



ILMC Assessment Report

September 25 2006

Green Lead Pilot Scheme – Site Assessment Form

The purpose of the visit to a ULAB collection center in the Caribbean was twofold. Firstly as part of the Green Lead Pilot Scheme there was a need to validate the application and use of the draft Green Lead Assessment Form for assessing compliance with the Green Lead Protocols.

Secondly, as part of the Basel Secretariat's ULAB recovery project in Central America and the Caribbean there was requirement to provide expert opinion on the environmental performance of the ULAB collection practices including the standards of occupational health of all those workers involved in the recovery process. A separate report on this aspect of the visit has been submitted to the Basel Secretariat.

This report represents the views and opinions of the International Lead Management Center (ILMC). Furthermore, any comments contained in the report about the procedures, practices and lead recovery processes observed and any recommendations to improve environmental performance and raise the standards of occupational health are those of the ILMC.

Whilst representatives of the Basel Secretariat and the Basel Convention Regional Center were present during the visit, their views and opinions are not represented in this report.

Brian Wilson, ILMC Program Manager

ULAB Collection Center

In attendance:

Ronnie Sookhoo - BCRC

Michael VanderPol - Environment Canada on secondment to the SBC Geneva

Brian Wilson - ILMC

Company Management

Introduction to the Company Premises

The Company is registered under the ISO 9002 quality standard.



Main Office Building

The site is split into two distinct business units, the battery manufacturing plant and the ULAB reception, storage, sorting and packing area.

A wire mesh fence separates the two units.

The ULAB Collection area is adjacent to the main office building and the area was free of any signs of spillage, acid residues or oxide paste.

Clearly displayed in the entrance hall of the Office is the Company's ISO 9001:2000 Certificate for Quality Management.

ISO 9001:2000 Certification not only confirms that quality standards are monitored and maintained, but the company also decided that as part of the Certification process the management would review the written safety policy, accountability and operational safety procedures, and as a result have conducted work place risk assessments, operator training in the correct working procedures, and work is undertaken in accordance with the National safety regulations, which also means that all accidents are investigated.

Operators are required to wear works overalls, personnel protective equipment including gloves and safety shoes. The overalls are washed every day and operators are required to shower at the end of their shift in the segregated wash room.

However, the ULAB reception, sorting and packaging areas were inspected to ascertain compliance with safe working practices and good housekeeping.

ULAB arrive at the collection facility in two ways. They are either collected from the Island, the domestic supply, or they are imported from other Caribbean Islands. The Company also collects quantities of lead acid USB, security and emergency lighting batteries from the Island. The Company also transfers leaded drosses, discarded pasted battery grids and oxidation wastes from a nearby battery manufacturing plant into the ULAB storage compound for packing and export to Venezuela for recycling.

Domestically sourced ULAB are collected in a dedicated and specially adapted truck with drop down sides and back for ease of access. The Drivers are trained in the correct ULAB handling procedures and understand the measures to be taken in the event of a spillage or emergency.

The truck carries four wooden pallets and a plastic container for any leaking batteries.



Most of the ULAB collected by the truck driver on the Island are from small shops, retailers and garages and the driver may only pick up a few ULAB at each stop. Great care is taken to stack ULAB on the truck by size. Each of the four wooden pallets is assigned to a different size ULAB, from small 6 volt motorcycle ULAB to large marine or storage ULAB. Stacking only a small number of ULAB at any one time allows for this separation of different sized batteries and helps considerably when the ULAB are removed from the Truck at the collection center as the ULAB are stacked in even layers. As the Driver completes each layer of ULAB, cardboard is placed on top of the layer and the ULAB shrink wrapped to prevent any further movement. Whilst the ULAB are loaded and stacked on the truck manually, the pallets of ULAB are removed from the truck at the ULAB reception area by Fork Truck.

The Truck is hosed down at the end of every shift with clean water to remove any acid residues.

The whole of the ULAB reception, sorting, storage and packing area is concreted with acid resistant concrete and laid in a manner that takes any water or effluent to the drains around the perimeter of the area. Any water or effluent run-off goes to the water treatment plant prior to discharge.



