

April 18, 2012

Florida Department of Environmental Protection
Division of Waste Management, MS #4500
Attn: Mr. Bheem Kothur and Mr. Anthony Tripp
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

**RE: DEP Permit Application for Mercury Recovery Facility – Revision No. [1]
Lighting Resources, LLC, 1007 SW 16th Lane, Ocala, FL
Facility ID# FLR 000 070 565**

Dear Mr. Kothur / Mr. Tripp:

On behalf of Lighting Resources, LLC, Shaw Environmental, Inc. (Shaw) is submitting this revised Application for a Florida Department of Environmental Protection (DEP) permit to operate a Mercury Recovery Facility located at 1007 SW 16th Lane in Ocala, Florida. The Application has been prepared to meet all applicable federal and state regulatory requirements including but not limited to Rules contained within Chapter 62-737 F.A.C. (*The Management of Spent Mercury-Containing Lamps and Devices Destined for Recycling*). Further, the Application has been prepared in accordance with the instructions contained in DEP Form No. 62-737.900(2).

The Application has been organized into the following eleven (11) tabbed sections:

- DEP Application Form # 62-737.900(2)
- Engineering Report
- Drawings
- Appendix A – Other Facility Permits
- Appendix B – Photographic Logs
- Appendix C – Equipment / Manufacturer Specifications
- Appendix D – Recordkeeping Forms
- Appendix E – Sampling and Analysis Standard Operating Procedures (SOP)
- Appendix F – Closure Costs Backup Data
- Appendix G – Financial Assurance Form
- Appendix H – Certificate of Insurance

Table 1 presented on the following page, presents further details on the organization of this Application; specifically, providing the sections of the Engineering Report and Drawings and/or Appendices that correspond to the specified parts / questions within the DEP Application Form No. 62-737.900(2).

Table 1 Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL Organization of Application					
Tab Name	Corresponding Part / Question Number(s) In DEP Application Form No. 62-737.900(2)				
	Part I - Information				Part II
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DEP Application Form # 62-737.900(2)	A.1 thru A.20	B.1 thru B.2	C.1 thru C.3	D.1 thru D.3	ALL
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If you should have any questions, please contact Bonnie Bishop-Clark at (904) 881-2229, or me at (407) 287.3216.

Very truly yours,

Shaw Environmental, Inc.



Eric K. Kramer, P.E.
Project Manager

enc: DEP Application (2-copies)

LIGHTING RESOURCES, LLC

1007 SW 16TH LANE

OCALA, FLORIDA

**MERCURY RECOVERY FACILITY
FL-DEP PERMIT APPLICATION**

REVISION NO. [1]

APRIL 2012



PREPARED BY:

Shaw® Shaw Environmental, Inc.

1228 Winter Garden Vineland Road

Winter Garden, FL 34787

(407) 287-3216

PROJECT No. 143925

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APPENDICES (*tabs 4 through 11*)

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- Appendix D - Recordkeeping Forms (e.g., material tracking, inspection, training, etc.)
- Appendix E - Sampling and Analysis Standard Operating Procedures
- Appendix F - Closure Costs Backup Data
- Appendix G - Financial Assurance Form



**FLORIDA DEP APPLICATION FORM
62-737-900(2)**



10. Operator's name: _____ Telephone: (____) _____

11. Operator's address:

Name: _____

Address:

Street or PO. Box	City	State	Zip
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12. Facility owner's name: _____ Telephone: (____) _____

13. Facility owner's address:

Street or PO. Box	City	State	Zip
-------------------	------	-------	-----

14. Legal structure: ☐ Corporation ☐ Non-profit Corporation ☐ Partnership ☐ Individual
☐ Local Government ☐ State Government ☐ Federal Government ☐ Other (specify)
Limited Liability Company (LLC)

15. If an individual, partnership, or business is operating under an assumed name, specify the county and state where the name is registered.

County: _____ State: _____

16. If the legal structure is a corporation, indicate the state of incorporation.

State of incorporation: _____
Corporate Office located at 805 E. Francis St., Ontario, CA

17. If the legal structure is an individual or partnership, list the owners' names and mailing addresses.

Name: _____

Address:

Street or PO. Box	City	State	Zip
-------------------	------	-------	-----

Name: _____

Address:

Street or PO. Box	City	State	Zip
-------------------	------	-------	-----

Name: _____

Address:

Street or PO. Box	City	State	Zip
-------------------	------	-------	-----

Name: _____

Address:

Street or PO. Box City State Zip

18. Site ownership status: ☐ owned ☐ to be purchased ☐ to be leased _____ years

☐ presently leased; the expiration date of the lease is: _____

If leased, indicate:

Land owner's name: _____

Land owner's address:

Name: _____

Address:

Street or PO. Box City State Zip

19. Name of professional engineer: _____

Registration no.: _____

Address: 1228 Winter Garden Vineland Road, Winter Garden, FL 34787

Name: _____

Address:

Street or PO. Box City State Zip

Associated with: _____

20. Facility located on Indian land: ☐ yes ☐ no

21. Existing or pending environmental permits: (attach a separate sheet if necessary)

TYPE OF PERMIT	AGENCY	PERMIT NUMBER	DATE ISSUED	EXPIRATION DATE
----------------	--------	---------------	-------------	-----------------

DEP - Air General Permit Registration(SEE APPENDIX A)

DEP- Hazardous Waste Transporter Approval Certificate(SEE APPENDIX A)

DEP- Large Quantity Handler of Universal Waste Registration(SEE APPENDIX A)

B. Site Information (SEE ENGINEERING REPORT - SECTION 2)

1. Facility location : County: _____ Nearest Community: _____

Latitude: _____ Longitude: _____

Section: _____ Township: _____ Range: _____

UTM # _____ / _____ / _____

2. Area of facility site (acres): _____

3. Attach a topographic map of the facility area and a scale drawing and photographs of the facility showing the location of all past, present, and future material receiving, storage and processing areas. Also show the incoming and outgoing material traffic pattern including estimated volume and controls. (SEE ENGR. REPORT: SECTION 2, Figures 1-6; AND APPENDIX B - Photographic Logs)

4. Is the site located in a 100-year flood plain? [] yes [] no
If yes, describe how facility will be constructed to prevent flooding (labeled as **Attachment ____**).
(SEE ENGR. REPORT: SECTION 2, Figure 5)

C. Land Use Information (SEE ENGINEERING REPORT - SECTION 2)

1. Present zoning of the site. _____
(SEE ENGR. REPORT: SECTION 2, Figure 3)

2. If a zoning change is needed, what should the new zoning be?

3. Present land use of site

(SEE ENGR. REPORT: SECTION 2, Figures 1-4)

D. Operating Information (SEE ENGINEERING REPORT - SECTION 3)

1. Is hazardous waste generated on site? [] yes [] no

List the types and anticipated annual amounts of generation (attach a separate sheet if necessary).

Hazardous Waste Code #D009: Phosphor Powder containing Mercury - 73.13 tons/year;

Note: the estimated annual volume was based on T-12 / 4-ft Tube Fluorescent Lamps (MCLs) and was calculated as follows -

$(5,000 \text{ MCLs/hr}) \times (6 \text{ hrs/day}) \times (5 \text{ days/wk}) \times (52 \text{ wks/yr}) = 7,800,000 \text{ MCLs}$

$(7,800,000 \text{ MCLs / yr}) \times (55\text{-gallon drum}/40,000 \text{ MCLs}) = 195 \text{ drums}$

$(195 \text{ drums/yr}) \times (750\text{lbs/drum}) = 146,250 \text{ lbs/yr} = 73.13 \text{ tons/yr}$

Hazardous Waste Code #D009: Air Filter Media containing Mercury - 1.98 tons/year;

Note: the estimated annual volume is based on volumes generated at

other Lighting Resources' Facilities. The Air Filter Media

are from the two Air Extraction Filter Units located in Area B

- the Lamp Processing Room, which will remove Mercury dusts

finer than 5-microns and Mercury Vapors.

2. Attach a brief description of the facility operation, nature of the business, and activities.

The proposed Facility is by DEP definition a Mercury Recovery Facility that will accept for processing mercury containing lamps (intact and crushed lamps). The Facility will also accept other universal wastes for transfer only to a reclamation facility or final destination facility.

(PLEASE REFER TO "ENGINEERING REPORT" - SECTION 3)

3. Specify below each process used for storing or recycling of lamps or devices (including daily design capacities for recycling operations) at the facility, and annual quantities, to be stored or processed at the facility. (Attach a separate sheet if necessary) SEE NOTE BELOW.

PROCESS	DAILY DESIGN CAPACITY	UNIT OF MEASURE	ANNUAL QUANTITY
MCL Recovery	30,000 T-12/4-ft. Lamps	$(5,000 \text{ MCLs/hr}) \times (6 \text{ hr/day})$	7.8 million

The material breakdown is in terms of process and storage capacity of T-12 lamps: 30,000 T-12 / 4-ft lamps. After 6 months of operation - subsequent to receipt of a DEP Permit, LRL will have enough data to provide DEP with a realistic breakdown of all types of MCLs including HIDs.

4. Indicate the type of material and total amount of maximum desired storage to be permitted by the facility. This is the maximum amount of raw or unprocessed material, such as lamps or devices, and the total types and amounts of processed material, such as glass or phosphor material, which shall exist at the facility at any time. This shall be the maximum allowed storage by the facility. (attach a separate sheet if necessary)

MCLs Unprocessed: 69,552 T-12 Lamps (45,000-lbs /22.5-tons)

MCLs Processed/Broken: Twenty-Eight(28)55-gallon drums @500-lbs.ea.(14,000-lbs /7-tons)

MCDs: Two(2) 55-gallon drums @750-lbs.ea.(1,500-lbs /0.75-ton)

Non-PCB Light Ballasts: Ten(10) 55-gallon drums @750-lbs.ea.(7,500-lbs /3.75-tons)

PCB Light Ballasts: Ten(10) 55-gallon drums @750-lbs.ea.(7,500-lbs /3.75-tons)

Large Type Batteries: One(1) 55-gallon drum @750-lbs.ea.(750-lbs /0.375-ton)

Small Type Batteries: Twelve (12) 55-gallon drums @750-lbs.ea.(9,000-lbs /4.5-tons)

Clean Lamp Glass(Cullet): Fifteen(15) 55-gallon drums @750-lbs.ea.(11,250-lbs/5.625-tons)

Clean Lamp Metals: Sixty(60) 55-gallon drums @750-lbs.ea.(45,000-lbs /22.5-tons)

Phosphor Powder: Fifteen(15) 55-gallon drums @750-lbs.ea.(11,250-lbs /5.625-tons)

5. Attach a description of how the facility shall be constructed and operated and the specifics of the technology which shall be utilized to process or recycle lamps and devices. Include any engineering plans, calculations and other related information describing the process to include the design, installation and operation of any air pollution control equipment. All engineering plans and reports shall be signed and sealed by a professional engineer registered in the State of Florida. Describe the specific types of materials the facility shall accept for introduction into its process. (e.g. fluorescent lamps, electrical thermostats etc.)

Construction and Operation Plans are labeled as Attachment (SEE ENGINEERING REPORT- SECTION 2)

6. Attach a description of the facility's Contingency Plan for responding to and dealing with spills or releases of hazardous material to the environment during facility operation or any other emergency conditions. Include the name and 24-hour response telephone number of the facility emergency response coordinator, who is to be contacted in the event of an emergency. Plans should at a minimum conform to the requirements of 40 CFR 264, Subpart D. Attach a description of procedures, structures, or equipment used at the facility to:

- (1) Mitigate effects of equipment failure
- (2) Prevent hazards in unloading operations (e.g., ramps, special forklifts);
- (3) Prevent undue exposure of personnel to hazardous material (e.g., protective clothing);
- (4) Prevent releases to soil, water or the atmosphere; and

Attach a description of the preparedness and prevention procedures including required equipment, testing and maintenance of equipment, access to communications or alarm system, required aisle space, and arrangements with local authorities. Procedures should at a minimum conform to the requirements of 40 CFR 264, Subpart C.

Contingency Plan is labeled as Attachment (SEE ENGINEERING REPORT- SECTION 4)

7. Attach a copy of the facility's Worker Health and Safety Plan including training. This plan shall be of sufficient detail to describe how workers will be informed of the hazards present in the workplace and how to protect them from exposure or injury from these conditions. The plan should contain elements to instruct employees in identification of hazards, releases, emergency response conditions and methods to prevent releases of hazardous material.

Worker Health and Safety Plan including training is labeled as Attachment (SEE ENGR.REPORT- SECTION 5)

8. Attach a copy of the facility's Quality Control Plan to be approved in accordance with Chapter 62-160, F.A.C. This plan should include detailed description of how the facility shall monitor the conformance to the facility's operational plan, training plan, its methods of determining compliance with permit conditions or Chapter 62-737, F.A.C., (e.g., material sampling and analysis) and the performance of its processing equipment or pollution control equipment (if applicable). The plan shall also contain the measures to monitor conformance with the facility's closure plan.

Quality Control plan to be labeled as Attachment (SEE ENGINEERING REPORT- SECTION 6)

9. Attach a copy of the facility's Closure Plan. This plan shall be of adequate detail as to describe how the facility shall properly remove all quantities of raw or unprocessed material and processed materials or wastes in the event of either voluntary or involuntary closure or cessation of operations. The plan must also include programs for clean up or decontamination of process equipment and process areas if applicable and any analytical testing which must be performed to determine the adequate removal of hazardous materials. The plan must also include the estimated costs involved in carrying out each aspect of the closure of the facility.

(SEE ENGINEERING REPORT- SECTION 7)

Attach the following information to meet the closure performance standard which requires removing all hazardous wastes and hazardous constituents and controlling, minimizing, or eliminating, to the extent necessary to protect human health and the environment, closure related releases of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the soil, ground water, surface waters or to the atmosphere. The closure plan must include the following information:

- a. A description of how the applicant will close the facility.

(SEE ENGINEERING REPORT- SECTION 7)

- b. An estimate of the maximum inventory of unprocessed and processed materials and wastes on site at any one time over the active life of the facility and a detailed description of the methods to be used during closure. The methods may include methods for removing, transporting, treating, storing, recycling or disposing of all processed and unprocessed materials and all hazardous wastes. Identify the type(s) of the off site recycling or hazardous waste management units the applicant will use, if applicable;

(SEE ENGINEERING REPORT- SECTION 7)

- c. A detailed description of the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during closure. The steps include procedures for cleaning equipment and removing contaminated materials, methods for sampling and testing contaminated operational areas of the facility, and criteria for determining the extent of decontamination required to satisfy the closure plan standard;

(SEE ENGINEERING REPORT- SECTION 7)

- d. A schedule for closure of each facility. The schedule must include, at a minimum, the total time required to close each facility and the time required for intervening closure activities which will allow tracking of the progress of final closure ; and

(SEE ENGINEERING REPORT- SECTION 7)

e. A detailed description of the costs of closure. Attach the most recent closure cost estimates for the facility and a copy of the financial mechanism used to establish financial assurance for closure of the facility. The financial information must be submitted using forms specified in 62-737.80-0(4), F.A.C.

Closure Plan is labeled as Attachment (SEE ENGINEERING REPORT- SECTION 7)

Financial Assurance Form is labeled as Attachment _____

10. Attach a copy of the documents used to demonstrate both general and pollution liability insurance coverage of at least \$1,000,000 as required in 62-737.800 F.A.C.. Proof of this coverage must be provided to the Department on an annual basis

Certificate of Insurance is labeled Attachment _____

11. Attach a list of the destinations and uses of processed material shipped off site for disposal or recycling. This is to include the markets for recycled glass or metal end caps or the recovered mercury from reclamation operations. For mercury recovery facility applications, identify the mercury reclamation facility which accepts your material for recovery of the mercury. If this is an out of state facility, include the facility's certification of compliance to the provisions identified in 62-737.840 (4), F.A.C.

List of Destinations Facilities and Uses labeled as Attachment (SEE ENGR.REPORT- SECTION 3)

12. Attach a copy of the facility's Inspection Plan. This plan shall include the measures the facility shall take to monitor and inspect the performance of process operations and pollution control equipment. Indicate the methods and frequency of these inspections and the types of logs or records which shall be maintained.

Inspection Plan is labeled as Attachment (SEE ENGINEERING REPORT- SECTION 8)

**APPLICATION FOR A MERCURY-CONTAINING LAMP OR DEVICE
MERCURY RECOVERY OR MERCURY RECLAMATION FACILITY PERMIT**

Part II - CERTIFICATION

TO BE COMPLETED BY ALL APPLICANTS

Facility Name: Lighting Resources LLC Ocala Facility EPA ID# FLR 000 070 565

1. Operator

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, I agree to comply with the provisions of Chapter 403, Florida Statutes, Chapter 62-737, F.A.C., and all rules and regulations of the Department of Environmental Protection. It is understood that the permit is only transferable in accordance with Chapter 62-737, F.A.C., and, if granted a permit, the Department of Environmental Protection will be notified prior to the sale or legal transfer of the permitted facility.



Signature of the Operator or Authorized Representative*

Daniel P. Gillelspeie, President
Name and Title (Please type or print)

Date: 4/4/2012 Telephone : (909) 923-3132

* If authorized representative, attach letter of authorization.

2. Facility Owner

This is to certify that I understand that this application is submitted for the purpose of obtaining a permit to construct, or operate a mercury-containing lamp or device mercury recovery or mercury reclamation facility . As owner of the facility, I understand fully that the facility operator and I are jointly responsible for compliance with the provisions of Chapter 403, Florida Statutes, Chapter 62-737, F.A.C. and all rules and regulations of the Department of Environmental Protection.



Signature of the Facility Owner or Authorized Representative*

Daniel P. Gillespie, President


Name and Title (Please type or print below signature)

Date: 4/4/2012 Telephone: (909) 923-3132

* If authorized representative, attach a letter of authorization

3. Land Owner

This is to certify that I, as land owner, understand that this application is submitted for the purpose of obtaining a permit to construct or operate a mercury-containing lamp or device mercury recovery or mercury reclamation facility on the property as described.



Signature of the Land Owner or Authorized Representative*

Daniel P. Gillespie, President

Name and Title (Please type or print)

Date: 4/04/2012 Telephone: (909) 923-3132

* If authorized representative, attach letter of authorization.

4. Professional Engineer Registered in Florida

[Complete when not exempted by Chapter 62-737, F.A.C.]

This is to certify that the engineering features of this mercury-containing lamp or device mercury recovery or mercury reclamation facility have been designed and examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, this facility, when properly constructed, maintained and operated, or closed, will comply with all applicable statutes of the State of Florida and rules of the Department of Environmental Protection.

Eric K Kramer
Signature

Eric Kramer, P.E.

Name (please type)

Florida Registration Number: # 49462

Mailing Address: 1228 Winter Garden Vineland

Street or PO. Box

Winter Garden

FL 24787

City

State Zip

Date

4-18-12

Telephone (407) 287-3216

[PLEASE AFFIX SEAL]

LIGHTING RESOURCES, LLC

1007 SW 16TH LANE

OCALA, FLORIDA

MERCURY RECOVERY FACILITY

FL-DEP PERMIT APPLICATION

REVISION NO. [1]

ENGINEERING REPORT

APRIL 2012



PREPARED BY:

Shaw® Shaw Environmental, Inc.

1228 Winter Garden Vineland Road

Winter Garden, FL 34787

(407) 287-3216

PROJECT No. 143925

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- D2 - Site Plan
- D3 - Building Layout
- D4 - Lamp Process Equipment Plan View
- D5 - Site Traffic
- D6 - Material Flow Diagram
- D7 - Facility Emergency and Evacuation Plan

APPENDICES

- Appendix A - Other Facility Permits
- Appendix B - Photographic Logs
- Appendix C - Equipment / Manufacturer Specifications
- Appendix D - Recordkeeping Forms (e.g., material tracking, inspection, training, etc.)
- Appendix E - Sampling and Analysis Standard Operating Procedures
- Appendix F - Closure Costs Backup Data
- Appendix G - Financial Assurance Form
- Appendix H - Certificate of Insurance



1.0 INTRODUCTION AND GENERAL INFORMATION

This Report and attached Appendices constitute a Florida Department of Environmental Protection (DEP) Permit Application for a Mercury Recovery Facility located at 1007 SW 16th Lane, in Ocala (Marion County), Florida, owned and to be operated by Lighting Resources, LLC. This Application has been prepared to meet all applicable federal and state regulatory requirements including but not limited to Rules contained within Chapter 62-737 F.A.C. (*The Management of Spent Mercury-Containing Lamps and Devices Destined for Recycling*).

1.1 Company Background

Lighting Resources, LLC (Lighting Resources) was originally established in March 1990 as a corporation in the State of California, and was later converted to a Limited Liability Company in January 2005 in the State of California. Lighting Resources has been providing environmentally safe and reliable, cost-effective recycling solutions for waste fluorescent lamps, ballasts, batteries, e-waste and mercury devices for over 20 years. Lighting Resources currently has facilities located in Arizona, California, Indiana, and Texas, and now in Florida (Ocala).

1.2 Facility Overview

The proposed Mercury Recovery Facility (Facility) is located on a 1.33-acre parcel of land and consists of a 16,539 square foot, steel and masonry building, with loading areas located along the east side of the building, asphalt paved parking areas to the south and east of the building, and a paved ingress / egress located at the south edge of the property off of SW 16th Lane. The Facility building has an administrative office located at the south end (just north of the site entrance), an unprocessed material and supply storage room / area located immediately behind (north of) the administrative office, a lamp processing room / area located at the far northwest end of the building, and a processed material and supply storage room / area in the far northeast end of the building. Material receiving (unloading) and transfer (loadout) docks are located along the east side of the Facility building.

The proposed Facility will accept mercury containing fluorescent and high intensity discharge lamps (MCLs), mercury containing devices (MCDs), ballasts (PCB and Non-PCB), and batteries. MCLs will be processed and separated into the following materials: glass, metal end caps / metal components, and mercury-containing phosphor powder. The processed and separated glass and metal materials passing TCLP (Toxicity Characteristics Leaching Procedure) for mercury (i.e., below the USEPA toxicity of 0.2 mg/l) will be recycled. The mercury-containing phosphor powder and MCDs will be transferred by a licensed hazardous waste hauler to a permitted mercury reclamation facility for processing and recovery of the mercury content of these materials. Ballast materials (PCB and Non-PCB) will be transferred by a licensed hazardous waste hauler to a permitted ballast recycling facility for processing and recovery of any recyclable materials and incineration of any PCB containing materials. Batteries to be accepted will include the following:

- Automotive / large equipment lead acid type batteries; and
- Small type batteries:
 - Alkaline,
 - Gell cells,
 - Lead acid
 - Lithium ion,



- Magnesium,
- Mercury,
- Ni-Cad,
- Ni-MH,
- Silver oxide, and
- Zinc.

All batteries will be sorted by type and sent to an authorized battery recycling facility.

All material handling / processing activities will take place solely within the Facility building. Materials received at the proposed Facility will be sorted / processed, consolidated, and loaded into outbound transfer trailer vehicles for transport to a licensed / permitted facility authorized to receive such materials.

1.3 General Facility Information

General information for the proposed Lighting Resources Facility (located in Ocala, Florida) as required by Title 40 § 270.14(b) (1), follows:

- Company Name: Lighting Resources, LLC
- Corporate Address: 805 East Francis Street, Ontario, CA 91761
- Corporate Telephone Number: (909) 923-3132
- Facility Address: 1007 SW 16th Lane, Ocala FL 34471
- Facility Telephone Number: (352) 509-3001
- Facility Facsimile Number: (352) 509-3012
- Facility EPA / DEP Identification Number: FLR 000 070 565
- Facility Contact: Bonnie Bishop-Clark, Southeast Branch Manager

1.4 Other Facility Permits

Lighting Resources, LLC has the following pending or approved permits or registrations:

- DEP Division of Air Management, General Air Permit Registration – received October 13, 2011.
- Florida Hazardous Waste Transporter Approval Certificate of Approval – effective through October 1, 2012.
- DEP Large Quantity Handler Facility for Universal Waste Lamps and Devices Registration – registered through March 1, 2012.

Please refer to **Appendix A** for copies of the above referenced documents.

1.5 Organization of Application

This Application has been prepared to address all of the information and issues required for a DEP Mercury Recovery Facility Permit. This Application has been organized into the following eleven (11) tabbed sections:

- DEP Application Form # 62-737.900(2)
- Engineering Report
- Drawings
- Appendix A - Other Facility Permits
- Appendix B - Photographic Logs



- Appendix C - Equipment / Manufacturer Specifications
- Appendix D - Recordkeeping Forms (e.g., material tracking, inspection, training, etc.)
- Appendix E - Sampling and Analysis Standard Operating Procedures
- Appendix F - Closure Costs Backup Data
- Appendix G - Financial Assurance Form
- Appendix H - Certificate of Insurance

Further details on the organization of this Application is presented on **Table 1-1** on the following page; specifically, providing the sections of the Engineering Report and Drawings and/or Appendices that correspond to the specified questions within the DEP Application Form (# 62-737.900(2)).



Table 1-1
Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL
Organization of Application

Tab Name	Corresponding Part / Question Number(s) In DEP Application Form No. 62-737.900(2)				
	Part I - Information				Part II
	General "A"	Site "B"	Land Use "C"	Operating "D"	
DEP Application Form # 62-737.900(2)	A.1 thru A.20	B.1 thru B.2	C.1 thru C.3	D.1 thru D.3	ALL
<u>Engineering Report:</u>					
Section 1.0 – Introduction and General Information	A.21			D.2	
Section 2.0 – Facility Site and Surrounding Area Information (contains Figs 1- 6, below)		B.1 thru B.4	C.1 thru C.3		
Figure 1 – USGS Topographic Map		B.1, B.3			
Figure 2 – Site and Surrounding Area on Aerial Photo		B.3	C.3		
Figure 3 – Zoning Map			C.1		
Figure 4 – Location of Surface Waters		B.3, B.4			
Figure 5 – Flood Insurance Rate Map		B.4			
Figure 6 – Site Plan on Aerial Photo		B.3			
Section 3.0 – Operating Plan				D.1 thru D.5, D.11	
Figure 7 – Air Monitoring Locations				D.5, D.7, D.8	
Section 4.0 – Emergency Procedures and Hazardous Waste Contingency Plan				D.6	
Section 5.0 – Worker Health and Safety Plan				D.7	
Section 6.0 – Quality Control Plan				D.8	
Section 7.0 – Closure Plan				D.9, D.11	
Section 8.0 – Inspection Plan				D.12	
<u>Drawings:</u>					
D1 – Site Plat of Survey		B.3			
D2 – Site Plan		B.3		D.5	
D3 –Building Layout		B.3		D.1, D.5	
D4 – Lamp Process Equipment Plan View				D.5	
D5 – Site Traffic		B.3		D.5	
D6 – Material Flow Diagram		B.3		D.5	
D7 – Facility Emergency and Evacuation Plan				D.5 thru D.8	
Appendix A: Other Facility Permits	A.21				
Appendix B: Photographic Logs		B.3	C.3		
Appendix C: Equipment / Manufacturer Specifications				D.5	
Appendix D: Recordkeeping Forms				D5. thru D.8	
Appendix E: Sampling and Analysis SOP				D.5, D.9	
Appendix F: Closure Costs Backup Data				D.9	
Appendix G: Financial Assurance Form				D.9.e	
Appendix H: Certificate of Insurance				D.10	



2.0 FACILITY SITE AND SURROUNDING AREA INFORMATION

The following paragraphs provide a description of the Lighting Resources, LLC existing site property, its historical use, and its current zoning and land use of site and surrounding properties.

2.1 Site Location and Historical Background

The Facility Site property is located in an industrial park at 1007 16th SW Lane, in Ocala, Florida (Marion County). The subject property was originally developed in 1978 with a single warehouse building and was owned / occupied by Nation Distributors — a distributor of alcoholic beverages, until the mid-1980s. From the mid to late 1980s, Handling Systems Engineering, Inc. — a conveyor systems wholesaler, occupied the property. Following the departure of Handling Systems Engineering, the property remained vacant until 1991. In 1991 an addition to the original structure was constructed at the northern portion of the original structure. The property was occupied by Van-Mor Enterprises, a motor vehicle wholesaler and builder, from 1999 until 2007. The current office area, located at the south end of the structure, was added in 2004. Mr. Todd Warriner purchased the property in 2007. The building and property remained vacant except for intermittent use as a gymnasium for a volleyball league from 2007 until purchased by Lighting Resources, LLC in December, 2010.

The Site location is presented on a USGS topographic quadrangle map and an aerial photo map on **Figures 1** and **2**, respectively, on the following pages.

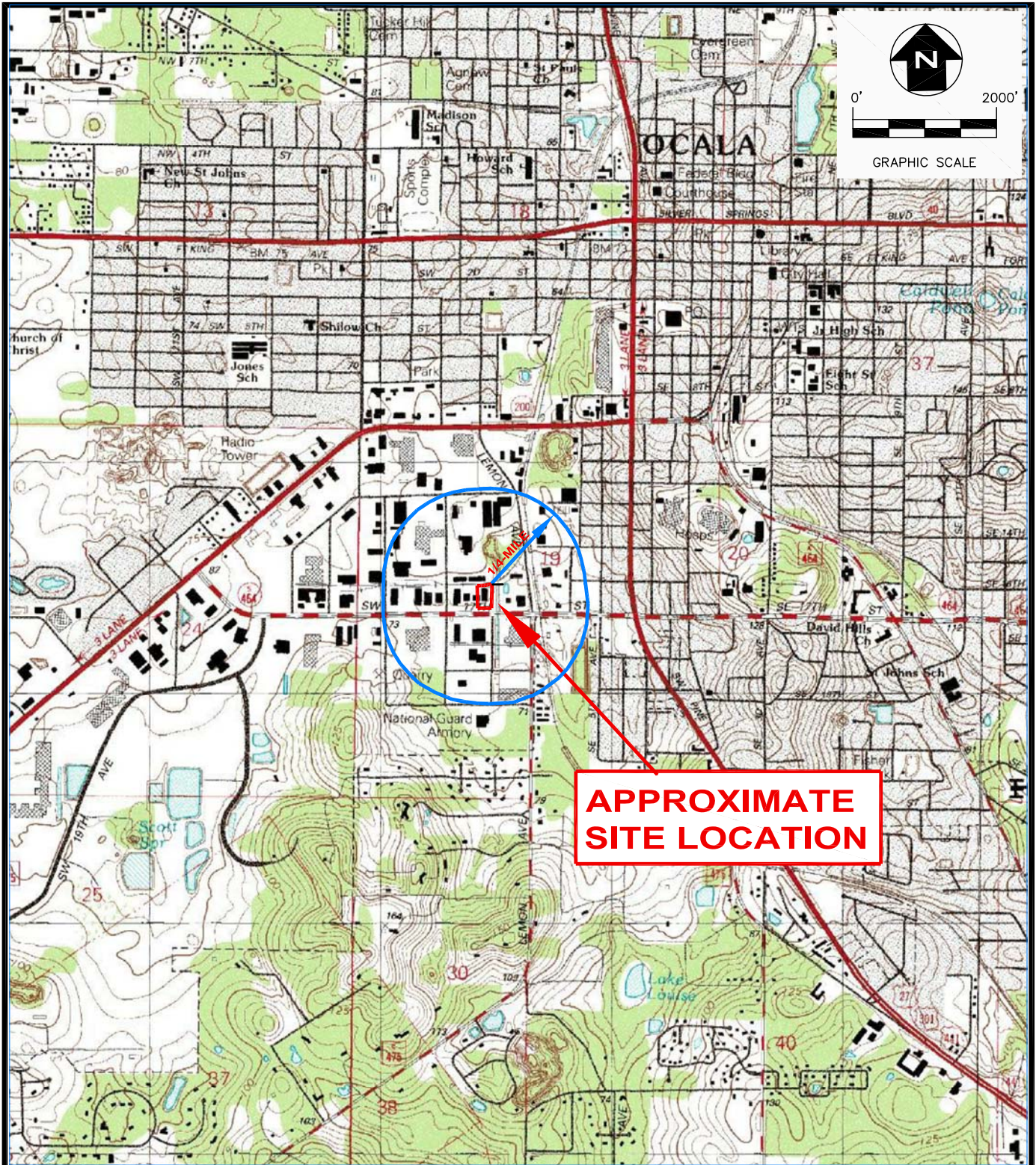
2.2 Site and Surrounding Area Zoning and Land Use

The subject Site is located in the Ocala Industrial Park and has a current zoning designation of “M-1” – Light Industrial. Properties located immediately adjacent to the Site are also zoned M-1 and have the following uses:

Adjacent Uses:

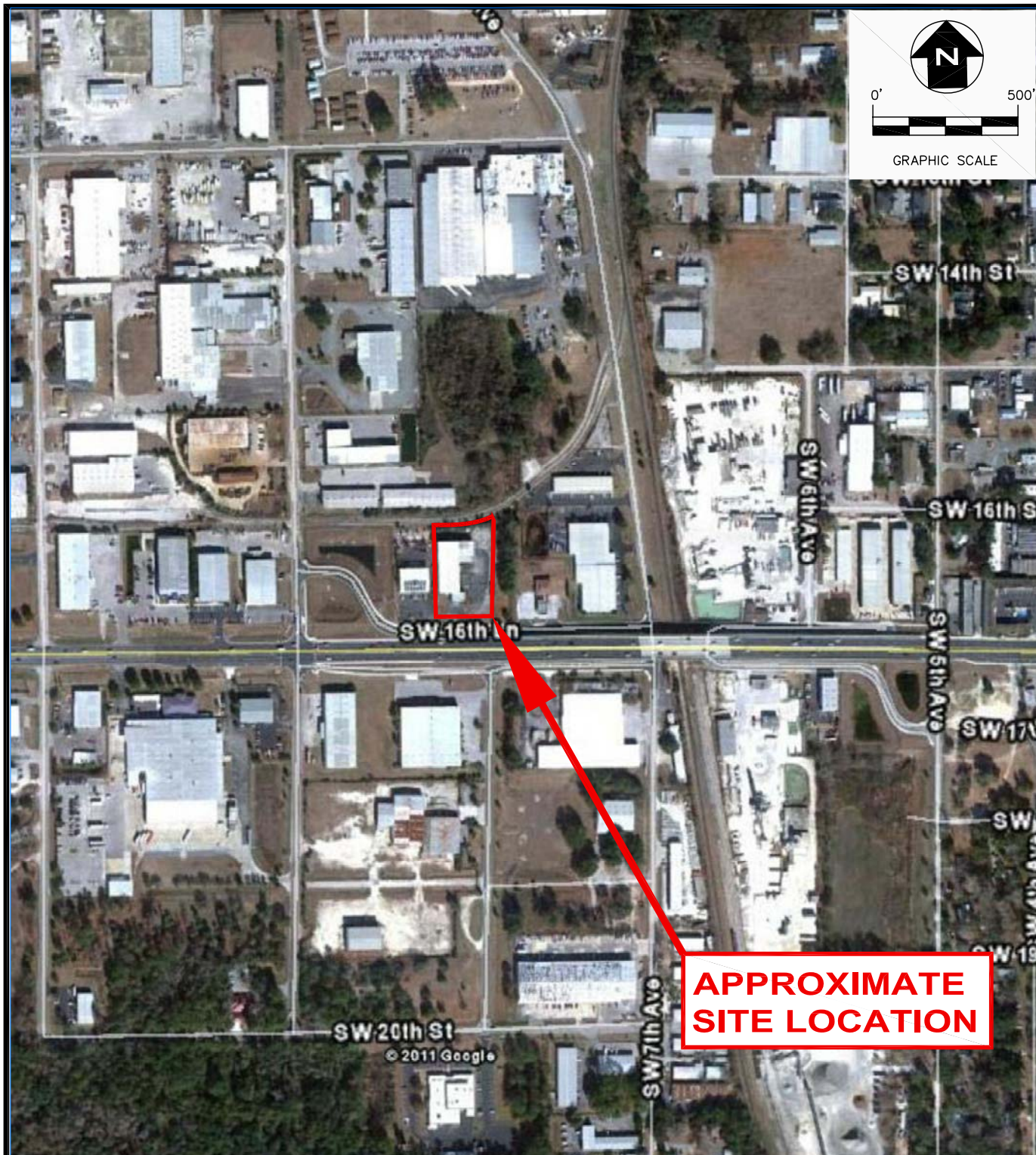
- North: immediately north is a railroad spur, and north of the railroad spur is a paint shop and vacant property owned by the City of Ocala;
- South: immediately south is SW 16th Lane and the SW 17th Place viaduct, and south of the two roads are a number of vacant buildings / properties of unknown use;
- West: immediately west is a chiropractic business (“Fakhoury Chiropractic / Fakhoury Equipment Inc.”); and
- East: immediately east is property owned by the Florida Department of Transportation that appears to be vacant, and a public storage facility (“American Self Storage”).





SOURCE:

U.S. GEOLOGICAL SURVEY 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAP "OCALA WEST, FL" DATED 1991.



**APPROXIMATE
SITE LOCATION**

SOURCE:

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH,
IMAGERY DATED 1/13/2011.



Shaw Environmental, Inc.

**LIGHTING RESOURCES, LLC - OCALA, FL
MERCURY RECOVERY FACILITY**

**FIGURE 2
SITE LOCATION AND SURROUNDING AREAS
SHOWN ON AERIAL PHOTOGRAPH**

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The zoning designations of the surrounding area properties located within ¼-mile of the site are as follow:

Surrounding Zoning:

- North, Northwest, and West: “M-1” - Light Industrial;
- Northeast: “M-1” - Light Industrial, and “M-2” -Medium Industrial;
- East and Southeast: “M-1” - Light Industrial, “M-3” - Heavy Industrial, and “B-1A” - Limited Neighborhood Business; and
- South and Southwest: “M-1” Light Industrial, and “M-2” - Medium Industrial.

The nearest residential use area is located over 2,000-feet south from the Facility frontage road SW 16th Lane / SW 17th Place. The Site and surrounding area zoning are presented on **Figure 3** (on page 9).

2.3 Surface Waters and Site Drainage

Based on a review of the USGS topographic map dated 1991 (as shown on **Figure 1**), the nearest surface water appears to be a small creek that runs immediately east of and parallel to the Site’s eastern boundary. The creek appears to begin on the property immediately east and adjacent to the Site, and terminate on the property that is immediately south and adjacent to SW 16th Lane / SW 17th Street. Based on a review of aerial photo imagery dated January 2011, the same area occupied by the creek appears to be covered in vegetation.

The next nearest surface water bodies located with respect to the subject Site (ranging in distances from 140-feet to 3,500-feet) are as follow:

- East-Northeast: a square-shaped area with vegetative growth (see **Figure 2**) located approximately 140-feet east to northeast of the Site, that may serve as a stormwater detention basin. The USGS map (dated 1991) presented on **Figure 1** shows this area with standing water; however, the aerial photograph (dated 2011) presented on **Figure 2**, shows only vegetation.
- East: a surface water impoundment associated with the business “Cemex Construction Materials” is located approximately 650-feet east of the Site, immediately east of SW 7th Road.
- Southeast: a surface water impoundment associated with the business “Rinker Materials” is located approximately 1,100-feet southeast of the Site, immediately south of SW 17th Place and east of SW 7th Road.
- Southwest: two surface water bodies are located over 3,500-feet southwest of the Site — both appear to be man-made stormwater detention ponds associated with residential developments.

Based on a review of topographic elevations of the Site and immediate surrounding areas from survey data presented on the Marion County Geographic Information Systems website, surface waters from the subject site appear to generally drain to the south and to the east — specifically, into roadside drainage ditches that run parallel to SW 16th Lane and SW 7th Road, respectively.



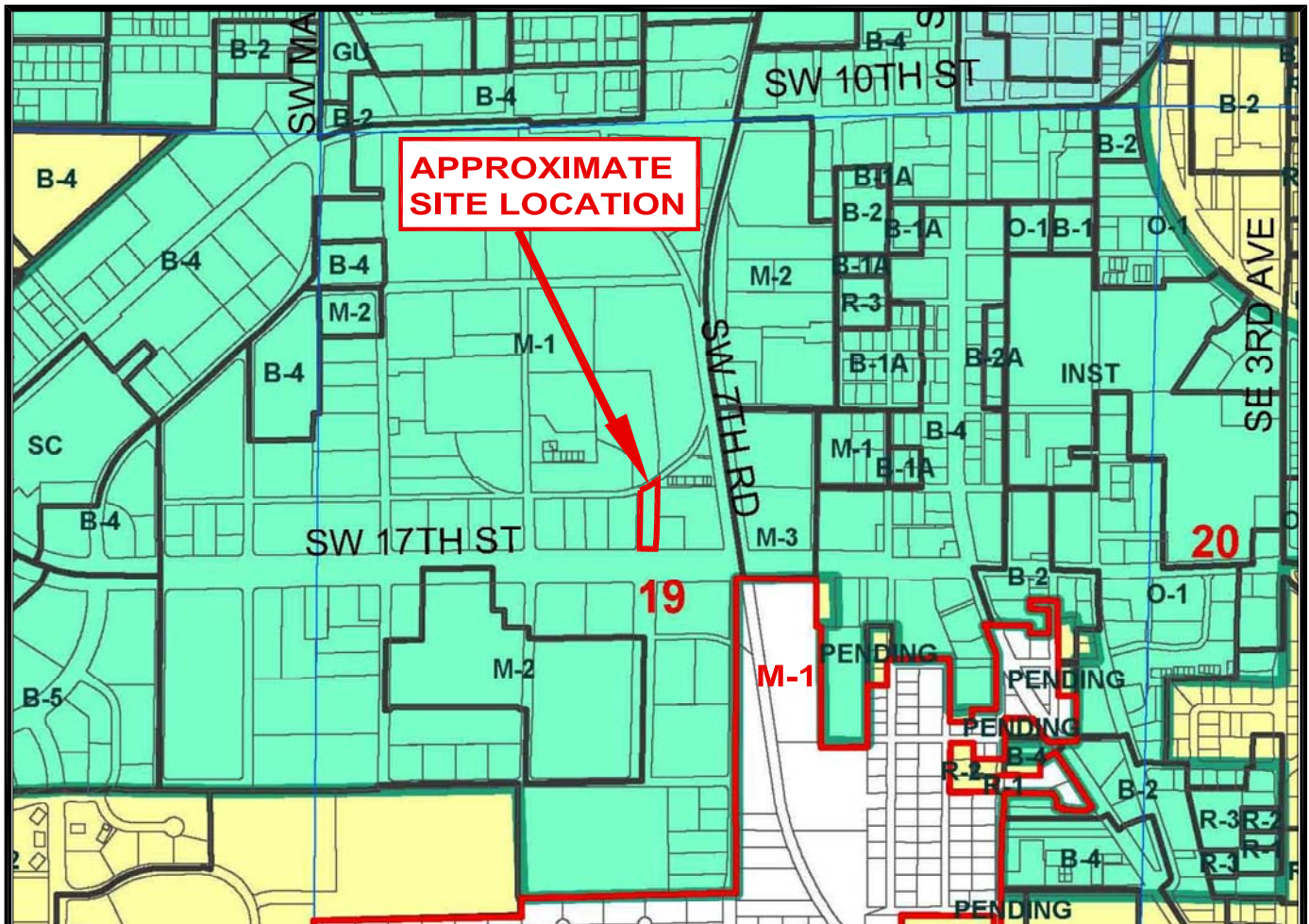
The proposed Mercury Recovery Facility operations will be conducted entirely inside the Facility building, and therefore there will be no threat of contamination from the Facility commingling with surface water runoff nor will there be a threat of any contamination entering the adjacent creek (located east of the Site). The locations of the surface water bodies as described above are presented on **Figure 1** (on page 6) and on **Figure 4** (on page 11).

The Facility building is serviced by a connection to the local municipal sewer system. Specifically, wastewater from all toilets / restrooms (within the building) drain into a connecting pipe that runs beneath the building and out to the municipal sewer interceptor line beneath the frontage road (south of Facility building). There are no floor drains within the Facility building nor is there a septic system on site. There is a drainage grate located immediately outside of the building in the loading dock area. In the unlikely event of a spill, any liquid would drain through this grate into a catch basin / holding area for testing prior to removal from site. The catch basin has a sump pump to remove any liquids.

2.4 100-Year Floodplains

Based on a review of the most recent Flood Insurance Rate Map ("FIRM" - Map No. 12083C0517D, dated August 2008) published by the Federal Emergency Management Agency, the subject Site is not located in the 100-year floodplain. As shown on **Figure 5** (presented on page 12), a portion of the Site has a flood zone designation of "X" which corresponds to areas outside the 100-year floodplains.





