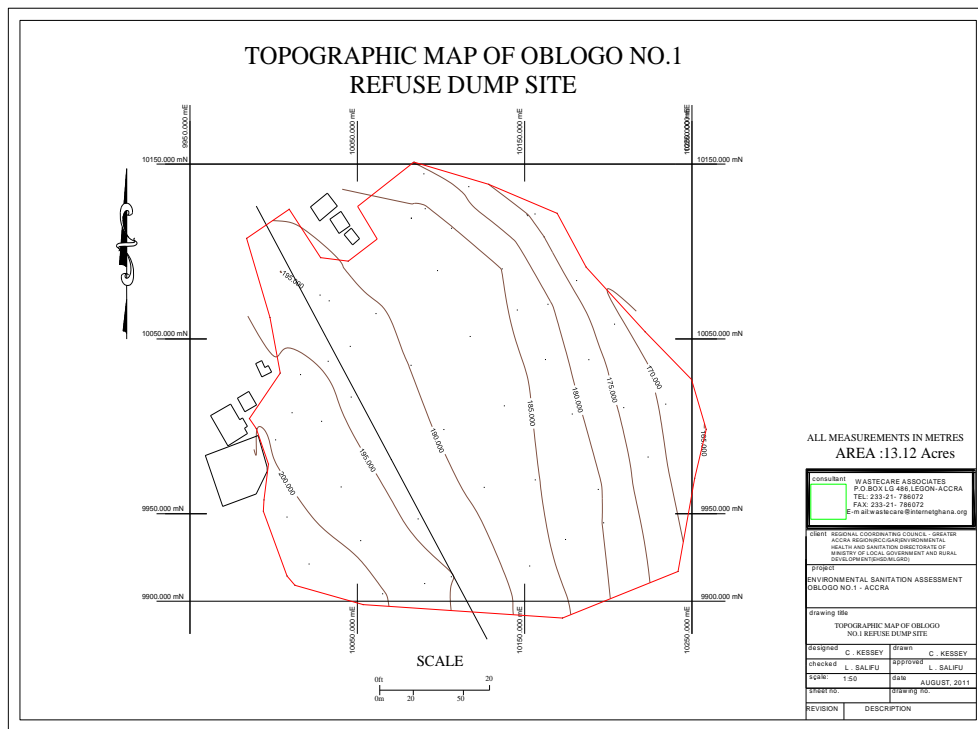


Figure 1: Topographic Map of Oblogo No1 Refuse dumpsite

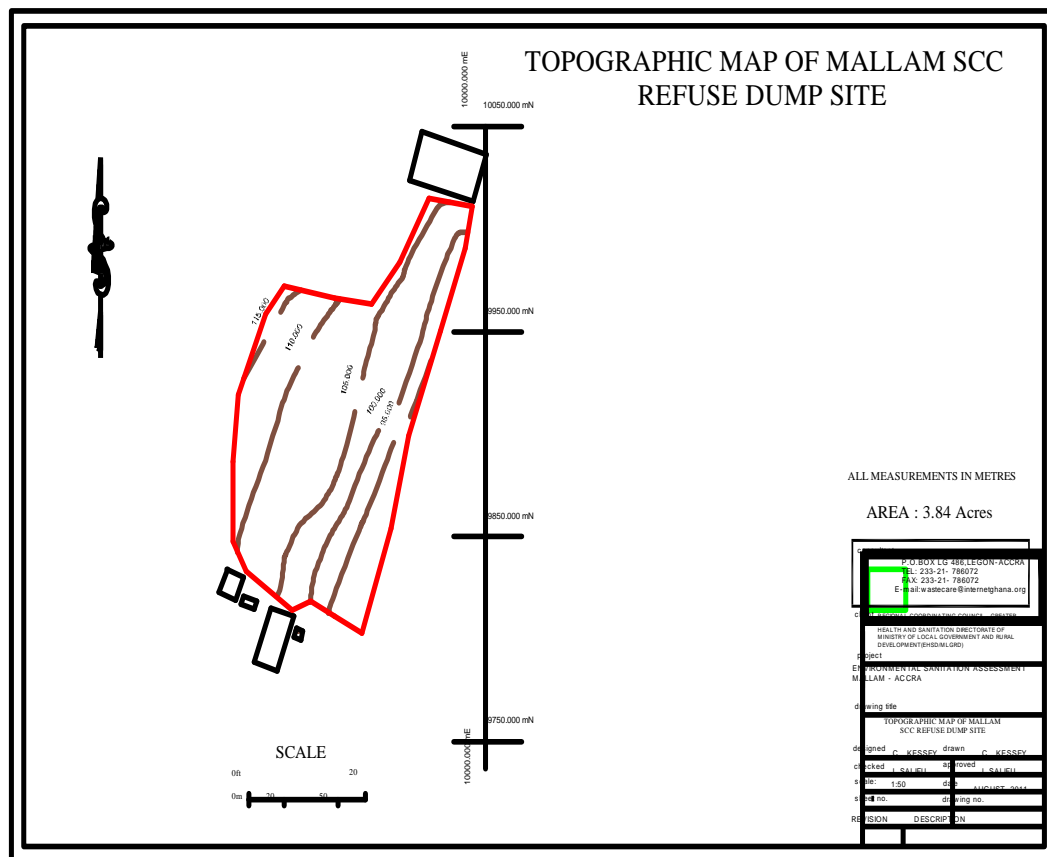


Figure 2: Topographic Map of Mallam SCC Refuse dumpsite