Not all ULAB are tested to ascertain whether they are “dead” because so many of the batteries arrive already palletized and ready for shipment.

However, all UALB deliveries are inspected to check for leaks and to insert cardboard where it has been missed when the ULAB were stacked or where the cardboard layers are not thick enough and the terminals are protruding, thereby threatening to puncture the case of the battery above.

Any ULAB found to be leaking are placed in a sealed and labeled plastic drum for export. Every effort is made to provide sufficient space in the sorting area to inspect pallets of ULAB and where necessary unpack and repack them, and it was clear that there are designated areas to undertake these tasks.



However, walkways and pedestrian areas were not clearly visible in the yard and it is recommended that where there is mobile equipment, such as fork trucks and low loaders, walkways should be designated and clearly marked in yellow paint and these areas should be out of bounds to trucks and pallets of ULAB should not be “parked” across them so as to ensure an unrestricted exit in the event of evacuation.

It was clear during the inspection that Company personnel are taking great care to pack and palletize the ULAB in accordance with the Green Lead Protocols. The ULAB in the yard had their ventilation caps intact and they were full of electrolyte. This is to the credit of the staff who have spent a lot of time educating those people working in the battery industry not to drain the electrolyte and deliver the ULAB whole to the Center.



However, some imported ULAB from one of the Caribbean islands were delivered out of compliance with the Green Lead Protocols.

As can be seen in the photograph on the left showing the imported ULAB from St. Lucia they have been palletized and stacked no more than four ULAB high, shrink wrapped in green plastic and strapped. However, there is little or no cardboard between the layers of ULAB and none on the top layer of any of the loads in the yard.

The Company are aware of this problem and are currently trying to educate the ULAB collectors on the Island to comply with the correct packing procedure.

On the day of the site visit the export containers were empty, but a few days later I received a photograph taken by an Independent Bureau Veritas inspector showing the pallets stacked with ULAB in the container.



Clearly, the ULAB have been heavily shrink-wrapped and unlikely to move in transit. The pallets have been packed well, but as an observation and a recommendation, there should be bracing at the end of the container to minimize any movement of the pallets in transit, particularly as they are stacked two high. This point was been noted by the Company and improvements made.

Small, 6 volt motorcycle batteries, USB and security batteries, and all leaded drosses are stored on site in 45 gallon plastic drums. The drums have lids, but they are fitted loosely until the drums are full. The lids are then pushed into position and the lid and the top of the drum shrink wrapped to prevent any spillage during transit. The drums are palletized, strapped and loaded into the containers for export. No photographs are yet available for the plastic bins loaded into the container for export.



As the ULAB collection center is adjacent to a battery manufacturing site, all employees working in the collection center are subject to the same hygiene regime and biological monitoring program as those employees working in the battery manufacturing plant. This means that all employees have regular lead in blood tests and annual medical examinations and all those working at the Center had lead in blood levels below 40 µg/dl. A key feature of the hygiene regime is a segregated eating area.

There would appear to be few instances if any, where in the ULAB storage area there would be a need to “Lock Out and Tag Off” the area. Power tools are not used and the FLT charging area is located outside the Storage Compound. No power outlets were found in the area other than those used for lighting. In which case, it would seem prudent to have a “Lock Out and Tag Off” procedure as part of the Site Safety Manual as a precaution in case isolation is required.

Recommendations and Conclusions for the ULAB Collection and Storage Center.

Essentially, after a few changes to the Safety Procedures outlined below and the way that ULAB are packed into the containers for export the ULAB Collection Center will comply with the Green Lead Protocols and the Basel Technical Guidelines for the Environmentally Sound Collection and Storage of ULAB.

Nevertheless, there are a number of recommendations for improved performance:

1. Great care is taken by the operators in the yard to check the palletized ULAB delivered to the Center. The Operators are looking for leaking batteries, poor packing, and trying to keep each layer of ULAB as even as possible. In the course of their work it is necessary to unpack and repack pallets of ULAB. Inevitably this means that ULAB end up on the concrete during this process.