Legend

- PARCELS
- SECTIONS
- HISTORIC DISTRICTS
- COMMUNITY REDEVELOPMENT AREA
- TCEA URBAN REDEVELOPMENT AREA
- CITY LIMITS
- URBAN SERVICE AREA

- A-1 - Agricultural
- B-1 - Neighborhood Business
- B-1A - Limited Neighborhood Business
- B-2 - Community Business
- B-2A - Limited Community Business
- B-3 - Central Business
- B-3A - CRA Commercial Corridor
- B-3B - CRA Mixed Use 1
- B-3C - CRA Mixed Use 2

- B-4 - General Business
- B-5 - Wholesale Business
- GU - Governmental Use
- INST - Institutional
- M-1 - Light Industrial
- M-2 - Medium Industrial
- M-3 - Heavy Industrial
- MH - Mobile Home Park
- O-1 - Office

- O-H - Office Historic
- OP - Office Park
- PUD-0 - Planned Unit Development
- PUD-01 - Planned Unit Development-1 Unit
- PUD-02 - Planned Unit Development-2 Units
- PUD-03 - Planned Unit Development-3 Units
- PUD-04 - Planned Unit Development-4 Units
- PUD-05 - Planned Unit Development-5 Units
- PUD-06 - Planned Unit Development-6 Units

- PUD-07 - Planned Unit Development-7 Units
- PUD-08 - Planned Unit Development-8 Units
- PUD-09 - Planned Unit Development-9 Units
- PUD-10 - Planned Unit Development-10 Units
- PUD-11 - Planned Unit Development-11 Units
- PUD-12 - Planned Unit Development-12 Units
- PUD-13 - Planned Unit Development-13 Units
- PUD-14 - Planned Unit Development-14 Units
- PUD-15 - Planned Unit Development-15 Units

- PUD-16 - Planned Unit Development-16 Units
- PUD-M-08 - Planned Unit Development-Mixed-8 Units
- PUD-RO - Planned Unit Development-Office
- R-1 - Single Family Residential
- R-1A - Single Family Residential
- R-1AA - Single Family Residential
- R-2 - Two-Family Residential
- R-3 - Multiple-Family Residential
- RBH-1 - Residential Business Historic-1

- RBH-2 - Residential Business Historic-2
- RBH-3 - Residential Business Historic-3
- RO - Residential Office
- RZL - Residential Zero Lot Line
- SC-1 - Neighborhood Shopping Center (Void)
- SC-2 - Community Shopping Center (Void)
- SC-3 - Regional Shopping Center (Void)
- SC - Shopping Center
- Ordinance Pending

SOURCE: CITY OF OCALA, FL ZONING MAP

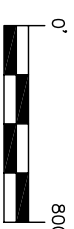
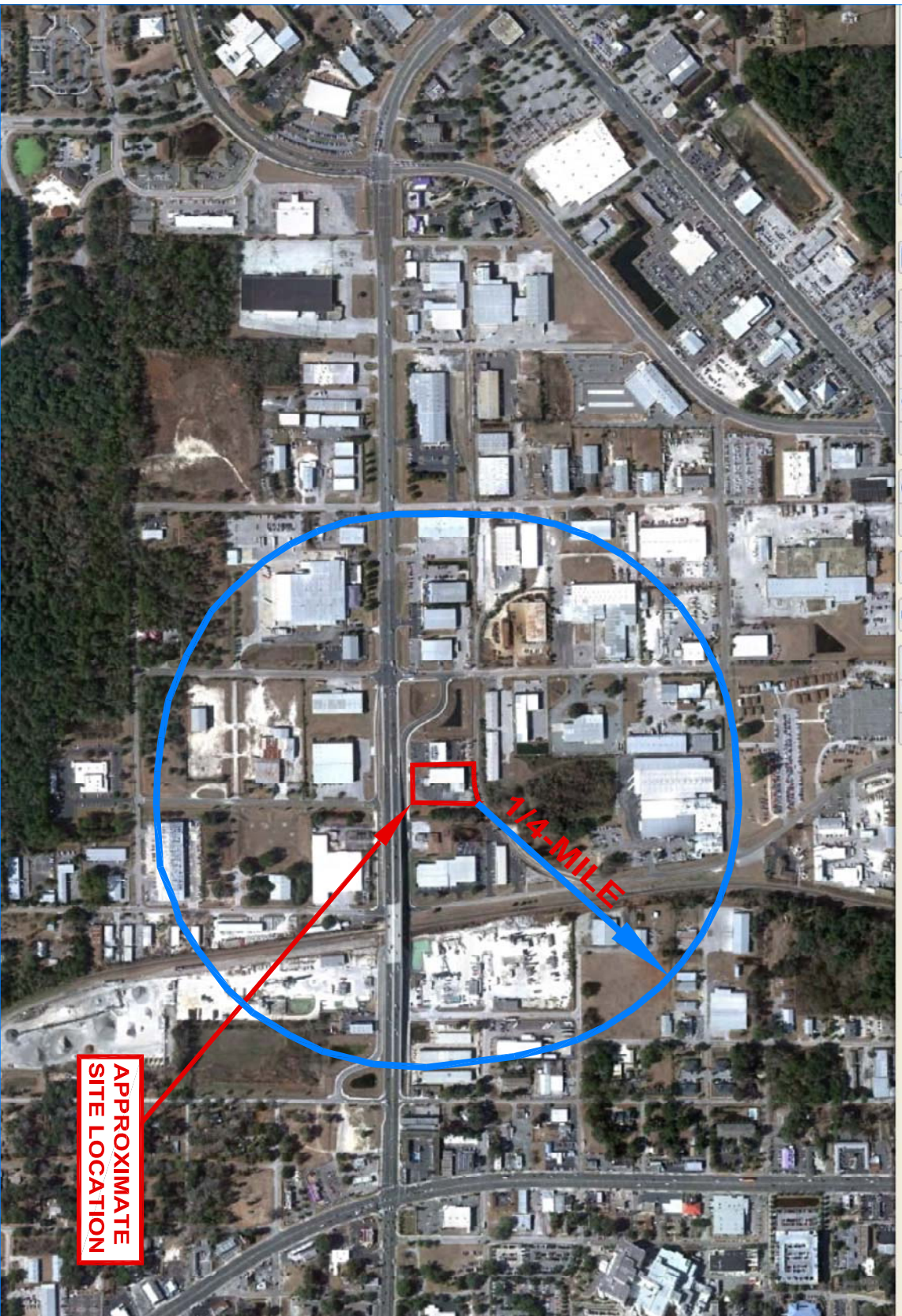


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LIGHTING RESOURCES, LLC - OCALA, FL MERCURY RECOVERY FACILITY

FIGURE 3
SITE AREA ZONING MAP

APPROVED BY: PCT PROJ. NO.: 143925 DATE: DEC. 2011



GRAPHIC SCALE

SOURCE:
AERIAL PHOTOGRAPH OBTAINED
FROM GOOGLE EARTH, IMAGERY
DATED 1/13/2011.

**LIGHTING RESOURCES, LLC - OCALA, FLORIDA
MERCURY RECOVERY FACILITY**

**FIGURE 4
LOCATION OF SURFACE WATERS**



Shaw Environmental, Inc.

DRAWN BY:

PCT

APPROVED BY:

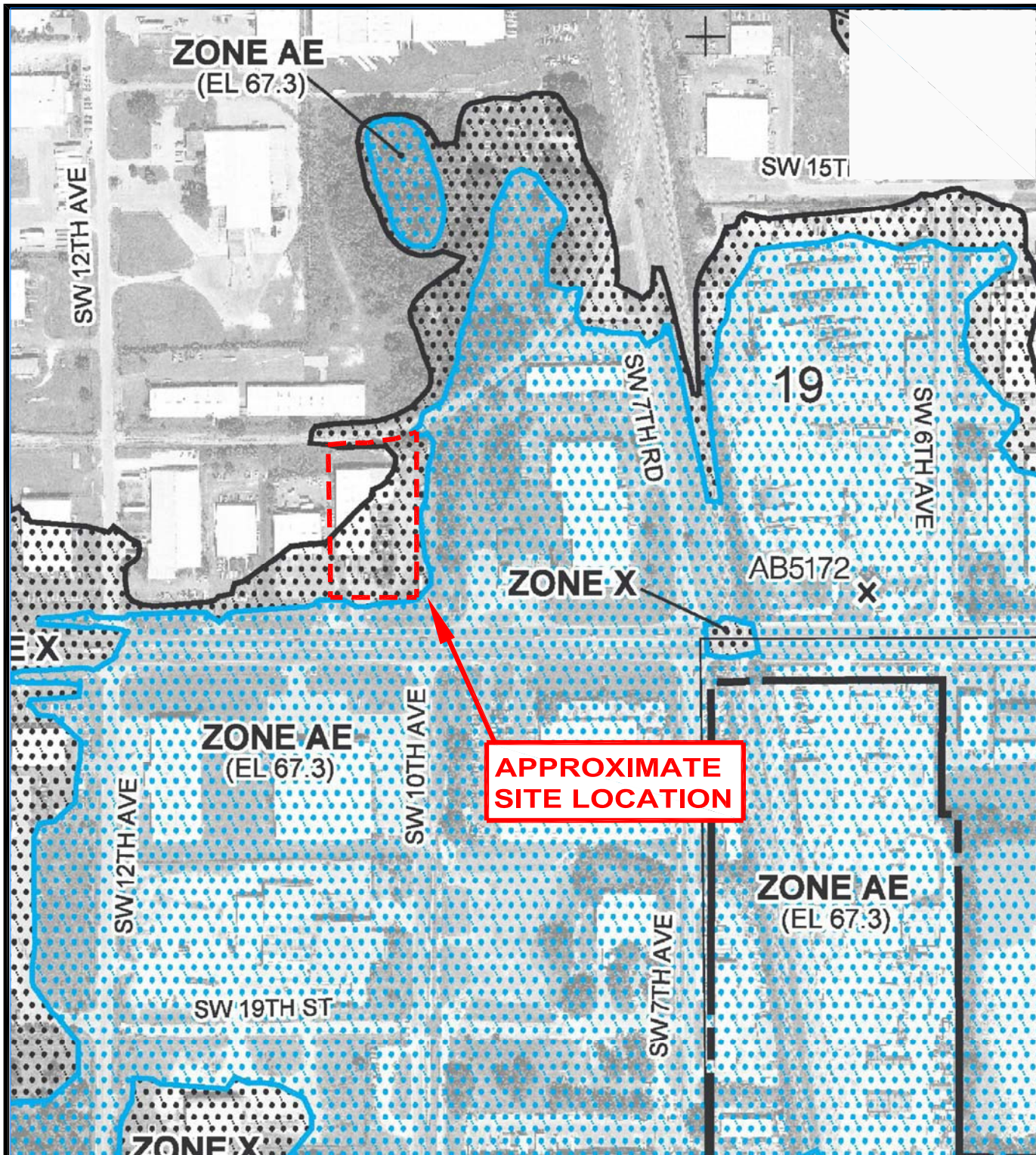
DAM

PROJ. NO.:

143925

DATE:

DEC. 2011



SOURCE: FEMA FLOODPLAIN MAP NO. 12083C0517D, DATED AUGUST 28, 2008.

FEMA ZONE DESIGNATION:

ZONE X- FLOODPLAIN AREA OF MODERATE FLOOD HAZARD, USUALLY THE AREA BETWEEN THE LIMITS OF THE 100-YEAR AND 500-YEAR FLOODS.

ZONE AE- THE BASE FLOODPLAIN WHERE BASE FLOOD ELEVATIONS ARE PROVIDED.



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**LIGHTING RESOURCES, LLC - OCALA, FL
MERCURY RECOVERY FACILITY**

**FIGURE 5
FLOOD INSURANCE RATE MAP**

APPROVED BY: PCT	PROJ. NO.: 143925	DATE: DEC. 2011
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2.5 Site Conditions

The Facility property consists of approximately 1.33 acres of land having the following constructed features:

- A 16,539 square foot building constructed of masonry and sheet steel, comprising approximately 28.5% of the site;
- Asphalt paved parking areas / surfaces located along the east side of the property (east of the building), and along the south / front area of the property, comprising approximately 45% of the site;
- Concrete paved loading ramps located along the east side of the building, comprising less than 3% of the site property; and
- Unpaved / vegetated areas along the site frontage, east and west sides, and rear (north side), comprising less than 25% of the site property.

The site has a security fence with a locking gate to prohibit unauthorized access to the material receiving, handling, and storage areas. The site plat of survey and site plan are presented on **Drawing Nos. D1** and **D2**, respectively (contained in tabbed section "**Drawings**"). A plan view of the site property shown on an aerial photograph is presented on **Figure 6** on the following page.

2.6 Facility Building Layout

The building is divided into the following four areas as shown on **Drawing No. D3** (contained in tabbed section "**Drawings**"):

- Administrative Offices – 1,532 square feet;
- Area A: Material Receiving, Loadout, and Staging Room – 8,750 square feet;
- Area B: Lamp Processing Room – 3,682 square feet; and
- Area C: Processed Glass and Supply Storage Room – 2,575 square feet.

Photographic logs of the Facility building (inside and outside) are presented in **Appendix B**.

Administrative Offices

The Administrative Offices area is an addition that was added on to the original constructed building in 1991. This area is located on the south edge of the building and contains offices, reception area, restrooms, and a meeting/conference room (see **Photo Inset No. 1** to the right).



Photo Inset 1: Administrative Offices





--- APPROXIMATE SITE BOUNDARY

SOURCE:

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH,
IMAGERY DATED 1/13/2011.



**LIGHTING RESOURCES, LLC - OCALA, FL
MERCURY RECOVERY FACILITY**

**FIGURE 6
SITE PLAN VIEW ON AERIAL PHOTOGRAPH**

APPROVED BY: PCT	PROJ. NO.: 143925	DATE: DEC. 2011
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Area A – Receiving, Loadout, and Staging Room

Area A is located immediately behind the Administrative Offices and is where all inbound materials will be received, inventoried, and temporarily stored /staged until processed and/or loaded out for transfer to an authorized and permitted reclamation facility or recycling facility. Area A has the following access points:

- North Wall Access Points: 1- overhead door (immediately west of the Administrative Offices, and 2-personnel doors (1-door immediately west of the overhead door, and 1-door east of the overhead door that is on the common wall shared by the Administrative Offices);
- South Wall Access Points: 1-overhead door and 1-personnel door on the common wall shared by the Lamp Processing Room, and
- East Wall Access Points: 2-overhead doors (doors are adjacent to concrete loading ramps, one is recessed and the other is at grade under a canopy cover), and 1-personnel door.

The Facility access points are illustrated on **Drawing Nos. 2 and 3** (contained in tabbed section “**Drawings**”).

Area A: Flooring / Working Surface. The Area A floor has been resurfaced with concrete. All stress cracks have been filled using *Adhesives Technology Crackbond JF 311*; and the entire floor has been sealed with a protective epoxy using *Sherwin Williams Tile-Clad High Solids Coating* (see **Appendix C** for product specifications). Any subsequent stress cracks will be filled and sealed in a similar manner using the same products.

Area A: Material Receiving / Loading Docks. A concrete ramp and two receiving / loading docks are located along the east wall of Area A, for receiving trucks / vehicles with unprocessed materials and for loadout of universal waste (i.e., Mercury Containing Devices and batteries) and mercury containing phosphor powder. Two overhead doors are located over the respective docks. The concrete ramp has a below grade, recessed landing area. To ensure that material / liquid does not run off from the ramp / dock area, a grate covered trench drain has been installed in the landing area (see **Photo Inset No. 2** to the right) with a 750-gallon sump / collection tank installed beneath to collect any liquid (i.e., stormwater) for testing prior to discharge.



Photo Inset No. 2: Receiving / Loading Docks

Area A: Canopied Loading Area. A third overhead door is located just north of the receiving / loading dock area along the east edge of the building (see **Photo Inset No. 3** to the right) where a canopy extends from the building roofline east over a concrete paved surface for truck loadout operations — specifically, for moving processed glass from



Photo Inset No. 3: Canopied Loading Ramp



Area B to Area C (for staging), and processed metals from Area B into a dedicated trailer parked in the northeast corner of the site for later shipment offsite.

Area A: Other Overhead Doors. There are two additional overhead doors — one located on the north wall and one located on the south wall of Area A. The north wall overhead door is used to move the staged lamps into Area B (the Lamp Processing Room) for processing; and the south wall overhead door is used to move stored supplies from Area C into the southwest corner of Area A (see **Photo Inset Nos. 4 and 5** right/below, and refer to **Drawing Nos. 2 and 3** (contained in tabbed section “Drawings”).



Photo Inset No. 4: Area A - West Wall, Staging / Storage Areas, and Portion of North Wall (and Overhead Door)

Area A: Lamp Staging / Storage. Unprocessed materials will be staged / stored on pallets along the west wall of Area A. Pallets will be oriented from west to east (starting from the west wall) in ten (10) rows — with each row measuring 50-inches in width by 30-feet in length, separated by 3-foot wide aisles. Each row will accommodate seven (7) standard 48-inch pallets. Rows 1 through 9 will be dedicated to the staging/storage of intact lamps, and Row 10 will be dedicated to the staging/storage of crushed lamps. Calculations are provided on the following page, demonstrating that Rows 1 through 9 will provide staging/storage for up to a maximum of 69,552 intact lamps, and Row 10 will provide staging/storage for up to a maximum of twenty-eight (28) 55-gallon drums of crushed lamps.



Photo Inset No. 5: Area A - South Wall, South Overhead Door, and Supply Storage



Area A: Lamp Staging / Storage Calculation. The maximum number of intact and crushed lamps that can be staged for processing is presented the step-by-step calculation below:

- **Rows 1 through 9 -Intact Lamps:** each row will have seven (7) pallets, each pallet will hold sixteen (16) lamp boxes (ea. lamp box 12" x 12" x 48"), and each lamp box will hold sixty-nine (69) lamps; therefore each pallet will accommodate the following number of lamps:

$$\frac{69 \text{ lamps}}{1 \text{ box}} \times \frac{16 \text{ boxes}}{1 \text{ pallet}} = 1,104 \text{ lamps per pallet}$$

Each row will therefore accommodate the following number of lamps:

$$\frac{1,104 \text{ lamps}}{1 \text{ pallet}} \times \frac{7 \text{ pallets}}{1 \text{ row}} = 7,728 \text{ lamps per row}$$

The total number of intact lamps that can be staged / stored in **Rows 1 through 9** equals the following:

$$\frac{7,728 \text{ lamps}}{1 \text{ row}} \times 9 \text{ rows} = 69,552 \text{ lamps}$$

Note: A total number of 75,000 lamps was conservatively used in the closure cost estimate (see **Table 7-3** in **Section 7** of this Report). The maximum storage of 69,552 lamps and the closure cost estimate number of 75,000 lamps both assume lamps are all four (4)-foot T-12 fluorescent tube type lamps. This assumption was conservatively made because of the following: 1) the size of these lamps are generally larger than other type lamps including CFLs, and U-Tubes; 2) it simplified the effort to calculate lamp storage and closure costs; and 3) the Facility has not begun operating and therefore a realistic estimate of the breakdown of lamps cannot be made at this time. Once the Facility has been granted a DEP permit and has been operating for several months (~ 6 months), a realistic breakdown of lamp types by volume can be made and submitted to DEP.

- **Row 10 - Crushed Lamps:** will have seven (7) pallets, each pallet will hold four (4) 55-gallon drums; therefore the total number of drums that can be staged / stored containing crushed lamps equals the following:

$$\frac{4 \times (1)55 - \text{gallon drums}}{1 \text{ pallet}} \times \frac{7 \text{ pallets}}{1 \text{ row}} = 28 \text{ drums}$$

Area B - Lamp Processing Room

The Area B - Lamp Processing Room contains the *Balcan MP 8000 Lamp Processor* equipment, and will be the only area where processing of lamps will occur. A plan view of the Balcan process equipment is presented on **Drawing No. D4** (in tabbed section "Drawings").



The Lamp Processing Room floor has been resurfaced with concrete; all stress cracks have been filled with *Adhesives Technology Crackbond JF 311*; and the entire floor sealed with two layers of Sherwin Williams Armor-Seal 650 SL/RC Self-Leveling/Re-Coatable Epoxy (see **Appendix C** for product specifications for the Balcon equipment and floor epoxies, adhesives, and sealants). The Lamp Processing Room has been completely insulated to R-19 value and air-conditioned for mercury vapor reduction and control purposes. The room is self-contained and sealed to retain and maximize the negative pressure environment created by the lamp processing equipment. Drums of mercury laden phosphor powder will be stored within the confines of the Lamp Processing Room.

Area C - Processed Glass and Supply Storage Room

The Processed Glass and Supply Storage Room will be used for general storage of boxes, containers and recyclable materials. It will also serve as the repository for recovered, clean glass. The Processed Glass and Supply Storage Room has two overhead doors located along the room's east exterior wall — the north overhead door will remain closed and the south overhead door will be used to loadout trucks with clean processed glass material (refer to **Drawing No. D3** in tabbed section "**Drawings**").

2.7 Site Parking and Security

The site has asphalt paved parking areas located immediately along the south frontage of the site and along the eastern portion of the site as shown in **Photo Inset No. 6** to the right. The following number of parking spaces are provided on site:

- Five (5) parking spaces located immediately south and adjacent to the Administrative Offices,
- Five (5) parking spaces located immediately east and adjacent to the Administrative Offices, and
- Eight (8) parking spaces located along the eastern edge of the south one-half of site.



Photo Inset No. 6: Site Parking

The site has a security fence with a locking gate to prohibit unauthorized access to the material receiving, handling, and storage areas. The fencing follows along the western edge, eastern edge and northern edge of the Facility property. The fencing in the southern portion of the site runs from east to west immediately behind the Administrative Offices (terminating at the Administrative Offices) as shown to the right in **Photo Inset No. 7** and on the Site Plan Drawing presented on **Drawing No. D2** (contained in tabbed section "**Drawings**").



Photo Inset No. 7: Site Security Fence



3.0 OPERATING PLAN

The following operating plan addresses the proper procedures for the handling, processing, and transport operations for the proposed Lighting Resources, LLC - Mercury Recovery Facility located in Ocala, Florida (Facility). The Facility will be operated in such a manner that is protective of public health, safety, and welfare. Further, the Facility will operate in strict accordance with all applicable federal and state rules and regulations, including but not limited to Rules contained within Chapter 62-737 of the Florida Administrative Code (F.A.C.) - *The Management of Spent Mercury-Containing Lamps and Devices Destined for Recycling*.

All material handling / processing activities will take place solely within the Facility building. Materials received at the Facility will be sorted / processed, consolidated, and loaded into outbound transfer vehicles for transport to a licensed / permitted facility authorized to receive such materials.

All Facility personnel will be appropriately trained and managed to comply with the contents of this operating plan prior to beginning duties. A copy of the operating plan will be located within the Administrative Offices and will remain available for reference to ensure proper management of Facility operations.

3.1 Overview of Facility Operations

The proposed Lighting Resources Facility is by DEP definition a *Mercury Recovery Facility* that will accept for processing (i.e., mercury recovery) both intact and crushed mercury containing lamps. Lighting Resources will also accept other universal wastes for transfer only to a reclamation facility or other final destination facility (i.e., recycler, treatment, or disposal type facility). Specifically, the proposed Lighting Resources Facility will accept the following mercury containing materials and universal wastes:

- Mercury Containing Lamps (MCLs) - fluorescent lamps, incandescent lamps, and high intensity discharge (HID) lamps (intact and broken);
- Mercury Containing Devices (MCDs) - thermometers, thermostats, switches, relays and manometers, etc.;
- Lighting Ballasts - PCB and Non-PCB ballasts;
- Automotive / Large Equipment Lead Acid Type Batteries; and
- Small Type Batteries:
 - Alkaline,
 - Gell cells,
 - Lead acid,
 - Lithium ion,
 - Magnesium,
 - Mercury,
 - Ni-Cad,
 - Ni-MH,
 - Silver oxide, and
 - Zinc.

All batteries will be sorted by type and sent to an authorized battery recycling facility.



Mercury Containing Lamps

Mercury Containing Lamps (MCLs) will be processed on-site and separated into the following materials:

- Glass,
- Metal end caps / metal components, and
- Mercury-containing phosphor powder.

The separated glass and metal materials will be cleaned by the processing equipment — specifically, removing mercury containing phosphor powder to levels well below the hazardous waste limit for mercury of 0.2 mg/L (please refer to analytical test results for processed glass and metals provided in **Appendix C**). Therefore best efforts will be made to recycle these materials. The mercury-containing phosphor powder will be containerized in 55-gallon steel drums, and transported offsite by a licensed hazardous waste hauler to a permitted mercury reclamation facility for processing and recovery of the mercury content of these materials.

Mercury Containing Devices

Mercury Containing Devices (MCDs) will be received for transfer only to an authorized mercury reclamation facility. Specifically, upon receipt the MCDs will be containerized in 55-gallon poly-drums, and later transferred offsite to a permitted / authorized mercury reclamation facility.

PCB and Non-PCB Ballasts

PCB Ballasts will be containerized in 55-gallon poly-drums, and transported offsite by a licensed hazardous waste hauler to a permitted facility authorized to receive / process PCB Ballasts.

Batteries

Upon receipt, batteries will be sorted by type, containerized in 55-gallon poly-drums, and later transferred offsite to a permitted / authorized battery processing / recycling facility.

3.2 Facility Hours of Operation

The Facility will operate Monday through Friday between the hours of 7:30 AM and 6:00 PM. Lamp processing will be conducted six (6) hours each day during the authorized operating hours.

3.3 Facility Access and Site Security

Facility access and site security will comply with the requirements of Title 40 CFR § 264, Subpart C and Title 40 CFR § 270. A description of procedures and site controls for limiting access, prohibiting unauthorized access, and for overall security is provided in the following paragraphs.



Security Procedures and Equipment

Facility security will be maintained through employee presence at the property during working shifts and by locking or otherwise securing all overhead and personnel access doors or other means of access when the Facility is not in operation. Ample exterior lighting will be provided to allow visual observation of the Facility building and premises. All gates, vehicular and personnel, shall be closed when not in use and locked during non-duty hours. The Facility is located within the patrol and response areas of the City of Ocala Police Department.

24-Hour Surveillance System

The Facility will only be accessible to employees, or authorized persons accompanied by Facility personnel. Facility access will not be available when the plant is not in operation or unattended by authorized Facility personnel. The Facility will be locked when not in operation. The Facility has an intrusion alarm system that will be monitored during non-duty hours.

Barriers and Controlled Entry

The active portion of the Facility, the container staging area and processing equipment room, are all located interior to the building structure. The Facility building itself serves as a barrier to unauthorized access during both operating and non-operating periods.

Entry to the Facility will be controlled by personnel in the Administrative Offices at the south end of the building / Facility. All visitors will be required to report at the Administrative Offices and if granted access to the main areas of the building they will be accompanied/ escorted by authorized Facility staff. Employees will be trained to report any unauthorized access / person(s) and to escort the unauthorized person(s) to the Administrative Offices where they will be escorted offsite.

All visitors, drivers, and contractors entering the Facility will be instructed to first report to the Administrative Offices where they will sign-in on a Facility log sheet, and will then be escorted by Facility personnel. Drivers making deliveries or pick-ups will be accompanied by the Facility receiving / shipping personnel. All Facility and vehicular gates and doors will be locked during non-working hours.

Signs, legible from a distance of 25-feet, will be posted on the interior of the building at the approach to the container staging area located along the west wall of the building. A sign will also be located on the outside of the building at the personnel door to the permitted area from the outside. These signs will bear the following words: "Notice - Unauthorized Personnel Are Not Permitted Inside Plant" and "Notice – All Visitors Must Register At Office." The signs will be in English and Spanish as they are the predominant languages of the area.

3.4 Facility Personnel Requirements and Training

Required training and responsibilities of Facility personnel will vary depending on the assigned tasks associated with each position. Prior to commencing work, each new employee will be trained in proper operational procedures, hazardous materials identification, personal protective equipment, and safety procedures in order to increase employee awareness of potential hazards associated with operations and to safeguard their well-being. Worker protection and safety will be ensured through complying with standards



and guidelines of the federal Occupational Safety and Health Administration (OSHA) worker safety regulations and with 62-737.800(4)(e)(1) F.A.C. Personnel will be trained to be proficient in the following areas necessary for operation of the Facility:

- Safety Procedures,
- Proper Use of Personal Protective Equipment (PPE),
- Load Checking, Screening, and Rejection Requirements,
- Operating Procedures,
- Fire Control,
- First Aid,
- Emergency Procedures,
- General Housekeeping Procedures,
- Equipment Operation and Maintenance,
- Material Loading and Unloading Procedures, and
- Site Security Procedures.

Personnel Training

All Facility personnel will be trained in accordance with Title 40 CFR § 265.16. Specifically, prior to commencing work at the Facility, all personnel must successfully complete a program of both classroom instruction and on-the-job training that teaches them to perform their duties in a manner to comply with the requirements of Title 40 CFR § 265.16, and in such a way that:

- Ensures the safe operation of the processing equipment,
- Ensures the Facility's compliance with its emergency response procedures, and
- Ensures the Facility's inspection methods are appropriate to identify and prevent releases to the environment.

Facility personnel must also be informed of the following:

- Their possible exposure to hazardous substances in their work environment, and
- The contents of the Facility's health and safety plan.

The owner / operator will ensure that the training program includes all the elements required under Title 40 CFR § 265.16.

The training program will be directed by a person trained in hazardous waste management procedures, and will include instruction which teaches Facility personnel hazardous waste management procedures (including emergency response and contingency plans implementation) relevant to the positions in which they are employed. Further, the training program will be designed to ensure Facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems, including where applicable:

- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;
- Key parameters for automatic material feed cut-off systems;
- Communications systems;
- Response to fires and/or explosions;



- Response to spill / release incidents; and
- Shutdown of operations.

Personnel training on the Facility's emergency response plan will include the following elements:

- Pre-emergency planning and coordination with outside parties,
- Personnel roles, lines of authority, training, and communication,
- Emergency recognition and prevention,
- Safe distances and places of refuge,
- Site security and control,
- Evacuation routes and procedures,
- Decontamination procedures,
- Emergency medical treatment and first aid,
- Emergency alerting and response procedures,
- Critique of response and follow-up, and
- PPE and emergency equipment.

All Facility staff will receive the appropriate level of OSHA HAZWOPER training in accordance with OSHA regulations Title 29 CFR § 1910.120(p)(8) and § 1910.120(q).

Facility personnel will be required to successfully complete the training program within six months after the date of their employment or assignment to the Facility, or to a newly assigned position at the Facility. Employees receiving training will be required to work in supervised positions until they have successfully completed the training requirements. Further, Facility personnel will be required to take part in continuing training including annual refreshers / review of their initial training.

The Facility owner / operator will maintain records of all personnel and training at the Facility. These records will include:

- The job title for each Facility position, and the name of the employee filling each position;
- A written job description for each position including the requisite skill, education, or other qualifications, and duties assigned to each position;
- A written description of the type and amount of both introductory and continuing training that will be given to each person filling a position;
- Records that document that the training or job experience has been given to, and successfully completed by facility personnel; and
- Training records on current personnel will be kept until closure of the Facility. Training records on former employees will be kept for at least three years from the date the employee last worked at the Facility. Personnel training records may accompany personnel transferred within the same company.

A summary of the personnel training is provided on the following page in **Table 3-1** (and also **Table 5-1**).



Table 3-1
Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL
Initial New Employee Training

Position Title (#)	Required Training
Part I – New Employee Orientation:	
ALL Staff	<ul style="list-style-type: none"> ▪ Corporate safety policies and procedures ▪ Site control and works zones ▪ Hazardous chemical and waste management ▪ Pre-placement physical requirements ▪ Work group indoctrination ▪ Plant tour: process and safety equipment ▪ OSHA hazard communication standard ▪ Production tasks orientation ▪ Environmental and waste control ▪ Work group rotation ▪ Laboratory tasks orientation ▪ Security tasks orientation ▪ Maintenance tasks orientation ▪ Transportation tasks orientation ▪ Material handling tasks orientation
Part II – Title Specific Training:	
Facility Manager (1)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced RCRA Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Operations Manager (1)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced RCRA Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Shift Supervisor (1)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Shipping Supervisor (1)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Customer Service and Transport Manager (1)	<ul style="list-style-type: none"> ▪ 24-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Driver -CDL Class "A" (4)	<ul style="list-style-type: none"> ▪ 24-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
MCL / Lamp Processing Operators (2)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Note: all personnel will receive training on the appropriate use and types of personal protective equipment to be used at the Facility. Further, all personnel will be fit tested for respirator equipment.	



Subsequent to receiving training, the new employees will be closely supervised during the first few months of working in the Facility (by experienced and senior employees) to ensure they understand all proper procedures and protocol.

A detailed worker health and safety plan has been prepared and is presented in **Section 5** of this Report (*Worker Health and Safety Plan*). A summary of the Facility staff positions, job descriptions / responsibilities, reporting supervisors, and position requirements is presented below in **Table 3-2**.

Table 3-2 Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL Facility Staffing Summary			
Position Title (#)	Job Description / Responsibilities	Supervisor	Requirements
Facility Manager (1)	Responsible for maintaining Facility operations in accordance with the Operating Plan. Supervises overall Facility operations including worker health and safety, regulatory compliance, environmental controls, and personnel training.	Reports to Company President	College degree or equivalent work experience
Operations Manager (1)	Responsible for operational compliance with all applicable regulations / requirements, Facility maintenance, schedules, and general recordkeeping.	Reports to Facility Manager	College degree or equivalent work experience
Shift Supervisor (1)	Oversees receiving and shipping, production, equipment maintenance, housekeeping, plant safety and employee training.	Reports to Operations Manager	Min. H.S. degree and 1-year process experience at Lighting Resources Facility
Shipping Supervisor (1)	Directly supervises all unloading and inventory of incoming materials and loading of all outbound material.	Reports to Shift Supervisor / Operations Manager	Min. H.S. diploma and 6-months process experience at Lighting Resources Facility
Customer Service and Transport Manager (1)	Directly supervises all assigned facility drivers and is responsible for customer pickup / delivery services; driver USDOT compliance and training; truck / trailer maintenance / permitting; and scheduling of incoming / outgoing freight.	Reports directly to Facility Manager	Min. 2-years college or equivalent work experience and a min. 5 years of supervisory experience in related service industry
Driver -CDL Class "A" (4)	Performs over the road transportation; loading/unloading of materials using various equipment (e.g., forklift, dolly, etc.); maintains vehicle and vehicle safety checks; prepares bills of lading, manifests, logbook, trip reports; and sealing/ repacking of containers for material transport to meet DOT regulations.	Reports to Customer Service and Transport Manager	Min. H.S. diploma or equivalent and min. 2-year successful, accident/incident-free commercial driving experience
Mercury Recovery Process Operator (2)	Performs production component separation of MCLs using the Balcan MP8000 equipment; performs maintenance on process equipment; unloads materials from trucks and containers as they arrive, sorts / stages materials according to category and size; and seals and replaces containers for transport.	Reports to Operations Manager / Shift Supervisor	Possesses manual dexterity, properly uses PPE, and ability to work with minimum supervision.



3.5 Site Layout and Facility Building

A detailed description of the Site and Facility building layout has been provided in the previous sections (**Sections 2.5, 2.6, and 2.7**). Plan drawings presenting the site plat of survey, site plan, and building layout are presented on **Drawing Nos. D1 through D3**, respectively, contained in tabbed section “**Drawings**.”

3.6 Site Traffic Flow

All site traffic will enter the site at the Facility entrance located off of SW 16th Lane. Material handling trucks/vehicles (loaded and empty) will be directed to proceed to the material receiving/loading docks located on the east side of the Facility building where they will either be inspected and unloaded, or will be loaded out with materials for transfer offsite. A site traffic flow diagram is presented on **Drawing No. D5** (contained in the tabbed section “**Drawings**”).

3.7 Material Flow

All incoming materials will be received at the dock area in Area A. Lamps will be moved to the lamp staging/storage area within Area A for later processing. Batteries will be staged along the north wall of Area A for sorting and later transfer offsite. Ballasts will be staged along the north wall of Area A (immediately adjacent to battery staging area) for later transfer offsite. Lamps will be moved from the lamp staging / storage area into the Area B – Lamp Processing Room for processing, and sorting / segregation into dedicated containers for glass, metals, and phosphor powder. The processed glass containers are moved into Area C for staging and later transfer offsite. The processed metal containers are moved into a dedicated trailer parked outside the Facility building (in northwest corner of site) for later transfer offsite. The phosphor powder containers are staged along the south wall of Area B for later transfer offsite.

All outbound phosphor powder containers, battery containers, and ballast containers are loaded out through dock area in Area A. The outbound processed glass containers will be loaded out either through the canopied loadout area located in Area A or through the south overhead door in Area C. The outbound processed metal containers will be loaded out through the canopied loadout area located in Area A.

A mater flow diagram is presented on **Drawing No. D6** (contained in the tabbed section “**Drawings**”).

3.8 Waste Acceptance Procedures

All incoming materials (i.e., lamps and universal wastes) will be inspected to verify that it is acceptable in content and origin, prior to acceptance to ensure compliance with Lighting Resources’ acceptable and permitted waste receiving policies and requirements. Accurate and up to date records will be maintained for all materials accepted, processed, and transferred.



Acceptable Waste

The Lighting Resources Facility will only accept the following wastes *for processing*:

- Intact mercury containing lamps, and
- Broken or crushed mercury containing lamps.

The Facility will also accept the following universal and non-regulated wastes for transfer to an approved and permitted facility for either processing, treatment, recycling or disposal:

- Batteries,
- Mercury containing devices (MCDs),
- Non-PCB lighting ballasts, and
- Lighting ballasts suspected to contain PCBs.

Occasionally, Lighting Resources may receive electronic waste items and items containing leaded glass. Any electronic waste items received will be separated and transferred to an approved facility authorized to process such wastes. Any leaded glass items received will be processed separately from the non-leaded glass wastes. Leaded glass will be accumulated in U.S. DOT rated 55-gallon drums and shipped to an approved facility for processing.

Prohibited Waste

The Lighting Resources Facility is prohibited from processing any hazardous waste other than crushed or broken mercury containing lamps. Further, the Facility is prohibited from accepting any of following wastes or materials:

- Radioactive Wastes,
- Liquid Wastes,
- Biological and Medical Wastes,
- Municipal Solid Wastes,
- Flammable Wastes,
- Explosive Wastes,
- Pyrophoric Wastes,
- Ignitable Waste,
- Reactive Waste,
- Acute Hazardous Waste,
- Toxic Waste, and
- Free Liquids or Leaking Containers.

Any attempt to deliver any of the above materials will be rejected by Lighting Resources. Waste rejection and load checking procedures are discussed further in **Section 3.9** and **Section 3.13**, respectively.

Material Receiving and Acceptance Procedures

Upon arrival of a shipment at the Lighting Resources Facility, the following sequence of events occurs:

- The driver presents the paperwork for the load to the shipping and receiving personnel who is trained to receive material into the Facility.
- Facility personnel will compare shipping documents and material description against



the material profiles of the material to be received.

- If the shipping documents conform to the material profile, the truck will be unloaded by personnel qualified to operate a forklift and staged in the receiving / loading dock area (inside the Facility) for inspection.
- The containers will be visually inspected to verify that the shipment contains only the waste material as described in the material profile and shipping document.
- Upon verification, the shipping documents will be signed acknowledging receipt of the material at the Facility and copies of the shipping document / waste manifest will then be forwarded to the generator (and customer if they are not the same) within 30 days.
- Should Lighting Resources deny acceptance of the delivery, the shipment will be returned to the generator or shipped to an alternate facility selected by the generator.
- Upon off-loading, each container will be logged into the waste tracking system and placed into an appropriate staging / storage area.
- A Lighting Resources receiving record will be executed to record all pertinent information.

A comprehensive load checking program will be implemented to ensure that no unauthorized wastes are accepted at the Facility. The load checking program is presented in a subsequent part of this section.

3.9 Waste Rejection Procedures

Wastes will be rejected at the Lighting Resources Facility for the following reasons:

- The waste does not conform to the material profile documentation and the waste contains materials that the Facility is not permitted to accept.
- The shipment contains other wastes that cannot be accepted by Lighting Resources.
- An unscheduled shipment is received that would cause Lighting Resources to exceed the permitted storage limit.

Upon discovery of the material that cannot be accepted at the Facility, the generator will be contacted and notified that material is unacceptable therefore rejected by Lighting Resources. The Facility will request direction from the generator as to whether the material is to be forwarded to an alternate facility that is authorized and permitted to receive such materials, or it is to be returned to the generator. Based on the instructions from the generator, the procedures listed below will be used to document the rejected shipment.

- Any material that is to be rejected will be marked with a label noting the material as non-conforming, and will remain in the delivery vehicle, or if unloaded will be immediately reloaded into the delivery vehicle for offsite shipment either to the generator or to an alternate facility that is authorized and permitted to receive such materials.
- In the unlikely event, a non-conforming material is discovered after the material has been accepted by the Facility, the generator will be immediately notified that the material is rejected, and arrangements will be made for the generator to send a vehicle for pickup and delivery of materials to the generator, or to an alternate facility that is authorized and permitted to receive such materials. If arrangements cannot be made, Lighting Resources will arrange for the proper transport of the rejected



materials to an authorized and permitted facility.

All rejected loads will be issued a load reject form with a new bill of lading or hazardous waste manifest form for use in shipping the material back to the generator or to an alternate approved facility (please refer to **Appendix D** for copies of forms). Any loads rejected will be recorded onto the Load Reject Log form (refer to Appendix D). All forms and logs shall be maintained at the Facility available for DEP inspection.

All reject load forms and logs will be maintained at the Facility and shall be made available for inspection. All Facility forms including reject load forms and reject load logs will be maintained at the Facility for a minimum period of three years.

3.10 Lamp and Universal Waste Handling and Containerization

All incoming materials will be inspected prior to acceptance to ensure **compliance** with Lighting Resources' acceptable and permitted waste receiving policies and requirements. All materials will be inventoried by either physical count for intact fluorescent and other kinds of intact lamps, or by weight for crushed or broken lamps, ballast, batteries, and mercury containing devices. Lamps will be staged in the designated location within Area A until they can be processed. Lamps will be processed onsite using the Balcan MP8000 lamp processing equipment (in the Area B – Lamp Processing Room) for component separation (i.e., glass, metals, and phosphor powder). All other materials received (e.g., ballasts, batteries, mercury containing devices) will be segregated by type and containerized in a dedicated part of Area A for later shipment offsite to an authorized facility for further processing, recycling, treatment, or disposal. A Material Flow diagram is presented on **Drawing No. D6**.

Containerization

All lamp materials will be containerized and staged in the designated location within Area A for later processing. Intact lamps will be containerized in lamp boxes and staged on wooden or composite plastic pallets. Crushed lamps will be containerized in 55-gallon drums and staged on wooden or composite plastic pallets. Containers may be of varying dimensions and may contain lamps of different types, quantities, and dimensions. Each pallet will hold containers stacked no higher than seven (7) feet, and the containers will be secured with shrink-wrap, bands, or other binding. If the pallet securing method impedes view of the marking/labeling of the containers, such labels/markings will be provided on the exterior of the pallet packaging. Refer to **Drawing No. D3** for the locations of the lamp staging areas.

Approved Container Types. U.S. DOT approved containers for shipping of lamps will be used for the staging / storage of the MCLs. Intact lamps will be stored in containers that are:

- Structurally sound,
- Adequate to prevent breakage, and
- Compatible with the contents of the lamps.

Crushed lamps will be stored in 55-gallon drums, or other containers that meet U.S. DOT specifications for such wastes. Lamp containers may be used, new, or reconditioned so long as they are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps. A large variety of acceptable container types are available that meet these specifications and selection is often driven by the size, shape, and quantity of the lamps being shipped. Intact MCLs may be shipped in containers approved for the transport



of the lamps as products. Crushed or broken MCLs will be shipped in U.S. DOT containers approved and authorized for shipment of hazardous waste.

Container Markings / Labels. All containers will be marked with the Lighting Resources tracking label. The tracking label will indicate the type of waste (e.g., “Universal Waste Lamps”), the date, and also contain an identification number that correlates to the Facility waste tracking log. The tracking log will contain generator information as well as the quantity of waste and also the date on which the waste was received. Containers used for phosphor powder will be marked with a “Hazardous Waste” label as required by Title 40 CFR § 262.32(b) as an Environmentally Hazardous Solid (Mercury, D009). The phosphor powder is an on-site generated by-product of the lamp processing operation. The Lighting Resources Facility will not accept phosphor powder from other sources.

Container Handling Practices. Containers will be moved by forklift from the receiving area to the staging or process areas. The container staging area in Area A is located along the west wall inside the building, on a sealed concrete floor slab. Containers of universal wastes will remain closed during staging except when adding or removing wastes, or conducting inventory, inspection, or sampling. The container staging area will be routinely inspected to ensure that the containers remain in good condition, sealed, and without any evidence of leakage, spillage, damage, or any other conditions that could cause or allow leakage or releases of mercury or other hazardous constituents to the environment under reasonably foreseeable conditions.

3.11 Final Destination of Materials

All universal wastes and processed / sorted lamp materials will be transported offsite for further processing (i.e., reclamation, recycling, or treatment) or disposal. Facilities that these materials will be sent to will be appropriately registered, licensed, or permitted by the states of residence. Documentation of transport to these facilities will be made and maintained at the Lighting Resources Facility for a minimum period of three years. Further, documentation shall be obtained from all destination facilities that clearly state the final disposition of all materials recovered, recycled, destroyed, and/or disposed of. Such documentation shall be maintained at the Lighting Resources Facility for a minimum period of three years.

The final destination facilities to be used by the Lighting Resources Facility for the processed lamp and transferred universal waste materials is described below.

- Processed Lamp Glass (cullet): will be transported offsite to a glass recycling facility or other potential user(s) as the market will bear. In the event that there are no available glass markets, the material will be transported to an authorized landfill for disposal (most likely Baseline Landfill in Marion County, Florida). Lamp glass (glass cullet) will be analytically tested by an approved laboratory for compliance with Chapter 62-737.840, F.A.C. prior to release from the Facility for recycling / reuse. Only lamp glass material (cullet) passing the TCLP for mercury (i.e., below the USEPA toxicity of 0.2 mg/l) will be recycled. Processed lamp glass materials will be shipped out as often needed. Weekly analytical testing will be done on a composite of the daily samples of processed lamp glass (cullet) collected the prior week. *(Note, in the unlikely event that the processed lamp glass materials do not pass the TCLP for mercury, the glass will be shipped to an authorized and permitted mercury reclamation facility).*
- Processed Lamp Metals: will be transported offsite to TOTALL Metal Recycling located in Granite City, Illinois for recycling of the metals (or to another approved



metal recycling facility). Lamp metal components will be analytically tested by an approved laboratory for compliance with Chapter 62-737.840 F.A.C. prior to release from the Facility for recycling / reuse. Only lamp metal materials passing the TCLP for mercury (i.e., below the USEPA toxicity of 0.2 mg/l) will be recycled. Processed lamp metal materials will be shipped out as often needed. Weekly analytical testing will be done on a composite of the daily samples of processed lamp metals collected the prior week. *(Note, in the unlikely event that the processed lamp metal materials do not pass the TCLP for mercury, the metals will be shipped to an authorized and permitted mercury reclamation facility).*

- Mercury Containing Phosphor Powder: will be transported offsite for recovery of the mercury to the Lighting Resources' Mercury Reclamation Facility located in Greenwood, Indiana, or alternatively to the Veolia Environmental Services' Mercury Reclamation Facility located in Tallahassee, Florida. Documentation will be obtained from the mercury reclamation facility documenting that 99% of the mercury was recovered. Such documentation shall be retained on-site for a minimum of three years.
- Mercury-Containing Devices (MCDs): will be transported offsite for recovery of the mercury to the Lighting Resources' Mercury Reclamation Facility located in Greenwood, Indiana, or alternatively to the Veolia Environmental Services' Mercury Reclamation Facility located in Tallahassee, Florida. Documentation will be obtained from the mercury reclamation facility documenting that 99% of the mercury was recovered. Such documentation shall be retained on-site for a minimum of three years.
- Batteries: will be transported offsite for reclamation of metals to TOTALL Metal Recycling located in Granite City, Illinois, or alternatively to either Battery Solutions, Inc. located in Howell, Michigan, or to Metal Conversion Technologies, LLC located in Cartersville, Georgia.
- Non-PCB Light Ballasts: will be transported offsite to TOTALL Metal Recycling located in Granite City, Illinois for recycling of metals (or to another approved metal recycling facility).
- PCB Light Ballasts: will be transported offsite to the Lighting Resources' Facility located in Phoenix, Arizona, or alternatively to Wisconsin Ballast located in Muskego, Wisconsin for decommissioning / destruction of the PCBs and reclamation of metals.
- Other Non-RCRA Regulated Recyclable Materials: will be transported to facilities approved for recycling of those specific commodities (e.g., cardboard, scrap metals, electronic wastes, etc.).