In the absence of any clearly defined walkways and pedestrian areas in the storage compound, ULAB could be placed, albeit with care, around the packing area and could form a tripping hazard or be placed in the path of a Fork Truck.



It is recommended that consideration be given to marking pedestrian Walkways and introducing a rule that prohibits ULAB being placed on the painted paths, or Fork Truck driving or parking on them. In this way, what is a very thorough operation will be even safer for the workers.

2. The second recommendation, which is already being addressed, concerns the packing of the containers and it is suggested that bracing should be placed at the door end of the container to make sure that the ULAB on the pallets do not move. The pallets are staked two high in the container, which is quite safe as they are packed closely together and cannot topple over.

However, pallet size and sometimes weight restrictions will mean that the pallets are not always loaded tightly up to the end of the container. Weight restrictions will also mean that there might be a small pallet of ULAB that is not packed tightly against the other pallets. Therefore, when the doors are closed there could be a sizeable gap between the pallets and the doors, where the top tier of palletized ULAB could fall and possibly crack and leak electrolyte. So bracing shown here, should be placed across the trailer to retain the pallets of ULAB.



3. Information detailing the correct packing arrangements for pallets of ULAB needs to be sent to the ULAB collection centers on certain Islands together with a copy of the Green Lead Protocols or the Basel Training Manual so that the correct procedures are followed. Compliance with this recommendation will save the Company time and money because repacking the pallets to comply with the Protocols will not be required.

4. At the time of the Assessment the Company had not inspected any of the premises of those agents and retailers that collect and store ULAB, although the Managers were aware that such inspections would be a useful means of ensuring sound handling of the ULAB. The Company is contemplating setting up such a program and it is recommended that Managers use the relevant sections of the Assessment Form as the basis for any site inspections.
5. The Company Safety Manual should be modified to include a full “Lock Out and Tag Off” procedure to cover any electrical repairs in the storage area that require isolation.
6. A full “permit to work (PW)” system should also be introduced for all maintenance work. Correctly set up, the maintenance work will never be delayed, but the PW ensures that the correct safety procedures are always included on the permit and workers in the Storage Compound are informed of the engineering work.
7. There did not appear to be a safe working practice for working at heights and this should be included in the Safety Manual.
8. A procedure for the operation of mobile plant on site should be prepared and included in the Safety Manual. The procedure should set out the training standards for drivers and the “no go” areas recommended above.

Subject to adoption of the above recommendations the ULAB Collection Center can be assessed as compliant with the Green Lead Protocols and the Basel Technical Guidelines for the collection, storage, packing and export of ULAB.

The next stage would be to Assess the ULAB Suppliers and Customer (Smelter) before proceeding to a Certification Audit – albeit this is academic at the moment as the Certification Procedure is still being drafted.

Recommendations and Conclusions for the Green Lead Assessment Form.

This version of the Green Lead Assessment Form was much easier to use than the previous drafts.

The questions on the form covered all the elements of the Green Lead Protocols and acted like a check list. The list was particularly useful during the site inspection, especially in the area of personal safety.

It was also helpful to me and the managers at the company to have a section on the form that provided feedback and guidance where there was a “non-compliance” with the Protocols.

I am satisfied that the latest draft Assessment Form does not require any modification.



Green Lead Site Assessment Form

This Form is designed to provide information to assist in the assessment of Pilot Scheme suitability.

1.0 General Information

Company Name	-
Location	-
Date	September 25 2006
Name of lead recycling plant/business	-
Name of Company Representative	-
Position of the Representative in the Company	-
Company Address	Caribbean
Phone number	-
Facsimile number	-
Internet Web Site	--
E-mail address of main contact person	-
Name of the Assessor	Brian Wilson
Assessors Credentials (SBC, ILMC, etc)	ILMC
Operational area (m ² /ha)	15000 sq ft
Lease or freehold site/property – for lease state expiration date.	Leasehold 99 yrs
Previous use of the site or property.	No previous use

3.0 Environmental Status

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
1	Is the operation certified to ISO 14001 or another recognized environmental management system?	no		
2	How does the company keep up to date with new environmental legislation and other applicable environmental requirements?	Training	✓	
3	What are the regulatory limits for atmospheric discharges including those for leaded processes specifically?	No regulatory limits exist currently	No limits exist – but not relevant to the ULAB collection center	
4	What are the point and diffuse sources of atmospheric discharges?	N/A to ULAB		
5	Do these discharges meet current regulatory requirements?	N/A to ULAB		
6	What type of ventilation is used in storage areas?	N/A to ULAB		
7	What are the face velocities for extraction/ventilation units?	N/A to ULAB		
8	What is the 12 month wind speed and direction profile to ascertain likely pollution hotspots?	N/A to ULAB		
9	How close is the general population to the plant?	2 miles	Area around the plant is an industrial zone	
10	How is spillage prevented from above or underground storage tanks?	N/A to ULAB		
11	What are the national standards for the discharge of process effluent?	1.0 mg / L		

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
12	What are the sources of wastewater at the site?	Spillage of battery electrolyte and vehicle washings		
13	Is there a common drainage system for process and surface water?	yes		
14	How does the company ensure that the drains are not leaking and potentially polluting the soil and groundwater?	Sumps have been installed and regular soil test are conducted		
15	How is waste battery acid and contaminated effluent treated?	neutralized	✓	
16	Is the waste liquid effluent discharged and, if so, how?	Through the water treatment plant	✓	
17	What non-hazardous process waste is generated at the site?	Wooden pallets and plastic wrapping		
18	How is non-hazardous waste disposed of?	It is sent to a waste disposal facility		
19	What is the National legislation for hazardous waste management?	Environment act 2000		
20	Which types of hazardous waste are generated at the site?	None – leaded waste is received	✓	
21	What is the chemical composition of the baghouse fume?	N/A		
22	How is the baghouse fume treated?	N/A		
23	What is the baghouse maintenance regime?	N/A		
24	How are hazardous solid waste materials stored?	On pallets and in sealed drums	✓	

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
25	Who controls documentation associated with hazardous waste?	QA / HSSE Manager	✓	
26	How does the company dispose of or treat solid hazardous waste?	ULAB and Drosses are exported to Venezuela under Basel Convention	✓	
27	Who is responsible for environmental management on the site?	QA / HSSE Manager	✓	
28	Is there a Site Sustainability Plan	No	✗	Prepare a Site Sustainability Plan – See the Guidelines at the Green Lead web site.
29	How does the company document, and respond to inquiries about environmental issues?	Written reply	✓	
30	Have any complaints been raised by adjacent communities in the past 12 months?	No	✓	
31	Have there ever been any actions taken against the company by any government agency?	Not against the ULAB collection Center	✓	

4.0 Occupational Lead Exposure

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
1	Number of employees	6		
2	Age and service profiles	Average age 43 yrs and 9yr service.		
3	Labor turnover rates	Very low?		
4	Hours of work – a. Days – Monday- Friday b. Days – Continuous c. Shiftwork	Monday – Friday 8.00 am - 4.00 pm		
5	Is there a hygiene policy?	yes	✓	
6	Does the plant have a dedicated health clinic Medical Officer and Occupational Nurse?	First aid officer and a company doctor on call	✓	
7	How are health risks communicated to employees?	Training	✓	
8	What are the changing facilities prior to and after work?	Works clothes and shower and change into clean clothes to go home	✓	
9	What is the washing and changing regime at the end of work?	All wash and shower	✓	
10	Are personnel issued with special protective equipment and/or works clothing?	yes	✓	
11	How often is works clothing washed?	daily	✓	
12	Is process clothing washed at the site?	Yes	✓	
13	Are eating and process areas segregated?	yes	✓	
14	Are the eating areas free of lead dust?	yes	✓	