3.12 Processing Throughput and Staging/Storage Volumes

The Lighting Resources Facility will process up to a **maximum of 30,000 MCLs per day**. This maximum limit is based on the maximum hourly throughput of the lamp processing equipment (described in the following section) and the anticipated daily hours of processing (i.e., up to six hours each day). The quantities of materials that the Facility will accept for processing or staging for transfer, will be limited by the amount of dedicated staging / storage space that will be available on any given day. A summary of the staging / storage space that has been dedicated for the different materials that the Facility will receive is presented on **Table 3-3** (on following page). Recordkeeping forms will be maintained electronically (e.g., in MS[®] Excel spreadsheets) up to date at the Facility, specifically documenting the material processing throughputs and staging/storage volumes (refer to



Appendix D for copies of these forms).

Time Limitations for Staging/Storing On-Site

Lighting Resources will document and monitor the time that all materials (unprocessed and processed) are retained on-site to ensure strict compliance with all applicable local, state, and federal requirements. With the exception of PCB ballasts, all other materials (MCLs, MCDs, batteries, non-PCB ballasts, phosphor powder, and processed glass and metals) will be transferred offsite within 10-days of receipt. PCB ballasts will be transported offsite within 24-hours of receipt. The applicable state and federal retention time restrictions are listed below:

Regulatory Required Retention Times:

- Intact MCLs: < 1-year
- Crushed MCLs: < 1-year
- MCDs: < 1-year
- Batteries: < 1-year
- Non-PCB Ballasts: < 1-year
- PCB Ballasts: < 1-year
- Phosphor Powder: < 90-days

Table 3-3
Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL
Materials Handling, Storage/Staging Summary

Description	Handling Description	Maximum Quantities Staged / Stored
Intact Mercury Containing Lamps (MCLs)	<p>Stage then process using lamp processing equipment. Sort processed materials into various components, and containerize for transport offsite in 55-gallon fiber drums (or 1-cubic yard tri-ply cardboard box) for reclamation (i.e., mercury containing phosphor powder), recycling (i.e., clean glass and clean metals), or disposal (i.e., clean glass).</p> <p>The total lamp processing and storage volume is conservatively reflected in terms of the four (4)-foot T-12 lamps for the following reasons: 1) the size of these lamps are generally larger than other type lamps including CFLs, and U-Tubes; 2) it simplified the effort to calculate lamp storage and closure costs; and 3) the Facility has not begun operating and therefore a realistic estimate of the breakdown of lamps cannot be made at this time. A total number of 75,000 lamps was conservatively used in the closure cost estimate (Table 7-3), even though the maximum storage volume of 69,552 lamps was calculated. Each lamp box is 12" x 12" x 48", holds 69 lamps, and weighs approx. 44.6-lbs. The total weight stored is equal to 45,000-lbs: (1,008-boxes x 44.6-lbs).</p>	<p>Rows 1-9: 69,552 lamps contained in 1,008 lamp boxes (45,000-lbs)</p>
Crushed or Broken Mercury Containing Lamps (MCLs)	<p>Stage then process using lamp processing equipment. Sort processed materials into various components, and containerize for transport offsite in 55-gallon fiber drums (or 1-cubic yard tri-ply cardboard box) to a permitted mercury reclamation facility (i.e., mercury containing phosphor powder), recycling (i.e., clean glass and clean metals), or disposal (i.e., clean glass). Each 55-gallon drum of crushed/broken MCLs is assumed to weigh 500-lbs.</p>	<p>Row 10: Twenty-eight (28) - 55-gal. drums (14,000-lbs)</p>



Table 3-3 Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL Materials Handling, Storage/Staging Summary		
Description	Handling Description	Maximum Quantities Staged / Stored
Mercury Containing Devices (MCDs)	Reload / containerize in 55-gallon poly-drums for transport offsite to a permitted mercury reclamation facility. Each 55-gallon drum of MCDs is assumed to weigh 750-lbs.	Two (2) - 55-gal. drums (1,500 lbs)
Large Type Batteries	Sort by type, containerize in 55-gallon poly-drums, and transport offsite to a battery recycling facility. Each 55-gallon drum of large type batteries is assumed to weigh 750-lbs.	One (1) - 55-gal. drum (750 lbs)
Small Type Batteries	Sort by type, containerize in 55-gallon poly-drums, and transported offsite to a battery recycling facility. Each 55-gallon drum of small type batteries is assumed to weigh 750-lbs.	Twelve (12) - 55-gal. drums (9,000 lbs)
PCB Lamp Ballasts	Containerize in 55-gallon steel drums, and transported offsite to a ballast recycling facility where the PCBs will either be destroyed by incineration or sent for disposal in a permitted RCRA Subtitle C – landfill. Each 55-gallon drum of PCB Lamp Ballasts is assumed to weigh 750-lbs.	Ten (10) - 55-gal. drums (7,500 lbs)
Non-PCB Lamp Ballasts	Containerize in 55-gallon steel drums, and transport offsite to a metal recycler. Each 55-gallon drum of Non-PCB Lamp Ballasts is assumed to weigh 750-lbs.	Ten (10) - 55-gal. drums (~7,500 lbs)
Processed "Clean" Glass (cullet)	Containerize in, 1-cubic yard (CY) tri-ply box or gaylord box type container to be later transported offsite for recycling or landfilled. Each 1-CY box is assumed to weigh 1,800-lbs.	Twenty (20) – 1 CY boxes (36,000 lbs)
Processed "Clean" Metals	Containerize in 55-gallon fiber drums, 1-cubic yard tri-ply box, or into a dedicated 20-cubic yard rolloff container to be later transported offsite for recycling. Each 55-gallon drum of processed "clean" metal materials is assumed to weigh 750-lbs.	Sixty (60) - 55-gal. drums (45,000 lbs)
Phosphor Powder	Containerize in 55-gallon steel drums for transport offsite to a permitted mercury reclamation facility. Each 55-gallon drum of phosphor powder is assumed to weigh 750-lbs.	Fifteen (15) - 55-gal.drums (11,250lbs)

Lithium primary batteries will not be transported or stored by Lighting Resources Florida branch. Transportation will be arranged by the battery recycler for transporting from the customer site to the battery recycler. All lithium-ion and lead acid batteries of any voltage along with any other battery chemistry over 9 volts, will have each terminal taped or the battery will be individually bagged. These batteries will be stored in lined 55-gallon drums and placed on a spill control pallet to prevent any accidental water reaching the drum base. The nearest fire extinguisher will be located 20 feet from these drums. When these drums reach volume capacity (750 pounds or less), the drum will be placed on the trailer provided by the battery recycler (parked trailer located in northeast corner of Site).

- Care shall be taken to ensure batteries are not exposed to a flammable environment.
- Batteries shall be stored in an area that is setback from traffic and other activities to ensure batteries are not disturbed; specifically they will be stored along the North wall of Area A.
- The battery storage area shall be secured, cool, well ventilated, and a dry environment.



- Battery storage temperatures shall be kept below 25°C and away from direct sunlight.
- Batteries shall be kept in original shipping containers if possible.
- The battery storage area shall be clearly identified as the Battery Storage Area; and within the battery storage area labeling shall be placed on the sorted battery types (e.g., lithium, etc.). The storage area shall have access to a Class D fire extinguisher.

3.13 Load Checking Program

A load checking (screening) program will be utilized throughout the operating life of the Facility in order to detect and eliminate any attempts to deliver unauthorized wastes to the Facility. The load checking program will consist of the following components:

- Employee training on load checking procedures,
- Formal and informal checkpoints locations,
- Load checking inspections,
- Procedures for handling unauthorized wastes, and
- Recordkeeping.

The following paragraphs provide a discussion of the five load checking components.

Employee Training on Load Checking Procedures

All Facility personnel involved in material receiving, handling, and processing will be trained on load checking procedures and how to recognize unauthorized wastes. Employee training on identification of unauthorized wastes will include familiarity with typical containers, markings, labels and placards that might aid in recognizing unauthorized wastes. Periodic personnel meetings will be held to ensure that all staff members involved with the load checking program remain aware of waste acceptance criteria.

Formal and Informal Checkpoints Locations

Formal load checking inspections will be performed and documented by employees responsible for receiving loads at the receiving dock area. Informal load checking will be the responsibility of all employees involved in material handling and processing activities. Employees conducting activities near the Facility entrance will monitor vehicles entering the Facility, watching for any potentially unauthorized waste type vehicle (e.g., placard, transporter name, etc.), and will alert management personnel if any unauthorized wastes are suspected.

Load Checking Inspections

Formal load checking inspections will be conducted on all waste loads delivered to the Facility. Load checking inspections will be performed by personnel receiving loads at the receiving / loading docks area. Assuming no unauthorized waste materials are found during the inspection, the driver will be allowed to leave and the inspected waste material will be promptly moved to the appropriate area of the Facility. Recordkeeping will be prepared and maintained on site for a minimum of three years for all loads received and accepted. Any unauthorized loads will be rejected and the driver will be instructed to either return the material to the generator or to an alternate facility that is authorized and permitted to receive such materials. A load rejection form will be completed and maintained on site for a minimum of three years.



Handling of Unauthorized Wastes

If unauthorized wastes are discovered during load checking activities, the Facility Manager and Operations Manager will be promptly notified of the person and company responsible for shipping the waste, and the waste generator. The material will remain on the delivery vehicle (or if material is unloaded, it will be reloaded onto the delivery vehicle), the generator will be immediately notified that the material is rejected, and the material will be returned to the generator, or to an alternate facility that is authorized and permitted to receive such materials.

In the unlikely event, the non-conforming (unauthorized) material is discovered after the material has been accepted by the Facility, the generator will be immediately notified that the material is rejected, and arrangements will be made for the generator to send a vehicle for pickup and delivery of materials to the generator, or to an alternate facility that is authorized and permitted to receive such materials. If arrangements cannot be made, Lighting Resources will arrange for the proper transport of the rejected materials to an authorized and permitted facility. All rejected loads will be issued a load reject form with a new bill of lading or hazardous waste manifest form (whichever is appropriate) for use in shipping the material back to the generator or to an alternate approved facility (please refer to **Appendix D** for copies of forms). Any loads rejected will be recorded onto the Load Reject Log form (refer to Appendix D). All forms and logs shall be maintained at the Facility available for DEP inspection for a minimum period of three years.

Recordkeeping

All incidents and formal load checking inspections will be documented in writing by the inspector and retained by the Facility for a minimum of three years. At a minimum, the following information will be logged for each incident and formal inspection which takes place:

- Date and time of inspection,
- Name of the hauling firm,
- Name of the driver,
- Vehicle license plate number,
- Source of the waste as reported by the driver,
- Inspector observations, and
- Signatures of inspector and driver.

3.14 Material Receiving, Tracking, and Recordkeeping Procedures

All incoming loads and pick-ups will be subject to strict quality control (QC) procedures to ensure that each load meets the Lighting Resources, LLC waste acceptance policy and permit requirements. Prior to shipment or pick-up, customers will notify Lighting Resources operational staff as to the nature and volume of the shipment. Each load will then be issued a Receiving Service Order (RSO) that will follow the shipment through the recycling process. A bill of lading/manifest (see **Appendix D**) will be generated at the time that the discreetly numbered RSO is opened.

The transportation document prepared will either be a RCRA compliant Uniform Hazardous Waste Manifest or a Lighting Resources generated Bill of Lading/Non-Hazardous Waste Manifest depending upon the waste generator's preference and waste management practices. The RSO and bill of lading will be in the possession of the driver and provided to



the generator at the time of the load pick-up and acceptance. Universal waste bills of lading prepared by Lighting Resources will carry the same control number as the RSO. If the generator prefers to ship waste using the Uniform Hazardous Waste or Non-Hazardous Waste Manifest, Lighting Resources personnel will enter the RSO number in the Control Number block of the manifest. The manifest number will also be entered on the receiving ticket to ensure accountability of documentation and positive cross-reference capability. All materials will be inspected by Lighting Resources drivers at the point of origin for packaging, transport compatibility, and compliance with materials that can be accepted at the Facility. Materials and packaging compliance issues will be resolved prior to acceptance of the load by the driver and materials generator. All containers or pallets of containers will be labeled to ensure compliance with transportation regulations and generator/customer accountability. For materials shipped or delivered to the Lighting Resources Facility, all boxes and drums will be inspected for leakage, weighed, opened, and physically examined and counted. Any loads containing leaking containers will be rejected, a load rejection form will be completed, and the driver will be instructed to return the load to the generator for proper containment and transfer to a permitted facility authorized to receive such wastes.

Upon arrival of the materials at the Facility, the bills of lading/manifests will be signed by Facility receiving personnel acknowledging receipt of the materials. The weight/physical count inventory will be recorded on the receiving ticket and subsequently entered into a computer database. The database is designed to record all pertinent information about the shipment and to provide "cradle to grave" accountability of all materials both received and transported offsite for additional processing, treatment, recycling or disposal. The following information will be retained within the Lighting Resources' database:

- Receiving Service Order (RSO),
- Date of receipt of materials,
- Date of processing of materials,
- Customer name,
- Generator name,
- Customer EPA Site ID Number,
- Generator EPA ID Site Number,
- Bill of Lading/Manifest Number,
- Waste type and quantity,
- Date that hazardous residues (on site generated phosphor powder) are shipped off-site for retort mercury reclamation,
- Outbound Manifest Number,
- Transporter name,
- Name of receiving reclamation facility,
- EPA Site ID Number of receiving reclamation facility,
- Date of processing by receiving reclamation facility, and
- Certificate of Recycling/Destruction Number issued by the receiving reclamation facility.

All paper documents will be retained for a minimum period of three years. The original copy of the signed manifest will be returned to the generator along with the Certificate of Recycling issued by Lighting Resources. The Certificate of Recycling will bear the same number as the RSO and the bill of lading/manifest. Bills of lading will be attached to and filed with the original copy of the RSO. Uniform Hazardous Waste Manifests will be filed



separately from the receiving tickets. All documents will be filed in monthly subdivisions for easy access and inventory reference.

3.15 Facility Operating Records and Records Retention

All records related to universal and hazardous waste management activities at the Facility will be maintained for a minimum of three (3) years, and will be made available upon request for inspection by any officer, employee, or representative of the DEP or U.S. EPA.

Information entered and maintained in the Facility operating records will include:

- Waste Disposition,
- Description of each waste received,
- Quantity (by description) of each waste received,
- Method of its storage (and processing),
- Date of its staging entry,
- The location and quantity of each waste, cross-referenced to the specific bill of lading/hazardous waste manifest (if a manifested waste),
- Records, analyses and results of waste characterizations and waste acceptance forms,
- Contingency plan implementation reports,
- Inspection records; results, and corrective measures,
- Notices to generators of facility permits,
- Closure cost estimates and annual updates,
- Annual hazardous waste minimization certification,
- Any notices, certifications and demonstrations received from generators, pursuant to the land disposal restrictions of Title 40 CFR § 268, and
- Other monitoring, testing, analytical data or corrective action information or data.

3.16 Mercury-Containing Lamp Description

The only hazardous constituent at levels of concern in the materials that will be processed by Lighting Resources will be mercury (USEPA Hazardous Waste Code - D009). The source of the mercury will be a small droplet of elemental (liquid) mercury that is contained within the lamp interior. During the life of the lamp, the charged mercury atoms discharge ultraviolet (UV) light, which is absorbed by a phosphor coating on the inside of the cylindrical glass lamp. When energized, the phosphors emit the light seen. The mercury is instantly volatilized when the lamp is turned on and re-condenses when external power is removed.

A typical 4-foot fluorescent lamp (type T-12 lamp) weighs 290 grams or about 0.64 pounds. Of this total weight, approximately 96% consists of glass with the metal end caps and phosphor powder comprising approximately 2% each of the remaining total weight. The weight of the mercury in the T-12 lamps will range between approximately 20 and 30 milligrams.

Other lamp sizes or types received for processing may include 8-foot fluorescent lamps, U-bend lamps, circle lamps, plastic coated lamps, and HID (high intensity discharge) lamps. All fluorescent and most HID lamps, contain some quantity of elemental mercury. The mercury will, through use of the lamp, migrate into the phosphor powder coating on the



interior fluorescent glass tube wall, phosphor coating on some HID lamps, or remain as a component of the fill gas in HID lamps. The amount of mercury in other type lamps will depend on the lamp type/size and can vary from 5 milligrams to 75 milligrams.

3.17 Lamp Processing Equipment and Operation

The Lighting Resources Facility will use the Balcan MP8000 equipment to process lamps. The Balcan MP8000 equipment is a completely self-contained, negative pressure lamp processor that has been designed and installed to separate, clean, and collect components of all types of mercury containing and incandescent type lamps and bulbs. The Balcan MP8000 can process up to 5,000 four (4)-foot fluorescent T-12 type lamps per hour through the primary in-feed conveyor while simultaneously accepting, processing, and separating glass, metal components, and mercury containing phosphor powder through the secondary process unit from crushed lamps including:

- Fluorescent lamps,
- Compact fluorescent lamps (CFL),
- Incandescent lamps, and
- High intensity discharge (HID) lamps.

Photo Insets 8 and 9 below, illustrate the different types of lamps that will be processed and the metal components that will result from processing. The maximum annual processing capacity (annual throughput) of the Balcan MP8000 is reported by the manufacturer to be between eight (8) and ten (10) million lamps. A copy of the manufacturer specifications for the Balcan MP8000 is provided in **Appendix C**. The maximum annual throughput at the Lighting Resources Facility will be limited by the amount of dedicated storage / staging space at the Facility, and the daily processing time of six (6) hours. **The maximum annual throughput at the Facility will be ≤ 7.8 million lamps.**



Photo Inset No. 8: Array of lamps that can be processed by the Balcan MP8000

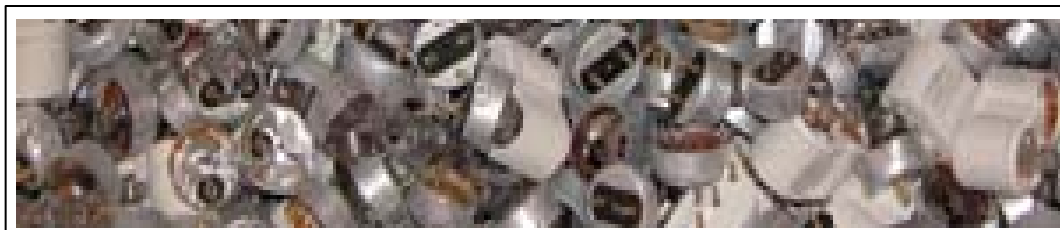
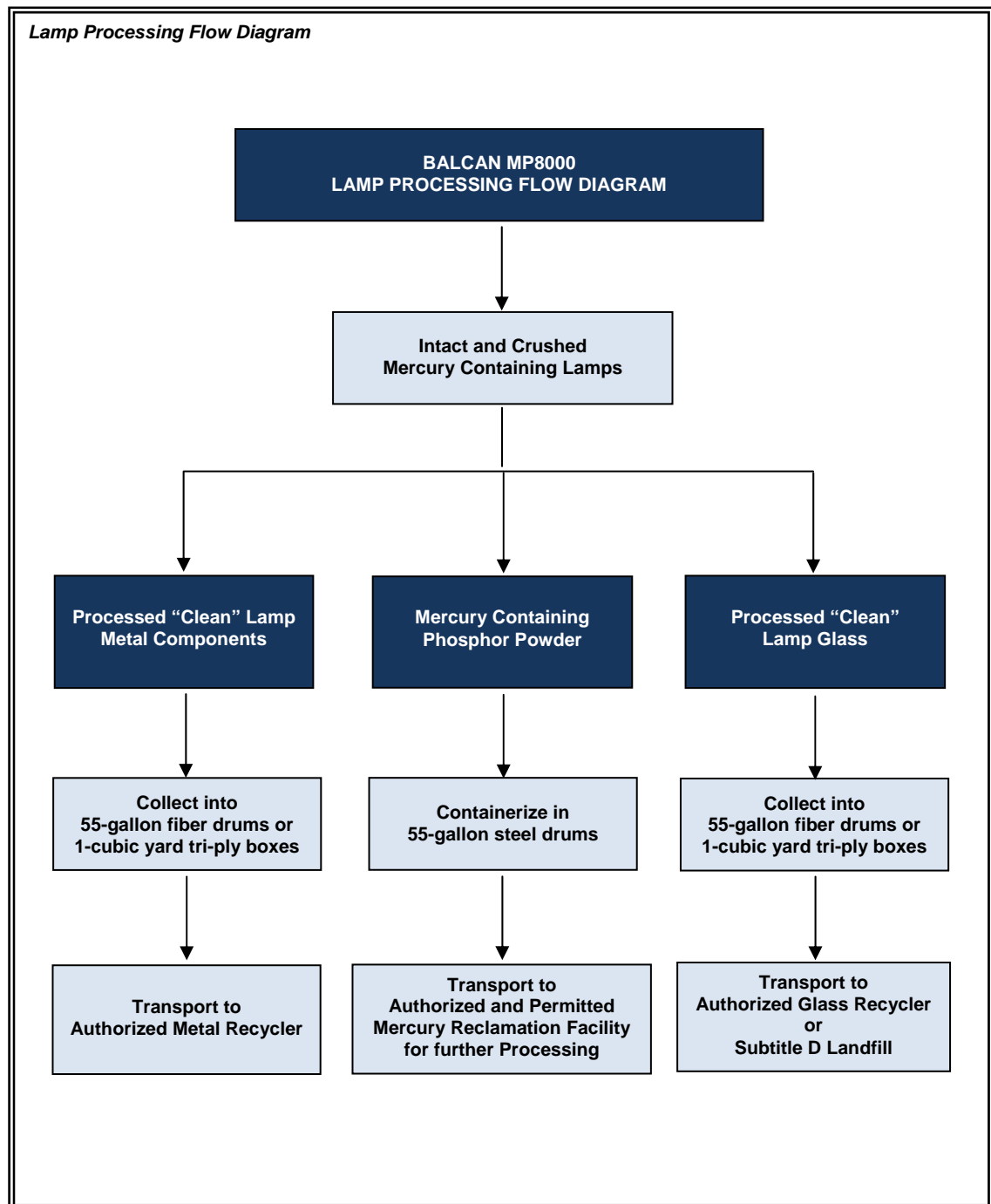


Photo Inset No. 9 Metal components resulting from lamp processing

Lamp Processing Flow Diagram

A process flow diagram of the Balcan lamp processing, material separation, and transport offsite is presented in the diagram below.



The total lamp processing and storage volume is conservatively reflected in terms of the four (4)-foot T-12 lamps for the following reasons: 1) the size of these lamps are generally larger than other type lamps including CFLs, and U-Tubes; 2) it simplified the effort to calculate lamp storage and closure costs; and 3) the Facility has not begun operating and therefore a realistic estimate of the breakdown of lamps cannot be made at this time. Once the Facility begins operations (i.e., subsequent to the Facility receiving a DEP Permit) for a period of several months, a realistic delineation of the different types of lamps will be made and submitted to DEP.

A total number of 75,000 lamps was conservatively used in the closure cost estimate (see **Table 7-3** in **Section 7** of this Report), even though the maximum storage volume of 69,552 lamps was calculated.

The MP8000 processing equipment consists of the following three processing sections/units, and air extraction filter units:

- Section 1 - Primary Process Unit: is where whole (intact) fluorescent tubes are loaded onto an infeed conveyor, conveyed to a crusher for separation, and conveyed to Section 3 for further processing.
- Section 2 – Secondary Process Unit: is where all other type lamps (i.e., non-linear) and crushed fluorescent tubes are loaded into a hydraulic lift chamber and conveyed to a multi-purpose rumbler for separation, and conveyed to Section 3 for further processing.
- Section 3 – Cleaning /Sorting Unit: is where materials from Section 1 and Section 2 units are conveyed for further processing; specifically, where the glass cullet and metal components are cleaned of phosphor powder and are sorted by material type (i.e., glass cullet sorted from metal components).
- Air Extraction Filter Units: the Balcan MP8000 has two (2) air extraction filter units to remove mercury bearing phosphor powder and mercury vapors from the contents of the processed lamps.

A plan view drawing of the MP8000 equipment, illustrating the different sections/units is presented on **Drawing No. D4** (contained in the tabbed section “**Drawings**”). **Photo Inset 9** below presents the layout of the different units. A detailed description for each of these sections/units is provided in the following paragraphs.



Photo Inset No. 9: Section 1 - Primary Process Unit in foreground; Section 2 -Secondary Process Unit to the right; and Section 3 - Cleaning/Sorting Unit at far backend.

Section 1 - Primary Process Unit

Intact fluorescent tube type lamps are fed into the Section 1 - Primary Process Unit via a 10-foot infeed conveyor. Once inside the enclosed primary unit, the lamps are imploded under a negative pressure environment (i.e., vacuum) initiating the separation of glass, metal components, phosphor powder, and vaporous mercury. Following implosion, the lamp components are moved automatically to the Section 3 Unit.

Section 2 - Secondary Process Unit

Lamps other than intact fluorescent tubes (i.e., HID, CFL, "U" tubes, crushed or broken fluorescent tubes, incandescent, halogen bulbs, etc.) are processed through the Section 2 - Secondary Process Unit. This unit consists of a fully enclosed hydraulic lift chamber, a horizontal, rotating rumbler, and an enclosed conveyor system for transporting the glass cullet and other lamp components to the Section 3 Unit for cleaning and separation. Lamps and crushed materials are introduced into the secondary unit via the hydraulic lift unit. The fully enclosed hydraulic lift unit accepts loose bulk lamps or drums of crushed lamps and lifts and tilts to pour the materials into a rumbler. The horizontal, rotating rumbler breaks intact lamps through tumbling, and separates and conveys the materials to the Section 3 Unit for cleaning and sorting.

Section 3 – Cleaning and Sorting Unit

Processed materials from the Sections 1 and 2 units are conveyed into the Section 3 – Cleaning and Sorting Unit. The Section 3 Unit consists of two (2) horizontal, rotating / vibrating rumblers (rumblers are each 4-meters long and are similar to trommels without screens/holes). Once inside the rumblers, the glass cullet and metal components are cleaned using a high-pressure vacuum to lift and collect the phosphor powder and mercury vapors. The cleaned glass and metals are conveyed from the rumblers into a magnetic separating chamber (i.e., chamber with rotating magnets) where the ferrous metal components are separated and removed from the glass cullet. The glass cullet then gets passed through a vibrating finger screen to separate and remove any remaining non-ferrous metals for separate capture while allowing the cleaned glass cullet to pass through for collection. Following the component cleaning and separation within the Section 3 Unit, the cleaned glass cullet and cleaned metal components are collected separately into cubic yard boxes, or fiber 55-gallon drums. The collected glass and metals are tested for residual mercury contamination prior to release for local reuse in accordance with Chapter 62.737.840 F.A.C. (please refer to the *Sampling and Analysis Standard Operating Procedures* contained in **Appendix E**).

Air Extraction Filter Units

The Balcan MP8000 has two (2) air extraction filter units to remove mercury bearing phosphor powder and mercury vapors from the contents of the processed lamps. Mercury-bearing lamp phosphor powder and air containing mercury vapors are drawn from fifteen separate locations on the Balcan processing units to ensure maximum collection of mercury vapors, and contaminated phosphor powder. Manufacturer information for the Balcan equipment and air extraction filter units is provided in **Appendix C**.



3.18 Analytical Testing of Processed Lamp Components

Analytical testing has been performed on the processed lamp components at the Lighting Resources Texas, LLC Facility located in Fort Worth, Texas. This facility uses the Balcan MP8000 equipment. A summary of the testing performed and analytical results is presented in **Table 3-4** below. The analytical results show that the lamp glass and lamp metals were below the U.S. EPA regulated toxicity level for mercury of 0.2 mg/L based on the toxicity characteristic leaching procedure (TCLP). A copy of the analytical results is provided in **Appendix C**.

Table 3-4 Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL Summary of Analytical Testing for Mercury		
Material Tested	Test Method	Result
Lamp Glass	TCLP Metals: SW846 – 1311/7470A	0.0149 mg/L
Lamp Metal End Caps	TCLP Metals: SW846 – 1311/7470A	0.0121 mg/L
Phosphor Powder Sample A-1	TCLP Metals: SW846 – 1311/7470A	0.0154 mg/L
	Total Mercury: SW846 – 7471B	69 mg/kg
Phosphor Powder Sample A-2	TCLP Metals: SW846 – 1311/7470A	0.0862 mg/L
	Total Mercury: SW846 – 7471B	640 mg/kg

3.19 Phosphor Powder / Mercury Vapor Capture and Air Pollution Control

The MP8000 is equipped with two air extraction filter units, each unit having a particulate capture and mercury vapor collection / filtration sub-units. The air extraction units are designed to draw off all mercury-bearing phosphor powder and mercury vapor from the contents of the lamps down to a particle size of five (5) microns. Both air extraction filter units will operate continuously to ensure the lamp processing is conducted under a negative pressure (i.e., under vacuum) at all times. Mercury bearing phosphor powder will be collected on the unit filters down to a 5-micron particle size. Dusts finer than 5-microns and vapors that pass through the filter units will be ducted to a main filter stack that contains sulphur-based activated carbon, with which the mercury reacts and allows the exhausted air to be mercury-free.

Mercury bearing phosphor powder and air containing mercury vapors will be drawn from fifteen separate locations on the processing equipment to ensure maximum collection of mercury, mercury vapors, and contaminated phosphor powder. The air and particulate filtration units will be set to operate continuously for mercury vapor collection and fugitive emission prevention. The air discharge from the filtration units will be vented and released directly within the confines of the lamp processing room obviating the necessity of an exterior exhaust stack(s). The environmental benefits and protections garnered will be incalculable as the lamp processing machine's integral air filtering system will continuously recirculate and clean the air potentially exposed to vaporous mercury.

HEPA filters used to separate phosphor powder will be cleaned via continuous air backflow and collected in sealed 55-gallon steel drums attached directly to the air filtration units. Each drum will collect powder from approximately 40,000 fluorescent lamps. When filled, drums will be removed from the machine, classified as D009 characteristic hazardous waste, and



staged for transport offsite to an authorized and permitted mercury reclamation facility.

Manufacturer information for the Balcan equipment and air extraction filter units is provided in **Appendix C**.

3.20 Air Monitoring and Air Emission Control

Internal air quality will be routinely monitored for mercury vapor in the air to ensure that personnel are working in a safe environment, and to ensure that the air pollution control equipment is operating properly. Lighting Resources will monitor specific areas of the Facility on a daily basis to ensure that the mercury levels are well below the OSHA Permissible Exposure Limit (PEL) of 0.1 mg/m^3 . Specifically, Lighting Resources shall utilize a threshold limit of 0.05 mg/m^3 and ensure Facility levels do not exceed this limit. The threshold limit of 0.05 mg/m^3 is the recommended exposure limit (REL) established by the National Institute for Occupational Safety and Health (NIOSH). The NIOSH REL of 0.05 mg/m^3 is a time weighted average for up to a 10-hour workday and a 40-hour work week.

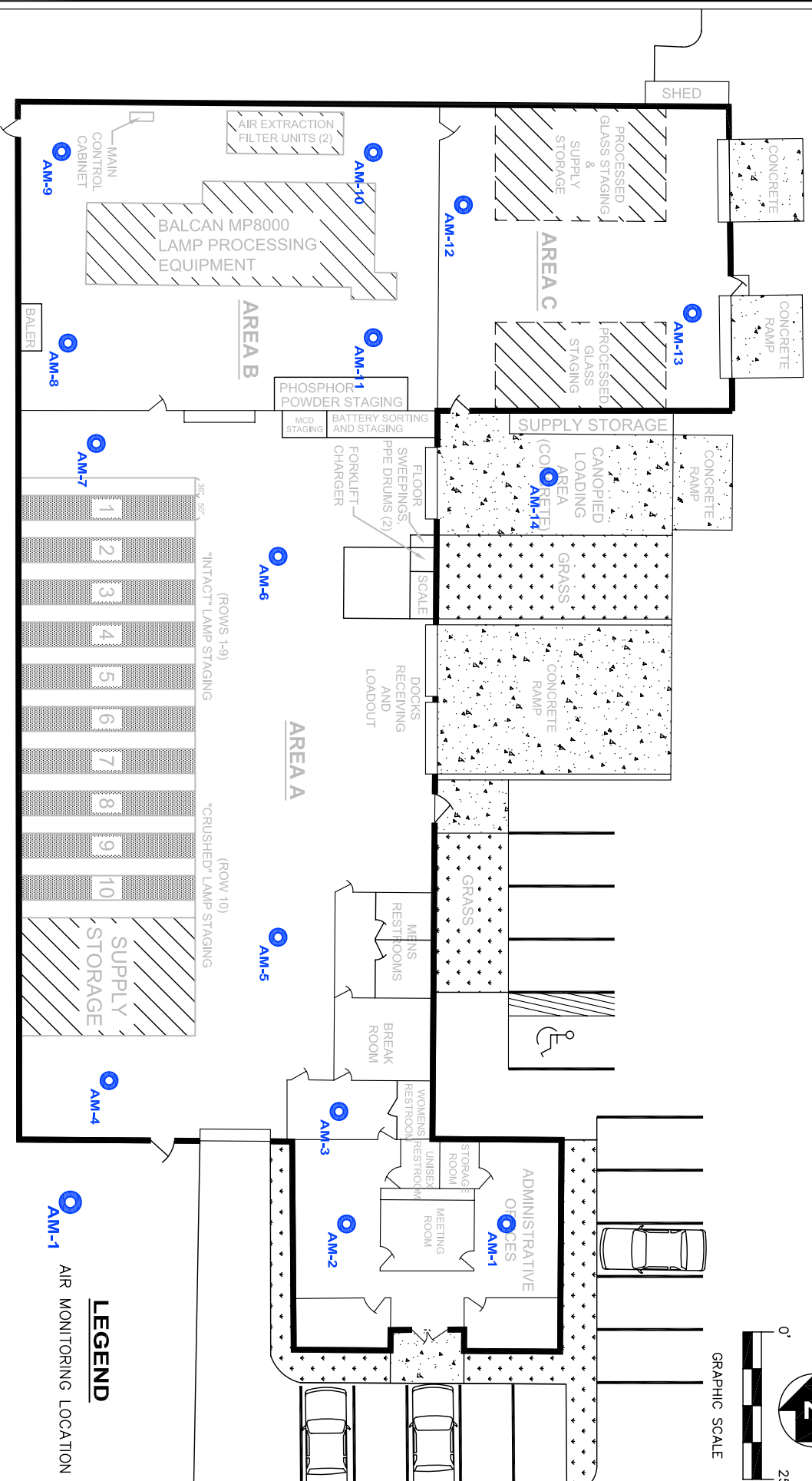
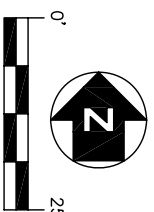
The areas where monitoring will be performed are shown on **Figure 7** on the following page. Lighting Resources will take ambient air readings using a Jerome 431 X Mercury Analyzer. Air readings will be taken in the Administrative Office area, and in Areas A, B, and C. The air monitoring form will list the sampling locations and air monitoring readings obtained. Air monitoring will be performed every two hours throughout each work day. The air monitoring form will contain the following information:

- Date and time of monitoring,
- Monitoring locations,
- Person's name performing the monitoring, and
- Mercury vapor reading.

This mercury analyzer instrument has a sensitivity of 0.001 mg/m^3 . During operation of the lamp processing equipment, air monitoring will also include additional sampling of the Balcan air filtration system (in Area C – the Lamp Processing Room) to assure that it is functioning properly.

In the unlikely event the ambient room air exceeds the designated threshold limit of 0.05 mg/m^3 , Lighting Resources will require the use of half-mask or full-face respirators with NIOSH mercury filters /cartridges by Facility personnel until the source of the mercury has been detected and mitigated. The Facility Manager or Emergency Coordinator will make this determination. All employees will be trained to OSHA Level C protection which includes air-purifying respirators. If mercury levels exceed concentrations appropriate for Level C protection, Facility operations will be immediately halted, personnel will be evacuated (refer to **Drawing No. D7** for locations of Facility building evacuation points, and emergency meeting points located outside of the Facility building), and emergency responders will be contacted (please refer to **Section 4** for emergency procedures). Facility operations will not resume until the Lighting Resources Emergency Coordinator determines that it is safe to do so.





Shaw Environmental, Inc.

LIGHTING RESOURCES, LLC - OCALA, FLORIDA
MERCURY RECOVERY FACILITY

FIGURE 7
AIR MONITORING LOCATIONS

DRAWN BY:

PEL

APPROVED BY:

PCT

PROJ. NO.:

143925

DATE:

DECEMBER 2011

In the event there are any spikes in the mercury levels in localized areas, the cause will be determined and appropriate remedial action will be taken. A spike would typically indicate an excess lamp breakage in a given shipment with poor containment, an equipment malfunction or system leak. Air filtration media will be deemed "saturated" and will be replaced when mercury emissions reach the threshold limit of 0.05 mg/m³. Frequent testing in multiple locations of the Facility during all operations will ensure that any malfunctions are corrected promptly.

Lighting Resources also has an extensive floor maintenance program to minimize any potential contamination of the plant floor. Any areas potentially contaminated through lamp breakage will be cleaned immediately upon breakage. Lighting Resources will routinely sweep its Facility floors using a combination of a floor sweeping compound and mercury vapor absorbent/suppression liquid. In order to check the effectiveness of its floor maintenance program, Lighting Resources will conduct periodic wipe sampling of its Facility floors and walls.

Lighting Resources will also implement a bootie policy to further minimize potential contamination. Any office staff or visitors will wear protective dust-resistant booties while inside the lamp processing room. Likewise, lamp processing personnel will have to wear the booties and remove them when exiting the lamp processing room. All work clothing and booties will remain at the Facility.

3.21 Sampling and Analytical Testing of Processed Lamp Materials

In accordance with 62-737.840 F.A.C., Lighting Resources will conduct routine sampling and analyses of the processed lamp materials prior to shipment offsite for further processing, recycling, or disposal. A brief summary of the sample collections and testing that will be performed is provided below. A detailed sampling and analysis plan is provided in **Appendix E**.

Sampling and Testing

Lighting Resources will take daily physical samples of the processed glass and metal materials, individually, at the point at which the materials exit the lamp processing equipment. Collected samples will be representative of the materials processed during the day they were collected. At the beginning of each week, the prior week's daily samples will be consolidated into one weekly composite sample and submitted for chemical analysis of total mercury content (or alternatively TCLP mercury content) using an approved EPA methodology. The weekly composite sample will be prepared by thoroughly mixing equal amounts of the daily samples into a single container. Sampling and testing will be performed for both processed glass and metals individually. The results of this analysis shall be considered the *weekly composite sample of process operations*. The **total mercury content of the weekly composite sample of process operations must be less than 3 parts per million (ppm)**, if the tested materials are to be shipped to a facility other than a mercury reclamation facility.



Twelve (12)-Week Average of Mercury Content

In accordance with 62-737.840 F.A.C., Lighting Resources will maintain a 12-week average value of the levels of mercury contained in the processed glass and processed metals. The 12-week average is a rolling average calculated using the most recent 12-weekly test results obtained from the weekly tested composite samples. The **12-week average for total mercury content must be less than 1 ppm**, if the tested materials are to be shipped to a facility other than a mercury reclamation facility.

3.22 Inspection and Maintenance Program

All Facility equipment, systems, structures, and material handling / processing / staging areas will be routinely inspected and maintained in a manner that ensures continued and proper operation compliant with all applicable regulations. Personnel will be assigned to routinely inspect and maintain the following:

- Overall facility cleanliness,
- Personal protective equipment,
- Safety and emergency equipment,
- Lamp processing equipment,
- Air handling system filters,
- Forklifts,
- Monitoring equipment,
- Material handling, processing, and staging areas (Areas A, B, and C),
- Facility floors, walls, and structures,
- Site fencing and gates,
- Site access roads,
- Receiving / loading dock area,
- Facility signage,
- All staged containers,
- Inventory of supplies,
- Employee restrooms,
- First aid equipment, and
- Spill emergency kits and equipment.

All equipment will be inspected and maintained in accordance with the manufacturer's recommendations. The frequency of inspection will depend upon the item. A detailed description of the Facility inspections and maintenance including scheduled frequency and lamp equipment maintenance (with photos) is provided in **Table 8-1** in **Section 8**. The inspection schedule will be followed for conducting routine preventative maintenance. If any equipment or associated parts are found to be faulty or worn out, the equipment will be repaired or replaced as soon as practical. Proper equipment and supplies will be available for use at the Facility during all hours of operations to ensure the continued and proper operation of the Facility.



EMERGENCY PROCEDURES AND HAZARDOUS WASTE CONTINGENCY PLAN

The purpose of this document is to describe the Emergency Procedures and Hazardous Waste Contingency Plan (Plan) for the Lighting Resources Facility and its operations pursuant to Title 40 CFR Part § 264, Subpart D, and Chapter 62-737 F.A.C. The provisions of this Plan will be carried out immediately whenever there is a medical emergency, or a fire, explosion, or spill / release of hazardous waste or hazardous waste constituents (mercury and other) which could threaten human health and/or the environment (in accordance with Title 40 CFR § 264.51(b)). This Plan outlines specific responsibilities and procedures for the prompt and effective response to any emergency situation. This Plan is organized by the following sections:

- Emergency Responsibilities of Emergency Coordinators,
- Emergency Contact Information,
- Regulatory Agencies Contact Information,
- Emergency Equipment,
- Medical Emergency Procedures,
- Fire and Explosion Emergency Procedures, and
- Mercury (or other Hazardous) Spill / Release Emergency Procedures.

This Emergency Procedures and Hazardous Waste Contingency Plan is designed to meet the applicable requirements of Title 40 CFR § 264, Subpart D, and Chapter 62-737 F.A.C.

4.1 Emergency Responsibilities of Emergency Coordinators

The Facility Manager will serve as the primary Emergency Coordinator, and the Operations Manager and Shipping Supervisor will serve as the alternate Emergency Coordinators in the absence of the Facility Manager. Both the primary and alternate Emergency Coordinators have been appropriately trained to respond to any and all emergencies that could potentially occur throughout the Facility. In the unlikely event of an emergency, the designated Emergency Coordinator will be responsible for implementing the response actions outlined within this Plan.

4.2 Emergency Contact Information

An emergency contact list containing the names and contact phone numbers listed below, will be posted in the Administrative Offices, and within Areas A, B, and C of the Facility. The emergency contact list will be clearly posted in each designated area on a wall that is unobstructed from view and access.

- Emergency Coordinator:

Name:	Bonnie Bishop-Clark (Facility Manager)
Office Phone:	352-509-3001
Cell Phone:	866-961-9100
Address:	3101 SW 34th Ave, #905, Ocala, FL 34474



- Alternate Emergency Coordinator #1:
 - Name: Heath Clark (Operations Manager)
 - Cell Phone: 404-291-5291
 - Work Phone: 352-509-3001
 - Address: 3101 SW 34th Ave, #905, Ocala, FL 34474

- Alternate Emergency Coordinator #2:
 - Name: Jason Sims (Shipping Supervisor)
 - Cell Phone: 352-274-7997
 - Work Phone: 352-509-3001
 - Address: 3900 NW 20th Ave., Ocala, FL 34475

- Emergency Contacts:
 - Ocala Police Department: 911
(non-emergency): (352) 369-7134
 - Ocala Fire Department: 911
(non-emergency): (352) 629-8503
 - Local Ambulance Service: 911
Ocala Regional Medical Center: (352) 401-1137
 - Florida DEP Central District: (407) 897-4100
 - U.S. EPA Region 4: (404) 562-8700
 - Marion County Emergency Management: (352) 351-8077
 - State Warning Point (800) 320-0519

4.3 Regulatory Agencies Contact Information

The names and numbers of regulatory agencies that will be contacted in the event of an emergency are listed below.

- Local: Marion County Emergency Management
692 NW 30th Ave.
Ocala, FL 34475
Phone: (352) 351-8077

- State: Florida DEP
Central District
3319 Maguire Blvd., Ste. 232
Orlando, FL 32803
Phone: (407) 897-4100

- Federal: U.S. EPA Region 4
Hazardous Waste Management Division
61 Forsyth St. SW
Atlanta, GA 30303
Phone: (800) 241-1754

- National Response Center: (800) 424-8802



4.4 Emergency Equipment

Lighting Resources shall maintain the following emergency equipment on-site and in working condition:

- Fire Extinguishers. Portable fire extinguishers will be maintained in the Facility building (see **Drawing No. D7** for locations) to extinguish a fire if one should occur.
- Mercury Vacuum. Mercury vacuums (2) will be maintained at the Facility for the cleanup of mercury spills and containment of mercury vapor in a HEPA / ULPA filter.
- Mercury Spill Kit. Commercial spill kits (2) will be maintained in the Facility building (see **Drawing No. D7** for locations) to respond to a mercury spill if one should occur. The spill kit will include but not be limited to: absorbent powder (e.g., MerconSORB™, Hg Absorb®, etc.), absorbent sponges, pump/aspirator, a cleaning/decontaminating solution (to safely suppress Mercury vapor), nitrile gloves, safety glasses, wipes, rinse bottle, recovery bags. Directions on how to use the equipment will be located in the cover of the box.
- Hazardous Material Release / Spill (other than Mercury). The following equipment will be maintained in the Facility building to facilitate containment of a hazardous material release or spill while waiting for emergency responders to arrive and take over:
 - Absorbent booms and mats,
 - Plastic bags and sheeting,
 - Vermiculite,
 - General Purpose Detergent,
 - Peristaltic pumps,
 - Amph-O-Mag Acid and Base Neutralizer,
 - D.O.T. containers & recovery drums,
 - Shovels, brooms, and various other hand tools, and
 - Barricades / cones.
- Respirators. Full-face respirators with mercury vapor cartridges and HEPA filters will be available (for all employees) for use in an emergency. Respirators will be maintained in a cabinet located between the Areas A and B rooms of the Facility Building.
- Protective Clothing. Tyvek full-body coveralls will be available (for all employees) for use in an emergency to provide protection from fluorescent lamp powder (i.e. dust) and mercury particulates. Tyveks will be maintained in a cabinet located between the Areas A and B rooms of the Facility Building.
- First Aid Kits and Eye Wash Stations. Commercial first aid kits and eye wash stations are located throughout the Facility (see **Drawing No. D7** for locations). The contents of the first aid kits or eye wash stations will be used in the event of an accident.
- Mercury Vapor Analyzer. A Jerome Mercury Vapor Analyzer will be maintained on-site to routinely perform air monitoring and to monitor mercury vapor emissions in an emergency. The mercury vapor analyzer will be maintained in the Administrative Office area.
- Communication Devices. The Emergency Coordinators will carry cellular phones at all times. Additionally, telephones are located within the Administrative Offices and are available to all Facility personnel to call 911 and emergency assistance.