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
15	Do employees wash their hands and face prior to eating?	Yes	✓	
16	Is there a respirator policy?	Yes	✓	
17	Are respirators issued and worn by employees in exposed areas?	Yes	✓	
18	Is there a hygiene surveillance program?	yes	✓	
19	Does every employee undergo a Hygiene Induction?	Yes	✓	
20	How are the employees' lead in blood levels measured?	Lead in Blood	✓	
21	What happens to employees with elevated levels of lead in blood?	Removed from work areas	✓	
22	How are lead in air values monitored?	Air Sampling – but N/A to collection area	✓	
23	What are the ranges and mean lead in blood levels for employees – by Department? ULAB Division	8 - 38 ug / 100 m/s Average 14 ug / 100 m/s	✓	
24	What are the lead in blood trends? ULAB Division	Lower lead in blood trend	✓	
25	Who is responsible for occupational health at the Site?	QA / HSSE Manager	✓	

5.0 Safety

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
1	Is there a safety management system such as OHSAS 18001/equivalent /participation in the MCEP, or a set of risk assessments as part of an ISO 9000:2000 series?	ISO 9001:2000 Certified	Work risk assessments completed as part of ISO 9002.	See action listed under 15
2	Is there a written and published Safety Policy?	yes	✓	
3	Is there an emergency and disaster plan?	yes	✓	
4	When was the emergency and disaster plan tested?	Oct 2006	✓	
5	Are there regular Safety Inspections and Audits?	yes	✓	
6	What competent person(s) carries out the Inspections?	QA / HSSE committee	✓	
7	How are any deficiencies identified in the Inspections corrected and who tracks them?	Works order – manager to follow up	✓	
8	Does every employee and contractor undergo a Safety Training Induction?	yes	✓	
9	Have risk assessments been carried out for each operation?	yes	✓	
10	Is there a record of every accident on site?	yes	✓	
11	Is every accident investigated?	yes	✓	
12	Who participates in the accident investigation?	QA / HSSE Manager, HSSE committee and Functional Manager.	✓	
13	How is Safety performance measured?	LTA and minors	✓	Should consider recording safety related incidents or near misses where there is no minor or LTA.

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
14	Is there a Permit to Work System for maintenance?	No	x	Should consider a permit to work system, especially as there are FLT in the compound and it is important when working in effluent treatment plant and above ground level in the storage area.
15	Are pedestrian walkways segregated and clearly marked from roadways and operating areas?	no	GI – no BTG - yes	Mark walkways with yellow paint to minimize risk to pedestrians
16	Who is responsible for the Implementation and Evaluation of the Safety Program?	QA / HSSE Manager	✓	
17	Is there a multi-stakeholder Safety Committee?	Yes	✓	
18	Are there special procedures for the following?			
	18a - Confined Space Entry	No	N/A to collection center	
	18b - Lockout/Tagout	No	x	Essential for any plant with power
	18c - Working at heights	No	x	Necessary for lighting maintenance
	18d - Materials Handling	Yes	✓	
	18e - Mobile Equipment	No	x	Necessary because FLT operate in the area
	18f - Hazardous materials/Explosives	yes		
	18g - Ladders and Scaffolding	No	✓	
	18h – Abrasive Wheels and Power Tools	No	N/A	
	18i – Welding (of any material)	No	N/A – Steel cased ULAB are sent to Venezuela to be opened.	

	18j – Working underground	N/A		
19	Do emergency exits display direction signs?	yes	✓	
20	What Fire Precautions and Procedures are in place?	Written Instructions, Fire Alarms Smoke detectors	✓	
21	When was the last Fire Drill with the local Fire Service?	Oct 2006	✓	

6.0 Suppliers and Customers

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
1	What companies are the main suppliers of leaded materials to the site?	Scrap metal dealers		
2	What are the annual quantities of purchased leaded raw materials (ULAB for recyclers)?	1500 Tons		
3	What are the main outlets for the finished products from the site?	Leaded waste is shipped to Funmetal in Venezuela		
4	How are the finished products transported from the Site?	The ULABs are transported via 20ft containers	✓	OK, but written instructions required to ensure ULAB are chocked in the container
5	Does a company representative visit the premises of suppliers of leaded materials?	yes	✓	
6	Does a company representative visit the premises of the customers of the products?	no		
7	Is there a process in place to evaluate EHS performance of suppliers?	No at the moment	✗	As ACL collect all the ULAB, it is only a matter of ensuring that the intermediate storage areas and manual handlings procedures conform to the Basel Guidelines and the GL Protocols – should not be difficult to set this up.
8	Does the company provide health, safety and environmental information to its customers about its products?	yes	✓	
9	What National and/or International Protocols are applied to the transport of new and/or used lead acid batteries?	Basel Convention for the Transboundary Movement of Hazardous Waste	✓	
10	Does the Company provide its Customers with information about environmentally safe disposal at the end of its product's life?	No – N/A – ULAB are exported to a specialist secondary lead plant		