4.5 Medical Emergency Procedures

All employee injuries at the site will be reported immediately to the Emergency Coordinator in charge. The Emergency Coordinator will determine whether the injury is minor and can be attended to on-site, or whether the injury is a medical emergency that warrants immediate attention by a medical professional offsite. The Emergency Coordinator will implement the procedures outlined below in the event of an on-site injury.

Emergency Coordinator Medical Emergency Procedures

1. Quickly evaluate the type and extent of injury. If the injury is determined to be a medical emergency follow steps 2 through 7 below.
2. Contact Ocala 911 Emergency Services with the location and details of injured party, and assign a worker to stand at the Facility entrance to direct incoming emergency services personnel upon their arrival.
3. Move injured personnel ONLY if failure to do so will result in additional harm or injury.
4. Begin emergency first aid as needed on injured personnel (including CPR if needed) until emergency services personnel arrive on site and take over scene.
5. If injury is a result of an operational activity, instruct workers accordingly with appropriate emergency response to remove the risk of further injury.
6. Notify the applicable local, state, and federal agencies of such emergency as required by specific regulations.
7. Document incident and response, and maintain documentation on file for a minimum period of three years.

First Aid Stations

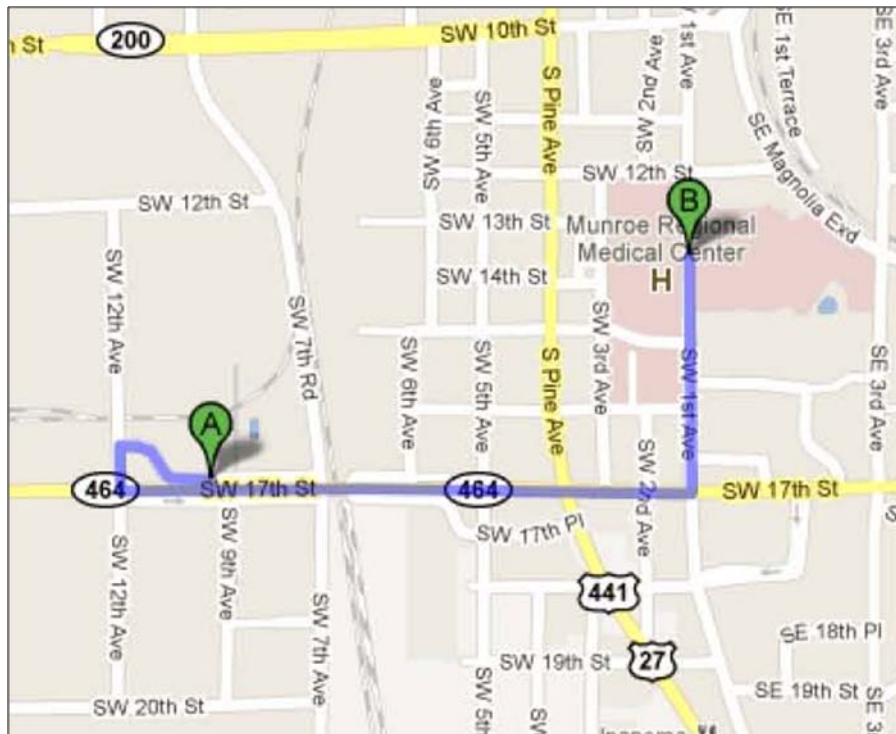
First Aid supplies for minor injuries will be available at five (5) first aid stations located throughout the Facility as shown on **Drawing No. D7**. As part of employee safety training, all staff will be shown where all first aid stations are located.

Local Medical Facility

The Ocala Regional Medical Center is located at 1431 SW 1st Ave, in Ocala, Florida, and is approximately 1.1 miles from the Lighting Resources Facility as shown in the map on the following page.



Emergency Route to Ocala Regional Medical Center



A 1007 SW 16th Ln, Ocala, FL 34471

1. Head **west** on **SW 16th Ln** toward **SW 12th Ave** go 0.1 mi
total 0.1 mi
2. Turn **left** onto **SW 12th Ave** go 272 ft
total 0.2 mi
3. Take the **1st left** onto **SW 17th St** go 0.6 mi
About 3 mins total 0.8 mi
4. Turn **left** onto **SW 1st Ave** go 0.3 mi
About 2 mins total 1.1 mi

B **Ocala Regional Medical Center**
1431 SW 1st Ave, Ocala, FL 34471-6558 - (352) 351-7200

4.6 Fire and Explosion Emergency Procedures

If a fire or explosion occurs at the Facility, the Emergency Coordinator will be immediately notified. A description of the incident including the location and extent as well as the threat to life or property will be given. The Emergency Coordinator will implement the procedures outlined below in the event of a fire or explosion emergency.

Emergency Coordinator Fire and Explosion Emergency Procedures

1. Quickly notify all site personnel by public address system or in person, specifically instructing all non-emergency trained personnel to quickly evacuate the Facility, and instructing emergency trained personnel where to assemble to assist in response effort.
2. Evaluate the situation to determine if any injuries are involved. If serious injuries are involved, quickly move any injured parties to a safe location (as necessary) and



notify Ocala 911 Emergency Services relaying the site location and emergency situation. Assign the appropriate staff person to wait at the Facility entrance to direct emergency services personnel upon arrival.

3. Instruct emergency trained personnel to begin fire fighting activities (as necessary) with available fire extinguishers if this can be done without threat to their safety. If mercury-containing materials are involved, ensure that workers are wearing proper respirators and any other required personal protective equipment (PPE).
4. Begin and/or supervise first aid on any injured parties as needed.
5. Evacuate workers immediately at any time that continued fire fighting activities endanger them (points of evacuation throughout the Facility building, and meeting locations outside of Facility building are presented on **Drawing No. D7**).
6. Continue with and/or supervise appropriate emergency and/or first aid procedures until relieved by emergency service personnel.
7. If the incident involves mercury containing materials, inform emergency service personnel upon arrival, the need to use respirators and any other PPE, and if necessary provide emergency service personnel with appropriate PPE.
8. Notify the applicable local, state, and federal agencies of the fire or explosion emergency as required by specific regulations.
9. Document incident and response, and maintain documentation on file for a minimum period of three years.

Fire Detection and Suppression Equipment

The following detection and fire suppression equipment are available at the Facility:

- Smoke and fire detection systems,
- Nine (9) Type A fire extinguishers,
- Two (2) Type C fire extinguishers, and
- Fire hydrant located at front of property.

The locations of the fire extinguishers are shown on **Drawing No. D7** (contained in tabbed section "**Drawings**"). As part of employee emergency training, staff will be shown where all fire extinguishers are located.

4.7 Mercury (or other Hazardous) Spill / Release Emergency Procedures

If a spill or release of mercury or other hazardous material occurs at the Facility, it will be the duty of the Emergency Coordinator to provide the appropriate emergency response to prevent a threat to life or the environment. The Emergency Coordinator will be advised of any spill immediately and will make the necessary decisions necessary to implement an emergency response plan. The Emergency Coordinator will implement the procedures outlined below in the event of a spill or release of mercury (or other hazardous material).

Emergency Coordinator Procedures for Mercury Spill / Release at Facility:

1. Quickly evaluate the situation to determine if any injuries are involved. If serious injuries are involved, quickly move any injured parties to a safe location (as necessary) and notify Ocala 911 Emergency Services relaying the site location and emergency situation. Assign the appropriate staff person to wait at the Facility



entrance to direct emergency services personnel upon arrival. Note, move injured parties to safety ONLY if it can be done without threat of additional injury. If movement is not possible, immediately place the injured party on oxygen.

2. Notify all personnel not wearing respirators to evacuate the affected spill / release area (points of evacuation throughout the Facility building, and meeting locations outside of Facility building are presented on **Drawing No. D7**).
3. Begin and/or supervise first aid on injured personnel as necessary. Immediately cover any and all open wounds to protect from exposure. Continue first aid until relieved by emergency services personnel.
4. Instruct workers wearing respirators to immediately spray calcium polysulfide wetting solution (or other equivalent product for suppression of mercury vapors) on spilled mercury containing materials.
5. Upon arrival, advise emergency services personnel of the need to use respirators and provide to them if necessary.
6. Use contained mercury vacuum system to collect spilled mercury containing materials. Keep mercury containing materials wet with calcium polysulfide solution (or other equivalent product for suppression of mercury vapors) at all times.
7. Wash floor with trisodium phosphate, HgX®, MERCON™ or other approved equivalent product; vacuum residue with contained collection system; and allow the washed area to air dry.
8. Check mercury vapor level with direct reading using a Mercury Vapor Analyzer. Continue to wear respirators until mercury vapor level drops below 0.05 mg/m³.
9. Notify the applicable local, state, and federal agencies of incident as required by specific regulations.
10. Document incident and response, and maintain documentation on file for a minimum period of three years.

Emergency Coordinator Procedures For Other Hazardous Material Spills / Release:

1. Quickly evaluate the situation to determine if any injuries are involved. If serious injuries are involved, quickly move any injured parties to a safe location (as necessary) and notify Ocala 911 Emergency Services relaying the site location and emergency situation. Assign the appropriate staff person to wait at the Facility entrance to direct emergency services personnel upon arrival. Note, move injured parties to safety ONLY if it can be done without threat of additional injury. If movement is not possible, immediately place the injured party on oxygen.
2. Notify all personnel to evacuate spill / release area and wait for emergency responders to contain and cleanup spill / release (points of evacuation throughout the Facility building, and meeting locations outside of Facility building are presented on **Drawing No. D7**).
3. Begin and/or supervise first aid on injured personnel as necessary. Immediately cover any and all open wounds to protect from exposure. Continue first aid until relieved by emergency services personnel.
4. Notify the applicable local, state, and federal agencies of incident as required by specific regulations.
5. Document incident and response, and maintain documentation on file for a minimum



period of three years.

6. Notify the applicable local, state, and federal agencies of incident as required by specific regulations.
7. Document incident and response, and maintain documentation on file for a minimum period of three years.

If a spill or release of mercury occurs en route to the Facility, it will be the duty of the Emergency Coordinator to provide the appropriate emergency response to prevent a threat to life or the environment. The Emergency Coordinator will be advised of any spill immediately and will make the necessary decisions necessary to implement an emergency response plan. The Emergency Coordinator will implement the procedures outlined below.

Emergency Coordinator and Driver Procedures for Mercury Spill En Route to Facility

1. Quickly evaluate the situation to determine if any injuries are involved. If serious injuries are involved, quickly move any injured parties to a safe location (as necessary) and notify Ocala 911 Emergency Services relaying the site location, emergency situation, and assistance needed. Note, move injured parties to safety ONLY if it can be done without threat of additional injury. If movement is not possible, immediately place the injured party on oxygen.
2. Notify all personnel not wearing respirators to evacuate the affected spill area. Use vehicle Warning Triangles to mark the spill area and to warn other motorists of the accident site.
3. Begin and/or supervise first aid on injured personnel. Immediately cover any and all open wounds to protect from mercury exposure. Continue first aid until relieved by emergency services personnel.
4. Drivers will put on appropriate PPE (respirator, Tyvek suit, gloves, etc.), and cover any and all mercury contaminated materials leaking or seeping from the vehicle with a mercury absorbent type powder or decontaminant powder (e.g., MerconSORB™, Hg Absorb®, HgX®, or other approved equivalent). Affected spill area will be covered with a tarp after powder is applied to prevent airborne spread of the spill.
5. Advise emergency services personnel of the need to use respirators and provide to them if necessary.
6. Do not open vehicle cargo area door until Emergency Coordinator and/or emergency response team is on site unless you can be reasonably sure that container (lamps, lamp boxes, etc.) breakage is very limited and that opening the vehicle cargo container will not contribute to additional release of mercury contaminated materials.
7. Upon notification of a spill incident by a Company driver or emergency services personnel, the Emergency Coordinator will immediately notify the following agencies of the spill event:
 - Florida DEP Emergency Response Office: 407-893-3337,
 - State Warning Point: 800-320-0519,
 - National Response Center: 800-424-8802, and
 - Emergency Response Team (Shaw): 407-287-3214.
8. The Emergency Coordinator will depart the scene only after the scene has been appropriately contained and remediated by the emergency response team.



9. Notify the applicable local, state, and federal agencies of incident as required by specific regulations.
10. Document incident and response, and maintain documentation on file for a minimum period of three years.



5.0 WORKER HEALTH AND SAFETY PLAN

The Worker Health and Safety Plan has been developed to protect the health and safety of all Lighting Resources personnel and the general public, to be protective of the environment, and to comply with all applicable local, state, and federal regulations (including but not limited to OSHA and DEP regulations). All new personnel will receive comprehensive health and safety training prior to actual participation in production work at the Facility. Subsequent to receiving training, the new employees will be closely supervised during the first few months of working in the Facility (by experienced and senior employees) to ensure they understand and follow all proper procedures and protocol.

Worker health and safety training will be performed on an ongoing basis, beginning with the initial new employee training, and continuing with monthly safety meetings, and yearly refresher training. This Plan is organized by the following sections:

- Fire Prevention and Control Procedures,
- Lockout/Tagout Procedures,
- Equipment Safety,
- General Safety Procedures,
- Air Monitoring, and
- Personnel Training.

5.1 Fire Prevention and Control Procedures

Facility personnel will be trained on fire prevention and control procedures to minimize the threat of fire at the Facility, to be protective of their health and safety, and the public health and safety, and to be protective of the environment.

Fire Prevention

Steps will be taken to minimize the threat of fire at the Facility. These steps will include but are not limited to employee training, prohibition of smoking, and use of fire detection and suppression equipment. Each preventive step is discussed further in the following paragraphs.

Employee Training

All employees will be made aware of the common site specific fire hazards, the fire prevention and control procedures, and the proper evacuation routes and designated meeting areas in the event of a fire. Employees will be instructed on the proper use of portable fire extinguishers.

Prohibition of Smoking

Because combustible materials may be exposed, smoking will not be allowed within the Facility. Signs are displayed indicating the designated smoking areas.

Fire Detection and Suppression Equipment

The Facility is outfitted with smoke and fire detection devices, and portable fire extinguishers. This equipment shall be inspected monthly to ensure they are in good working order. A licensed contractor will perform service on the fire extinguishers annually, or following each use.



5.2 Lockout / Tagout Procedures

All site personnel will be trained on lockout / tagout procedures; specifically, personnel will be taught the importance of using such procedures, which personnel will be authorized to perform lockout / tagout of equipment, and under what circumstances will lockout / tagout be used.

Lockout / Tagout

The purpose of this procedure is to establish the minimum requirements for the lockout/tagout of energy. It shall be used to ensure that before an employee performs any servicing or maintenance activities where the unexpected energization or start-up of machines or equipment or release of stored energy could cause injury to employees, all potentially hazardous energy shall be controlled by lockout/tagout methods.

Rules for Using Lockout / Tagout Procedures. All equipment shall be locked out/tagged out to protect against accidental or inadvertent operation when such operation could cause injury. At such time employees shall be instructed to not operate any switch, valve or other energy-isolating device bearing a lock/tag. Any equipment which may not be locked out must, at a minimum, be tagged out to notify employees that the equipment is not safe for use.

Responsibility. The Facility Manager shall ensure that all employees are properly instructed on lockout/tagout procedures, and on the safety significance of these procedures. If outside contractors are to be used to perform service or maintenance on machines or equipment at the Facility, Lighting Resources and the contractor will familiarize each other with their respective lockout/tagout procedures.

Requirements for Locks / Tags. The following is a list of requirements for all lockout / tagout devices to be used at the Facility:

- *Durable:* Devices must be durable for the environment in which they will be placed. Tags must be resistant to the site conditions and remain legible for the period of time that they are used.
- *Standardized:* Across the site, locks and tags must be standardized by color, shape or size. Tags must also use a standard print and format.
- *Substantial:* Locks must not be capable of being removed without the use of excessive force or unusual techniques. Tags must not be able to be removed inadvertently or accidentally. In addition, tags must be attached with a non-reusable type of attachment.
- *Identifiable:* All devices must identify the employee applying the device. For tags on energized equipment, the tag must provide a specific warning against operation of the machine or equipment.

Preparation for Lockout / Tagout. An investigation shall be made to locate and identify all energy sources to be certain which switch, valve or other energy isolating devices apply to the equipment to be locked out/tagged out. More than one energy source may be involved. Questionable energy source problems shall be resolved before job authorization is obtained and lockout / tagout commences.



Sequence of Lockout/Tagout Procedures. The following is the sequence of lockout / tagout procedures that must be followed at all times at the Facility:

1. Only an authorized employee may execute lockout / tagout procedures.
2. Notify all affected employees that a lockout / tagout is required and the reason it is required.
3. If the equipment is operating, shut it down by the normal stopping procedure.
4. Verify that isolation and de-energization of the machine or equipment has been accomplished.
5. Follow equipment-specific repair or maintenance procedures.

Restoring Equipment to Normal Operations. The following is the sequence of procedures to follow when restoring equipment to normal operations:

1. Only the employee who originally locked out/tagged out the equipment may remove the devices, unless otherwise authorized by the Facility Manager.
2. After the servicing and/or maintenance are complete and equipment is ready for normal operation, check the area around the machines or equipment to ensure that no one is exposed.
3. After all tools have been removed from the affected machine or equipment, guards have been reinstalled and personnel are clear of the area, remove all lockout or tagout devices. Operate the energy isolating devices to restore energy to the machine or equipment.
4. Notify employees that lockout/tagout devices have been removed from the machine or equipment.

5.3 Equipment Safety

Facility personnel will be trained to implement the following safety procedures when operating equipment:

- Immediately report all malfunctions,
- Check equipment before starting,
- Use steps and hand holds,
- Keep steps clean,
- Inspect area before operating equipment,
- Operate from driver's seat only,
- Wear seat belts,
- Never mount operating/moving equipment,
- Keep attachments low,
- Check blind areas,
- Keep enough clearance,
- Avoid excessive speed/power,
- Park on level ground,
- Lower attachments to ground when parked,



- Avoid leaving equipment unattended,
- Always work with adequate lighting,
- Clean equipment before repairing,
- Be aware of nearby personnel,
- Check work area, and
- Use audible vehicle reverse movement warning devices.

5.4 General Safety Procedures

Special attention shall be paid to safety at all times, and steps will be taken to minimize the risk to personal safety. These topics discussed below include communications and security, personal protective equipment and confined space entry.

Hazard Communications and Security

Electrical service and telephones are available for regular and emergency communications. Should any part of the Facility be vandalized, Lighting Resources will immediately notify the Police Department. The portion of the site or equipment that has been vandalized will be inspected to determine the amount of damage. If equipment is determined to be unsafe it will be locked out/ tagged out until maintenance can be performed.

Personal Protective Equipment

All employees at the Facility will be required to wear proper personal protective equipment (PPE). Required PPE may include gloves, hearing protection, eye protection, hard hats, steel-toed boots, chemical protective coveralls, half-face or full-face respirators or any combination of the above as required for specific tasks or work areas. All employees will be trained in the proper use and care of PPE and will be fit tested for all respirator equipment.

Confined Space Entry

In the event that a confined space entry must occur, proper notification procedures will be followed to help ensure that accidents do not occur at the Facility. A confined space is considered to be any space that is large enough and so configured that it can be bodily entered to perform work, with limited or restricted means of entry or exit, but is not designed for continuous employee occupancy. All employees will be trained in the procedures for recognizing and conducting confined space entries.

5.5 Air Monitoring

All employees will be trained on air monitoring procedures at the Facility. Monitoring points, proper use and maintenance of monitoring equipment, monitoring documentation, action level, and frequency of monitoring will all be included as part of the training. Air monitoring of the Facility will be conducted every two hours during each operating day to ensure that personnel are working in a safe environment. A detailed discussion of the air monitoring procedures is provided in **Section 3.20**.



5.6 Personnel Training

The primary objectives of the personnel training program are as follows:

- To make employees aware of the potential hazards they may encounter;
- To provide the knowledge and skill training necessary to protect employee health and safety, and the environment;
- To make workers aware of the purpose, and the limitations of process and safety equipment; and
- To ensure that workers can respond to emergencies.

The personnel training program consists of initial new employee training, monthly safety meetings, and a yearly formal refresher training program conducted or coordinated by the Facility Manager.

Initial New Employee Training

Initial new employee training will be conducted for new employees under the direction of the Facility Manager. All Facility personnel will be trained in accordance with Title 40 CFR § 265.16. Specifically, prior to commencing work at the Facility, all personnel must successfully complete a program of both classroom instruction and on-the-job training that teaches them to perform their duties in a manner to comply with the requirements of Title 40 CFR § 265.16. The initial new employee training is comprehensive and will be provided to all new employees prior to working on-site. Subsequent to receiving training, the new employees will be closely supervised during the first few months of working in the Facility (by experienced and senior employees including the Facility Manager and Operations Manager) to ensure they understand and follow all proper procedures and protocol.

The training is broken down into two parts: Part I consists of new employee orientation provided to all new employees covering corporate and Facility policies and training relevant to the Facility; and Part II training which is position / title specific training consists of OSHA, RCRA, DOT and other regulatory training. A summary of the training provided to new employees is provided on the following page on **Table 5-1**. A detailed discussion of personnel training is also provided in **Section 3.4** of this Report.





Table 5-1 Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL Initial New Employee Training	
Position Title (#)	Required Training
Part I – New Employee Orientation:	
ALL Staff	<ul style="list-style-type: none"> ▪ Corporate safety policies and procedures ▪ Site control and works zones ▪ Hazardous chemical and waste management ▪ Pre-placement physical requirements ▪ Work group indoctrination ▪ Plant tour: process and safety equipment ▪ OSHA hazard communication standard ▪ Production tasks orientation ▪ Environmental and waste control ▪ Work group rotation ▪ Laboratory tasks orientation ▪ Security tasks orientation ▪ Maintenance tasks orientation ▪ Transportation tasks orientation ▪ Material handling tasks orientation
Part II – Title Specific Training:	
Facility Manager (1)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced RCRA Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Operations Manager (1)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced RCRA Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Shift Supervisor (1)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Shipping Supervisor (1)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Customer Service and Transport Manager (1)	<ul style="list-style-type: none"> ▪ 24-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Driver -CDL Class "A" (4)	<ul style="list-style-type: none"> ▪ 24-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
MCL / Lamp Processing Operators (2)	<ul style="list-style-type: none"> ▪ 40-Hour HAZWOPER Training ▪ Universal Waste Handler Training ▪ Advanced U.S. DOT Hazardous Materials Training ▪ Courses 2 and 3 (see next page)
Note: all personnel will receive training on the appropriate use and types of personal protective equipment to be used at the Facility. Further, all personnel will be fit tested for respirator equipment.	

Monthly Safety Meetings

Monthly safety meetings will be held to reinforce and review basic safety principles. In order to maintain safety awareness all Facility employees will participate in the monthly safety meetings. The topics for the monthly safety meetings will review any incidents occurring on-site during the past month and topics various topics taken from the *Worker Health and Safety Plan*.

Yearly Refresher Training

All Facility employees will receive the OSHA 8-Hour HAZWOPER refresher course to ensure that all employees maintain current with their OSHA HAZWOPER certification. The yearly employee refresher training will generally consist of the following three (3) courses:

- Course 1 – General Safety Training:
 - Corporate safety policies and procedures
 - Site control and works zones
 - Hazardous chemical and waste management
 - Physical requirements
 - Work group organization
 - Plant process and safety equipment
 - OSHA HAZWOPER annual refresher
- Course 2 - Hazardous Waste Management:
 - Resource Conservation and Recovery Act (RCRA)
 - Toxic Substance Control Act (TSCA)
 - The Clean Air Act (CAA)
 - The Clean Water Act (CWA)
 - The Emergency Planning and Right to Know Act (EPCRA)
 - Review of Material Safety Data Sheets (MSDS)
 - Receipt, processing, and material handling procedures
 - U.S. DOT – Safe Transportation of Hazardous Materials
 - Security policies and procedures
 - Waste storage, staging, pre-shipment, and disposal policies, methods, and procedures
 - Good housekeeping policies and procedures
- Course 3 - Emergency Prevention and Preparedness:
 - Toxicology
 - Hazard identification
 - Hazard prevention and response
 - Chemical and material profiles
 - Waste Analysis Plan
 - Emergency contingency plan
 - Decontamination / clean-up procedures
 - Personal protective equipment and air purifying respirator training
 - Air monitoring
 - Basic and advanced first aid training
 - Emergency site evacuation
 - Fire safety and fire extinguisher training
 - Lamp processing equipment use and safety
 - Forklift use and safety
 - Lockout / tagout procedures



6.0 QUALITY CONTROL PLAN

This Quality Control Plan has been prepared to comply with all applicable state and federal regulations including but not limited to 62-737.800(f) F.A.C. The Quality Control Plan includes the following components:

- Operating Practices and Procedures,
- Facility Inspections,
- Waste Identification Procedures,
- Sampling and Analysis Procedures, and
- Air Monitoring and Emission Control Procedures.

Lighting Resources will ensure compliance by strict adherence to its materials handling and processing procedures, inspections and monitoring programs, and an aggressive waste acceptance and analysis procedures.

6.1 Operating Practices and Procedures

Quality assurance practices will commence at the time of materials receipt. Drivers will conduct inspection of materials offered for transport at customer facilities prior to acceptance. Unauthorized waste materials will be refused. Containers will be inspected for safety and compliance with applicable regulations. Lighting Resources' drivers will be provided bills of lading or uniform hazardous waste manifests as appropriate. Additionally, material labels compliant with Title 40 CFR § 273 and Title 49 CFR § 172 will be provided to the drivers and generators.

Materials delivered to the Facility by common carrier or directly by the generator will be inspected for acceptance at the receiving dock by trained Lighting Resources personnel. Materials that are not authorized or are non-compliant due to improper containment, labeling, or other reason, will be refused and the generator will be immediately notified. A detailed waste acceptance program and load checking program are described in detail in **Section 3**.

Deliveries to the Facility will be scheduled in advance, so that all necessary tracking and inventory forms will be available upon arrival. All materials transport and receipt documents will be reviewed and signed by the Operations Manager or Shipping Supervisor for accurate preparation and completion. Information for all materials received will be entered into the Lighting Resources waste tracking database. All paper copies of documents, bills of lading, uniform hazardous waste manifests, inventory count sheets, etc., will be maintained on site for a minimum of three (3) years.

Daily Operations Procedural Review

The Operations Manager will prepare a daily activities report that summarizes all materials received, inventoried and staged for processing, materials processed, and materials shipped off-site. Additionally, the Facility Manager will prepare a daily inspection report and PULSE report (see **Appendix D**). All reports will be maintained on site for a minimum of three (3) years.



Training

In-depth personnel training will be provided to all employees and will cover Facility operations and procedures, all applicable job tasks, and regular health and safety training. Personnel training is discussed further in **Section 3.4** and **Section 5.6** of this Report.

Equipment Performance

Equipment performance will be monitored on a daily basis. Visual and audible keys are the primary indicators that the machinery is functioning as designed. Visual inspection of the discharge of glass readily identifies malfunctions; reduction in glass clarity or excessive lamp metals mixed in the glass discharge provides immediate indication that the Balcan MP8000 may not be functioning correctly.

The Balcan MP8000 has a number of catchment drawers designed to capture materials that are not properly processed or passed through the system. These catchment drawers will be removed from the machine and emptied as part of the end-of-shift equipment inspection.

The Facility will use the Jerome Model 431X Mercury Vapor Analyzer as its mercury vapor detection device. All employees will be trained in its use and adjustment. Mercury vapor level readings will be taken daily every two hours and will provide indications regarding filter status and operation. If significantly increased mercury readings are observed, a special inspection will be conducted immediately to determine the cause of the elevated reading and to perform any necessary repairs or adjustments. The mercury vapor analyzer requires annual calibration and parts replacement. Lighting Resources will return the meter to the Arizona Instruments Company for the necessary maintenance and calibration within the manufacturers' recommended service interval each year and will maintain the appropriate calibration and service records on site. Please refer to **Section 3.20** for more detailed information on air monitoring and emission control procedures.

Additionally, routine sampling and laboratory testing will be conducted to analyze for residual mercury levels on the processed lamp glass and metals. If elevated levels are observed, an investigation will be conducted to determine the cause and perform any necessary mitigation (please refer to **Appendix E** for the *Sampling and Analysis Standard Operating Procedures*).

6.2 Facility Inspections

Lighting Resources personnel will conduct regular inspections of the Facility to ensure personnel health and safety, site security, proper operational practices, acceptable equipment operation, and compliance with all applicable regulations. The Inspection Plan is presented in **Section 8**, and copies of all inspection and monitoring forms are provided in **Appendix D**.

6.3 Waste Identification Procedures

The waste identification procedures are designed to ensure that Facility personnel possess sufficient information regarding the properties of the waste streams, and to ensure the safe handling, staging, and processing of materials in a manner that is protective of human health and the environment. The specific universal hazardous wastes handled and / or processed at the Facility will be well defined and characterized.



Bills of lading and manifests will be required for all incoming material loads. Facility personnel will review all paperwork for each incoming load at the receiving / loading dock area, to ensure they are in proper order and accurately reflect what is being delivered. Further, all loads will be visually inspected to ensure there are no unauthorized materials, all materials are properly contained, and all containers are appropriately labeled (please refer to **Section 3** for a detailed discussion on waste acceptance procedures and load checking). Following inspection the material containers will be moved into the various material staging areas on-site for either processing (i.e., lamps) or transfer offsite (i.e., mercury containing devices, ballasts, and batteries). Containers will be identified as follows:

- Intact mercury containing lamps (Area A),
- Crushed mercury containing lamps (Area A),
- Mercury containing devices (Area A),
- Batteries (Area A),
- Lamp ballasts (Area A),
- Mercury containing phosphor powder (Area B),
- Processed glass (Area C), and
- Processed metals (parked trailer outside building).

The above-listed materials will be readily identifiable and will not possess any other hazardous constituent or chemical characteristics of concern other than that associated with mercury.

Incoming Materials

Data from both the U.S. EPA and the fluorescent and HID lamp manufacturers indicate that the types of lamps processed at the Facility normally exceed the 0.20 mg/kg TCLP toxicity threshold for mercury. Incoming lamps will therefore all be assumed to be hazardous wastes, and testing of the incoming lamp materials will not be routinely conducted. All other materials (mercury containing devices, ballasts, and batteries) will only be accepted on-site for transfer to another facility for reclamation, treatment, recycling, or disposal (please refer to **Section 3** for further information).

6.4 Sampling and Analysis Procedures

In accordance with 62-737.840 F.A.C., Lighting Resources will conduct routine sampling and analyses of the processed lamp materials prior to shipment offsite for further processing, reclamation, recycling, or disposal. A brief summary of the sample collections and testing that will be performed is provided below. A detailed sampling and analysis plan is provided in **Appendix E**.

Sampling and Testing

Lighting Resources will take daily physical samples of the processed glass and metal materials, individually, at the point at which the materials exit the lamp processing equipment. Collected samples will be representative of the materials processed during the day they were collected. At the beginning of each week, the prior week's daily samples will be consolidated into one weekly composite sample and submitted for chemical analysis of total mercury content (or alternatively TCLP mercury content) using an approved EPA methodology. The weekly composite sample will be prepared by thoroughly mixing equal amounts of the daily samples into a single container. Sampling and testing will be performed for both processed glass and metals individually. The results of this analysis shall be



considered the *weekly composite sample of process operations*. The **total mercury content of the weekly composite sample of process operations must be less than 3 parts per million (ppm)**, if the tested materials are to be shipped to a facility other than a mercury reclamation facility.

Twelve (12)-Week Average of Mercury Content

In accordance with 62-737.840 F.A.C., Lighting Resources will maintain a 12-week average value of the levels of mercury contained in the processed glass and processed metals. The 12-week average is a rolling average calculated using the most recent 12-weekly test results obtained from the weekly tested composite samples. The **12-week average for total mercury content must be less than 1 ppm**, if the tested materials are to be shipped to a facility other than a mercury reclamation facility.

6.5 Air Monitoring and Emission Control Procedures

Internal air quality will be routinely monitored for mercury emissions in the air to ensure that personnel are working in a safe environment, and to ensure that the air pollution control equipment is operating properly. Lighting Resources will monitor specific areas of the Facility on a daily basis to ensure that the mercury levels are well below the OSHA PEL of 0.1 mg/m³. Specifically, Lighting Resources shall maintain levels below a threshold of 0.05 mg/m³ and ensure Facility levels do not exceed this limit. The threshold limit of 0.05 mg/m³ is the recommended exposure limit (REL) established by the National Institute for Occupational Safety and Health (NIOSH). The NIOSH REL of 0.05 mg/m³ is a time weighted average for up to a 10-hour workday and a 40-hour workweek.

The areas where monitoring will be performed are shown on **Figure 7** (presented in **Section 3.20**). Lighting Resources will take ambient air readings using a Jerome 431 X mercury analyzer. Air readings will be taken in the Administrative Office area, and in Areas A, B, and C. The air monitoring form will list the sampling location and air monitoring readings obtained. Air monitoring will be performed every two hours throughout each work day.

In the event there are any spikes in the mercury levels, the cause will be determined and appropriate remedial action will be taken. A spike would typically indicate an excess lamp breakage in a given shipment with poor containment, an equipment malfunction or system leak. Air filtration media will be deemed "saturated" and will be replaced when mercury emissions reach the threshold limit of 0.05 mg/m³. Frequent testing in multiple locations of the Facility during all operations will ensure that any malfunctions are corrected promptly.

Lighting Resources also has an extensive floor maintenance program to minimize any potential contamination of the plant floor and a bootie policy to further minimize potential contamination. Please refer to **Section 3.20** for a more detailed discussion of the air monitoring and emission control procedures.



This Closure Plan has been prepared to meet the closure requirements of 62-737 F.A.C. A closure date for the Lighting Resources Facility has not been established and it is anticipated that the Facility will remain open and operate indefinitely. For purposes of this closure plan, a nominal date of twenty years from issuance of this permit has been chosen; therefore, the date for which closure activities would begin was assumed to be January 2032. It is recognized, however, that the term of permits issued by the DEP is five (5) years and will require periodic renewal.

7.1 Closure Procedures

It is anticipated that the Facility will remain open and operate indefinitely. However, for purposes of this Closure Plan the procedures for final closure of the Facility will be the following:

- Notification of intent to close will be provided by Lighting Resources to DEP and to current clients at a minimum of 30 days prior to initiating any closure activities.
- Cease acceptance of all universal wastes and lamp materials. Advance notice to clients will be provided so that they can redirect their materials to other authorized / permitted facilities.
- Complete the processing of existing inventory of lamps (MCLs); the sorting/segregation and containerization of all other materials for loadout (batteries, ballasts, mercury containing devices, lamp glass, lamp metals, and phosphor powder, etc.).
- Transport any inventory of remaining waste materials not processed by Facility, co-products and recovered materials to appropriate outlets, customers and authorized off-site treatment, recycling, or disposal sites.
- Visually inspect containment systems, floors, walls, ceilings, and all equipment surfaces inside the Facility building for evidence of contamination. If visual contamination is suspected then sampling, analytical testing, and decontamination procedures will be followed in accordance with procedures outlined in **Section 7.3** and **Appendix E** of this Report.
- If no visual contamination is evident, the hazardous materials containment systems will be steam washed. The resulting wash water from this activity will be sampled, analyzed, and disposed of in accordance with applicable regulations.
- Lighting Resources will submit appropriate certification of closure to DEP.

7.2 Maximum Inventory Estimate

With the exception of the unprocessed MCLs (whole lamps) and lamp glass cullet, the maximum inventory to be stored at the Facility was estimated in drum equivalents and by weight. Drum equivalents and estimated weights (shown in parenthesis) were used in order to prepare the closure cost estimate. Most of the service vendors had provided pricing based on number of drums or poundage. The maximum storage limits based on physical space limitations were used to estimate the volumes presented in **Table 7-1** on the following page.



Table 7-1 Lighting Resources, LLC – Mercury Recovery Facility, Ocala, FL Maximum Material Inventory at Closure		
Material	Volume Estimate	Assumptions
Mercury Containing Devices (MCDs)	Two (2) 55-gallon drums (1,500 lbs)	Assumed volume based on maximum available on-site storage for MCDs (refer to Table 3-2 in Section 3 of this Report for full description of assumptions)
Mercury Containing Lamps (MCLs):		
Unprocessed MCLs	75,000 type T-12, 4-ft fluorescent lamps (45,000-lbs)	Volume was intentionally assumed higher (75,000 MCLs) than the maximum on-site storage of 69,552 lamps in order to provide a conservative closure cost estimate (refer to Table 3-2 in Section 3 of this Report for full description of assumptions)
Processed / Crushed MCLs	Twenty-Eight (28) 55-gallon drums (14,000-lbs)	Assumed volumes based on maximum available on-site storage (refer to Table 3-2 in Section 3 of this Report for full description of assumptions)
Phosphor Powder (containing mercury)	Fifteen (15) 55-gallon drums (11,250-lbs)	
Clean Lamp Glass (cullet)	Twenty (20) 1-cubic yard containers (36,000-lbs)	
Clean Lamp Metals	Sixty (60) 55-gallon drums (45,000-lbs)	
Lamp Ballasts:		
Non-PCB Lamp Ballasts	Ten (10) 55-gallon drums (7,500-lbs)	Assumed volumes based on maximum available on-site storage (refer to Table 3-2 in Section 3 of this Report for full description of assumptions)
PCB Lamp Ballasts	Ten (10) 55-gallon drums (7,500-lbs)	
Batteries:		
Small type batteries	Twelve (12) 55-gallon drums (9,000--lbs)	Assumed volumes based on maximum available on-site storage (refer to Table 3-2 in Section 3 of this Report for full description of assumptions)
Large type batteries	One (1) 55-gallon drum (750 lbs)	

7.3 Decontamination Procedures

A detailed discussion of decontamination procedures is provided in **Appendix E** of this Report. A summary of the decontamination procedures is outlined below:

- **Facility Equipment:** If contamination is visually observed or suspected on equipment, the following steps will be taken to decontaminate the affected equipment:
 - Disassemble equipment if possible.
 - Wash thoroughly with ES7X® laboratory detergent (or approved equivalent) and hot tap water using a brush to remove any particulate matter or surface film.
 - Rinse thoroughly with deionized water and allow to air dry.
 - Using wipe samples confirm equipment is completely decontaminated.



- If laboratory results of wipe samples confirm equipment is clean, then proceed to next step. If results indicate equipment is still contaminated, repeat above steps as necessary until a clean confirmation is obtained.
- Wrap equipment completely with plastic ("shrink") wrap or containerize to prevent contamination during staging and transport.
- Area B Lamp Processing Room Equipment: The lamp process equipment and all associated components in the Lamp Processing Room (Area B) will be disassembled, cleaned, using the methods described above, and either sold to third parties for reuse, or as recycled scrap materials.
- Areas A, B, and C Surfaces: Wipe samples of all surfaces (including but not limited to floors, walls, and ceilings) will be collected from all material handling, processing, and staging areas (i.e., Areas A, B, and C) throughout the Facility and will be analyzed for mercury. If there are hazardous levels of mercury, the following steps will be followed to decontaminate:

For solid surfaces (including floors and half walls):

- Using a solution of deionized water and mercury cleaning chemicals (e.g., ES7X® or approved equivalent), wipe and mop affected surfaces.
- Take wipes samples and test subsequent to cleaning / decontamination efforts.
- If laboratory results of wipe samples confirm surface area is clean, then stop. If results indicate surface is still contaminated, repeat above steps as necessary until a clean confirmation is obtained. This step will be repeated until the areas have been tested clean.

For areas with batting / insulation (including ceilings and areas above half walls):

- If batting is intact, vacuum surface using a mercury HEPA / ULPA filtered vacuum (i.e., use only a mercury removal vacuum that has appropriate filters).
- Take wipe samples of the vacuumed surface to confirm if surface is clean.
- If laboratory results of wipe samples confirm surface is clean, then stop. If results indicate surface is still contaminated, repeat above steps as necessary until a clean confirmation is obtained.
- If batting is not intact, completely remove batting and containerize in lined 55-gallon drums. Transport drums using a licensed hazardous waste hauler to a facility authorized and permitted to receive such materials.
- Vacuum the exposed surface from where the batting was removed using the mercury HEPA / ULPA filtered vacuum that has been exposed from the area where batting was removed using a mercury HEPA / ULPA filtered vacuum (i.e., use only a mercury removal vacuum that has appropriate filters).
- Take wipe samples of the vacuumed surface in area where batting was removed to confirm if surface is clean.
- If laboratory results of wipe samples confirm surface is clean, then stop. If results indicate the surface is contaminated, repeat above steps as necessary until a clean confirmation is obtained.



- **All Other Areas:** If contamination is visually observed or suspected on other areas specifically not listed above, steps will be taken to decontaminate and clean the affected area using the appropriate methods described above (and detailed in **Appendix E**), and repeated as necessary until the affected area tests clean.

If contamination is not observed from sampling and testing activities (as outlined above and in **Appendix E**), the subject area(s) will be cleaned using the best available method for proper decontamination. The lamp processing and storage areas will be cleaned using a combination of wiping with water and vacuuming with a treated carbon system. Walls, floors, and other surfaces (electrical conduits, light switches, outlets, tops of suspended lighting fixtures, etc.) will be wiped, swept, vacuumed, and water or steam washed. If needed, solutions of dilute nitric acid, bleach, or degreasing compound will be used. The rinsate from washing will be collected, sampled, analyzed, and disposed of in accordance with all applicable regulations.

Confirmation of Sampling Plan for Structures, Equipment, Buildings and Outdoor Areas

Confirmation sampling and testing will be performed in accordance with the procedures outlined in the *Sampling and Testing Standard Operating Procedures* (see **Appendix E**). To ensure the Facility has been completely decontaminated, a series of wipe samples and tests will be performed. A detailed *Closure Sampling and Testing Plan* that would include the methods, sample location diagrams, and frequency for sampling and testing can be submitted to DEP in advance of beginning closure activities for review and approval.

Confirmation of Soil Sampling

Confirmation sampling and testing of soils will be performed in accordance with the procedures outlined in the *Sampling and Testing Standard Operating Procedures* (see **Appendix E**). Any areas determined to be contaminated will be overexcavated, containerized, and transported offsite by a licensed hazardous waste hauler to a RCRA Subtitle C landfill facility authorized and permitted to dispose of such materials. A detailed *Closure Sampling and Testing Plan* that would include the methods, sample location diagrams, and frequency for sampling and testing can be submitted to DEP in advance of beginning closure activities for review and approval.

Analytical Test Methods/Standards

Analytical methods for testing mercury or other contamination are the EPA (RCRA- SW 846) recommended methods. After decontamination, all process equipment, vehicles, drums, other containers will be removed from the building, and any waste materials, hazardous or non-hazardous will be managed in accordance with applicable regulations.

7.4 Closure Schedule

For purposes of this closure plan, a nominal date of twenty years from issuance of this permit has been chosen; therefore, the date for which closure activities would begin was assumed to be May 2032. Milestones for the completion of closure activities are listed in **Table 7-2** on the following page. The estimated time to complete closure is approximately four months. Therefore, the Facility does not foresee any problems complying with required closure timeframe of 180-days.



Table 7-2 Lighting Resources, LLC – Mercury Recovery Facility, Ocala, FL Closure Schedule		
Activity	Time to Complete	Assumptions
Notification given to FL-DEP that Facility will be closing	<i>(advance notice will be given prior to closure)</i>	<i>Conservatively assume a 60-day advance notice</i>
Facility Closure Activities Begin <u>May 1, 2032</u>:		
Final volume of processed materials and universal wastes transported offsite to other facilities for further processing, recycling, and/or disposal	Two weeks (10-days)	
Dismantling / dis-assembly of lamp process equipment	Two weeks (10- days)	Assumes 2-man crew on site
Decontamination of dismantled lamp process equipment, containers, floors, and walls (includes sampling and lab testing of rinsate)	Three weeks (15-days)	Assumes 2-man crew working 5-days on site + total of 10-days for lab testing
Sampling / testing of soils	Six (6) days	Assumes 1-person / 1-day on site to collect samples + total of 5-days for lab testing
Removal / transport of dismantled / decontaminated equipment and containers to a metal recycler	Two weeks (10-days)	
Removal / transport of contaminated materials / wastes (sample wipes, rinsate, filters, etc.) to a treatment / disposal facility	Two weeks (10-days)	
Conduct final site inspection, and prepare and submit Closure Certification Report to DEP	Three weeks (15-days)	
TOTAL CLOSURE TIME: 15-weeks and 1-day	CLOSURE COMPLETION DATE: Mid- to Late August 2032	

7.5 Closure Cost Estimate

The closure cost estimate for the Lighting Resources Facility has been prepared based on the following worst-case conditions:

- Maximum Facility storage volumes for all materials,
- All materials will be transferred off-site to a third party reclamation, treatment, recycling, or disposal facility,
- No salvage value for any decommissioned structures or equipment,
- Materials with potential economic value are assumed to have zero dollar value, and
- Decommissioning, decontamination, and sampling / testing will be performed by a third party consultant.



The closure cost estimate will be adjusted annually for inflation using DEP's inflation factors. Further, the closure cost estimate will be amended whenever there are changes in operating plans or Facility design that may affect the closure plan. The closure cost estimate is provided on **Table 7-3** on the following pages. The cost estimate electronic spreadsheet file with backup data is also provided in **Appendix F** (includes Excel spreadsheet file on disk and service provider pricing sheets).



TABLE 7-3 LIGHTING RESOURCES, LLC - OCALA, FL MERCURY RECOVERY FACILITY DEP PERMIT APPLICATION _ REVISION NO. [1] CLOSURE COST ESTIMATE (APRIL 2012)									
Line Item #	Description	Service Provider / RS Means		Units	Quantity	Unit Cost	Total Cost	Notes	
		Name	Location						
REMOVAL OF WASTE & RECYCLABLE MATERIAL INVENTORY: (assume worst cast scenario (i.e., maximum inventory))									
Mercury-Containing Lamps (MCLs):									
1	Unprocessed MCLs	Transport by Hauler (unlicensed) to DEP permitted mercury recovery / reclamation facility	HUB	Chicago, IL	semi-trailer	3	\$525.00	\$1,575	Conservatively assumed 75,000 T-12 / 4-ft lamps — however, the calculation of storage capacity yielded 69,552 lamps, and to be conservative in this cost estimate it was assumed that 75,000 lamps would need handling/ removal from site. HUB contracts locally with a transporter in Jacksonville, FL; 2.8 semi-trailer trucks needed based on calculation of 48 pallets per truck, 8 lamp boxes per pallet, 69 lamps per box, 552 lamps per pallet (69 x 8), 26,496 lamps per trailer -truck (552 lamps x 48 pallets); therefore the 3rd truck will have space for 9 addtl pallets. Contact- Evan Singley (with HUB) 630.437.6053
		Processing by DEP permitted mercury recovery / reclamation facility (cost is all incl.)	AERC Recycling Solutions	West Melbourne, FL	linear foot	300,000	\$0.035	\$10,500	75,000 T-12 / 4-ft lamps = (75,000 x 4 ft) = 300,000 linear feet
2	Processed: Crushed / Unintentially Broken MCLs	Transport by hazardous waste licensed hauler to an authorized, state permitted mercury recovery / reclamation facility	Freehold Cartage / RS Means	Bartow, FL	see note	see note	\$2,586.53	\$2,587	Twenty-Eight (28) 55-gallon drums will have to be transported. Freehold Cartage will most likely be used, however to be conservative the pricing for transportation was obtained from RS Means Environmental Remediation Cost Data (2006). The Means pricing was adjusted from 2006 dollars to 2012 dollars using DEP inflation factors (refer to DEP website). Assumed travel distance of 500 miles from Ocala, FL to Williamston, SC. The RS Means minimum shipping charge of \$2,587 (incl. inflation) - RS Means Cost Code #33-19-0202 was greater than the per mile charge of \$1,255 (\$2.47 per mile @ 500 miles, incl. inflation) - RS Means Cost Code #33-19-0213; therefore, the cost of \$2,587 was used. Refer to Excel File (for RS Means costs) saved on disk contained in Appendix F within the Engineering Report.
		Processing by an authorized, state permitted mercury recovery / reclamation facility (cost is all incl.)	Waste Management Lamp Tracker Inc.	Williamston, SC	lbs	14,000	\$1.05	\$14,700	Assume 500 lbs per 55-gal drum x 28 drums = 14,000 lbs.
3	Phosphor Powder	Transport by hazardous waste licensed hauler to DEP permitted mercury recovery / reclamation facility	Freehold Cartage	Bartow, FL	55-gal. drum	15	\$52.00	\$780	Minimum 9-drums per transport at \$50 per drum plus 4% surcharge fee (equals a total of \$52 per drum). Each drum assumed to weigh 750-lbs each. Freehold contact - Andrew / Mike Avery, 863.287.1830
		Processing by DEP permitted mercury recovery / reclamation facility (cost is all incl.)	Veolia Environmental Services	Tallahassee, FL	55-gallon drum	15	\$254.25	\$3,814	\$225 per drum plus 13% surcharge (equals a total of \$254.25 per drum)
4	Clean Glass Cullet (i.e., passes TCLP for Mercury)	Test material to confirm it passes TCLP for Mercury	Columbia Analytical Services	Jacksonville, FL	1-test per sample	4	\$40.00	\$160	EPA Method 7470; Columbia Analytical Services contacted for pricing at 1-800-695-7222
		Transport by Hauler to Marion County Baseline Landfill for disposal	Florida Express Environmental	Ocala, FL	1-cubic yard (CY) container (e.g., triply or gaylord box)	20	\$150.00	\$3,000	Florida Express Env. Contact - John Paglia at 352.369.5411 ext 205.
		Landfill Disposal at Marion County - Baseline Landfill	Baseline Landfill	Marion County, FL	ton	18	\$42.00	\$756	Marion County - Baseline Landfill charges a fee of \$42/ton. Based on published data, the unit weight of crushed cullet glass ranges from 1,000-lbs/cy to 1,800-lbs/cy; therefore to be conservative a 1-CY box was assumed to weigh 1,800-lbs (1-CY Box = 1,800-lbs). The total weight is therefore equal to: (20-boxes x 1,800-lbs/box) = 36,000-lbs or 18-tons.

TABLE 7-3 LIGHTING RESOURCES, LLC - OCALA, FL MERCURY RECOVERY FACILITY DEP PERMIT APPLICATION _ REVISION NO. [1] CLOSURE COST ESTIMATE (APRIL 2012)									
Line Item #	Description		Service Provider / RS Means		Units	Quantity	Unit Cost	Total Cost	Notes
			Name	Location					
5	<u>Recycled: Metal End Caps / Metal Comp.</u> (i.e., passes TCLP for Mercury)	<u>Test</u> material to confirm it passes TCLP for Mercury	Columbia Analytical Services	Jacksonville, FL	1-test per sample	4	\$40.00	\$160	TOTALL Metal Recycling provides free hauling of metal end caps and pays Lighting Resources a fixed dollar amount based on a buy-back agreement (ranges from \$5,800 to \$12,000 - - depending upon volume. Each drum assumed to weigh 750-lbs. PLEASE refer to Appendix F contained within the Engineering Report for a copy of a letter from TOTALL Metal Recycling to Lighting Resources, LLC , stating that in the event of Facility closure (LRL - Ocala, FL), TOTALL Metal Recycling will continue to take the materials (i.e., <u>metal end caps</u> , non-pcb ballasts, e-waste, dry-cell batteries and lead acid batteries) from Lighting Resources in Ocala, Florida at no cost. Contact - Matt VanDorn, phone number 618-877-0585.
		<u>Transport</u> by Hauler to an authorized metals reclaimer	TOTALL Metal Recycling	Granite City, IL	55-gallon drum	60	no charge	see note	
		<u>Metals Recycling</u> by authorized recycler / reclaimer	TOTALL Metal Recycling	Granite City, IL	55-gallon drum	60	no charge	see note	
Mercury-Containing Devices (MCDs):									
6	<u>MCDs: Thermometers, Thermostats, Switches, Relays and Manometers</u>	<u>Transport</u> by Hauler (unlicensed) to DEP permitted mercury recovery / reclamation facility	Veolia Environmental Services	Tallahassee, FL	55-gallon drum *	2	\$56.50	\$113	* \$50 per drum plus 13% energy and security surcharge (equals a total of \$56.50 per drum). Each drum assumed to weigh 750-lbs.
		<u>Processing</u> by DEP permitted mercury recovery / reclamation facility (cost is all incl.)	Veolia Environmental Services	Tallahassee, FL	55-gallon drum *	2	\$242.95	\$486	* \$215 per drum plus 13% energy and security surcharge (equals a total of \$242.95 per drum). Each drum assumed to weight 750-lbs.
Lead Acid Batteries:									
7	<u>Small / Other Type Batteries: Alkaline, Gel Cells, Lead Acid, Lithium-Ion, Magnesium, Mercury, Ni-Cad, Ni-MH, and Silver Oxide</u>	<u>Transport</u> by a licensed hazardous waste hauler to a facility permitted and authorized to receive and process such battery type materials	Freehold Cartage / RS Means	Bartow, FL	see note	see note	\$2,587.00	\$2,587	Twelve (12) 55-gallon drums will have to be transported. Freehold Cartage will most likely be used, however to be conservative the pricing for transportation was obtained from RS Means Environmental Remediation Cost Data (2006). The Means pricing was adjusted from 2006 dollars to 2012 dollars using DEP inflation factors (refer to DEP website and Excel File saved on disk in Appendix F in the Engineering Report). Assumed travel distance of 1,000 miles from Ocala, FL to Granite City, IL. The RS Means minimum shipping charge of \$2,587 (incl. inflation) - Cost Code #33-19-0202 was greater than the per mile charge of \$2,470 (\$2.47 per mile @ 1,000 miles, incl. inflation) - RS Means Cost Code #33-19-0238; therefore, the cost of \$2,587 was used. Refer to Excel File (for RS Means costs) saved on disk contained in Appendix F within the Engineering Report.
		<u>Metals Reclaimer</u> by a facility permitted and authorized to receive and process such battery type materials	TOTALL Metal Recycling	Granite City, IL	lbs	9,000	no charge	see note	Twelve (12) drums , each drum assumed weight of 750 lbs = (12 x 750 lbs) = 9,000 lbs. T PLEASE refer to Appendix F contained within the Engineering Report for a copy of a letter from TOTALL Metal Recycling to Lighting Resources, LLC , stating that in the event of Facility closure (LRL - Ocala, FL), TOTALL Metal Recycling will continue to take the materials (i.e., metal end caps, non-pcb ballasts, e-waste, <u>dry-cell batteries</u> and <u>lead acid batteries</u>) from Lighting Resources in Ocala, Florida at no cost. TOTALL Metal Recycling Contact - Matt VanDorn, phone number 618-877-0585.
8	<u>Automotive & Large Equipment Lead Acid Batteries</u>	<u>Transport</u> by a licensed hazardous waste hauler to a facility permitted and authorized to receive and process such battery type materials	Freehold Cartage / RS Means	Bartow, FL	55-gallon drum	1	no charge	see note	One (1) 55-gallon drum at 750-lbs will have to be transported. Assumed the 1-drum will be shipped with the "small" type battery drums (see Line Item # 7 above), shipped to Granite City, IL, and therefore the cost is covered in the Line Item #7 (above) for transport.
		<u>Metals Reclaimer</u> by a facility permitted and authorized to receive and process such battery type materials	TOTALL Metal Recycling	Granite City, IL	lbs	750	no charge	see note	PLEASE refer to Appendix F contained within the Engineering Report for a copy of a letter from TOTALL Metal Recycling to Lighting Resources, LLC , stating that in the event of Facility closure (LRL - Ocala, FL), TOTALL Metal Recycling will continue to take the materials (i.e., metal end caps, non-pcb ballasts, e-waste, <u>dry-cell batteries</u> and <u>lead acid batteries</u>) from Lighting Resources in Ocala, Florida at no cost. TOTALL Metal Recycling Contact - Matt VanDorn, phone number 618-877-0585.

TABLE 7-3 LIGHTING RESOURCES, LLC - OCALA, FL MERCURY RECOVERY FACILITY DEP PERMIT APPLICATION _ REVISION NO. [1] CLOSURE COST ESTIMATE (APRIL 2012)									
Line Item #	Description	Service Provider / RS Means		Units	Quantity	Unit Cost	Total Cost	Notes	
		Name	Location						
Light Ballasts:									
9	<u>Unprocessed PCB Light Ballasts</u>	<u>Transport</u> by a licensed hazardous waste hauler to a facility permitted and authorized to receive / process PCB Ballasts	Freehold Cartage / RS Means	Bartow, FL	see note	see note	\$3,211.00	\$3,211	Ten (10) 55-gallon drums will have to be transported. Freehold Cartage will most likely be used, however to be conservative the pricing for transportation was obtained from RS Means Environmental Remediation Cost Data (2006). The Means pricing was adjusted from 2006 dollars to 2012 dollars using DEP inflation factors (refer to DEP website and Excel File saved on disk in Appendix F of the Engineering Report). Assumed travel distance of 1,300 miles from Ocala, FL to TOTALL Metal Recycling in Granite City, IL (first stop, see below Non-PCB Ballasts, Line Item # 10) and to Wisconsin Ballast in Muskego, WI (second stop, PCB Ballasts Line Item #9). The RS Means per mile charge of \$3,211 - Cost Code #33-19-0240 (\$2.47 per mile @ 1,300 miles, incl. inflation) was greater than the minimum shipping charge of \$2,910 - Cost Code #33-19-0203 (see Excel File on disk for RS Means Costs located in Appendix F in the Engineering Report); therefore, the cost of \$3,211 was used.
		<u>Processing</u> by a facility permitted and authorized to receive / process PCB Ballasts	Wisconsin Ballast	Muskego, WI	lbs	7,500	\$0.36	\$2,700	Ten (10) 55-gal drums; assumed one (1) 55-gallon drum of ballast material weighs 750 lbs. ; total weight = (10 x 750) = 7,500 lbs. Unit cost assumes incineration.
10	<u>Unprocessed Non-PCB Light Ballasts</u>	<u>Transport</u> by a licensed hazardous waste hauler to a facility permitted and authorized to receive / process Non-PCB Ballasts	Freehold Cartage / RS Means	Bartow, FL	55-gallon drum	10	no charge	see note	Ten (10) 55-gal drums; assumed one (1) 55-gallon drum of ballast material weighs 750 lbs.; total weight = (10 x 750) = 7,500 lbs. Transport of the Unprocessed Non-PCB Light Ballasts will be combined in the same trailer truck with the transport of Unprocessed PCB Light Ballasts (Line Item # 9) since TOTALL Metal Recycling Facility located in Granite City, IL is en route to the Wisconsin Ballast facility located in Muskego, WI.
		<u>Processing</u> by a facility permitted and authorized to receive / process Non-PCB Ballasts	TOTALL Metal Recycling	Granite City, IL	lbs	7,500	no charge	see note	Ten (10) 55-gal drums; assumed one (1) 55-gallon drum of ballast material weighs 750 lbs. ; total weight = (10 x 750) = 7,500 lbs. PLEASE refer to Appendix F contained within the Engineering Report for a copy of a letter from TOTALL Metal Recycling to Lighting Resources, LLC , stating that in the event of Facility closure (LRL - Ocala, FL), TOTALL Metal Recycling will continue to take the materials (i.e., metal end caps, <u>non-PCB ballasts</u> , e-waste, dry-cell batteries and lead acid batteries) from Lighting Resources in Ocala, Florida at no cost, and provide free pickup of the metal end caps and non-PCB ballasts. TOTALL Metal Recycling Contact - Matt VanDorn, phone number 618-877-0585.
Subtotal:								\$47,128	
FACILITY DECOMMISSIONING & DECONTAMINATION:									
<u>Dis-Assembly & Salvage of BALCAN MP8000 Process Equipment</u> (list below)									
11	→ Dis-Assembly	Labor to dis-assemble and pack for later removal by metal reclaimer	Shaw Environmental	Winter Garden, FL	hours	160	\$65.00	\$10,400	2-man crew for 10-days; OSHA Level C PPE; decontamination labor and costs are below.
	→ Haul for Salvage	Transport and Reclamation by Metal Reclaimer	TOTALL Metal Recycling	Granite City, IL	see note	see note	no charge	see note	TOTALL Metal Recycling provides free hauling and pays Lighting Resources a fixed dollar amount based on buy-back agreement for all metal end cap materials and will pickup, transport, and recycle at no cost all equipment / metals.

TABLE 7-3 LIGHTING RESOURCES, LLC - OCALA, FL MERCURY RECOVERY FACILITY DEP PERMIT APPLICATION _ REVISION NO. [1] CLOSURE COST ESTIMATE (APRIL 2012)									
Line Item #	Description	Service Provider / RS Means		Units	Quantity	Unit Cost	Total Cost	Notes	
		Name	Location						
Removal & Decontamination of Any Hazardous Residue: (list below)									
12	→ Containers	Surface Wipe sampling to det w/ rinsate	Shaw Environmental	Winter Garden, FL	hours	16	\$80.00	\$1,280	2-man crew for 1-day; OSHA Level C PPE.
		Decontaminate w/ rinsate	Shaw Environmental	Winter Garden, FL	hours	20	\$80.00	\$1,600	2-man crew for 1-day; OSHA Level C PPE.
		Sample rinsate	Shaw Environmental	Winter Garden, FL	hours	2.5	\$80.00	\$200	20 samples by 2-man crew
		Test rinsate (lab cost)	Columbia Analytical Services	Jacksonville, FL	1-test per sample	20	\$40.00	\$800	EPA Method 7470; Columbia Analytical Services contacted for pricing at 1-800-695-7222
		Transport contaminated rinsate (leachate) by a licensed hazardous waste hauler to a Chemical Waste Landfill for disposal	Waste Management	Bartow, FL	55-gal. drum (\$65 /drum + \$150 pickup fee)	10	\$65.00	\$800	Ten (10) 55-gallon drums will have to be transported. Unit pricing of \$65 per 55-gallon drum plus ADDED a \$150 stop fee per pickup.
		Landfill Disposal of any contaminated rinsate (leachate) and other matls (e.g., rags, wipes, PPE, etc.).	Waste Management - Emelle Landfill	Emelle, AL	55-gallon drum (\$248 /drum + \$220 profile fees)	10	\$248.00	\$2,700	Ten (10) 55-gallon drums will have to be disposed of. Unit pricing of \$248 per 55-gallon drum (assumes half liquid + half rags) plus ADDED ADEM and WM Profile Fees of \$170 and \$50, respectively.
13	→ Equipment	Decontaminate w/ rinsate	Shaw Environmental	Winter Garden, FL	hours	20	\$80.00	\$1,600	2-man crew for 1-day; OSHA Level C PPE.
		Sample rinsate	Shaw Environmental	Winter Garden, FL	hours	2.5	\$80.00	\$200	20 samples by 2-man crew
		Test rinsate (lab cost)	Columbia Analytical Services	Jacksonville, FL	1-test per sample	20	\$40.00	\$800	EPA Method 7470; Columbia Analytical Services contacted for pricing at 1-800-695-7222
		Transport contaminated rinsate (leachate) by a licensed hazardous waste hauler to a Chemical Waste Landfill for disposal	Waste Management	Emelle, AL	55-gal. drum (\$65 /drum + \$150 pickup fee)	10	\$65.00	\$800	Ten (10) 55-gallon drums will have to be transported. Unit pricing of \$65 per 55-gallon drum plus ADDED a \$150 stop fee per pickup.
		Landfill Disposal of any contaminated rinsate (leachate) and other matls (e.g., rags, wipes, PPE, etc.).	Waste Management - Emelle Landfill	Emelle, AL	55-gallon drum (\$248 /drum + \$220 profile fees)	10	\$248.00	\$2,700	Ten (10) 55-gallon drums will have to be disposed of. Unit pricing of \$248 per 55-gallon drum (assumes half liquid + half rags) plus ADDED ADEM and WM Profile Fees of \$170 and \$50, respectively.
		14	→ Walls, Ceiling, & Floor	Decontaminate w/ rinsate	Shaw Environmental	Winter Garden, FL	hours	32	\$80.00
Sample rinsate	Shaw Environmental			Winter Garden, FL	hours	6	\$80.00	\$480	48 samples by 2-man crew
Test rinsate (lab cost)	Columbia Analytical Services			Jacksonville, FL	1-test per sample	48	\$40.00	\$1,920	EPA Method 7470; Columbia Analytical Services contacted for pricing at 1-800-695-7222
Transport contaminated rinsate (leachate) by a licensed hazardous waste hauler to a Chemical Waste Landfill for disposal	Waste Management			Emelle, AL	55-gal. drum (\$65 /drum + \$150 pickup fee)	34	\$65.00	\$2,360	Twenty-Four (24) 55-gallon drums will have to be transported. Unit pricing of \$65 per 55-gallon drum plus ADDED a \$150 stop fee per pickup.
Landfill Disposal of any contaminated rinsate (leachate) and other matls (e.g., rags, wipes, PPE, debris, insulation / batting - from walls and ceiling, etc.).	Waste Management - Emelle Landfill			Emelle, AL	55-gallon drum (\$248 /drum + \$220 profile fees)	34	\$248.00	\$8,652	Twenty-Four (24) 55-gallon drums will have to be disposed of. Unit pricing of \$248 per 55-gallon drum (assumes half liquid + half rags) plus ADDED Alabama-DEM and WM Profile Fees of \$170 and \$50, respectively.

TABLE 7-3 LIGHTING RESOURCES, LLC - OCALA, FL MERCURY RECOVERY FACILITY DEP PERMIT APPLICATION _ REVISION NO. [1] CLOSURE COST ESTIMATE (APRIL 2012)									
Line Item #	Description		Service Provider / RS Means		Units	Quantity	Unit Cost	Total Cost	Notes
			Name	Location					
15	→ Soils	<u>Sample</u> soil	Shaw Environmental	Winter Garden, FL	hours	10	\$80.00	\$800	1-person OSHA Level C PPE
		<u>Test</u> soil (lab cost)	Columbia Analytical Services	Jacksonville, FL	1-test per sample	6	\$40.00	\$240	EPA Method 7471; Columbia Analytical Services contacted for pricing at 1-800-695-7222
Preparation and Travel Time for Field Work (decontamination work)			Shaw Environmental	Winter Garden, FL	hours	16	\$80.00	\$1,280	2-man crew (includes developing a Health & Safety Plan and Work Plan for decontamination activities)
Field Supplies, Materials, Equipment (absorbent booms,Level C PPE HEPA vacuum, mercury vapor monitor, mercury vapor analyzer, power washer, etc.), and other Direct Expenses for decon. work			Shaw Environmental	Winter Garden, FL	lump sum	1	\$3,500.00	\$3,500	Wash the affected area with a mercury vapor suppression solution, such as HgX®
Removal of Decontaminated Containers & Equipment by Metal Reclaimer:									
Transport and Reclamation by Metal Reclaimer			TOTALL Metal Recycling	Granite City, IL	semi-trailers	3	no charge	see note	TOTALL Metal Recycling provides free hauling and pays Lighting Resources a fixed dollar amount based on buy-back agreement for metal end caps. TOTALL Metal Recycling provides trailer / containers on Site (i.e, at the Lighting Resources Ocala, FL Facility).
Subtotal:								\$45,672	
PREPARE CLOSURE CERTIFICATION REPORT:									
Prepare draft and final report			Shaw Environmental	Winter Garden, FL	hours	40	\$140	\$5,600	Assume final site inspection, write-up of field notes/reports, prepare two review drafts and one final draft for submission to DEP.
Subtotal:								\$98,400	
ADD 10% Contingency:								\$9,840	
TOTAL COSTS:								\$108,240	

7.6 Financial Assurance Mechanism

The financial assurance that has been established for the closure of the Facility is a Trust Fund Agreement (DEP Form # 62-730.900(4)(e)). A copy of the financial assurance form is provided in **Appendix G**. During the life of the Facility, the financial assurance will be revised / updated in accordance with permit modifications or changes in the closure cost estimate. Post-closure care is not included in the closure cost estimate since no wastes or waste residues will remain at the Facility after the closure activities are completed.

7.7 Closure Certification

Final closure of the Facility will be certified by the owner/operator and a third party professional engineer registered in the State of Florida. The closure certification will be submitted within 60 days of completion of closure activities. The third party engineer will be present during critical points of the closure and subsequent to completing all closure activities for a final site inspection.

The third party engineer will prepare a closure certification report for submittal to DEP. The certification report will contain the following documentation:

- Volume of waste and waste residue removed;
- Written description of the method of waste handling and transport;
- Copies of waste manifests, shipping papers, or bills of lading for the off-site treatment, recycling, or disposal of materials (i.e., wastes, waste residues, recoverable materials) removed from the site during closure;
- Written description of the decontamination, and sampling and testing methods used, including handling methods (i.e., containers, preservatives, ice chests, and chain of custody forms);
- Complete documentation of all analytical test results;
- Written chronological summary of closure activities and associated costs;
- Photographic documentation of closure activities;
- Written description of field tests performed, methods and results;
- Daily field logs; and
- Plan drawings of sample locations and any areas remediated pursuant to closure activities.



INSPECTION PLAN

This section presents in **Tables 8-1** and **8-2** (on following pages) a description of the items that will be routinely inspected, monitored, and maintained daily and on each operating shift. All inspections, monitoring, and maintenance activities will be documented using designated Facility recordkeeping forms contained in **Appendix D**. The inspection / monitoring / maintenance forms will include but not be limited to the following:

- General housekeeping in the various areas of the building (floors and equipment are clean),
- Material inventory and determination of retention times (ensure no materials retained for greater than 10 days),
- Visual inspection of containers for labels/dates and condition,
- Aisle spacing between storage/staging rows,
- Is the lamp storage / staging area arranged in accordance with the Plan,
- First aid stations fully stocked,
- Spill kits fully stocked,
- Worker safety inspection (personnel are wearing appropriate personal protective equipment, "PPE," and are conducting operations in accordance with all Facility Plans,
- Fire protection and control equipment is in working order and unobstructed / accessible,
- Visual inspection and repairs of floors, walls, ceilings for cracks and/or gaps,
- Inventory of necessary supplies (boxes, drums, filters, etc.),
- Air monitoring equipment for proper working order,
- Air monitoring readings collected in each area of the building,
- Routine maintenance of equipment, and
- Inspection, cleaning, and maintenance of all Facility equipment including but not limited to the Balcan Lamp Processing Equipment (e.g., removal of debris, replacement of belts, filters, and worn parts, etc.).

Inspections will be conducted daily to ensure that Facility operations are being conducted correctly and in a safe manner; all tools and equipment/machinery are in proper working order; all safety and emergency equipment are properly maintained and unobstructed; and the Facility is secure and undamaged. If inspections reveal any operational, safety or security issues, or any potential issues, the problems will be documented and corrective actions will be taken immediately.

All inspections and monitoring will be documented (on the appropriate forms) and signed by the personnel conducting them. Completed and signed forms will be maintained at the Facility for a minimum of three (3) years. All records will be made available to regulatory agencies upon request.





Table 8-1 Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL Inspection and Monitoring Schedule	
Inspection Item	Frequency
Monitoring Equipment:	
Air Emissions Monitoring Equipment	Every 2 Hours
Health and Safety:	
First Aid Kit Contents / Expiration Dates	Monthly
First Aid Kit Locations	Twice Daily
Spill Kit Contents / Expiration Dates	Monthly
Spill Kit Locations	Twice Daily
Wash Stations	Twice Daily
Spill Control Equipment: Brooms, Pans, HEPA / ULPA Vacuums, Absorbents	Twice Daily
Respirators	Twice Daily
Respirator Cartridges	Twice Daily
Emergency Contact List	Twice Daily
Emergency Shower and Eye Wash	Twice Daily
Hearing Protection	Twice Daily
Protective Eye Glasses	Twice Daily
Fire Extinguisher Status	Monthly or after each use
Fire Extinguisher Locations	Twice Daily
Telephone / Communication Devices	Twice Daily
Emergency Exits	Twice Daily
Facility Signs	Daily
Facility Security:	
Door Locks	Daily
Vehicle Locks	Daily
Security Fence and Gate	Daily
Log In / Log Out Procedures at Office	Twice Daily
Area A - Lamp Staging / Storage Area:	
Overall Cleanliness	Twice Daily
Floor Slab	Twice Daily
Signs	Twice Daily
Area Walls and Ceiling	Twice Daily
Aisle Space	Twice Daily
Pallets	Twice Daily



Table 8-1 Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL Inspection and Monitoring Schedule	
Inspection Item	Frequency
Container Condition	Twice Daily
Container Closures	Twice Daily
Containers Labeled , Dated, and Signed	Twice Daily
Container Stacking/Storage	Twice Daily
Containers Logged In	Twice Daily
Container Status / Retention Time	Twice Daily
Area A - Related Material Handling, Staging, and Management Areas:	
Overall Cleanliness	Twice Daily
Load /Unloading Areas,	Twice Daily
Battery Sorting / Staging Area	Twice Daily
Area Floors, Walls, and Ceiling	Twice Daily
Area B - Lamp Processing Room & Equipment Inspection and Maintenance:	
Overall Cleanliness	Twice Daily
Lamp Feed Table	Daily
Broken Glass	Daily
Conveyors	Daily
Conveyor Drawers (remove and empty)	Each Shift
Conveyor Belts (inspect for wear, damage, debris)	Weekly
Universal Rumbler Drawers (check, remove, empty)	Each Shift
Vibrating Flat Bed Grid (check and clear)	Daily
Flexible Pipework (inspected)	Daily
Internal Inspection (remove rumbler side panels)	Monthly
Fumbler Wheels	Daily
Panels	Daily
Floor Sweep	Daily
Tools & Flammables	Daily
Trash & Cardboard	Daily
Phosphor Powder Staging Area	Twice Daily
Floors, Walls, and Ceiling	Twice Daily
Area C – Processed Glass and Supply Storage Room:	
Overall Cleanliness	Daily
Floor Slab	Twice Daily

**Table 8-1
Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL
Inspection and Monitoring Schedule**

Inspection Item	Frequency
Signs	Twice Daily
Aisle Space	Twice Daily
Pallets	Twice Daily
Glass Container Condition	Twice Daily
Glass Container Closures	Twice Daily
Glass Containers Labeled & Dated	Twice Daily
Glass Container Stacking/Storage	Twice Daily
Glass Containers Logged In	Twice Daily
Glass Container Status / Retention Time	Twice Daily
Supply Storage and Inventory	Daily
Floors, Walls, and Ceilings	Twice Daily
Loading Dock Area:	
Overall Cleanliness	Daily
Drainage Grate and Sump	Daily
Pallets	Daily
Trash & Cardboard	Daily
Aisle Ways / Packaging Storage:	
Aisle Ways	Daily
Packaging Storage	Daily
Forklifts & Miscellaneous:	
Forklifts	Daily
Receiving & Production Workstation	Daily



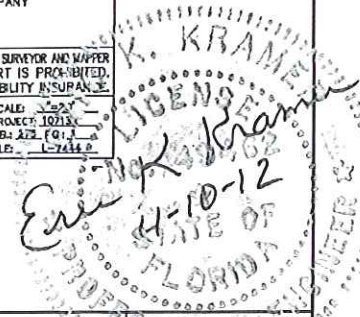
Table 8-2 Lighting Resources, LLC - Mercury Recovery Facility, Ocala, FL Shift Inspection	
Inspection Item	Inspection Frequency
Inventory	Each Shift
Daily Production Plan	Each Shift
Processed Materials	Each Shift
PPE Check and Violations	Each Shift
Spills	Each Shift
Incidents and Injuries	Each Shift
Employee Attendance	Each Shift



DRAWINGS

(11" X 17" AND 30" X 42")

- D1 Site Plat of Survey**
- D2 Site Plan**
- D3 Building Layout**
- D4 Lamp Process Equipment
Plan View**
- D5 Site Traffic**
- D6 Material Flow Diagram**
- D7 Facility Emergency and
Evacuation Plan**



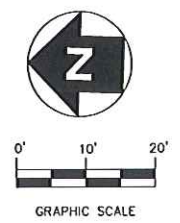
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REV. NO.	DATE	DESCRIPTION



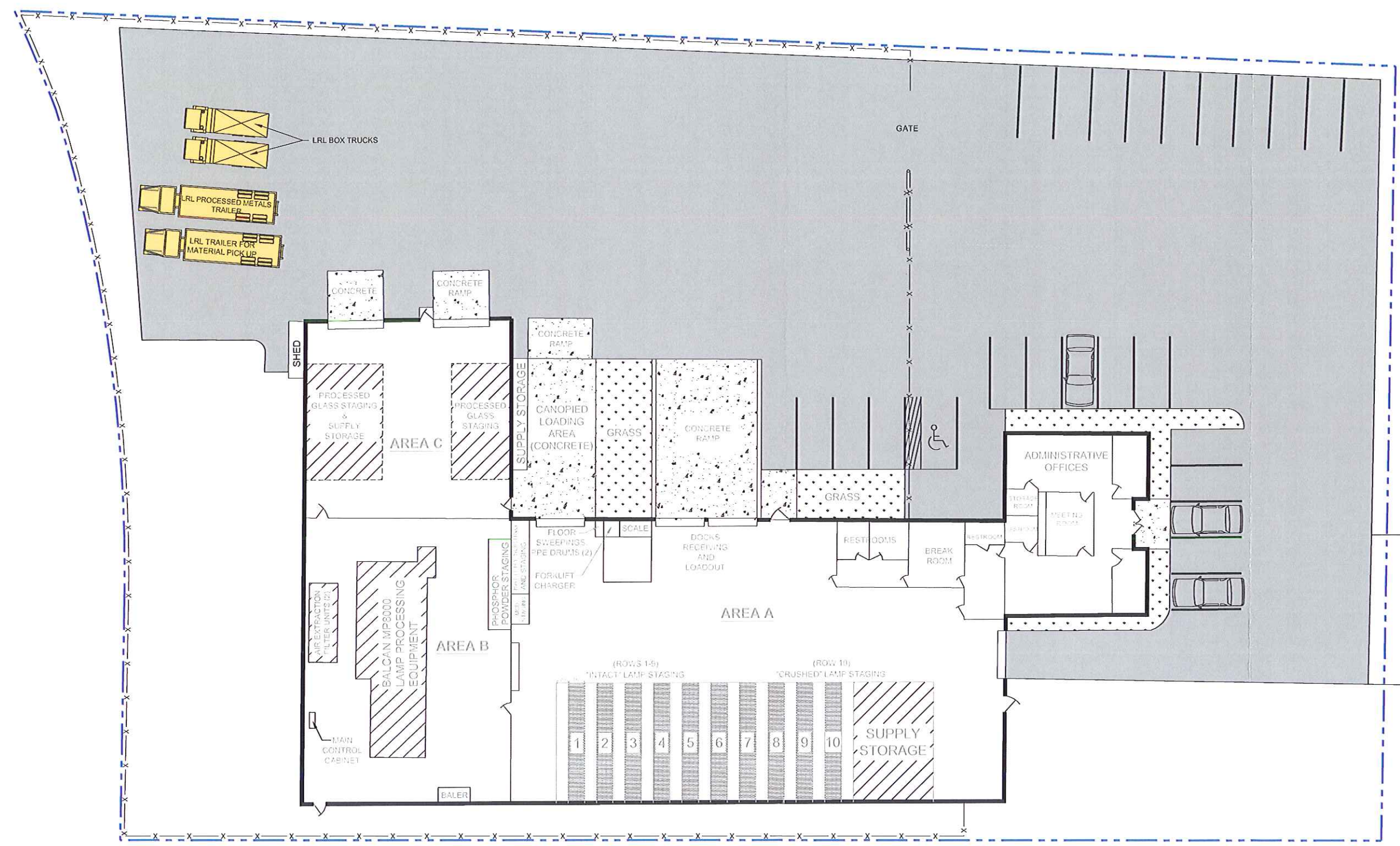
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DRAWN BY:	PEL	<div style="font-size: 48pt; font-weight: bold; text-align: center;">D1</div>	<div style="text-align: center;">1 OF 7 SHEETS</div>
CHECKED BY:	PCT		
APPROVED BY:	EKK		

D1



- LEGEND**
- PROPERTY BOUNDARY
 - FENCE
 - CONCRETE
 - GRASS
 - ASPHALT



SW 16TH LANE



REV. NO.	DATE	DESCRIPTION
1	4/2/2012	ADDED PARKED TRUCKS / TRAILERS, AND LIGHTING RESOURCES' LOGO.



LIGHTING RESOURCES, LLC - OCALA, FLORIDA
MERCURY RECOVERY FACILITY

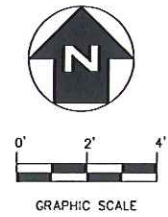
SITE PLAN

PROJ. NO.:	143925	DATE:	APRIL 2012
DESIGNED BY:	PCT	DRAWING NO.	D2
DRAWN BY:	PEL		
CHECKED BY:	PCT		
APPROVED BY:	EKK		

2 OF 7 SHEETS

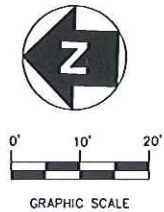


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CHECKED BY:	PCT		
APPROVED BY:	EKK		

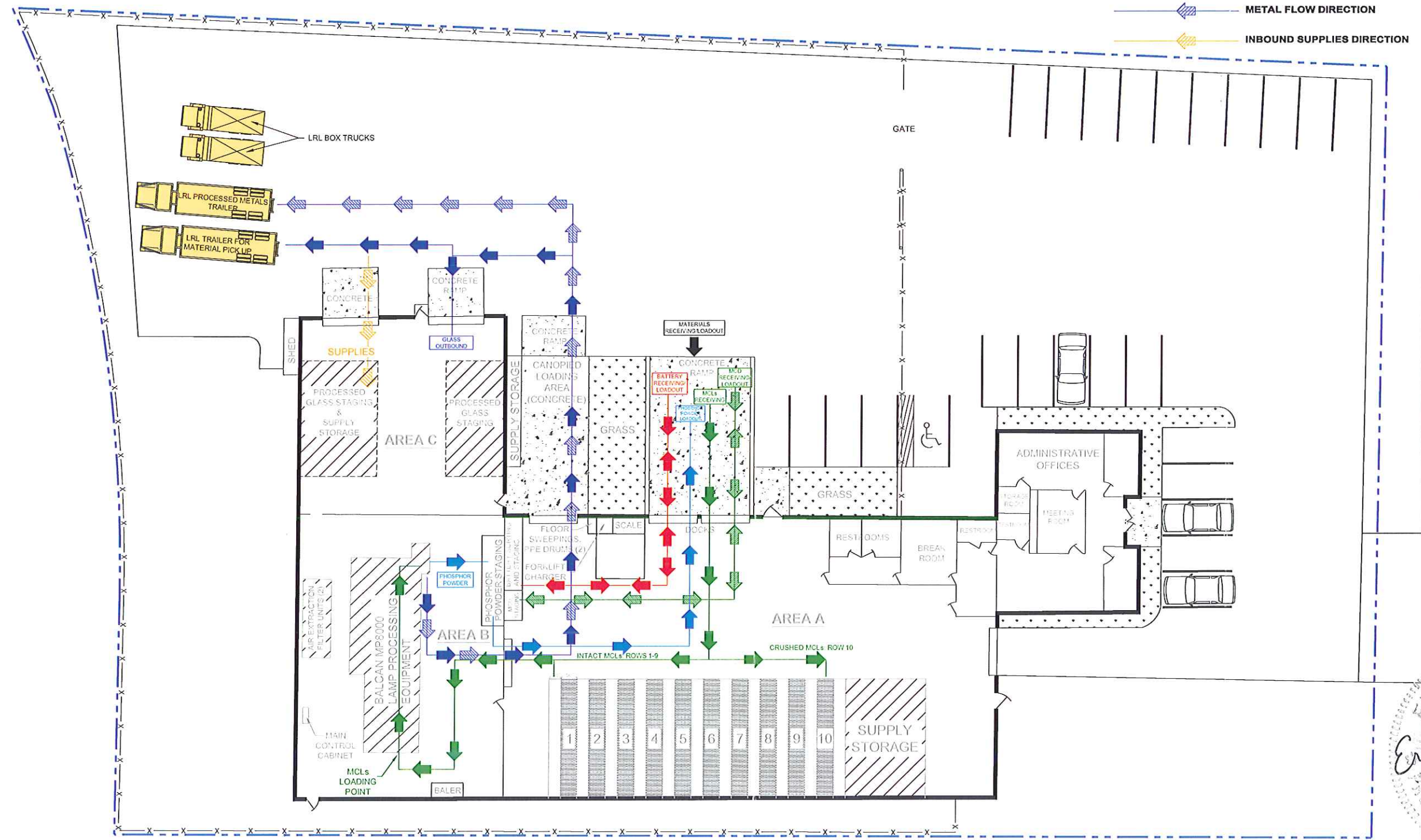


PROJ. NO.:	143925	DATE:	APRIL 2012
DESIGNED BY:	PCT	DRAWING NO.	<div style="font-size: 2em; font-weight: bold; text-align: center;">D4</div> <div style="text-align: center;">4 OF 7 SHEETS</div>
DRAWN BY:	PEL		
CHECKED BY:	PCT		
APPROVED BY:	EKK		





- LEGEND**
- PROPERTY BOUNDARY
 - FENCE
 - MCD FLOW DIRECTION
 - MCLs FLOW DIRECTION
 - PHOSPHOR FLOW DIRECTION
 - BATTERY FLOW DIRECTION
 - GLASS FLOW DIRECTION
 - METAL FLOW DIRECTION
 - INBOUND SUPPLIES DIRECTION



SW 15TH LANE

APR 10 2012

PROFESSIONAL ENGINEER

1	4/2/2012	ADDED PARKED TRUCKS / TRAILERS, AND LIGHTING RESOURCES' LOGO.
REV. NO.	DATE	DESCRIPTION



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

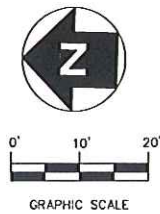


LIGHTING RESOURCES, LLC - OCALA, FLORIDA
MERCURY RECOVERY FACILITY

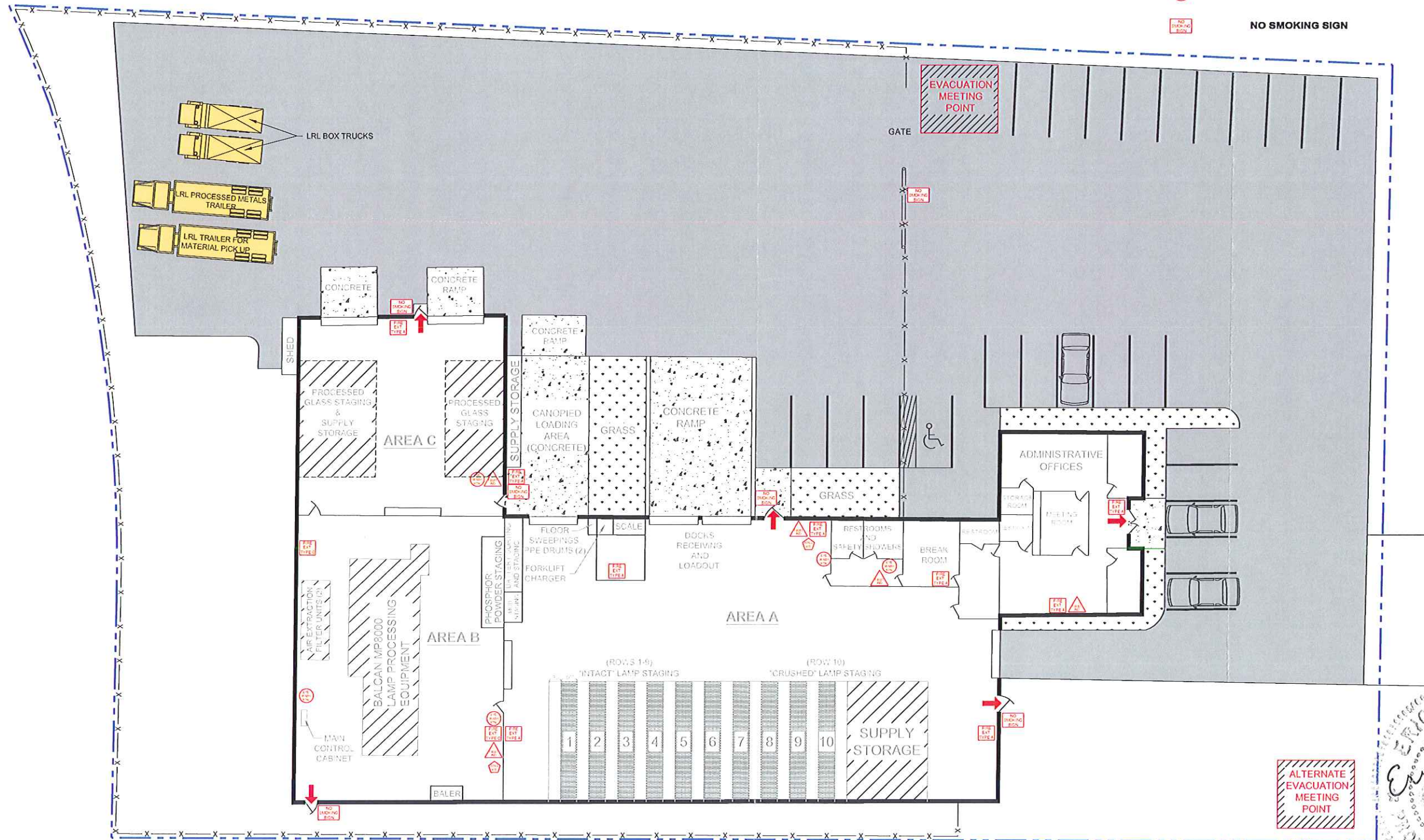
MATERIAL FLOW DIAGRAM

PROJ. NO.:	143925	DATE:	APRIL 2012
DESIGNED BY:	PCT	DRAWING NO.:	D6
DRAWN BY:	PEL		
CHECKED BY:	PCT		
APPROVED BY:	EKK		6 OF 7 SHEETS

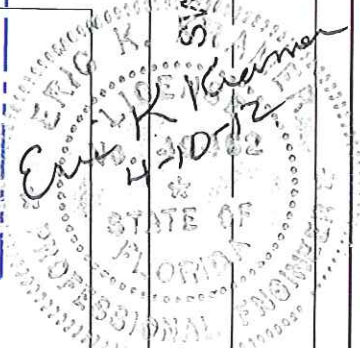
T:\Projects\2011\1435 Lighting Resources LLC\Drawings\FINAL DRAWING SET\07 EMERGENCY AND EVACUATION PLAN.dwg 2012 4:05:53 PM



- LEGEND**
- PROPERTY BOUNDARY
 - FENCE
 - EMERGENCY EXITS
 - FIRE EXTINGUISHER
 - FIRST AID BOX
 - MERCON SPILL KIT™
 - EYE WASH LOCATIONS
 - NO SMOKING SIGN



SW 16TH LANE



1	4/2/2012	ADDED EYE WASH STATIONS, SAFETY SHOWERS, NO SMOKING SIGNS, EVACUATION MEETING POINTS, PARKED TRUCKS / TRAILERS, AND LIGHTING RESOURCES' LOGO.
REV. NO.	DATE	DESCRIPTION



LIGHTING RESOURCES, LLC
OCALA, FLORIDA



LIGHTING RESOURCES, LLC - OCALA, FLORIDA
MERCURY RECOVERY FACILITY

FACILITY EMERGENCY AND EVACUATION PLAN

PROJ. NO.:	143925	DATE:	APRIL 2012
DESIGNED BY:	PCT	DRAWING NO.	D7
DRAWN BY:	PEL		
CHECKED BY:	PCT		
APPROVED BY:	EKK		7 OF 7 SHEETS

APPENDIX A

OTHER FACILITY PERMITS

- A.1 AIR GENERAL PERMIT REGISTRATION**
- A.2 HAZARDOUS WASTE TRANSPORTER
CERTIFICATE OF APPROVAL**
- A.3 LARGE QUANTITY HANDLER OF
UNIVERSAL WASTE REGISTRATION**

A.1 AIR GENERAL PERMIT REGISTRATION

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DIVISION OF AIR
RESOURCE MANAGEMENT

DIVISION OF AIR
RESOURCE MANAGEMENT

VOLUME REDUCTION, MERCURY RECOVERY OR MERCURY RECLAMATION
AIR GENERAL PERMIT EXAMPLE REGISTRATION WORKSHEET

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Facility Identification Number - If known (seven digit number)

0830171-001

DIVISION OF AIR
RESOURCE MANAGEMENT

Registration Type

Check one:

INITIAL REGISTRATION - Notification of intent to:

- ☒ Construct and operate a proposed new facility.
- ☐ Operate an existing permitted facility not currently using an air general permit (e.g., a facility proposing to go from an air operation permit to an air general permit). If the facility currently holds one or more air operation permits, such permit(s) must be surrendered by the owner or operator upon the effective date of this air general permit. (See "Surrender of Existing Air Operation Permit(s)" below.)
- ☐ Operates an existing facility not currently permitted or using an air general permit.