11	Can Customers contact the Company to ask about the use and disposal of its products?	yes	✓	
12	Does the Company impose any environmental standards of performance on suppliers of leaded materials?	Yes – whole ULAB stored upright and not drained	✓	
13	Does the Company carry out Environmental & Safety inspections of Suppliers & Customers?	Suppliers yes Customer no	✓	OK – But should be linked to EHS inspection noted in 7

8.0 Community Issues - Awareness and Attitudes

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
1	What do you know about lead contamination from ULAB?	That ULAB is harmful to both human health and the environment	✓	
2	Have you ever attended a health awareness class about lead?	yes	✓	
3	Do you know the effects of lead exposure on the: <ul style="list-style-type: none"> • Environment; atmosphere, water, soil, eco systems? • Population – Adults and Children? 	Yes	✓	
4	How often do you come into contact with Lead Acid Batteries?	Daily		
5	What do you do with your used ULAB and why?	It is collected by scrap dealer for recycling	✓	
6	What do you think should be done with a used ULAB?	It should be recycled	✓	
7	In your opinion, how should the problem of lead contamination from ULAB be solved?	By public awareness and public education		
8	What incentives encourage you to return a used battery to a collection center/battery retailer?	Financial incentives		
9	Do you know of any lead contamination awareness programs performed by any Governmental Institutions?	Yes, the university has leaflets	✓	
10	Has any information provided been effective in encouraging you to dispose of your ULAB in an environmentally sound manner?	Yes the leaflets have been extremely helpful	✓	

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
11	How do you think waste disposal programs could be improved?	By improving the collection network and by enhanced incentives		
12	Are you aware of any incentive programs for returning used batteries for recycling? (ACL)	Yes	✓	
13	Do you have any comments or suggestions for the Lead Industry or Government Environmental Agencies that would help promote a sustainable environmentally sound and socio-economically acceptable solution to the recycling of ULAB?	Private involvement is key, however the state along with other environmental agency has a pivotal role.		
14	Do you live close to either, a Lead Mine, Lead Smelter, ULAB Recycling Plant, ULAB collection center or a battery retailer.	No		

9.0 Product Use – Domestic/Industrial (For Surveys by random sampling only)

		Answer and/or Reference Document	GL /Basel Technical Guidelines Compliant	Recommendations/Corrective Action
1	Are there lead acid batteries in your home, including UPS units?	No		
2	If so, how many?	None		
3	What are lead acid batteries used for in your home? <ul style="list-style-type: none"> • TV • Lighting • Refrigeration • Computers (UPS) • Other uses 	Lead acid batteries are not used for any domestic appliances		
4	What type of lead acid batteries are used in your home? <ul style="list-style-type: none"> • 12 volt car /truck batteries • Deep cycle batteries • Other batteries 	12 volts car batteries		
5	Were the lead acid batteries bought as new from a registered supplier?	Yes		
6	What is/are the make or brand of the battery/batteries?	Power Master		
7	Are the batteries reconditioned?	No	✓	
8	How are the batteries recharged?	They are recharged with a battery charger		
9	How long do the batteries last?	2 years		
10	Are you aware of the health hazards associated with lead exposure?	no	✗	Obviously informed about what to do with ULAB, but unfortunate that the health and environmental issues were unknown. More leaflets and information must be distributed with every battery sold.
11	What do you do with a ULAB?	Sell to scrap dealer	✓	

12	Are the ULAB collected or do you have to take them to a collector?	They are collected		
13	Who collects the ULAB?	Scrap dealer	✓	