RE-REGISTRATION (for facilities currently using an air general permit) - Notification of intent to:

- ☐ Continue operating the facility after expiration of the current term of air general permit use.
- ☐ Continue operating the facility after a change of ownership.
- ☐ Make an equipment change requiring re-registration pursuant to Rule 62-210.310(2)(e), F.A.C.
- ☐ Any other change not considered an administrative correction under Rule 62-210.310(2)(d), F.A.C.

Surrender of Existing Air Operation Permit(s) - For Initial Registrations Only, if Applicable

All existing air operation permits for this facility are hereby surrendered upon the effective date of this air general permit; specifically permit number(s):

N/A

General Facility Information

Facility Owner/Company Name (Name of corporation, agency, or individual owner who or which owns, leases, operates, controls, or supervises the facility.)

Lighting Resources LLC

Site Name (Name, if any, of the facility site; e.g., Plant A, Metropolis Plant, etc. If more than one facility is owned, a complete registration must be submitted for each.)

Facility Location (Physical location of the facility, not necessarily the mailing address.)

Street Address: 1007 SW 16th Lane

City: Ocala

County: Marion

Zip Code: 34471-1228

Facility Start-Up Date (Estimated start-up date of proposed new facility.)(N/A for existing facility.)

Filed as LQH Transfer facility 3-1-2011, anticipated Mercury recovery permit by 01-01-2012.

Facility Contact

Name and Position Title (Plant manager or person to be contacted regarding day-to-day operations at the facility.)

Print Name and Title: Bonnie Bishop-Clark - Branch Manager

Facility Contact Telephone Numbers

Telephone: 352-509-3001

Fax: 352-509-3012

Cell phone: 904-881-2229

E-mail: bonnie@lightingresourcesinc.com

Facility Contact Mailing Address

Organization/Firm: Lighting Resources LLC

Mailing Address: 1007 SW 16th Lane

City: Ocala

County: Marion Zip Code: 34471 - 1228

Other Contact/Representative (to serve as additional Department contact)

Name and Position Title

Print Name and Title: Heath Clark

Other Contact/Representative Telephone Numbers

Telephone: 352-509-3001

Fax: 352-509-3012

Cell phone: 404-291-5291

E-mail: heath@lightingresourcesinc.com

Other Contact/Representative Mailing Address

Organization/Firm: Lighting Resources LLC

Mailing Address: 1007 SW 16th Lane

City: Ocala

County: Marion Zip Code: 34471 - 1228

Government Facility Code (check only one)

- ☐ Facility not owned or operated by a federal, state, or local government.
- ☐ Facility owned or operated by the federal government.
- ☐ Facility owned or operated by the state.
- ☐ Facility owned or operated by the county.
- ☐ Facility owned or operated by the municipality.
- ☐ Facility owned or operated by a water management district.

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REVENUE

Type of Process

Check all that apply:

- ☐ Volume Reduction
- ☒ Mercury Recovery
- ☐ Mercury Reclamation

Dual Air Handling Systems

For facilities with dual air handling systems pursuant to Rule 62-96.417(1)(c), F.A.C., provide a description of the primary and secondary air handling systems (i.e., number, type and capacity of filters). List the make and model numbers of the air pollution control equipment on the primary and secondary air handling systems. Also, list the type of adsorbent used, the number and location of filters, and the filter capacity and replacement frequency. Attach additional pages if necessary.

Per manufacturer,

The air handling system comprises of (2) Dantherm Filtration Airmaster air extractor units. Each unit extracts approximately 2800m³ air per hour. Each unit is connected to its own activated carbon vessel which contains 2000 pounds of sulfur based carbon @ 20%.

Each extractor contains (6) filters which are polyester pleated with a PTFE coating. The life of these filters is 12-24 months depending on throughput and climate.

The carbon vessels remove mercury vapor to 0.0001 mg/m³. An average 5 plus year lifespan of the carbon is anticipated.

In addition, is attached a description from the MP8000 manufacturer.

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Helpful Definitions

“Department” or “DEP” - The State of Florida Department of Environmental Protection.

“Emissions Unit” - Any part or activity of a facility that emits or has the potential to emit any air pollutant.

“Facility” - All of the emissions units which are located on one or more contiguous or adjacent properties, and which are under the control of the same person (or persons under common control).

“Mercury Reclamation Process” - A facility where operations or processes are performed or equipment is used to receive and recapture mercury from spent lamps, mercury-containing devices, mercury-containing materials or residuals, or pourable, commodity grade mercury materials and that can demonstrate, using a quality control plan approved in accordance with Chapter 62-160, F.A.C., and an EPA analytical test method for determining the total mercury content of a waste material, an effective reclamation rate of at least 99% of the mercury introduced into its process or a resulting total mercury concentration remaining in the processed material that is below the method detection limit; and by which a commercial grade of mercury is produced for recycling.

“Mercury Recovery Process” - A facility where operations or processes are performed or equipment is used to receive and process spent mercury-containing lamps or devices for the purpose of crushing or dismantling and separating the lamps or devices in a manner as to produce: separated, individual recyclable components such as glass and scrap metal; and mercury-containing phosphor powder, ampoules or other mercury-containing residuals which will be processed at a mercury reclamation facility for the purpose of reclamation of the mercury.

“OSHA” - United States Occupational Safety and Health Administration.

“Owner” or “Operator” - Any person or entity who or which owns, leases, operates, controls or - supervises an emissions unit or facility.

“Volume Reduction Process” - A facility where operations or processes are performed or equipment is used to receive and process spent mercury-containing lamps or devices in a manner such as crushing, grinding, compacting, or physically altering the state of the lamps or devices and which does not produce separation of the residuals, and is used for the size or volume reduction of lamps or mercury-containing devices.

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ENVIRONMENTAL PROTECTION
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REVENUE

MP8000 Lamp Recycling Plant Emissions

Correctly designed lamp recycling plants should operate under negative pressure to reduce emissions of mercury vapour into the workplace. Whilst there should be zero emissions of mercury from a lamp recycling system this is not always the case and therefore these are required under laws to be kept to a minimum level.

Balcan lamp recycling systems use air extraction filter units to draw off all mercury bearing phosphor powder and vapour from the contents of the lamps down to less than 5 micron size. These ensure the plant operates at negative pressure. All mercury bearing vapours pass through the filters and are ducted to the Main Carbon Filter Stack. The vessel contains approximately 2 cubic metres of Sulphur based Activated Carbon, with which the mercury reacts and allows the exhausted air to be mercury free and ducted to atmosphere.

Balcan's philosophy is to work as close to zero emissions as possible and by using a single large carbon vessel we are able to achieve consistently low to zero results. We believe the advantage of a single vessel is in economies of scale with an improved lifetime expectancy of the carbon, over using smaller 'barrel' filters. Using one large high flow, annular carbon vessel, gives a much greater surface area with maximum throughput and removal of mercury from the vapour stream. Through years of regular monitoring you will also be able to see when the emissions start to increase, albeit very slowly, indicating the carbon is beginning to reach its capacity. Due to the size of the vessel this will give the ability of being able to schedule a carbon replacement service before permissible limits are reached. We believe that when using smaller filters the time between levels beginning to increase and saturation can happen quickly and can lead to unnecessary loss of production when not having the time to schedule carbon replacement.

Maximum permissible emissions from exhaust 0.025mg/m³

Typical emissions from Balcan MP8000 - 0.0001 - 0.002mg/m³

Estimated lifespan of carbon – 5 years based on throughput of 5-10 Million lamps per year.

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D-1b. Daily Operations Procedural Review.

The Operations Manager will prepare a Daily Activities Report (Appendix D-1) that summarizes all materials received, inventoried and staged for processing, materials shipped off-site, and processed. This daily report will also provide, as a minimum, twice-daily mercury vapor readings taken throughout the facility, records of daily inspections, equipment inspections, and general housekeeping. Additionally, the facility manager submits a daily PULSE report (Appendix D-2) to the Company President detailing facility performance based upon the manager's morning walk-through inspection.

D-1c. Training.

The Operations Manager will maintain a master training calendar (Appendix D-3) that lists and tracks completion of all required training for RCRA, OSHA and USDOT compliance. Monthly classes are scheduled in conjunction with scheduled safety meetings.

D-1d. Equipment Performance.

Equipment performance is monitored on a daily basis. Visual and audible keys are the primary indicators that the machinery is functioning as designed. Visual inspection of the discharge of glass readily identifies malfunctions. The Balcan MP800 cleans the lamp glass to a standard unmatched by any other like purposed equipment currently in use by any other mercury recovery facility. Reduction in glass clarity or excessive lamp metals mixed in the glass discharge provides immediate equipment status feedback.

As mentioned previously, mercury vapor levels as indicted by the Jerome Model 431X Mercury Vapor Analyzer provides indications regarding filter and filtration efficiency and effectiveness. Vapor level readings are taken and recorded at least twice daily. Significant vapor increases above those normally associated with process, ambient air temperature increases, and experience require special inspections to determine the cause and any necessary repairs or adjustments. An equally sensitive equipment efficiency analysis tool is the weekly composite sample laboratory test results. Significant increases of residual mercury levels on the lamp glass or metals may indicate equipment deficiencies that warrant investigation and possible repair.

Lighting Resources uses the Jerome Model 431X Mercury Vapor Analyzer as its premier mercury vapor detection device. All employees are trained in its use and adjustment. This device requires annual calibration and parts replacement. Lighting Resources will return the meter to the Arizona Instruments Company for the necessary maintenance and calibration within the manufacturers' recommended service interval and will maintain the appropriate calibration and service records on site.

**A.2 HAZARDOUS WASTE TRANSPORTER
CERTIFICATE OF APPROVAL**



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

HAZARDOUS WASTE TRANSPORTER CERTIFICATE OF APPROVAL

This is to certify that the carrier specified below has been approved as a hazardous waste transporter in Florida. The terms and conditions of this certificate require that the holder comply with all applicable portions of Chapter 62-730, Florida Administrative Code. This certificate shall be rendered null and void if any information contained within becomes obsolete. The certificate shall remain valid through the expiration date specified below.

TRANSPORTER: Lighting Resources LLC

FACILITY ID NO: FLR000070565

FACILITY ADDRESS: 1007 SW 16th Ln
Ocala, FL 34474

INSURANCE CARRIER: ACE AMERICAN INSURANCE

INSURANCE POLICY#: H08416266005

EFFECTIVE DATE: October 01, 2011

EXPIRATION DATE: October 01, 2012

APPROVED TRANSFER FACILITY: NO

APPROVAL ISSUED BY: _____ DATE: November 10, 2011

Aprilia Graves
Engineering Specialist IV
Hazardous Waste Regulation Section
850/245-8755

A.3 LARGE QUANTITY HANDLER OF UNIVERSAL WASTE REGISTRATION



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard, Jr.
Secretary

03/02/2011

Brian Anderson
Lighting Resources LLC
1007 SW 16th Lane
Ocala, FL 34471-

The Florida Department of Environmental Protection has reviewed your application for registration as a transporter or handler for universal waste lamps and devices destined for recycling. Based on the information received, the facility located at **1007 SW 16th Lane, Ocala, FL 34474-3529** has been registered through **March 1, 2012** with the following status:

Facility ID # **FLR000070565**

Transporter of Universal Waste Lamps and Devices

Large Quantity Handler Facility for Universal Waste Lamps and Devices

The registration form for the year **2012** will be sent to the contact person on your application.

Chapter 62-737, Florida Administrative Code (F.A.C.), (copy enclosed) specifies several other requirements including packaging, training and record keeping for transporters and handlers of and reverse distribution programs for universal waste lamps or devices destined for recycling. These requirements are simple, flexible and make good business and environmental sense (summarized on enclosed fact sheets).

This registration does not allow you to transport or handle universal waste lamps or devices which are destined for landfill or other disposal. The transportation or handling of universal waste lamps or devices destined for disposal is subject to our hazardous waste management regulations under Chapter 62-730, F.A.C.

If any of your facility's information on the Universal Waste Lamp and Device Transporter and Handler Registration Form changes, please notify me at Mail Stop 4555 at the address above. I can also be contacted at (850) 245-8759 or at Laurie.Tenace@dep.state.fl.us.

Sincerely,

Laurie Tenace
Environmental Specialist
Hazardous Waste Management Section

Enclosures

APPENDIX B

PHOTOGRAPHIC LOGS

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	E. Kramer	Date of Photos:	9/13/2011



Photo No. 1 Front of Site looking north at south wall of Area A (Lamp Staging and Supply Storage) and Administrative Offices to the right of Area A.



Photo No. 2 Front of Site looking northeast at Administrative Offices and guest parking area.

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	E. Kramer	Date of Photos:	9/13/2011



Photo No. 3

Front of Site looking north along western edge of Site property with adjacent property (located to the west of Site) shown on the left.



Photo No. 4

Southeast area of Site looking northwest at employee parking area, eastern edge of Administrative Offices and Facility Building, and receiving / loading docks in background (on the the right).

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	E. Kramer	Date of Photos:	9/13/2011



Photo No. 5

Southeast area of Site looking north to northwest at employee parking area, eastern edge of Facility Building, receiving / loading docks, site fencing, canopied area with empty drum storage, and 3-parked trailers for loadout of processed glass and metals.



Photo No. 6

Southeast area of Site looking northwest at eastern edge of Facility Building, receiving / loading docks, site fencing, and canopied area.

Photographic Record

Client: Lighting Resources, LLC **Site Name / Location:** Lighting Resources, LLC / Ocala, FL

Project No.: 143925 **Photos Taken by:** E. Kramer **Date of Photos:** 9/13/2011



Photo No. 7

Close-up photo of receiving / loading dock bay (east side of Facility Building).



Photo No. 8

Close-up photo of canopied area along east side of Facility Building showing empty drum storage on the right.

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	E. Kramer	Date of Photos:	9/13/2011



Photo No. 9

Northeast corner of Facility Building looking west at Area C overhead doors on east side of building.



Photo No. 10

Looking west along north side of Facility Building (north wall of Area C; around the corner from area shown in Photo No. 9, above).

Photographic Record

Client: Lighting Resources, LLC **Site Name / Location:** Lighting Resources, LLC / Ocala, FL

Project No.: 143925 **Photos Taken by:** E. Kramer **Date of Photos:** 9/13/2011



Photo No. 11

Parked trailers for processed glass and metals located in northeast corner of Site.



Photo No. 12

Northwest corner of Site looking south along west side of Facility Building and Site property (fencing on the right).

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	E. Kramer	Date of Photos:	9/13/2011



Photo No. 13 Northeast corner of Area A showing battery sorting and staging area along Area A north wall on left, and overhead door to outdoor canopied area on right.



Photo No. 14 Southwest corner of Area A showing supply storage and south overhead door.

Photographic Record

Client: Lighting Resources, LLC

Site Name / Location: Lighting Resources, LLC / Ocala, FL

Project No.: 143925

Photos Taken by: E. Kramer

Date of Photos: 9/13/2011



Photo No. 15

Close-up of supply storage in Area A southwest corner.



Photo No. 16

Looking at west wall of Area A in northwest corner. Common wall between Areas A and B shown on far right.

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	E. Kramer	Date of Photos:	9/13/2011



Photo No. 17

Looking north at north wall of Area A (also common wall between Areas A and B.



Photo No. 18

Looking northwest at northwest corner of Area B (Lamp Processing Room) showing sealed floor. Lamp processing equipment was not installed at time of photo.

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	E. Kramer	Date of Photos:	9/13/2011



Photo No. 19

Looking northeast at northeast corner of Area B (Lamp Processing Room) showing sealed floor, north wall and east / common wall and access door between Areas B and C.

Photographic Record

Client: Lighting Resources, LLC

Site Name / Location: Lighting Resources, LLC / Ocala, FL

Project No.: 143925

Photos Taken by: H. Clark

Date of Photos: 12/1/2011



Photo No. 20

Looking at the west wall, northwest corner, and portion of north wall of Area A. Photo shows supplies in foreground and material rows and aisles in background.



Photo No. 21

Looking at the west wall, southwest corner, and portion of south wall of Area A. Photo shows supplies in background and material rows and aisles in foreground.

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	H. Clark	Date of Photos:	12/1/2011



Photo No. 22

Looking in a southeasterly direction in the Area B – Lamp Processing Room, Photo shows the Balcan MP8000 equipment primary processing unit in foreground, secondary processing unit immediately behind, cleaning/sorting unit on far left in photo, and overhead ductwork that pulls vapors and powder to air filtration units (not shown, would be on left hand side)..



Photo No. 23

Looking in a northeasterly direction in the Area B – Lamp Processing Room. Photo shows the Balcan MP8000 equipment secondary processing unit, hydraulic drum lift on left and rumbler on right.

Photographic Record

Client: Lighting Resources, LLC		Site Name / Location: Lighting Resources, LLC / Ocala, FL			
Project No.:	143925	Photos Taken by:	H. Clark	Date of Photos:	12/1/2011



Photo No. 24

Looking in a southerly direction in the Area C – Processed Glass and Supply Storage Room.

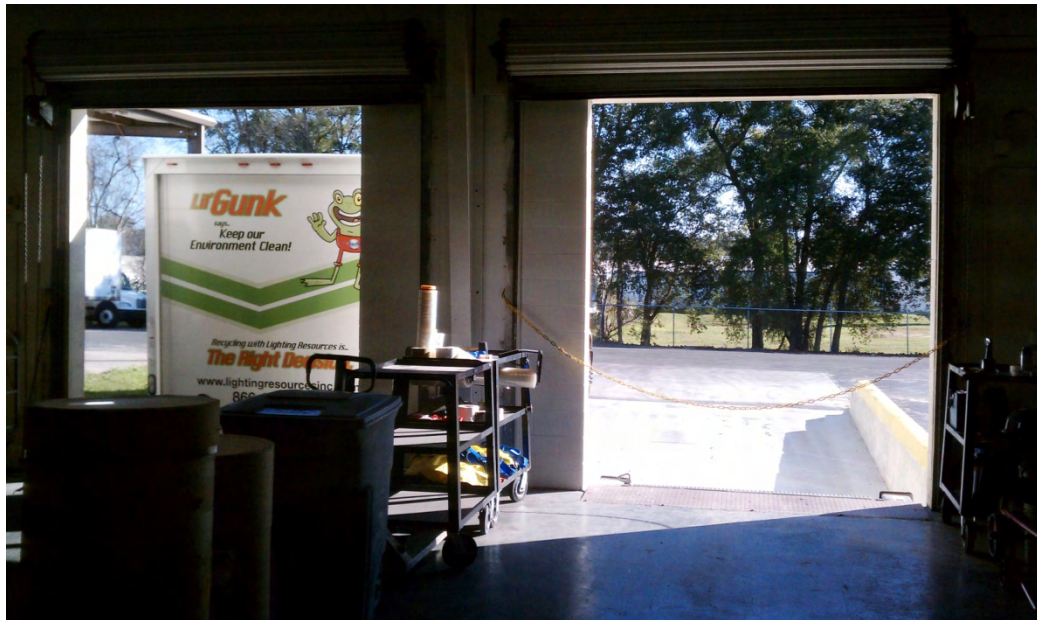


Photo No. 25

Looking in an easterly direction at the Area A overhead doors and material receiving/loadout docks.

APPENDIX C

EQUIPMENT / MANUFACTURER SPECIFICATIONS

- C.1 CRACKBOND JF311 JOINT FILLER**
- C.2 TILE-CLAD COATINGS**
- C.3 MP8000 BALCAN EQUIPMENT**
- C.4 AIR FILTERS**
- C.5 ANALYTICAL TEST DATA FOR
PROCESSED LAMP MATERIALS**
- C.6 ES7X® MSDS**
- C.7 HgX® MSDS**

C.1 CRACKBOND JF311 JOINT FILLER

1. Product Name

Crackbond JF311 Polyurea Heavy Duty Joint Filler

2. Manufacturer

Adhesives Technology Corp.
450 East Copans Road
Pompano Beach, FL 33064
(800) 892-1880
(954) 782-2221
Fax: (800) 362-3320
E-mail: info@atc.ws
Web Address: www.atc.ws

3. Product Description

GENERAL DESCRIPTION

Crackbond JF311 is a two component, rapid curing 1:1 ratio, Polyurea Joint Filler designed for heavy duty traffic and freezer applications. It is a self leveling, 100% solids, low viscosity, flexible system that provides 10-15% movement of installed joint width. **Crackbond JF311** can be used at temperatures between -40°F - 120°F.

Quick Selection Guide	
Coverage (22 oz cart)	1/4" joint x 2" depth 6.7 feet
Gel-Time (72°)	3 min.
Cure Time (72°)	90 min.
Application Temperature Range	-40°F. – 120°F.

BASIC USE

Crackbond JF311 is used to fill interior control joints or new construction saw joints on horizontal concrete surfaces. **Crackbond JF311** is designed for industrial floor applications receiving heavy duty vehicle traffic. **Crackbond JF311** can be used in exterior applications, when minimal joint movement from thermal cycling will occur. With a very rapid cure time, repaired joints can be opened to traffic in 90 minutes (at 72°F).

LIMITATIONS: **Crackbond JF311** is not intended for joints that are subject to high movement. **Crackbond JF311** is a moisture sensitive product prior to full cure. Joints must be clean and dry to facilitate a strong bond.

COLOR

"A" Component (ISO): Amber

MIXED: Concrete Gray

"B" Component (Poly): Gray

SOLIDS: Weight: 100% Volume: 100%

SHELF LIFE: 18 Months

STORAGE STABILITY: Product must be stored in unopened containers at 60°F – 90°F.

SIZE/PACKAGING

Cartridge Sizes: **Crackbond JF311** is available in:

- 9 oz. cartridges; part number: A9-JF311HN
- 22 oz. cartridges; part number: A22-JF311

The resin and hardener are uniformly dispensed from a dual cartridge system and mixed simultaneously through a mixing nozzle, providing installers with a self mix delivery system.

SYSTEM REQUIREMENTS:

System Size	9 oz.	22 oz.
Product:	A9-JF311HN	A22-JF311N
Dispensers (air):	N/A	TA22HD
(manual):	TM9HD	TM22HD
Nozzle:	T12HGR	T12

Bulk Sizes: **Crackbond JF311** is also available in:

- 10 gallon kit; part number; B10GM-JF311

Due to rapid gel-time, bulk sizes only recommended for pump applications.

4. Technical Data

Technical Data		
Properties	ASTM	Results
Tensile Strength (psi)	D412	1,200 psi
Elongation	D412	82 %
Bond Strength (psi)	C882	400 psi
Shore A Hardness	D2240	75 – 80A
Adhesion to Concrete (psi)	D4541	275 psi
Abrasion Resistance	Excellent	
Viscosity of Resin (ISO component)	600 cps at 77°F.	
Viscosity of Hardener (POLY Component)	460 cps at 77°F.	
Gel-Time / Cure Time	3 minutes (100 gram mass / 90 minutes	
Note: Higher temperatures and larger quantities will shorten the gel-time. Lower temperatures and smaller quantities will lengthen the gel-time.		

Manufactured In The U.S.A. by Adhesives Technology Corp.

Sample Specification – Joint filler material shall be a two component, 1:1 ratio, 100% solids polyurea system supplied in a two component side by side cartridge and dispensed through a static mixing nozzle supplied by the manufacturer. The polyurea material must have a tensile strength of 1,200 psi and an elongation of 82%, per ASTM D412. Cured adhesive shall have a Shore A hardness of 75 – 80A as per ASTM D2240. Adhesive shall be **Crackbond JF311** manufactured by Adhesives Technology Corp., Pompano Beach, Florida.

5. Installation

Job site preparation and work flow – to achieve the desired results, carefully follow these procedures!

- Make sure the joints are prepared in advance before starting a new cartridge. If at all possible, schedule dispensing to consume an entire cartridge at one time with no interruption of material flow.

SYSTEM REQUIREMENTS		
System Size	9 oz.	22 oz.
Product:	A9-JF311HN	A22-JF311N
Dispensers (air):	N/A	TA22HD
(manual):	TM9HD	TM22HD
Nozzle:	T12HGR	T12

Note, the T12 mixer nozzle is the correct mixer for this product.

The 9 oz cartridge is packaged with the T12 Mixer nozzle.

The 22 oz cartridge is packaged with the T12 Mixer nozzle.

Dual Cartridge Joint Filler Application Instructions – Joint Preparation and Cartridge Set up

JOINT PREPARATION:

Remove all dust, debris, oil and any other contamination from the construction and/or saw cut joints. For best results re-cut joints with a dry diamond blade. Joints must be clean and dry. Install material into joint so that material is slightly higher than the face of the concrete. Allow Crackbond JF311 to set for approximately 45 minutes (at 75° F.) then use a sharp 8" wall scraper to shave excess material from top of slab.

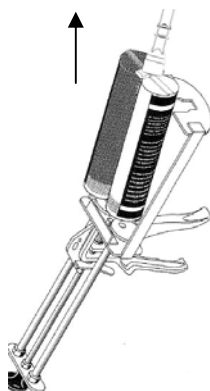
CARTRIDGE SET-UP:

While preparing cartridge for dispensing, keep cartridge in upright position to prevent material from leaking out of cartridge. Do not tilt cartridge until material is to be applied to the repair area.

IMPORTANT: During set-up of cartridge (purging air and equalizing) and initial dispensing of material, keep cartridge and nozzle assembly pointed straight up. **AFTER** purging/equalizing and initial shot of material, always keep cartridge and nozzle pointed downward to prevent material in nozzle from flowing back into cartridge.

I. Shake cartridge vigorously for 60 seconds, then stand cartridge upright for 5 minutes.

II. Insert cartridge into dispenser. Make sure it is properly positioned with shoulder of cartridge flush with front/top bracket of the dispenser. Remove plastic cap from the top of the cartridge. **IMPORTANT!** Before attaching nozzle, dispense a small amount of material into a disposable container until both materials flow evenly from cartridge. Place nozzle onto cartridge and secure by threading in a clock-wise direction. Make sure that the nozzle and cartridge assembly is secure.



III. Point nozzle straight up and slowly apply pressure to dispenser, moving product up through the nozzle until it reaches the tip, then dispense 1 stroke of material into a rag (1-2 quick bursts if using an air tool). After purging and balancing always point cartridge downward when not dispensing to prevent mixed material in the nozzle from flowing back into the cartridge.



Repairing Small Joints and/or Cracks in Concrete

IV. Place the mixing nozzle directly over the crack, joint or repair area. Dispense material using full smooth trigger pulls (no short choppy strokes) and allow material to gravity feed into the crack/joint. Over-fill the crack/joint so that material is slightly higher than the face of the concrete slab you are repairing.

V. Allow the Crackbond JF311 to set for approximately 45 minutes (at 75° F.) then use a sharp 8" wall scraper to shave excess material from top of slab.

VI. Allow material to fully cure before subjecting repaired area to any type of traffic.

Manufactured In The U.S.A. by Adhesives Technology Corp.

CRACKBOND JF311 CHEMICAL RESISTANCE CHART

Chemical (Reagent)	Recommended For Continuous Service	Limited Recommendation (Occasional Spills)
Acetic Acid (10%)	X	
Acetone		X
Bleach		X
Bleach (10%)	X	
Citric Acid (5%)	X	
Crude Oil	X	
Motor Oil		X
Gasoline		X
Diesel Fuel	X	
Skydrol		X
Hydraulic Oil	X	
Ethylene Glycol		X
Fatty Acids	X	
Water (Room Temperature)	X	
NaCl (10%)	X	
Hydrochloric Acid (10%)	X	
Lactic Acid (5%)	X	
Methyl Ethyl Ketone		X
Nitric Acid (1%)	X	
Phosphoric Acid (10%)	X	
Sodium Hydroxide (20%)	X	
Sulfuric Acid (20%)	X	
Toluene		X
Urea (50%)	X	
Vinegar	X	
Xylene		X

This chart is intended as an aid in evaluating the performance of the JF311 in various chemical exposures at 75°F. The data is intended as a guide only. In severe or combination exposures, a sample should be tested under actual or simulated use conditions to determine suitability.

Manufactured In The U.S.A. by Adhesives Technology Corp.

COVERAGE CHART

9 oz. – 22 oz. – 128 oz (Gallon)



Bulk packaging should be mixed/dispensed from a metering pump

Joint Size	Lineal Feet/Gallon	Lineal Feet per 9 oz Cartridge	Lineal Feet per 22 oz cartridge
1/8" x 1"	154.0	10.3	26.7
1/8" x 1-1/4"	123.2	8.3	21.3
1/8" x 1-1/2"	102.7	6.9	17.8
1/8" x 1-3/4"	88.0	5.9	15.2
1/8" x 2"	77.0	5.2	13.3
3/16" x 3/4"	136.9	9.2	23.7
3/16" x 1"	102.7	6.9	17.8
3/16" x 1-1/4"	82.1	5.5	14.2
3/16" x 1-1/2"	68.4	4.6	11.9
3/16" x 1-3/4"	58.7	3.9	10.2
3/16" x 2"	51.3	3.4	8.9
1/4" x 1"	77.0	5.2	13.3
1/4" x 1-1/4"	61.6	4.1	10.7
1/4" x 1-1/2"	51.3	3.4	8.9
1/4" x 1-3/4"	44.0	3.0	7.6
1/4" x 2"	38.5	2.6	6.7
1/2" x 1"	38.5	2.6	6.7
1/2" x 1-1/4"	30.8	2.1	5.3
1/2" x 1-1/2"	25.7	1.7	4.4
1/2" x 1-3/4"	22.0	1.5	3.8
1/2" x 2"	19.3	1.3	3.3

BUILDING CODES

Installation of Crackbond products must comply with applicable local, state and national code requirements.

SITE CONDITIONS

Material shall be delivered in original unopened containers and stored in a dry environment at a temperature between 60° and 90°F.

PRECAUTIONS

- Wear safety glasses
- Avoid prolonged contact with skin.
- Keep out of reach of children
- Do not take internally
- If Ingested seek medical attention immediately.
- Eye contact. Flush with water for at least 15 minutes. Call a physician immediately.

6. Availability and Cost

AVAILABILITY

Crackbond products are available through select distributors who can provide you with all of your construction needs. Please contact Adhesives Technology Corp. at (800) 892-1880 for a distributor near you.

COST

Cost information is available from your local distributor.

7. Warranty

All warranties of the product listed herein, in the corresponding ATC catalog, and in any other current literature, expressed or implied, including warranties of merchantability and fitness for a particular purpose are specifically and expressly excluded, with the following exception: At its sole discretion, ATC will repair or replace any product which it considers to be defective in material or workmanship, excepting normal wear and tear within sixty (60) days from the date of purchase from ATC. ATC shall not be liable for any injury, loss or damage, direct, indirect, incidental or consequential or arising out of use of, misuse of, negligence, accident or inability to use any ATC product.

8. Technical Services

For technical support contact Adhesives Technology Corp. at (800) 892-1880.

9. Maintenance

None required.

10. Filing System

Additional product information and specifications are available either on line at www.atc.ws or contact Adhesives Technology at (800) 892-1880 to get copies mailed to you.

Actual user performance and data may differ due to variations of base material, installation procedures and personnel, weather conditions and other factors. Adhesives Technology Corp. reserves the right to change specifications or information printed in this Tech Data Sheet without notice or liability for these changes. Adhesives Technology Corp. will not be liable for any claim based on the use of data or other information printed in this Tech Data Sheet.

Manufactured In The U.S.A. by Adhesives Technology Corp.

C.2 TILE-CLAD COATINGS



Protective & Marine Coatings

TILE-CLAD® HIGH SOLIDS

PART A
PART B
PART B
PART B

B62Z
B60VZ70
B60VZ75
B60VZX70

SERIES
GLOSS HARDENER
EG-SHEL HARDENER
MR GLOSS HARDENER

Revised 12/10

PRODUCT INFORMATION

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PRODUCT DESCRIPTION

TILE-CLAD HIGH SOLIDS is a low VOC, two-package, epoxy-polyamide coating for use in industrial maintenance environments and high performance architectural applications.

- Chemical resistant
- Abrasion resistant
- Low VOC
- B60VZX70 Hardener - resists film attack by mildew
- Outstanding application properties

PRODUCT CHARACTERISTICS

Finish:	Gloss and Eg-Shel
Color:	Wide range of colors available, including safety colors
Volume Solids:	56% ± 2%, mixed, may vary by color
Weight Solids:	70% ± 2%, mixed, may vary by color
VOC (EPA Method 24):	Unreduced: <400 g/L; 3.33 lb/gal mixed Reduced 10%: <413 g/L; 3.44 lb/gal
Mix Ratio:	1:1 by volume

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	4.0 (100)	7.0 (175)
Dry mils (microns)	2.5 (63)	4.0 (100)
~Coverage sq ft/gal (m²/L)	225 (5.5)	359 (8.8)
Theoretical coverage sq ft/gal (m²/L) @ 1 mil / 25 microns dft	896 (21.9)	

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 4.0 mils wet (100 microns):

	@ 55°F/13°C	@ 77°F/25°C 50% RH	@ 110°F/43°C
To touch:	3 hours	1 hour	20 minutes
Tack free:	6 hours	2 hours	30 minutes
To recoat:			
minimum:	6 hours	2 hours	30 minutes
maximum:	30 days	30 days	30 days
To stack:	18 hours	16 hours	3 hours
To cure:	21 days	14 days	7 days
<i>If maximum recoat time is exceeded, abrade surface before recoating.</i>			
<i>Drying time is temperature, humidity, and film thickness dependent.</i>			
Pot life:	4 hours	4 hours	2 hours
Sweat-in-time:	1 hour	30 minutes	10 minutes

Shelf Life:	36 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C).
Flash Point:	92°F (33°C), PMCC, mixed
Reducer/Clean Up:	Reducer #54, R7K54-Spray R6K25-Brush & Roll

RECOMMENDED USES

For use over prepared substrates such as steel, galvanizing, and concrete in industrial environments.

- Laboratories
 - Masonry surfaces
 - Offshore structures
 - Storage tanks
 - Structural & support steel
 - Institutional kitchens
 - DOE Nuclear Fuel Facilities
 - DOE Nuclear Weapons Facilities
 - Chemical processing equipment
 - Institutional & commercial wall coating
 - Suitable for use in USDA inspected facilities
 - Conforms to AWWA D 102, OCS #5
 - Acceptable for use in high performance architectural applications.
 - Conforms with MPI # 77
 - This product meets specific design requirements for non-safety related nuclear plant applications in Level II, III and Balance of Plant, and DOE nuclear facilities*.
- Lavatories
 - Power plants
 - Schools
 - Marine applications
 - Clean rooms
 - Nuclear Power Plants
 - Nuclear fabrication shops

* Nuclear qualifications are NRC license specific to the facility.

PERFORMANCE CHARACTERISTICS

Substrate*: Steel

Surface Preparation*: SSPC-SP6/NACE 3

System Tested*:

- 1 ct. Recoatable Epoxy Primer @ 4.0 - 6.0 mils (100-150 microns) dft
- 1 ct. Tile-Clad HS @ 3.0 mils (25 microns) dft

*unless otherwise noted below

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load	80 mg loss
Accelerated Weathering - QUV	ASTM D4587, QUV-A, 5,000 hours	Passes
Adhesion	ASTM D4541	1050 psi
Corrosion Weathering	ASTM D5894, 10 cycles, 3336 hours	Rating 9 per ASTM D610 for rusting; Rating 10 per ASTM D714 for blistering
Nuclear Decontamination	ASTM D4256/ANSI N 5.12	99% Water Wash; 95% Overall
Direct Impact Resistance	ASTM D2794	95 in. lb.
Dry Heat Resistance	ASTM D2485	200°F (93°C)
Exterior Durability	1 year at 45° South	Excellent, chalks
Flexibility	ASTM D522, 180° bend, 1/4" mandrel	Passes
Moisture Condensation Resistance	ASTM D4585, 100°F (38°C), 1000 hours	Passes, no blistering, rust, or delamination
Pencil Hardness	ASTM D3363	F-H
Radiation Tolerance	ASTM D4082 / ANSI 5.12	Pass
Salt Fog Resistance	ASTM B117, 2,500 hours	Rating 10 per ASTM D610 for rusting; Rating 10 per ASTM D714 for blistering

Epoxy coatings may darken or yellow following application and curing. Provides performance comparable to products formulated to federal specification: TT-C-535B



Protective & Marine Coatings

TILE-CLAD® HIGH SOLIDS

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PRODUCT INFORMATION

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RECOMMENDED SYSTEMS

	Dry Film Thickness / ct.	
	Mils	(Microns)
Steel, Epoxy Primer:		
1 ct. Recoatable Epoxy Primer	4.0-6.0	(100-150)
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)
Steel, Universal Primer:		
1 ct. Kem Bond HS	2.0-5.0	(50-125)
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)
Steel, Acrylic Primer:		
1 ct. Pro-Cryl WB Universal Primer	2.0-4.0	(50-100)
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)
Steel, Epoxy Mastic Primer:		
1 ct. Epoxy Mastic Aluminum II	4.0-6.0	(100-150)
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)
Aluminum:		
1 ct. DTM Wash Primer	0.7-1.3	(18-32)
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)
Concrete Block:		
1 ct. Heavy Duty Block Filler	10.0-18.0	(250-400)
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)
Galvanized Metal:		
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)
Poured Concrete/Tilt-Up Concrete Smooth (including floors):		
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)
Wood, including floors:		
1-2 cts. Tile-Clad High Solids	2.5-4.0	(63-100)

The systems listed above are representative of the product's use, other systems may be appropriate.

DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

* Iron & Steel: SSPC-SP2
* Aluminum: SSPC-SP1
Galvanizing: SSPC-SP1
Concrete & Masonry: SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3
Wood, interior: Clean, smooth, dust free
* Primer required

Surface Preparation Standards

	Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	.
	Pitted & Rusted	D St 2	D St 2	SP 2	.
	Rusted	C St 3	C St 3	SP 3	.
Power Tool Cleaning	Pitted & Rusted	D St 3	D St 3	SP 3	.

TINTING

Tint Part A with Maxitoner colorants or Blend-A-Color Toner at 200% strength into Part A. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

APPLICATION CONDITIONS

Temperature: 55°F (13°C) minimum, 110°F (43°C) maximum (air, surface, and material)
At least 5°F (2.8°C) above dew point
Relative humidity: 85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:
Parts A & B: 1 gallon (3.78L) and 5 gallon (18.9L) containers
Weight: 10.78 ± 0.2 lb/gal ; 1.3 Kg/L mixed, may vary by color

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.



Protective & Marine Coatings

TILE-CLAD® HIGH SOLIDS

PART A B62Z
PART B B60VZ70
PART B B60VZ75
PART B B60VZX70

SERIES
GLOSS HARDENER
EG-SHEL HARDENER
MR GLOSS HARDENER

Revised 12/10

APPLICATION BULLETIN

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SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Iron & Steel

Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6/NACE 3, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). Prime any bare steel within 8 hours or before flash rusting occurs. Primer Required.

Aluminum

Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1. Primer Required.

Galvanized Steel

Allow to weather a minimum of six months prior to coating. Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1. When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

Concrete and Masonry

For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3. Surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 28 days @ 75°F (24°C). Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Steel-Seam FT910.

Wood

Surface must be clean, dry and sound. Remove any oils and dirt from the surface using a degreasing solvent or strong detergent. Sand to remove any loose or deteriorated surface wood and to obtain a proper surface profile. Prime with recommended primer and paint as soon as possible. No painting should be done immediately after a rain or during foggy weather. Knots and pitch streaks must be scraped or sanded and spot primed before full coat of primer is applied. All nail holes or small openings must be properly caulked.

Surface Preparation Standards

Condition of Surface	ISO 8501-1 BS709:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal	Sa 3	Sa 3	SP 5	1
Near White Metal	Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast	Sa 2	Sa 2	SP 6	3
Brush-Off Blast	Sa 1	Sa 1	SP 2	4
Hand Tool Cleaning	C St 2	C St 2	SP 2	-
Rusted	D St 2	D St 2	SP 2	-
Pitted & Rusted	C St 3	C St 3	SP 3	-
Rusted	D St 3	D St 3	SP 3	-
Power Tool Cleaning	D St 3	D St 3	SP 3	-

APPLICATION CONDITIONS

Temperature: 55°F (13°C) minimum, 110°F (43°C) maximum
(air, surface, and material)
At least 5°F (2.8°C) above dew point

Relative humidity: 85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reducer/Clean UpReducer #54, R7K54, R6K25

Airless Spray

Pressure.....2400 psi
Hose.....3/8" ID
Tip019"
Filter60 mesh
Reduction.....R7K54 as needed up to 10% by volume

Conventional Spray

GunBinks 95
Fluid Nozzle66
Air Nozzle.....69 PB
Atomization Pressure.....60 psi
Fluid Pressure.....20 psi
Reduction.....R7K54 as needed up to 10% by volume

Brush

Brush.....Nylon/Polyester or Natural Bristle
Reduction.....R6K25 as needed up to 10% by volume

Roller

Cover1/4"-3/8" " woven with solvent resistant core
Reduction.....R6K25 as needed up to 10% by volume

If specific application equipment is not listed above, equivalent equipment may be substituted.



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APPLICATION BULLETIN

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APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly with low speed power agitation. Make certain no pigment remains on the bottom of the cans. Then combine one part by volume of Part A with one part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated. Re-stir before using.

If reducer solvent is used, add only after both components have been thoroughly mixed, after sweat-in.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	4.0 (100)	7.0 (175)
Dry mils (microns)	2.5 (63)	4.0 (100)
~Coverage sq ft/gal (m ² /L)	225 (5.5)	359 (8.8)
Theoretical coverage sq ft/gal (m ² /L) @ 1 mil / 25 microns dft	896 (21.9)	

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 4.0 mils wet (100 microns):

	@ 55°F/13°C	@ 77°F/25°C 50% RH	@ 110°F/43°C
To touch:	3 hours	1 hour	20 minutes
Tack free:	6 hours	2 hours	30 minutes
To recoat:			
minimum:	6 hours	2 hours	30 minutes
maximum:	30 days	30 days	30 days
To stack:	18 hours	16 hours	3 hours
To cure:	21 days	14 days	7 days

If maximum recoat time is exceeded, abrade surface before recoating.

Drying time is temperature, humidity, and film thickness dependent.

Pot life:	4 hours	4 hours	2 hours
Sweat-in-time:	1 hour	30 minutes	10 minutes

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer #54, R7K54. Clean tools immediately after use with Reducer #54, R7K54. Follow manufacturer's safety recommendations when using any solvent.

DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Do not apply the material beyond recommended pot life.

Do not mix previously catalyzed material with new.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer #54, R7K54.

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

Quik-Kick Epoxy Accelerator is acceptable for use. See data page 4.99 for details.

Insufficient ventilation, incomplete mixing, miscatalyzation, and external heaters may cause premature yellowing.

Excessive film build, poor ventilation, and cool temperatures may cause solvent entrapment and premature coating failure.

Refer to Product Information sheet for additional performance characteristics and properties.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

C.3 MP8000 BALCAN EQUIPMENT

Balcan MP8000 Information Pack

At Balcan we believe our recycling systems are the best in the world, offer the best return on investment, as well as user experience. We also believe that when making an investment in such equipment it is important to know how much things cost. The true cost of purchasing this type of equipment from other manufacturers can significantly increase with add-ons, which are not supplied as standard. Balcan lamp recycling systems process many different types of lamps, as well handling crushed lamps and drums of lamps, so we do not have these extra add-ons. Our simple pricing structure makes calculating your return on investment easy. We also offer a return on investment analysis, whereby we calculate the return on investment through our customized spreadsheet. If you would like to take advantage of this all we require is the typical price per lamp you charge as well as anticipated quantities.

Enclosed in this package is:

1. General Description of MP8000
2. MP8000 sections
3. Installation & Commissioning
4. Warranty
5. Assembly prior to shipment
6. Equipment for provision by client
7. Floor plan – also available electronically for use with CAD drawing packages for accurate scaling.
8. CE Certificate
9. Utility Requirements
10. Spares & Servicing
11. Output fraction details
12. Emissions
13. MP8000 Specifications



BALCAN GAINED MILLENNIUM PRODUCTS STATUS FOR THREE DESIGNS
HYPODERMIC NEEDLE AND SYRINGE DESTRUCTOR
PNEUMATIC SPLITTER FOR EMPTYING PLASTIC VIALS
BELL-Q THROWING LINE FOR EMERGENCY WATER RESCUE
Directors J H T Rinfret, E M Rinfret, A J Rinfret, J P Rinfret & M A Rinfret
Company Registration N° 1037378



General Description for MP8000 Lamp Recycling Plant

The Balcan MP6000 Lamp Recycling Plant has a capacity to process in 5,000 x 4ft fluorescent tubes per hour (between 8 and 10 million per annum) on the basis that whole lamps are readily available close to the feeding hopper to be fed into the crusher mounted onto it. Pre-crushed lamps in drums as well as whole smaller lamps can be loaded directly into the secondary multipurpose unit and can increase the throughput.

The whole plant fits in an area of 11m x 15m and is recommended to be sited in an enclosed building with good ventilation





The MP8000 Lamp Recycling Plant comprises:

SECTION ONE - allows both whole and broken fluorescent tubes to be accepted

SECTION TWO - accepts and processes most other kinds of unspecified lamps

SECTION THREE – Processes & cleans the debris

AIR FILTRATION SYSTEM

CONTROL CABINET



Section One comprises:

1. Crusher & Conveyor allowing whole fluorescent tubes to be loaded directly into it.
2. Inlet point to allow broken linear lamps to be entered for processing.
3. Conveyor to Section Three

Section Two comprises:

1. Safety cage / screening surrounding:
2. Drum Lift (Hydraulically operated) / Loading point – Accepts 55-gallon drums filled with debris. Max Drum Weight – 250Kg. This unit can also be filled directly with whole unbroken lamps but not long linear types above 600mm.
3. Multi-purpose rumbler to separate the glass from other types of lamps and return it to Section Three.

Section Three comprises:

1. Two x four metre long plain rumblers to remove and clean as much phosphor powder from the glass as possible.
2. Conveyor to carry cleaned material to:
3. Rotating magnets for separating the end caps from the glass cullet which is further conveyed onto and through to:
4. A vibrating grid to further remove any extraneous material from the glass before falling into a suitable collection skip/dumpster.

Air Extraction Filter Units are used to draw off all mercury bearing phosphor powder and vapour from the contents of the lamps down to 5 micron size. These ensure the plant operates at negative pressure. All finer dusts and vapours that pass through the filters are ducted to our Main Filter Stack containing approximately 2 cubic metres of Sulphur based Activated Carbon, with which the mercury reacts and allows the exhausted air to be mercury free and ducted to atmosphere.

Maximum permissible emissions from exhaust 0.025mg/m³

Typical emissions 0.0001-0.002mg/m³

Electrical Control Cabinet: for the sequential operation of the plant. This ensures all electrical equipment is switched on and off in the correct sequence and also allows for complete shutdown of the plant in an emergency (Emergency Stop switches are fitted around the plant) . In the case of a fault overloads and proximity switches are fitted to all components to provide controlled shutdown. Safety interlocks prevent the machine operating in an unsafe manner. For maintenance purposes it allows each component to be individually operated when necessary.



INSTALLATION & COMMISSIONING

Balcan automatically offers a customizing install service for the equipment.

We are able to change and tailor the layout of the plant, depending on the building it is to be installed in.

After an order is placed Balcan will contact you to discuss a potential site visit, or ask for photographs, and/or a layout of the building.

Each recycling plant is unique and being the designer and manufacturer this service allows us to make modifications during the assembly process and provide the correct sizes and quantities of ductwork for the air is supply.

When the unit has shipped and the delivery date is confirmed, we arrange for our team of engineers to attend site. Balcan will unpack the containers and assemble the plant.

When the system is operational balcan will conduct the necessary commissioning tests. Balcan engineers will remain on site for a number of days to train the operatives in the use of the equipment, discuss daily checks, preventative maintenance actions as well as servicing and fault findings.

Balcan normally allows up to 10 working days for a full install with comprehensive hands on commissioning.



WARRANTY

Balcan warrants that the goods supplied under a contract are new, unused, of the most recent or current models and they incorporate all recent improvements in design and materials unless provided otherwise in the contract. Balcan further warrants that all goods supplied under a contract shall have no defect arising from design, materials, or workmanship (except when the design and/or material is required by the purchaser's specifications) or from any act or omission of Balcan, that may develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.

This warranty would remain valid for twelve (12) months after the goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the contract. The purchaser shall promptly notify Balcan in writing of any claims arising under this warranty.

Upon receipt of such notice Balcan shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser other than, where applicable, the cost of inland delivery of the repaired or replaced goods or parts from ex works or the port or place of entry to the final destination.

If Balcan, having been notified, fails to remedy the defect(s) within the period specified in SCC, the purchaser may proceed to take such remedial action as may be necessary, at Balcan's risk and expense and without prejudice to any other rights which the purchaser may have against Balcan under the contract.

ASSEMBLY PRIOR TO SHIPMENT

The plant will be assembled and run at the premises of Balcan prior to being shipped. It is recommended that clients visit us during this period to ascertain that the plant operates to their satisfaction. Once delivered to the site of client, Balcan will provide engineers to assemble and supervise operation of the plant. The opportunity will also be available for potential operators of the plant to be given full training not only about the operation of the plant, but also about any maintenance that may be required. A stay of five days is envisaged for this purpose with the last two being for final training purposes. Balcan expects to pay for their own engineers, but where possible, to be taken to and from the site.



EQUIPMENT FOR PROVISION BY CLIENT

We supply ducted frameworks to fit over collection points. The client is asked to supply the dimensions of these to allow for the frame to be correctly sized. For our own purpose we use self tipping mini skips.





BALCAN ENGINEERING LIMITED

BANOVALLUM COURT
BOSTON ROAD
INDUSTRIAL ESTATE
HORNCastle
LINCOLNSHIRE
ENGLAND LN9 6JR
Tel +44 (0) 1507 528 500
Fax +44 (0) 1507 528 528
email balcan@balcan.co.uk
www.balcan.co.uk

EC DECLARATION OF CONFORMITY

We hereby declare that the machinery listed below complies with the following directive:

Machinery Directive 98/37/EC
Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC

Machine / Product Description : Fluorescent Tube and Small Lamp Recycling Plant

Make : Balcan Lamp Recycling Plant
Model No : MP 8000
Serial No : 1402
Manufactured By : Balcan Engineering Ltd

The machine has been designed and manufactured in accordance with the following standards: BS EN 626-1&2:1995, BS EN 953:1998, BS EN 982:1996, BS EN 61310-1:1995, BS EN 61310-2:1995 & IEC 61310-2:1995, BS EN 61310-3:1999 & IEC 61310-3:1999, BS EN 1005-4:2005, BS EN ISO 13849-1:2006 BS EN ISO 13850-2006, BS EN ISO 13857:2008, BS EN ISO BS EN12100-1, BS EN 12100-2, BS EN 1037:1996, BS EN 1088:1995 & A1:2007, BS EN1093-1: 1999, BS EN 983:1996 and BS EN60204-1:2006.

The Technical Construction File for the above machine is retained at the following address:

Balcan Engineering Ltd
Banovallum Court
Boston Road Industrial Estate
Horncastle,
Lincolnshire
LN9 6JR
United Kingdom

Signed : 
Print : A.J. Rinfret

Date : 22 April 2010
Position: Director

Being the responsible person appointed by the manufacturer (or nominated representative of the manufacturer established in the EC, and employed by (Balcan Engineering Ltd)



BALCAN GAINED MILLENNIUM PRODUCTS STATUS FOR THREE DESIGNS
HYPODERMIC NEEDLE AND SYRINGE DESTRUCTOR
PNEUMATIC SPLITTER FOR EMPTYING PLASTIC VIALS
BELL-Q THROWING LINE FOR EMERGENCY WATER RESCUE
Directors J H T Rinfret, E M Rinfret, A J Rinfret, J P Rinfret & M A Rinfret
Company Registration N° 1037378



UTILITY REQUIREMENTS

Client to provide the following utilities for the MP8000 Lamp Recycling Plant

- 1. Compressed Air Supply required: 6.0 bar 7.2Nm³/h**
- 2. 3 Phase Electrical Supply for connection to Control Panel. Current requirements will be advised when 3 phase voltage supply is known.
Typical power consumption 15-20KW.**

The client is required to provide a suitably qualified electrician and appropriate cabling for wiring the control box to the main power supply in accordance to local requirements.

Each Balcan Lamp Recycling Plant is supplied to the country specific voltage. All motors and electrical components will be supplied in accordance with the country wiring and electrical requirements.

Spares and Servicing – MP8000

Balcan are one of the UK's largest lamp recyclers as well as being the designers and manufacturers of their range of lamp recycling plants. The advantage of this is the ability to design out faults from their systems and to understand how other lamp recyclers may work thus providing a very efficient, cost effective and low maintenance system.

Balcan is able to offer an annual service contract if requires for their systems, but it is not a requirement. Servicing and maintenance have been kept to a minimum and the systems designed to be easily serviced and maintained if required. The design of the Balcan equipment allows most aspects of servicing and maintenance to be carried out with the machine operating under negative pressure, thereby reducing the need for high levels of personnel protective equipment (PPE).

Typical Spares:

1. Set of Filters for air extraction units – these last between 9 – 24 months depending on usage.
2. Conveyor belts – Balcan recommends a set of spare conveyor belts be purchased with the machine. Whilst belts usually last for many years no one can foresee situations which may cause damage to these. As the conveyors are a major component of the recycling plant, for carrying the untreated glass as well as the cleaned outputs it is important to be able to obtain spares if required.

Other Spares:

Balcan's recording of spares supply over the years for their systems, has found that apart from the typical recommended spares, which should be readily available, all other components have proved extremely reliable. All other components are readily available from Balcan, however, the systems have been designed to be able to use readily available / universal parts which are available from the individual country, e.g.:

A system supplied to the USA will be fitted with a US brand and spec motor, usually imported. Therefore should that motor ever fail a motor should be immediately available from the US. This has the added advantage of saving on time & shipping costs. It also helps keep the costs of ownership down.

Servicing:

Servicing schedules are kept to a minimum with daily checks usually being all that are required. Weekly & monthly maintenance is dependent on throughput of lamp and usually involves simple cleaning and visual inspections.

Annual service visits or contracts are available if required. Please contact Balcan for more information.

MP8000 Lamp Recycling Plant - Output Fractions

Outputs consist of the following:

1. Glass
2. End Caps – Metal or Plastic when processed separately.
3. Mercury Bearing Phosphor Powder.

Balcan Lamp Recycling Systems produce some of the cleanest output fractions from this type of equipment.

Typical residual contaminations:

Glass – Residual
Contamination:

Typically 0.5-3 mg/Kg (0.5-3ppm) 'analyzed as bulk product'
Max 0.025 mg/l TCLP

End caps – Metal or plastic in processed separately (mixed if processed together)

Mercury Phosphor Powder – Typical mercury content <1Kg per 1000Kg



MP8000 Lamp Recycling Plant Emissions

Correctly designed lamp recycling plants should operate under negative pressure to reduce emissions of mercury vapour into the workplace. Whilst there should be zero emissions of mercury from a lamp recycling system this is not always the case and therefore these are required under laws to be kept to a minimum level.

Balcan lamp recycling systems use air extraction filter units to draw off all mercury bearing phosphor powder and vapour from the contents of the lamps down to less than 5 micron size. These ensure the plant operates at negative pressure. All mercury bearing vapours pass through the filters and are ducted to the Main Carbon Filter Stack. The vessel contains approximately 2 cubic metres of Sulphur based Activated Carbon, with which the mercury reacts and allows the exhausted air to be mercury free and ducted to atmosphere.

Balcan's philosophy is to work as close to zero emissions as possible and by using a single large carbon vessel we are able to achieve consistently low to zero results. We believe the advantage of a single vessel is in economies of scale with an improved lifetime expectancy of the carbon, over using smaller 'barrel' filters. Using one large high flow, annular carbon vessel, gives a much greater surface area with maximum throughput and removal of mercury from the vapour stream. Through years of regular monitoring you will also be able to see when the emissions start to increase, albeit very slowly, indicating the carbon is beginning to reach its capacity. Due to the size of the vessel this will give the ability of being able to schedule a carbon replacement service before permissible limits are reached. We believe that when using smaller filters the time between levels beginning to increase and saturation can happen quickly and can lead to unnecessary loss of production when not having the time to schedule carbon replacement.

Maximum permissible emissions from exhaust 0.025mg/m³

Typical emissions from Balcan MP8000 - 0.0001 - 0.002mg/m³

Estimated lifespan of carbon – 5 years based on throughput of 5-10 Million lamps per year.



Balcan Lamp Recycling Systems

MP8000 Specification



www.cfl-lamprecycling.com

GENUINELY KINDER TO THE ENVIRONMENT



Balcan MP8000 Specification

The MP8000 is the largest unit in the Balcan Lamp Recycler Range.
It combines the Multi Purpose unit along with a high capacity conveyor
loaded crushing system to handle fluorescent tubes at a
rate of 5000 per hour

Capacity:

Whole lamps 5000 fl tubes / hour

Crushed lamps 4000-5000 / hour

Mix (crushed & whole) 5000 / hour

Weight equivalent 1800-2000Kg / hour

Electrical Requirements:

Each unit is supplied to customers available
electrical supply and country requirements

Consumption: Max.10 kW 3Ph

Compressed air: 7.2Nm³/h (4.5CFM)

Supply pressure: 6 bar

Connection pipe: 0,75" thread

Mercury (Hg) Emissions from final exhaust:

Typically 0.001-0.002mg/m³

Max Permissible 0.025mg/m³

Estimated carbon filter life: 5 years

Output Fractions:

Glass, End Caps (metal or plastic depending on
lamps processed. If lamps are mixed for processing
then the end cap fraction will be mixed.)

Mercury Bearing Phosphor Powder

Residual Contamination & Leachate Values

Analysed as water: Max 0.025mg/l

Analysed as Bulk Product: Typically 1-3mg/Kg

BALCAN

BALCAN ENGINEERING LTD

Banovallum Court, Boston Road Industrial Estate, Horncastle,
Lincolnshire, LN9 6JR United Kingdom.

Telephone +44 (0)1507 528500 • Email info@balcan.co.uk

www.cfl-lamprecycling.com



THE QUEEN'S AWARDS
FOR ENTERPRISE:
INNOVATION
2006

GENUINELY KINDER TO THE ENVIRONMENT

C.4 AIR FILTERS

MJC Mini Cartridge Filters

Installation, Operation and Maintenance Manual.

Unit designation:

MJC Mini 4/22/21, 8/40/21;
 MJC Mini 9/22/22, 16/40/22, 26/66/22;
 MJC Mini 13/22/32, 24/40/32, 40/66/32..

Manufactured by: Dantherm Filtration Ltd, Seacroft, Leeds LS14 1NG. UK
 Telephone number: +44 (0) 113 273 9400.

Description of units and intended use.

The MJC Mini is a range of compact cartridge filters with reverse jet cleaning designed particularly for smaller ventilation and dust collection, where the duty is continuous and / or arduous.

The open based filter versions will normally be bolted to a prepared flange on the vessel or container to be ventilated.

Units fitted with a base unit and quick release bin may be free standing or secured to the floor.

All units may be specified with a built-in ventilating fan for dust extraction purposes or to maintain a small negative pressure in the system. Standard fan sizes are 0.75, 1.1 2.2 and 3.0kW. A 4.0kW fan may be a special option.

Typical airflow volume capabilities range from 500 to 3000m³/h.

Handling.

The filter units are supplied with two slinging points incorporated into the lid construction.

- **Safety note:** ensure that the lid is securely bolted in the closed position before lifting using the slinging points.

The units may also be handled by forklift truck when mounted on a suitable pallet.

MJC Mini Unit typical weights: all weights kg.

	MJC Mini 13/22/32 no fan	MJC Mini 24/40/32 no fan	MJC Mini 40/66/32 no fan
Insertable	102	108	114
Cased vent	146	178	215
Cased with low tray-style, QR bin	184	216	253
Cased with hopper, QR bin	196	228	265

	MJC Mini 9/22/22 no fan	MJC Mini 16/40/22 no fan	MJC Mini 26/66/22 no fan
Insertable	83	87	91
Cased vent	120	145	175
Cased with low tray-style, QR bin	151	176	206

	MJC Mini 4/22/21 no fan	Mini 8/40/21 no fan
Insertable	37	39
Cased vent	58	74
Cased with inlet	90	111
Cased with inlet and tray-style QR bin	121	142

Add weight in kg. for optional items: -

Silencer	12
Silencer W/cwl	1.5
0.75 kw fan	38
1.1 kw fan	40
2.2 kw fan	46
3 kw fan	53
Bin Balance	2
Vent W/cowl	2

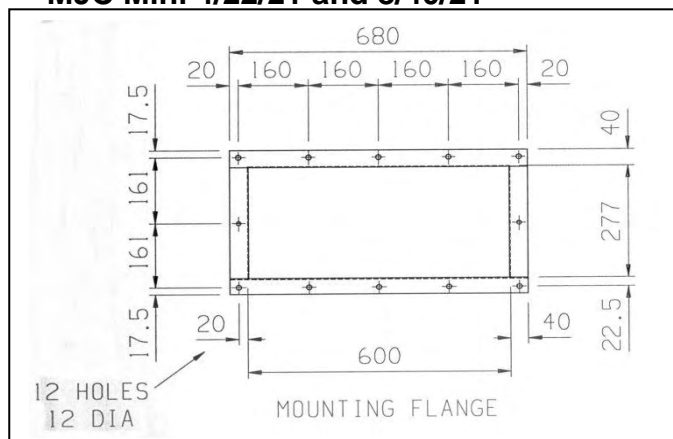
INSTALLATION.

IMPORTANT: the mechanical and electrical installation must be performed by suitably qualified and experienced personnel.

For UK installations: Approved electricians should be employed and an NICEIC or equivalent certificate obtained upon completion. Warranty claims relating to any electrical components will not be entertained unless a valid NICEIC or equivalent certificate is available.

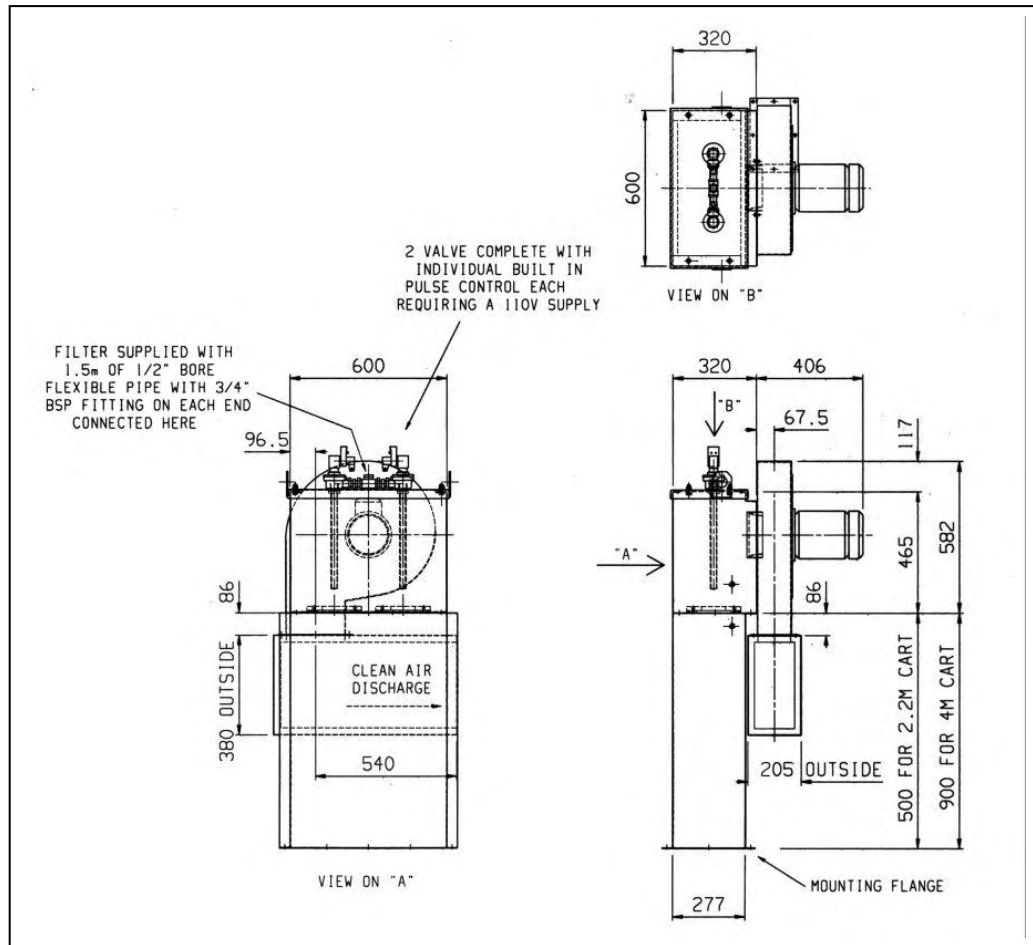
Open based units should be sealed and securely bolted to a prepared flange on top of the vessel or housing to be ventilated. The units are supplied fully assembled. The required unit and flange dimensions are given in the information below. Units with the standard base units and quick release bin may be free standing or secured as appropriate.

MJC Mini 4/22/21 and 8/40/21

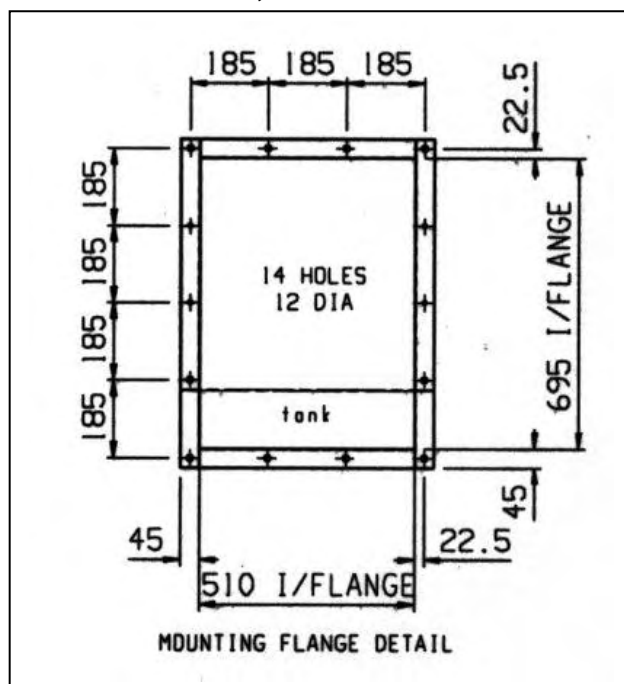


A suitable gasket or tube sealant material should be applied inboard of the base flange holes before bolting in place, to prevent leakage during normal use.

MJC Mini 4/21 and 8/21 - continued

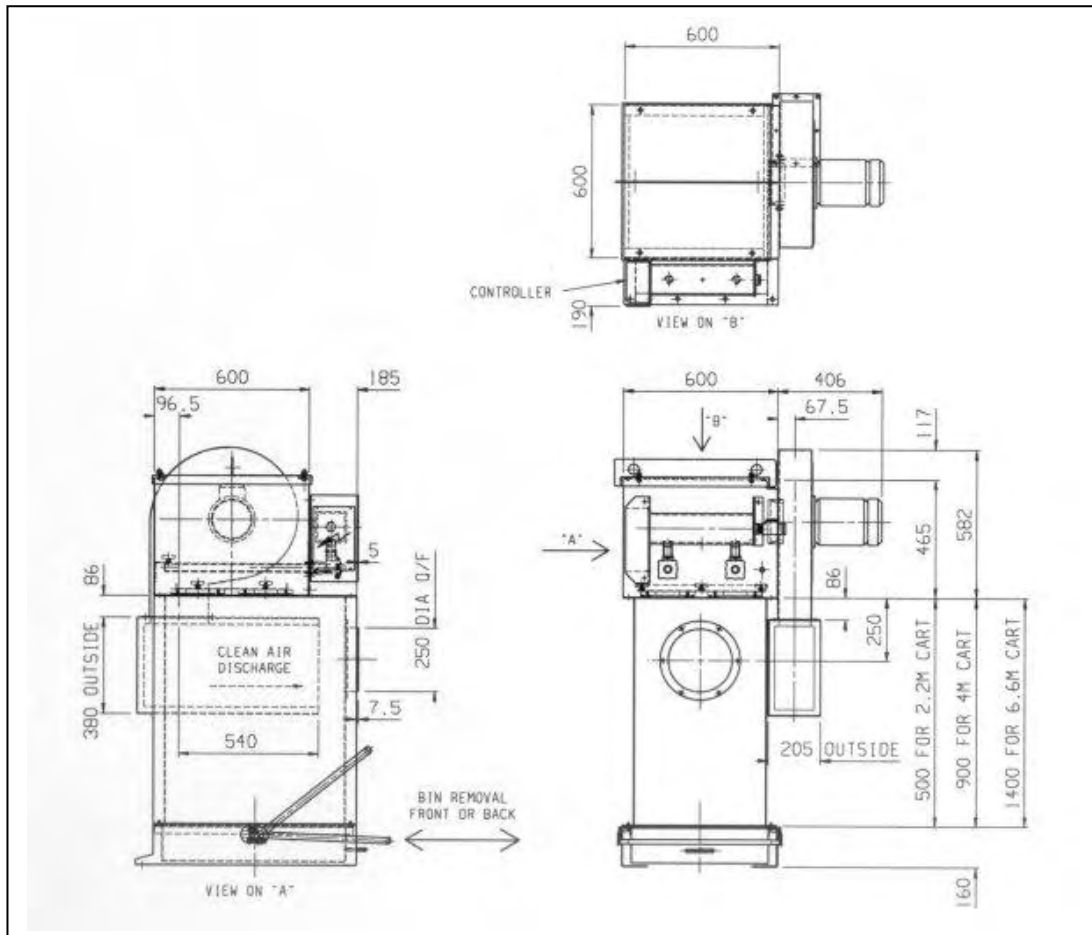


MJC Mini 9/22/22, 16/40/22 and 26/66/22

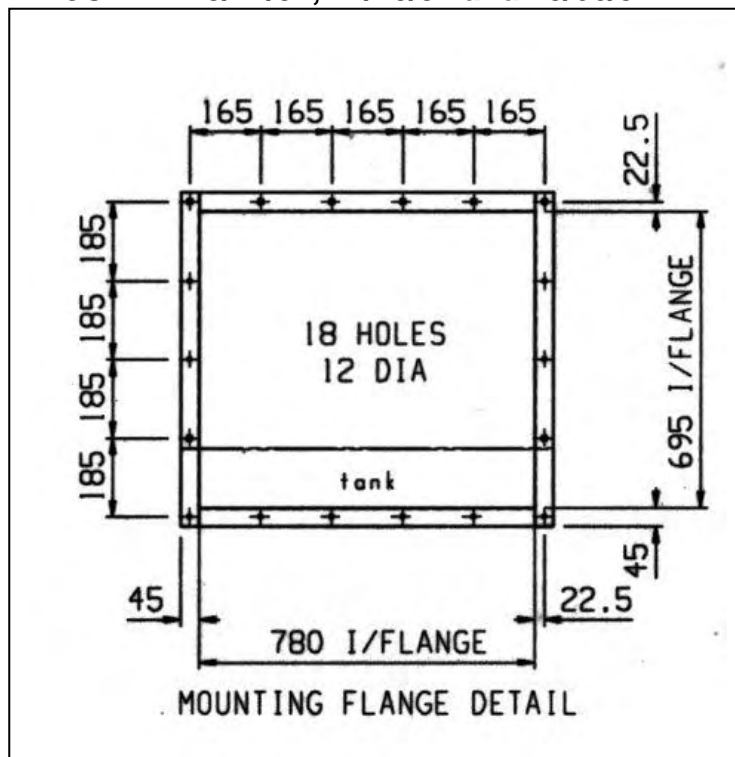


A suitable gasket or tube sealant material should be applied inboard of the base flange holes before bolting in place, to prevent leakage during normal use.

MJC Mini 9/22/22, 16/40/22 and 26/66/22 - continued

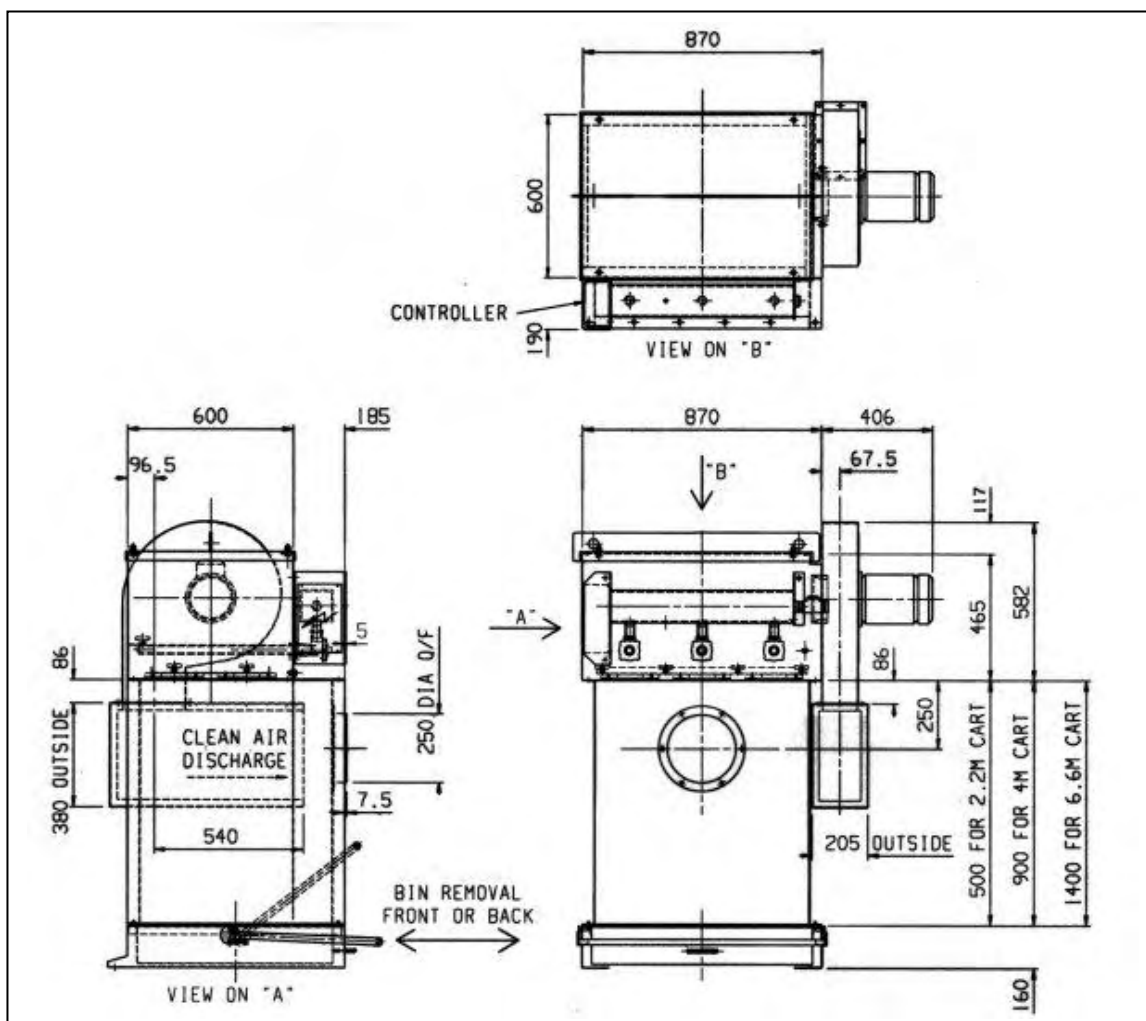


MJC Mini 13/22/32, 24/40/32 and 40/66/32



A suitable gasket or tube sealant material should be applied inboard of the base flange holes before bolting in place, to prevent leakage during normal use.

MJC Mini 13/22/32, 24/40/32 and 40/66/32 - continued



Connections – mechanical.

When the unit has been securely bolted into position, the compressed air supply for the reverse jet cleaning may be connected directly to the compressed air tank, which has a ½" BSP female fitting.

Note that the MJC Mini 4/22/21 and 8/40/21 units have no tank, simply a pipe connection. These units are supplied with a flexible pipe with a ¾" BSP connection to facilitate access for maintenance. The compressed air system should have the capacity to operate the filter reverse jet cleaning system. Details are given below: -

Reverse jet cleaning: single 4.7 or 7.7 litre steel compressed air reservoir.

Max. working pressure: 7.0 bar.

Test pressure: 13.0 bar.

Normal cleaning pressure for cartridges: **5.5 barg**. The compressed air should be dry and free from oil. A pressure regulator should be fitted to ensure that the pressure in the filter receiver is limited to 5.5barg. The normal working range is from 5.0 to 5.5barg. Lower pressures may result in less effective filter cartridge cleaning.

Compressed air consumption (typical): 50 Normal litres per pulse (Mini 4/22/21, 8/40/21).

60 Normal litres per pulse (all other units)

For a typical two minute cleaning cycle operating continuously, this would be equivalent to: -

3.0 Nm³/h for the MJC Mini 4/22/21 and 8/40/21 models,

3.6 Nm³/h for the MJC Mini 9/22/22, 16/40/22 and 26/66/22 models,

5.4 Nm³/h for the MJC Mini 13/22/32, 24/40/32 and 40/66/32 models.

Cleaning valves:

MJC Mini 4/22/21 and 8/40/21: - combined 3/4" diaphragm / solenoid valve, 110 or 127V AC, 50 / 60Hz. 24V DC available upon request.

Number of cleaning valves: 2 Each valve services 1 cartridge.

MJC Mini 9/22/22, 16/40/22, 26/66/22: - combined 1" diaphragm / solenoid valves, 110, 127, 220 or 240V AC, 50 / 60Hz. Other voltages upon request.

Number of cleaning valves: 2 Each valve services 2 cartridges.

MJC Mini 13/22/32, 24/40/32, 40/66/32: - combined 1" diaphragm / sol. valves, 110, 127, 220 or 240V AC, 50 / 60Hz. Other voltages upon request.

Number of cleaning valves: 3 Each valve services 2 cartridges.

Reverse jet timer controls:

MJC Mini 4/22/21 and 8/40/21: - direct mounted individual timer, one per valve.

All other MJC Mini units: - 3-way printed circuit board housed in IP65 enclosure protected by a 1amp circuit board fuse.

Connections – electrical.

For UK installations: Approved electricians should be employed and an NICEIC certificate obtained upon completion. Warranty claims relating to any electrical components will not be entertained unless a valid NICEIC certificate is available.

MJC Mini 4/22/21 and 8/40/21, no fan: -110V single phase 50 or 60Hz

MJC Mini, all other models, no fan: - 110 or 220V single phase 50 or 60Hz.

Fan, if fitted: - typically 380/415V 3-phase for any fan up to 3.0kW or optional 220/240V single phase supply for 0.75, 1.1kW fan only, as required.

If a fan is fitted, connections should be made directly to the motor terminal box. The fan motor may be up to 3.0kW (4.0kW special option). The fan case is fixed rigidly to the filter body. The fan motor should be supplied via a suitable starter/controller, such as Dantherm M1 to M4 for European applications, M5 to M8 for US applications.

Method of Control.

Fan assisted units: -The filter reverse jet controller and fan should be controlled in such a way that the reverse jet cleaning and fan are energised together. At end of the duty the fan should be de-energised but reverse jet

cleaning should if practicable remain run on for a few minutes. This after-clean period will be particularly useful if the dust is slightly moist or sticky.
Vent. units: - energise cleaning during duty cycle, plus after-clean as above.

OPERATION

When the filter is used for the first time, check that the reverse jet cleaning is operating correctly. Each valve should pulse in turn strongly and with similar intensity. There should be no leakage of compressed air between pulses. Initially the time interval between pulses should be set to give a complete cleaning cycle every two minutes.

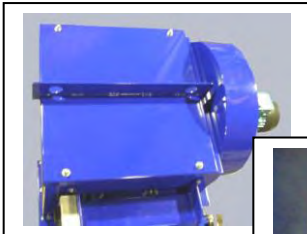
If a fan is fitted, check that its direction of rotation is correct. If rotation is incorrect, the fan will provide reduced extraction but the motor is likely to run under overload conditions.

MAINTENANCE

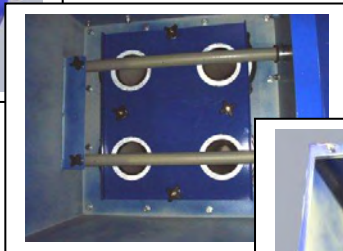
- **Safety note:** Before commencing maintenance work, ensure that it is safe to do so. Isolate the electrical and compressed air supplies. All work should comply with national health and safety regulations.
- Wear suitable protective clothing. Refer to health and safety data for the dust materials to be filtered.

Items that may require attention during the life of the unit are the filter cartridges, the cleaning valves, the electronic controller and fan (if fitted).

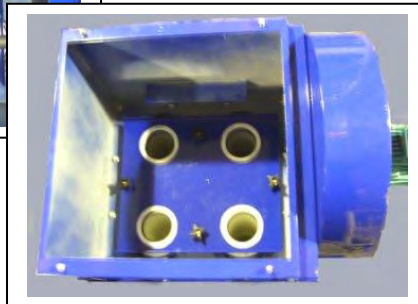
Cartridge removal and replacement – All units except MJC Mini 4/22/21 and MJC Mini 8/40/21



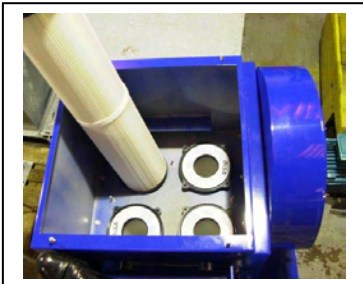
Remove the nuts securing the lid and lift off the lid, putting it in a safe position.



Unscrew knobs securing jet tubes and withdraw jet tubes from socket.



Unscrew and remove the knobs and washers from the cartridge clamping plates. Remove the clamping plates.

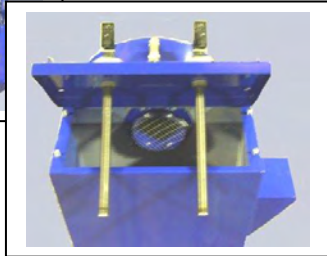
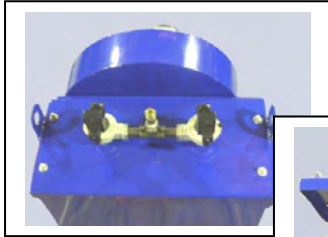


Withdraw the cartridges, shaking them first before extracting to remove excess loose material.

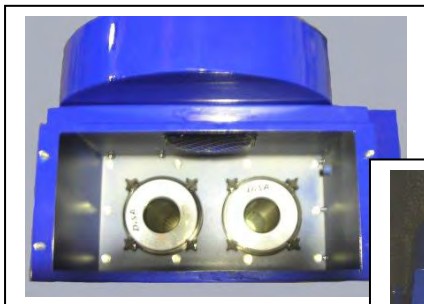
You are strongly advised to replace the black cartridge sealing ring before re-fitting a cartridge.

Before replacing the cartridges, clean the area around the cartridge sealing ring location. Insert the cartridges carefully. Locate the cartridge clamping plates and screw down the clamping plate knobs firmly but evenly by hand. Do not overtighten by using a tool. Then replace jet tubes and lid.

Cartridge removal and replacement – MJC Mini 4/22/21 and MJC Mini 8/40/21 only



Remove the nuts securing the lid and lift off the lid, putting it in a safe position, so that the wiring and compressed air hose are not stressed.



Unscrew and remove the knobs and washers securing the cartridges.



Withdraw the cartridges, shaking them first before extracting to remove excess loose material.

You are strongly advised to replace the black cartridge sealing ring before re-fitting a cartridge.

Before replacing the cartridges, clean the area around the cartridge sealing ring location. Insert the cartridges carefully. Screw down the four cartridge clamping knobs firmly but evenly by hand. Do not overtighten by using a tool.

Cleaning valves.

MJC Mini 4/22/21 and 8/40/21. There are two diaphragm type cleaning valves fitted directly onto the filter lid. Each diaphragm valve incorporates a solenoid pilot valve and a single reverse jet timer (see reverse jet controller below).

All other MJC Mini models. These have two or three diaphragm type cleaning valves connected to a small compressed air manifold tank secured to the side of the filter body. The solenoid valves are connected to a separate controller (see Reverse jet controller below).

It is possible that a diaphragm may require replacing. To do this, isolate the compressed air supply and disconnect from the valve. Remove the diaphragm valve lid slowly after removing its securing screws. Note whether any oil or water is present. If there is, check the condition of the supply filter / separator or the compressor itself.

There may be a loose coil spring located on the diaphragm. Be careful not to lose this item as the unit is taken apart. When replacing a diaphragm, ensure that all surfaces are clean, to prevent subsequent leaks. Do not forget the spring, if fitted.

To remove a solenoid coil, first check that the electrical supply is safely isolated. Then remove the clip on its retaining post and slide the unit off. Remove the electrical connector after unscrewing its retaining screw.

Check wiring for mechanical damage. If any external wiring is replaced, ensure that suitable weatherproof sealing glands are used.

Reverse jet controller. (except Mini 4/22/21 and 8/40/21)

This is housed in an IP65 enclosure on the filter unit. Apart from a circuit board fuse plus adjusters for the cleaning pulse duration and interval, the timer contains no serviceable parts. If a fault occurs with the controller the complete timer board should be replaced. This is fixed in the enclosure by four screws.



When replacing this item, note carefully the positions of the electrical connections so that they may be replaced in identical positions.

It is possible that the time interval between pulses may require adjustment, if more or maybe less cartridge cleaning is required. To do this, open the controller lid and locate the circular slotted potentiometer marked "Interval". Clockwise rotation increases the time interval. Do not adjust more than a quarter turn at a time. To check the new setting, energise the cleaning and measure the new time interval. The maximum interval available is approximately 70 seconds.

The control marked "**Duration**" should **NOT be adjusted**, as this would alter the factory setting of 100 milliseconds. This could adversely affect the cleaning performance.

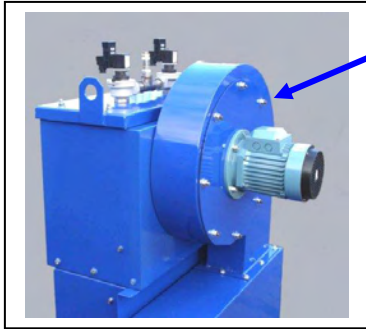
Reverse jet controller - Mini 4/22/21 and 8/40/21 only.



Each valve is fitted with an individual timer. The timer has two adjustable controls. The duration control marked "ms" should always be set to 100. The other marked "min" is the time between pulses and may be set to suit conditions, but not less than 0.5 minutes.

Fan.

If a fan is fitted, it will be mounted on the side of the filter clean air chamber. Normally no maintenance will be required for the fan, but if removal is necessary, proceed as follows: -



Remove the nuts securing the motor mounting plate to the fan case.

Carefully withdraw the motor and impeller assembly from the fan case.

To remove the fan impeller from the shaft, release the nut from the shaft end and remove it and the metal washer. Slide the impeller from the shaft. Retain the shaft key.

When re-assembling, ensure that the shaft, key, keyway and impeller bore are clean and free from debris and dust.

The inlet side of the fan is protected by a metal mesh guard. When maintaining the fan inspect the security of this item.

After re-assembly check that the fan operates freely without catching on the inlet components.

Fault location.

Fault	Possible cause	Suggested remedy
Filter becomes blocked unexpectedly	Vessel being ventilated too full, if directly mounted onto vessel Reverse jet cleaning not operating No compressed air pressure Timer board faulty One or more solenoid valves not operating	Check level probe Controller switched off or disconnected Check and reinstate compressed air supply Replace timer board Check output from timer board. If output ok, replace suspect solenoid pilot valve coil
Dust escapes from filter	Damaged cartridge or seal Loose clamping plate	Replace cartridge and seal ring Remove clamping plate and its cartridges. Clean mating surfaces. Replace cartridge sealing rings and replace clamping plate according to maintenance instructions
Filter gradually blocks over a period of time	Insufficient cleaning	Reduce time between cleaning pulses Increase after-clean time Replace cartridges if they are getting old
Cleaning pulse weak	Low compressed air pressure Diaphragm leaking Solenoid faulty	Restore pressure Check and replace diaphragm Replace solenoid coil
For fan-assisted units, the following may apply		
Unexpectedly low fan performance	Fan rotating in wrong direction	Reverse two phases of the electrical supply at the motor terminal box.
Excessive vibration	Dust on fan impeller	Remove and clean fan – check filter for dust leaks
Excessive vibration persists	Fan impeller out of balance	Remove impeller and inspect for damage. Re-balance impeller if there is no obvious damage.

Dismantling.

At the end of its working life, the filter may be removed and dismantled. Disposal of unserviceable items may then be carried out.

To remove the unit, first isolate and then disconnect compressed air and electrical supplies. The compressed air tank (if fitted) should be discharged by carefully opening the drain tap. A flange mounted filter can then be unbolted from the vessel upstand.

- **Safety note:** The filter lid should be secured in the closed position before lifting the unit from its position.
- When the filter is lifted from its upstand, the aperture in the vessel to which it had been fixed should immediately be covered to prevent the possibility of personnel falling into the vessel.

For disposal purposes, please note the following components and their principal materials.

Filter body and lid:	Mild steel painted
Compressed air tank:	Mild steel, painted
Diaphragm valves:	Aluminium alloy, steel, rubber
Controller:	Plastics, copper, electrical circuit board

Filter cartridges: These are composed of various non-chlorinated polymer plastics and contain no metal parts. Safe disposal method will depend upon the nature of the material filtered by the cartridges as traces may remain even after thorough manual cleaning.

Technical assistance and further information.

If you require further information, clarification or technical assistance, please contact the Technical Department.

For UK, please contact: -

Dantherm Filtration Ltd.,
Limewood Approach,
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C.5 ANALYTICAL TEST DATA FOR PROCESSED LAMP MATERIALS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Nashville

2960 Foster Creighton Road

Nashville, TN 37204

Tel: 800-765-0980

TestAmerica Job ID: NUG2247

Client Project/Site: [none]

Client Project Description: Lamp Glass

For:

Lighting Resources Texas, LLC

101 E. Bowie Street

Fort Worth, TX 76110

Attn: Tom Slattery

Madonna Myers

Authorized for release by:

07/20/2011 05:29:43 PM

Madonna Myers

Project Manager

madonna.myers@testamericainc.com

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Sample Summary

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
NUG2247-01	A-1 Phosphos Powder	Soil	07/07/11 13:00	07/16/11 08:20
NUG2247-02	B-1 Phosphos Powder	Soil	07/07/11 13:02	07/16/11 08:20
NUG2247-03	Lamp Glass	Misc. Solid	07/07/11 13:00	07/16/11 08:20
NUG2247-04	Alum Ends	Misc. Solid	07/07/11 13:02	07/16/11 08:20

Definitions/Glossary

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Qualifiers

Metals

Qualifier	Qualifier Description
MHA	Due to high levels of analyte in the sample, the MS/MSD calculation does not provide useful spike recovery information. See Blank Spike (LCS).

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.
EPA	United States Environmental Protection Agency
ND	Not Detected above the reporting level.
MDL	Method Detection Limit
RL	Reporting Limit
RE, RE1 (etc.)	Indicates a Re-extraction or Reanalysis of the sample.
%R	Percent Recovery
RPD	Relative Percent Difference, a measure of the relative difference between two points.

Client Sample Results

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Client Sample ID: A-1 Phosphos Powder

Lab Sample ID: NUG2247-01

Date Collected: 07/07/11 13:00

Matrix: Soil

Date Received: 07/16/11 08:20

Method: SW846 1311/7470A - TCLP Metals by 6000/7000 Series Methods - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0154		0.0100		mg/L		07/19/11 10:20	07/19/11 16:21	1.00

Method: SW846 6010B - Total Metals by EPA Method 6010B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		95.6		mg/kg		07/19/11 11:25	07/20/11 12:06	100
Barium	216		191		mg/kg		07/19/11 11:25	07/20/11 12:06	100
Cadmium	ND		95.6		mg/kg		07/19/11 11:25	07/20/11 12:06	100
Chromium	ND		95.6		mg/kg		07/19/11 11:25	07/20/11 12:06	100
Lead	ND		95.6		mg/kg		07/19/11 11:25	07/20/11 12:06	100
Selenium	ND		191		mg/kg		07/19/11 11:25	07/20/11 12:06	100
Silver	ND		95.6		mg/kg		07/19/11 11:25	07/20/11 12:06	100

Method: SW846 7471A - Mercury by EPA Methods 7470A/7471A

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	69		9.8		mg/kg		07/18/11 14:00	07/20/11 11:25	100

Client Sample Results

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Client Sample ID: B-1 Phosphos Powder

Lab Sample ID: NUG2247-02

Date Collected: 07/07/11 13:02

Matrix: Soil

Date Received: 07/16/11 08:20

Method: SW846 1311/7470A - TCLP Metals by 6000/7000 Series Methods - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0862		0.0200		mg/L		07/19/11 10:20	07/20/11 09:48	2.00

Method: SW846 6010B - Total Metals by EPA Method 6010B

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		96.0		mg/kg		07/19/11 11:25	07/20/11 12:20	100
Barium	248		192		mg/kg		07/19/11 11:25	07/20/11 12:20	100
Cadmium	ND		96.0		mg/kg		07/19/11 11:25	07/20/11 12:20	100
Chromium	ND		96.0		mg/kg		07/19/11 11:25	07/20/11 12:20	100
Lead	ND		96.0		mg/kg		07/19/11 11:25	07/20/11 12:20	100
Selenium	ND		192		mg/kg		07/19/11 11:25	07/20/11 12:20	100
Silver	ND		96.0		mg/kg		07/19/11 11:25	07/20/11 12:20	100

Method: SW846 7471A - Mercury by EPA Methods 7470A/7471A

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	640	MHA	200		mg/kg		07/18/11 14:00	07/20/11 11:53	2000

Client Sample Results

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Client Sample ID: Lamp Glass

Lab Sample ID: NUG2247-03

Date Collected: 07/07/11 13:00

Matrix: Misc. Solid

Date Received: 07/16/11 08:20

Method: SW846 1311/7470A - TCLP Metals by 6000/7000 Series Methods - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0149		0.0100		mg/L		07/19/11 10:20	07/19/11 16:26	1.00

Client Sample Results

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Client Sample ID: Alum Ends

Lab Sample ID: NUG2247-04

Date Collected: 07/07/11 13:02

Matrix: Misc. Solid

Date Received: 07/16/11 08:20

Method: SW846 1311/7470A - TCLP Metals by 6000/7000 Series Methods - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0121		0.0100		mg/L		07/19/11 10:20	07/19/11 16:29	1.00

QC Sample Results

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Method: SW846 1311/7470A - TCLP Metals by 6000/7000 Series Methods

Lab Sample ID: 11G3760-BLK1

Matrix: Water

Analysis Batch: 11G3760

Client Sample ID: Method Blank

Prep Type: TCLP

Prep Batch: 11G3760_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0100		mg/L		07/19/11 10:20	07/19/11 15:27	1.00

Lab Sample ID: 11G3760-BS1

Matrix: Water

Analysis Batch: 11G3760

Client Sample ID: Lab Control Sample

Prep Type: TCLP

Prep Batch: 11G3760_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	0.0200	0.0201		mg/L		100	80 - 120

Lab Sample ID: 11G3760-BSD1

Matrix: Water

Analysis Batch: 11G3760

Client Sample ID: Lab Control Sample Dup

Prep Type: TCLP

Prep Batch: 11G3760_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Mercury	0.0200	0.0195		mg/L		98	80 - 120	3	20

Lab Sample ID: 11G3760-MS1

Matrix: Water

Analysis Batch: 11G3760

Client Sample ID: Matrix Spike

Prep Type: TCLP

Prep Batch: 11G3760_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	ND		0.0200	0.0203		mg/L		102	75 - 125

Lab Sample ID: 11G3760-MSD1

Matrix: Water

Analysis Batch: 11G3760

Client Sample ID: Matrix Spike Duplicate

Prep Type: TCLP

Prep Batch: 11G3760_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Mercury	ND		0.0200	0.0196		mg/L		98	75 - 125	4	20

Method: SW846 6010B - Total Metals by EPA Method 6010B

Lab Sample ID: 11G3827-BLK1

Matrix: Soil

Analysis Batch: 11G3827

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 11G3827_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.952		mg/kg		07/19/11 11:25	07/19/11 22:29	1.00
Barium	ND		1.90		mg/kg		07/19/11 11:25	07/19/11 22:29	1.00
Cadmium	ND		0.952		mg/kg		07/19/11 11:25	07/19/11 22:29	1.00
Chromium	ND		0.952		mg/kg		07/19/11 11:25	07/19/11 22:29	1.00
Lead	ND		0.952		mg/kg		07/19/11 11:25	07/19/11 22:29	1.00
Selenium	ND		1.90		mg/kg		07/19/11 11:25	07/19/11 22:29	1.00
Silver	ND		0.952		mg/kg		07/19/11 11:25	07/19/11 22:29	1.00

Lab Sample ID: 11G3827-BS1

Matrix: Soil

Analysis Batch: 11G3827

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 11G3827_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Arsenic	20.2	19.3		mg/kg		95	80 - 120

TestAmerica Nashville

QC Sample Results

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Method: SW846 6010B - Total Metals by EPA Method 6010B (Continued)

Lab Sample ID: 11G3827-BS1

Matrix: Soil

Analysis Batch: 11G3827

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 11G3827_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec.	
							Limits	
Barium	808	811		mg/kg		100	80 - 120	
Cadmium	20.2	20.4		mg/kg		101	80 - 120	
Chromium	80.8	82.5		mg/kg		102	80 - 120	
Lead	20.2	21.2		mg/kg		105	80 - 120	
Selenium	20.2	20.3		mg/kg		100	80 - 120	
Silver	20.2	21.9		mg/kg		108	75 - 125	

Lab Sample ID: 11G3827-BSD1

Matrix: Soil

Analysis Batch: 11G3827

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 11G3827_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	% Rec	% Rec.		RPD	Limit
							Limits			
Arsenic	20.2	19.3		mg/kg		96	80 - 120	0.1	20	
Barium	806	811		mg/kg		101	80 - 120	0.05	20	
Cadmium	20.2	20.4		mg/kg		101	80 - 120	0.09	20	
Chromium	80.6	82.1		mg/kg		102	80 - 120	0.5	20	
Lead	20.2	20.9		mg/kg		104	80 - 120	1	20	
Selenium	20.2	20.3		mg/kg		101	80 - 120	0.2	20	
Silver	20.2	21.8		mg/kg		108	75 - 125	0.2	20	

Lab Sample ID: 11G3827-MS1

Matrix: Soil

Analysis Batch: 11G3827

Client Sample ID: Matrix Spike

Prep Type: Total

Prep Batch: 11G3827_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec.	
									Limits	
Arsenic	5.74		20.2	24.8		mg/kg		94	75 - 125	
Barium	25.3		808	844		mg/kg		101	75 - 125	
Cadmium	ND		20.2	20.2		mg/kg		100	75 - 125	
Chromium	4.10		80.8	87.8		mg/kg		104	75 - 125	
Lead	4.34		20.2	24.4		mg/kg		99	75 - 125	
Selenium	0.891		20.2	22.5		mg/kg		107	75 - 125	
Silver	ND		20.2	24.2		mg/kg		120	75 - 125	

Lab Sample ID: 11G3827-MSD1

Matrix: Soil

Analysis Batch: 11G3827

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total

Prep Batch: 11G3827_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	% Rec	% Rec.		RPD	Limit
									Limits			
Arsenic	5.74		19.3	27.2		mg/kg		111	75 - 125	9	20	
Barium	25.3		774	881		mg/kg		111	75 - 125	4	20	
Cadmium	ND		19.3	18.7		mg/kg		97	75 - 125	8	20	
Chromium	4.10		77.4	80.6		mg/kg		99	75 - 125	9	20	
Lead	4.34		19.3	26.5		mg/kg		115	75 - 125	8	20	
Selenium	0.891		19.3	20.8		mg/kg		103	75 - 125	8	20	
Silver	ND		19.3	22.8		mg/kg		118	75 - 125	6	20	

QC Sample Results

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Method: SW846 7471A - Mercury by EPA Methods 7470A/7471A

Lab Sample ID: 11G3763-BLK1

Matrix: Soil

Analysis Batch: 11G3763

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 11G3763_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.099		mg/kg		07/18/11 14:00	07/20/11 11:02	1.0

Lab Sample ID: 11G3763-BS1

Matrix: Soil

Analysis Batch: 11G3763

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 11G3763_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	0.163	0.17		mg/kg		105	80 - 120

Lab Sample ID: 11G3763-BSD1

Matrix: Soil

Analysis Batch: 11G3763

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 11G3763_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Mercury	0.166	0.19		mg/kg		112	80 - 120	9	20

Lab Sample ID: 11G3763-MS1

Matrix: Soil

Analysis Batch: 11G3763

Client Sample ID: B-1 Phosphos Powder

Prep Type: Total

Prep Batch: 11G3763_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Mercury	640	MHA	0.164	920	MHA	mg/kg		16800	75 - 125
								0	

Lab Sample ID: 11G3763-MSD1

Matrix: Soil

Analysis Batch: 11G3763

Client Sample ID: B-1 Phosphos Powder

Prep Type: Total

Prep Batch: 11G3763_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	% Rec	% Rec. Limits	RPD	RPD Limit
Mercury	640	MHA	0.160	920	MHA	mg/kg		17600	75 - 125	0.8	20
								0			

QC Association Summary

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Metals

Leach Batch: 11G3717

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
NUG2247-01	A-1 Phosphos Powder	TCLP	Soil	TCLP Extraction	
NUG2247-03	Lamp Glass	TCLP	Misc. Solid	TCLP Extraction	
NUG2247-04	Alum Ends	TCLP	Misc. Solid	TCLP Extraction	
NUG2247-02	B-1 Phosphos Powder	TCLP	Soil	TCLP Extraction	

Analysis Batch: 11G3760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
11G3760-BLK1	Method Blank	TCLP	Water	SW846 1311/7470A	11G3760_P
11G3760-BS1	Lab Control Sample	TCLP	Water	SW846 1311/7470A	11G3760_P
11G3760-BSD1	Lab Control Sample Dup	TCLP	Water	SW846 1311/7470A	11G3760_P
11G3760-MS1	Matrix Spike	TCLP	Water	SW846 1311/7470A	11G3760_P
11G3760-MSD1	Matrix Spike Duplicate	TCLP	Water	SW846 1311/7470A	11G3760_P
NUG2247-01	A-1 Phosphos Powder	TCLP	Soil	SW846 1311/7470A	11G3760_P
NUG2247-03	Lamp Glass	TCLP	Misc. Solid	SW846 1311/7470A	11G3760_P
NUG2247-04	Alum Ends	TCLP	Misc. Solid	SW846 1311/7470A	11G3760_P
NUG2247-02	B-1 Phosphos Powder	TCLP	Soil	SW846 1311/7470A	11G3760_P

Analysis Batch: 11G3763

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
11G3763-BLK1	Method Blank	Total	Soil	SW846 7471A	11G3763_P
11G3763-BS1	Lab Control Sample	Total	Soil	SW846 7471A	11G3763_P
11G3763-BSD1	Lab Control Sample Dup	Total	Soil	SW846 7471A	11G3763_P
NUG2247-01	A-1 Phosphos Powder	Total	Soil	SW846 7471A	11G3763_P
11G3763-MS1	B-1 Phosphos Powder	Total	Soil	SW846 7471A	11G3763_P
11G3763-MSD1	B-1 Phosphos Powder	Total	Soil	SW846 7471A	11G3763_P
NUG2247-02	B-1 Phosphos Powder	Total	Soil	SW846 7471A	11G3763_P

Analysis Batch: 11G3827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
11G3827-BLK1	Method Blank	Total	Soil	SW846 6010B	11G3827_P
11G3827-BS1	Lab Control Sample	Total	Soil	SW846 6010B	11G3827_P
11G3827-BSD1	Lab Control Sample Dup	Total	Soil	SW846 6010B	11G3827_P
11G3827-MS1	Matrix Spike	Total	Soil	SW846 6010B	11G3827_P
11G3827-MSD1	Matrix Spike Duplicate	Total	Soil	SW846 6010B	11G3827_P
NUG2247-01	A-1 Phosphos Powder	Total	Soil	SW846 6010B	11G3827_P
NUG2247-02	B-1 Phosphos Powder	Total	Soil	SW846 6010B	11G3827_P

Prep Batch: 11G3760_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
11G3760-BLK1	Method Blank	TCLP	Water	EPA 7470	
11G3760-BS1	Lab Control Sample	TCLP	Water	EPA 7470	
11G3760-BSD1	Lab Control Sample Dup	TCLP	Water	EPA 7470	
11G3760-MS1	Matrix Spike	TCLP	Water	EPA 7470	
11G3760-MSD1	Matrix Spike Duplicate	TCLP	Water	EPA 7470	
NUG2247-01	A-1 Phosphos Powder	TCLP	Soil	EPA 7470	11G3717

QC Association Summary

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Metals (Continued)

Prep Batch: 11G3760_P (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
NUG2247-03	Lamp Glass	TCLP	Misc. Solid	EPA 7470	11G3717
NUG2247-04	Alum Ends	TCLP	Misc. Solid	EPA 7470	11G3717
NUG2247-02	B-1 Phosphos Powder	TCLP	Soil	EPA 7470	11G3717

Prep Batch: 11G3763_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
11G3763-BLK1	Method Blank	Total	Soil	EPA 7471	
11G3763-BS1	Lab Control Sample	Total	Soil	EPA 7471	
11G3763-BSD1	Lab Control Sample Dup	Total	Soil	EPA 7471	
NUG2247-01	A-1 Phosphos Powder	Total	Soil	EPA 7471	
11G3763-MS1	B-1 Phosphos Powder	Total	Soil	EPA 7471	
11G3763-MSD1	B-1 Phosphos Powder	Total	Soil	EPA 7471	
NUG2247-02	B-1 Phosphos Powder	Total	Soil	EPA 7471	

Prep Batch: 11G3827_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
11G3827-BLK1	Method Blank	Total	Soil	EPA 3051A/6010	
11G3827-BS1	Lab Control Sample	Total	Soil	EPA 3051A/6010	
11G3827-BSD1	Lab Control Sample Dup	Total	Soil	EPA 3051A/6010	
11G3827-MS1	Matrix Spike	Total	Soil	EPA 3051A/6010	
11G3827-MSD1	Matrix Spike Duplicate	Total	Soil	EPA 3051A/6010	
NUG2247-01	A-1 Phosphos Powder	Total	Soil	EPA 3051A/6010	
NUG2247-02	B-1 Phosphos Powder	Total	Soil	EPA 3051A/6010	

Lab Chronicle

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Client Sample ID: A-1 Phosphos Powder

Lab Sample ID: NUG2247-01

Date Collected: 07/07/11 13:00

Matrix: Soil

Date Received: 07/16/11 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total	Prep	EPA 3051A/6010		0.956	11G3827_P	07/19/11 11:25	ALJ	TAL NSH
Total	Analysis	SW846 6010B		100	11G3827	07/20/11 12:06	LTB	TAL NSH
Total	Prep	EPA 7471		0.98	11G3763_P	07/18/11 14:00	MB	TAL NSH
Total	Analysis	SW846 7471A		100	11G3763	07/20/11 11:25	MB	TAL NSH
TCLP	Leach	TCLP Extraction		1.00	11G3717	07/14/11 14:00	SJM	TAL NSH
TCLP	Prep	EPA 7470		1.00	11G3760_P	07/19/11 10:20	DEB	TAL NSH
TCLP	Analysis	SW846 1311/7470A		1.00	11G3760	07/19/11 16:21	DEB	TAL NSH

Client Sample ID: B-1 Phosphos Powder

Lab Sample ID: NUG2247-02

Date Collected: 07/07/11 13:02

Matrix: Soil

Date Received: 07/16/11 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
Total	Prep	EPA 3051A/6010		0.960	11G3827_P	07/19/11 11:25	ALJ	TAL NSH
Total	Analysis	SW846 6010B		100	11G3827	07/20/11 12:20	LTB	TAL NSH
Total	Prep	EPA 7471		0.99	11G3763_P	07/18/11 14:00	MB	TAL NSH
Total	Analysis	SW846 7471A		2000	11G3763	07/20/11 11:53	MB	TAL NSH
TCLP	Leach	TCLP Extraction		2.00	11G3717	07/14/11 14:00	SJM	TAL NSH
TCLP	Prep	EPA 7470		1.00	11G3760_P	07/19/11 10:20	DEB	TAL NSH
TCLP	Analysis	SW846 1311/7470A		2.00	11G3760	07/20/11 09:48	DEB	TAL NSH

Client Sample ID: Lamp Glass

Lab Sample ID: NUG2247-03

Date Collected: 07/07/11 13:00

Matrix: Misc. Solid

Date Received: 07/16/11 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
TCLP	Leach	TCLP Extraction		1.00	11G3717	07/14/11 14:00	SJM	TAL NSH
TCLP	Prep	EPA 7470		1.00	11G3760_P	07/19/11 10:20	DEB	TAL NSH
TCLP	Analysis	SW846 1311/7470A		1.00	11G3760	07/19/11 16:26	DEB	TAL NSH

Client Sample ID: Alum Ends

Lab Sample ID: NUG2247-04

Date Collected: 07/07/11 13:02

Matrix: Misc. Solid

Date Received: 07/16/11 08:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared Or Analyzed	Analyst	Lab
TCLP	Leach	TCLP Extraction		1.00	11G3717	07/14/11 14:00	SJM	TAL NSH
TCLP	Prep	EPA 7470		1.00	11G3760_P	07/19/11 10:20	DEB	TAL NSH
TCLP	Analysis	SW846 1311/7470A		1.00	11G3760	07/19/11 16:29	DEB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Road, Nashville, TN 37204, TEL 800-765-0980

Method Summary

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Method	Method Description	Protocol	Laboratory
SW846 1311/7470A	TCLP Metals by 6000/7000 Series Methods		TAL NSH
SW846 6010B	Total Metals by EPA Method 6010B		TAL NSH
SW846 7471A	Mercury by EPA Methods 7470A/7471A		TAL NSH

Protocol References:

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Road, Nashville, TN 37204, TEL 800-765-0980

Certification Summary

Client: Lighting Resources Texas, LLC
Project/Site: [none]

TestAmerica Job ID: NUG2247

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Nashville	A2LA	ISO/IEC 17025		0453.07
TestAmerica Nashville	A2LA	WY UST		453.07
TestAmerica Nashville	AIHA	IHLAP		100790
TestAmerica Nashville	Alabama	State Program	4	41150
TestAmerica Nashville	Alaska	Alaska UST	10	UST-087
TestAmerica Nashville	Arizona	State Program	9	AZ0473
TestAmerica Nashville	Arkansas	State Program	6	88-0737
TestAmerica Nashville	CALA	CALA		3744
TestAmerica Nashville	California	NELAC	9	1168CA
TestAmerica Nashville	Colorado	State Program	8	N/A
TestAmerica Nashville	Connecticut	State Program	1	PH-0220
TestAmerica Nashville	Florida	NELAC	4	E87358
TestAmerica Nashville	Illinois	NELAC	5	200010
TestAmerica Nashville	Iowa	State Program	7	131
TestAmerica Nashville	Kansas	NELAC	7	E-10229
TestAmerica Nashville	Kentucky	Kentucky UST	4	19
TestAmerica Nashville	Kentucky	State Program	4	90038
TestAmerica Nashville	Louisiana	NELAC	6	LA100011
TestAmerica Nashville	Louisiana	NELAC	6	30613
TestAmerica Nashville	Maryland	State Program	3	316
TestAmerica Nashville	Massachusetts	State Program	1	M-TN032
TestAmerica Nashville	Minnesota	NELAC	5	047-999-345
TestAmerica Nashville	Mississippi	State Program	4	N/A
TestAmerica Nashville	Montana	MT DEQ UST	8	NA
TestAmerica Nashville	Nevada	State Program	9	TN00032
TestAmerica Nashville	New Hampshire	NELAC	1	2963
TestAmerica Nashville	New Jersey	NELAC	2	TN965
TestAmerica Nashville	New York	NELAC	2	11342
TestAmerica Nashville	North Carolina	North Carolina DENR	4	387
TestAmerica Nashville	North Dakota	State Program	8	R-146
TestAmerica Nashville	Ohio	OVAP	5	CL0033
TestAmerica Nashville	Oklahoma	State Program	6	9412
TestAmerica Nashville	Oregon	NELAC	10	TN200001
TestAmerica Nashville	Pennsylvania	NELAC	3	68-00585
TestAmerica Nashville	Rhode Island	State Program	1	LAO00268
TestAmerica Nashville	South Carolina	State Program	4	84009
TestAmerica Nashville	South Carolina	State Program	4	84009
TestAmerica Nashville	Tennessee	State Program	4	2008
TestAmerica Nashville	Texas	NELAC	6	T104704077-09-TX
TestAmerica Nashville	USDA	USDA		S-48469
TestAmerica Nashville	Utah	NELAC	8	TAN
TestAmerica Nashville	Virginia	NELAC Secondary AB	3	460152
TestAmerica Nashville	Virginia	State Program	3	00323
TestAmerica Nashville	Washington	State Program	10	C789
TestAmerica Nashville	West Virginia	West Virginia DEP	3	219
TestAmerica Nashville	Wisconsin	State Program	5	998020430

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

COOLER REC



Cooler Received/Opened On 7/16/2011 @ 0820

NUG2247

1. Tracking # 8894 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 97460373

2. Temperature of rep. sample or temp blank when opened: 3.9 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 (Front)

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) [Signature]

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # [Signature]

I certify that I unloaded the cooler and answered questions 7-14 (initial) [Signature]

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) [Signature]

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) [Signature]

I certify that I attached a label with the unique LIMS number to each container (initial) [Signature]

21. Were there Non-Conformance issues at login? YES...NO Was a PIPE generated? YES...NO...# [Signature]



TestAmerica Austin - 14500
Summit Drive, A-100 Austin,
Texas 78728

TestAmerica Houston -
6310 Rothway Street,
Houston, Texas 77040

TestAmerica Savannah -
5102 LaRoche Avenue,
Savannah, GA 31404

TestAmerica Corpus Christi -
1733 NPID, Corpus Christi,
Texas 78408

TestAmerica Nashville -
2960 Foster Creighton Dr.,
Nashville, TN 37204

Other

NUG2247
07/27/11 23 59

Customer Information				Project Information				Analyses / Method Requested												
P.O.		Project Name		<div>Thomas Slattery & Lighting Resources, Inc.</div>																
W.O.		Lab Number																		
Company		Bill To																		
Send Report To:		Invoice Attn																		
Address:		Address:																		
City/State/Zip		City/State/Zip																		
Phone		Phone																		
Fax		Fax																		
Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Bottles	A	B	C	D	E	F	G	H	I	J	K	L	Comments
1	A-1 Phosphor Powder	7-7-11	1300		WATER		1	X	X											
2	B-1 Plastic Powder	7-7-11	1300		WATER		1	X	X											
3	lamp glass	7-7-11	1300				1	X												
4	Alum Bags	7-7-11	1300				1	X												
5																				
6																				
7																				
8																				
9																				
10																				

Relinquished by		Relinquished by		Relinquished by	
Date	Time	Date	Time	Date	Time
7/14/11		7/15/11		7/16/11	
Company Name: Lighting Resources		Company Name: TestAmerica		Company Name: Paul Apple	
Received by: Apple Computer		Received by: TestAmerica		Received by: TestAmerica	
Company Name: TestAmerica		Company Name: TestAmerica		Company Name: TestAmerica	

Shipment Method		Arb. No.		Required Turnaround	
Date	Time	Date	Time	Date	Time
7/14/11		7/15/11		7/16/11	
Company Name: TestAmerica		Company Name: TestAmerica		Company Name: TestAmerica	

C.6 ES7X® MSDS



Material Safety Data Sheet

Catalog Number: 76671
Revision date: 26-Apr-2006

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY INFORMATION

Catalog Number: 76671

Product name: ES 7X® LABORATORY DETERGENT

Synonyms: 7X ES; 7X PF

Supplier:

MP Biomedicals, LLC
29525 Fountain Parkway
Solon, OH 44139
tel: 440-337-1200

Emergency telephone number: CHEMTREC: 1-800-424-9300 (1-703-527-3887)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA Exposure Limits:
WATER	7732-18-5	80 - 90%	None	None
Pentamethylenephosphonate heptasodium	22042-96-2	10 - 20%	None	None
DIOCTYL SULFOSUCCINATE SODIUM SALT	577-11-7	1 - 5%	None	None
Glycol Ether	112-34-5	1 - 5%	None	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Irritating to eyes

Category of Danger:

Irritant

Principle routes of exposure: Skin

Inhalation: May cause irritation of respiratory tract

Ingestion: May be harmful if swallowed.

Skin contact: May cause allergic skin reaction

Eye contact: Moderately irritating to the eyes

ANSI Classification Irritant - eye, mild

Statements of hazard CAUSES EYE IRRITATION.

Statement of Spill or Leak - ANSI Label Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment.

Statement of First Aid In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician. If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call a physician. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. In case of contact, flush eyes with running water for at least 15 minutes. Consult a physician for irritation or any other symptom.

Catalog Number: 76671

Product name: ES 7X® LABORATORY
DETERGENT

Page 1 of 8

Precautions - ANSI Label Do not breathe vapors or spray mist Avoid contact with eyes Do not taste or swallow.

4. FIRST AID MEASURES

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Inhalation: Move to fresh air. Call a physician immediately.

Skin contact: Rinse immediately with plenty of water for at least 15 minutes Remove and wash contaminated clothing before re-use Call a physician immediately Consult a physician if necessary

Ingestion: If swallowed, seek medical advice immediately and show this container or label. Drink 1 or 2 glasses of water. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician

Eye contact: Flush eye(s) immediately with plenty of water. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Rinse immediately with plenty of water, also under the eyelids. Call a physician immediately Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician If symptoms persist, call a physician

Protection of first-aiders: No information available

Medical conditions aggravated by exposure: None known

5. FIRE FIGHTING MEASURES

Suitable extinguishing media:

Use dry chemical, CO2, water spray or `alcohol` foam., Use dry chemical, CO2, water spray or "alcohol" foam, Use media appropriate for the surrounding fire.

Specific hazards:

Burning produces irritant fumes.

Unusual hazards:

None known

Special protective equipment for firefighters:

Wear self contained breathing apparatus for fire fighting if necessary. In the event of fire and/or explosion do not breathe fumes.

Specific methods:

Water mist may be used to cool closed containers.

Flash point:

Not determined

Autoignition temperature:

Not determined

NFPA rating:

NFPA Health: 0

NFPA Flammability: 0

NFPA Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:

Use personal protective equipment. Remove all sources of ignition.

Environmental precautions:

Do not flush into surface water or sanitary sewer system.

Methods for cleaning up:

Soak up with inert absorbent material.

7. HANDLING AND STORAGE

Storage:

ROOM TEMPERATURE

Handling:

Use only in area provided with appropriate exhaust ventilation.

Safe handling advice:

Wear personal protective equipment. Remove and wash contaminated clothing before reuse.

Technical measures/storage conditions:

Keep containers tightly closed in a cool, well-ventilated place.

Incompatible products:

Oxidising and spontaneously flammable products

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Ensure adequate ventilation, especially in confined areas.**PERSONAL PROTECTIVE EQUIPMENT****Respiratory protection:** In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit.**Hand protection:** Pvc or other plastic material gloves**Skin and body protection:** Impervious clothing Long sleeved clothing**Eye protection:** If splashes are likely to occur, wear: Goggles Safety glasses with side-shields**Hygiene measures:** Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor

Tan to yellowish-grey, Hazy

Physical state:

Liquid

Formula:

Not applicable

Melting point/range:

No data available at this time.

Boiling point/range:

No Data available at this time.

Density:

No data available

Vapor pressure:

No data available

Evaporation rate:

No data available

Vapor density:

No data available

Solubility (in water):

Soluble

Flash point:

Not determined

Autoignition temperature:

Not determined

10. STABILITY AND REACTIVITY

Stability:

Stable under recommended storage conditions.

Polymerization:

None under normal processing.

Hazardous decomposition products:

Thermal decomposition can lead to release of irritating gases and vapours such as carbon oxides.

Materials to avoid:

Strong oxidising agents

Conditions to avoid:

Exposure to air or moisture over prolonged periods.

11. TOXICOLOGICAL INFORMATION

Product Information**Acute toxicity****Components**

WATER

Pentamethylenephosphonate
heptasodiumDIOCTYL SULFOSUCCINATE
SODIUM SALT

Glycol Ether

RTECS Number:

ZC0110000

Not Available

WN0525000

Not Available

Selected LD50s and LC50s

Oral LD50 Rat = > 90 ml/kg

Oral LD50 Rat : >5 gm/kg

Dermal LD50 Rabbit : >5 gm/kg

Oral LD50 Rat : 1900 mg/kg

Oral LD50 Mouse : 2643 mg/kg

Oral LD50 Rat : 5660 mg/kg

Oral LD50 Mouse : 2400 mg/kg

Dermal LD50 Rabbit : 2700 mg/kg

Chronic toxicity:

Chronic exposure may cause nausea and vomiting, higher exposure causes unconsciousness.

Local effects:	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Specific effects:	May include moderate to severe erythema (redness) and moderate edema (raised skin), nausea, vomiting, headache.
Primary irritation:	No data is available on the product itself.
Carcinogenic effects:	No data is available on the product itself.
Mutagenic effects:	No data is available on the product itself.
Reproductive toxicity:	No data is available on the product itself.

12. ECOLOGICAL INFORMATION

Mobility:	No data available
Bioaccumulation:	No data available
Ecotoxicity effects:	No data available
Aquatic toxicity:	May cause long-term adverse effects in the aquatic environment.

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants	United Kingdom - The Red List:
WATER	Not Listed	Not Listed	Not Listed
Pentamethylenephosphonate heptasodium	Not Listed	Not Listed	Not Listed
DIOCTYL SULFOSUCCINATE SODIUM SALT	Not Listed	Not Listed	Not Listed
Glycol Ether	Not Listed	Not Listed	Not Listed

Components	Germany VCI (WGK)	World Health Organization (WHO) - Drinking Water	Ecotoxicity - Fish Species Data
WATER	Not Listed	Not Listed	Not Listed
Pentamethylenephosphonate heptasodium	Not Listed	Not Listed	LC50 (96 hr) rainbow trout:>180 mg/L, <252 mg/L.;LC50 (96 hr) bluegill sunfish:758 mg/L.:
DIOCTYL SULFOSUCCINATE SODIUM SALT	Not Listed	Not Listed	Not Listed
Glycol Ether	1	Not Listed	LC50 (96 hr) bluegill:1300 mg/L. Cond:Static, 23 °C.;LC50 (24 hr) goldfish:2700 mg/L.:

Components	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Microtox Data	Ecotoxicity - Water Flea Data
WATER	Not Listed	Not Listed	Not Listed
Pentamethylenephosphonate heptasodium	EC50 (96 hr) freshwater algae:2 mg/L.:	Not Listed	EC50 (48 hr) water flea:242 mg/L.:
DIOCTYL SULFOSUCCINATE SODIUM SALT	Not Listed	Not Listed	Not Listed
Glycol Ether	Not Listed	Not Listed	LC50 (24 hr) water flea:2850 mg/L.:

Components	EPA - ATSDR Priority List	EPA - HPV Challenge Program Chemical List	California - Priority Toxic Pollutants
WATER	Not Listed	Not Listed	Not Listed
Pentamethylenephosphonate heptasodium	Not Listed	indicator 4; Fully and ICCA sponsored	Not Listed
DIOCTYL SULFOSUCCINATE SODIUM SALT	Not Listed	indicator 4; Fully sponsored	Not Listed
Glycol Ether	Not Listed	indicator 2; Not sponsored	Not Listed

Components	California - Priority Toxic Pollutants	California - Priority Toxic Pollutants
WATER	Not Listed	Not Listed
Pentamethylenephosphonate heptasodium	Not Listed	Not Listed
DIOCTYL SULFOSUCCINATE SODIUM SALT	Not Listed	Not Listed
Glycol Ether	Not Listed	Not Listed

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:

Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Residue from fires extinguished with this material may be hazardous.

Contaminated packaging: Methods for cleaning up:

Do not re-use empty containers
Soak up with inert absorbent material.

14. TRANSPORT INFORMATION

UN/Id No:

Not regulated

DOT:

Proper shipping name:

Not Regulated

Components	U.S. DOT - Appendix A Table 1 - Reportable Quantities
WATER	Not Listed
Pentamethylenephosphonate heptasodium	Not Listed
DIOCTYL SULFOSUCCINATE SODIUM SALT	Not Listed
Glycol Ether	RQ = 1 pound (as glycol ethers)

TDG (Canada):

WHMIS hazard class:

Non-controlled

IMDG/IMO

IMDG - Hazard Classifications

Not Applicable

Components	U.S. DOT - Appendix B - Marine Pollutan	U.S. DOT - Appendix B - Severe Marine Pollutants
WATER	Not Listed	Not Listed
Pentamethylenephosphonate heptasodium	Not Listed	Not Listed
DIOCTYL SULFOSUCCINATE SODIUM SALT	Not Listed	Not Listed
Glycol Ether	Not Listed	Not Listed

IMO-labels:**15. REGULATORY INFORMATION****International Inventories****Components**

WATER

Inventory - United States TSCA - Sect. 8(b)

Present

Canada DSL Inventory List -

Present

Australia (AICS):

Present

Inventory - China:

Present

EU EINECS List -

231-791-2; H2O

Korean KECL:

KE-35400

Philippines PICCS:

Present

Components

Pentamethylenephosphonate heptasodium

Inventory - United States TSCA - Sect. 8(b)

Present

Canada DSL Inventory List -

Present

Australia (AICS):

Present

Inventory - China:

Present

EU EINECS List -

244-751-4; C9H28N3O15P5.xNa

Korean KECL:

KE-28512

Philippines PICCS:

Present

Components

DIOCTYL SULFOSUCCINATE SODIUM SALT

Inventory - United States TSCA - Sect. 8(b)

Present

Canada DSL Inventory List -

Present

Australia (AICS):

Present

Inventory - China:

Present

EU EINECS List -

209-406-4; C20H38O7S.Na

Inventory - Japan:

2-1623

Korean KECL:

KE-32402

Philippines PICCS:

Present

Components

Glycol Ether

Inventory - United States TSCA - Sect. 8(b)

Present

Canada DSL Inventory List -

Present

Australia (AICS):

Present

Inventory - China:

Present

EU EINECS List -

203-961-6; C8H18O3

Inventory - Japan:

2-422; 7-97

Korean KECL:

KE-10466

Philippines PICCS:

Present

U.S. regulations:

Components	California Proposition 65	Massachusetts Right to Know List:	New Jersey Right to Know List:	Pennsylvania Right to Know List:
WATER	Not Listed	Not Listed	Not Listed	Not Listed
Pentamethylenephosphonate heptasodium	Not Listed	Not Listed	Not Listed	Not Listed
DIOCTYL	Not Listed	Not Listed	Not Listed	Not Listed
SULFOSUCCINATE SODIUM SALT				
Glycol Ether	Not Listed	Not Listed	Not Listed	environmental hazard

Components	Florida substance List:	Rhode Island Right to Know List:	Illinois - Toxic Air Contaminants	Connecticut - Hazardous Air Pollutants
WATER	Not Listed	Not Listed	Not Listed	Not Listed
Pentamethylenephosphonate heptasodium	Not Listed	Not Listed	Not Listed	Not Listed
DIOCTYL	Not Listed	Not Listed	Not Listed	Not Listed
SULFOSUCCINATE SODIUM SALT				
Glycol Ether	Not Listed	Not Listed	Not Listed	Not Listed

Components	SARA 313 Emission reporting/Toxic Release of Chemicals	CERCLA/SARA - Section 302 Extremely Haz	NTP:	IARC:
WATER	Not Listed	Not Listed	None	None
Pentamethylenephosphonate heptasodium	Not Listed	Not Listed	None	None
DIOCTYL	Not Listed	Not Listed	None	None
SULFOSUCCINATE SODIUM SALT				
Glycol Ether	form R reporting required for 1.0% de minimis concentration; Chemical Category N230; (applies to R-(OCH ₂ CH ₂) _n -OR" ethers, where n = 1,2, or 3"; R=alkyl C7 or less or R = phenyl or alkyl subst. p	Not Listed	None	None

SARA 313 Notification:

The above is your notification as to the SARA 313 listing for this product(s) pursuant to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

If you are unsure if you are subject to the reporting requirements of Section 313, or need more information, please call the EPA Emergency Planning and Community Right-To-Know Information Hotline: (800) 535-0202 or (202) 479-2499 (in Washington, DC or Alaska).

State Notification:

The above information is your notice as to the Right-to-Know listings of the stated product(s). Individual states will list chemicals for a variety of reasons including, but not limited to, the compounds toxicity; carcinogenic, tumorigenic and/or reproductive hazards; and the compounds environmental impact if accidentally released.

16. OTHER INFORMATION

Prepared by: Health & Safety

Disclaimer: The information and recommendations contained herein are based upon tests believed to be reliable. However, MP Biomedicals does not guarantee the accuracy or completeness NOR SHALL ANY OF THIS INFORMATION CONSTITUTE A WARRANTY, WHETHER EXPRESSED OR IMPLIED, AS TO THE SAFETY OF THE GOODS, THE MERCHANTABILITY OF THE GOODS, OR THE FITNESS OF THE GOODS FOR A PARTICULAR PURPOSE. Adjustment to conform to actual conditions of usage maybe required. MP Biomedicals assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

End of Safety Data Sheet

C.7 HgX® MSDS

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HgX®

Material Safety Data Sheet**SECTION I****PRODUCT IDENTIFICATION****HAZARD RATING**

PRODUCT NAME: HgX® Mercury Decontaminant Powder

MANUFACTURER NAME: Acton Technologies, Inc.

CHEMICAL FAMILY: Salt/Chelating Agent

FORMULA: Proprietary Blend of Sodium Thiosulfate and Ethylenediaminetetraacetic Acid

**SECTION II****HAZARDOUS INGREDIENTS**

NONE

SECTION III**PHYSICAL DATA**

VAPOR DENSITY:	Not Applicable	PERCENT VOLATILE:	Not Applicable
SOLUBILITY IN H ₂ O:	Appreciable	SPECIFIC GRAVITY:	Est. above 1.0 (No Data)
EVAPORATION RATE:	Not Applicable	ODOR:	None
APPEARANCE:	Granular (white)		

SECTION IV**FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT:	Not Applicable	AUTO-IGNITION TEMPERATURE:	Not Applicable
FLAMMABLE LIMITS IN AIR:	Not Flammable	EXTINGUISHING MEDIA:	Not Applicable
FIRE FIGHTING PROCEDURES:	Extremely high temperatures may cause evolution of toxic SO ₂ or H ₂ S gases.		

SECTION V**HEALTH HAZARD DATA**

PERMISSIBLE EXPOSURE DATA:	Not Applicable
----------------------------	----------------

**EFFECT OF
OVEREXPOSURE:**

None Known

FIRST AID PROCEDURES:

Inhalation: Avoid breathing dust by wearing dust respirator. Remove to fresh air if effects occur.

Eyes: Irrigate eyes for 15 minutes. For serious irritation, seek medical attention.

Skin: Flush skin with water for 15 minutes. For serious irritation, seek medical attention.

Ingestion: Ingestion in gross quantities could be harmful - seek medical attention.

SECTION VI

REACTIVITY DATA

STABILITY:

Stability limited in solution

**HAZARDOUS
POLYMERIZATION:** Will not occur.

INCOMPATIBILITY:

Acids, oxidizing agents

**CONDITIONS TO
AVOID:**

High temperatures, Acids and oxidization agents

**HAZARDOUS
DECOMPOSITION OF
PRODUCTS:** High temperatures (800-900° F) may cause evolution of toxic SO₂ or H₂S gases.

SECTION VII

SPILL OR LEAK PROCEDURE

**STEPS TO BE
TAKEN IN CASE
OF SPILL OR
LEAK:**

Sweep up and remove excess. Flush residue with water.

**DISPOSAL
PROCEDURE:**

Unused, in dry form HgX® may be stored indefinitely. It may be disposed of according to local, state and federal environmental regulations.

HgX® which has been used to decontaminate a mercury spill must be handled as follows: Separate the solids and do a toxicity test on the solids and the liquid. Depending on the toxicity readings, more HgX® may be added to further decontaminate the liquid or solids which then should be disposed of according to local, state, and federal environmental regulations.

SECTION VIII

**SPECIAL PROTECTION
INFORMATION**

VENTILATION:

As necessary to remove dust.

EYE PROTECTION:

Wear safety glasses with side shields.

PROTECTIVE
GLOVES/APRON:

Wear clothing sufficient to protect skin from
contact.

SECTION IX SPECIAL PRECAUTIONS

Store in cool, dry area. Avoid storage where contact with acids or oxidizing agents is likely. Avoid breathing dust. Avoid skin and eye contact.

NOTICE

This data is furnished gratuitously, independent of any sale of the product, and only for your independent investigation and verification. While this data is believed to be correct, Acton makes no representation as to its accuracy. Acton makes no warranties, guaranties, or representations of any kind or nature with respect to the product or to this data, either expressed or implied, and whether arising by law or otherwise, including but not limited to any implied warranty of merchantability or fitness for any particular purpose. Acton shall in no event be liable for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication or use of or reliance upon this data.

HgX® Mercury Decontaminant Powder
Review and Revision: May 2008

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100 THOMPSON STREET P.O. BOX 726 PITTSBURGH, PENNSYLVANIA 15106 USA PHONE: 570.654.0612 FAX: 570.654.2810

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HgX®

Where to use HgX

Needless to say, anywhere where the possibility of mercury contamination exists... which is just about anywhere metallic mercury, mercury salts or liquids containing mercury are used.

Some typical trouble spots include:

- Chlorine and caustic plants
- Chemical laboratories
- Hospitals
- University laboratories
- Plants where neon signs, batteries, fluorescent and high intensity discharge lamps and mercury type instruments are manufactured and repaired
- Dental offices and laboratories
- Pre-soak in laundry operations for workers' outer garments

[Top](#)

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Technical Bulletin: Directions for the reduction of mercury vapor

For use on all surfaces exposed to metallic mercury, mercury salts or materials containing mercury in any form. HgX® is particularly recommended for rough surfaces, such as concrete floors having cracks or crevices-wooden floors with open joints, etc.

Dry Method

Distribute 8 oz. of HgX® powder evenly over 100 sq. ft. of floor area to be treated. Brush or sweep HgX® lightly into all cracks and crevices, then spray, sprinkle or swab with water.

Wet Method

For the initial treatment add 1.5 pounds of HgX® slowly or sift into 5 gallons of water - do not dump. Subsequent applications may be reduced to 1 pound for each 5 gallons of water. HgX® solution should be milky. If clear, increase quantity. Apply with a sprayer, large whitewash brush or mop. Saturate surface thoroughly and allow to stand over night, preferably over holidays or weekends. Rinse-mop or sponge with clear water to remove residual HgX®, if necessary.

We suggest washing or generous spraying of all floors and wall surfaces every two weeks in operating areas with HgX® which will provide a coating or film on metallic mercury or reduce to non-vaporizing form. HgX® will also react with various Mercury compounds and materially reduce mercury contaminated air from such sources.

For regular sweeping, we suggest saturating ordinary sawdust with HgX® solution as described herein. You will reduce the dust hazard and treat the area at the same time.

Closed System Method

To decontaminate closed systems which cannot be treated practically by the wet method outlined above, fill the system

with HgX® solution (1.5 pounds in 5 gallons of water) and agitate or circulate the solution for several hours. Drop the solution and flush thoroughly with clear water. Repeat if necessary.

Due to the variations in the water supply in certain areas the quantity of HgX® may require some adjustment. If the water, after adding the recommended quantity of HgX®, does not turn milky (white) within 15 minutes or half hour, add additional HgX® until it does. The solution upon standing several hours (overnight) will turn clear but retain its efficacy. The precipitation on the bottom of the container is merely the excess above saturation.

CAUTION: Be sure to properly ventilate all areas suspected of mercury contamination. Continue adequate ventilation during decontamination procedures until mercury vapor concentration is lowered to acceptable levels. HgX® Powder and HgX® Solution may cause corrosion to some metals. Clean all treated metal surfaces with clear water and dry thoroughly. Avoid contact with eyes, skin or clothing. Use rubber gloves. Do not mix HgX® with other cleaning agents or any other materials. Use cold tap water to make up solutions.

[Top](#)

100 THOMPSON STREET P.O. BOX 726 PITTSTON, PENNSYLVANIA 18640 USA PHONE: 570.654.0612 FAX: 570.654.2810

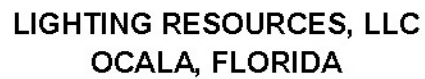
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APPENDIX D

RECORDKEEPING FORMS



Facility Status (Estatus):	<input type="checkbox"/> Operating (<i>Funcionamiento</i>)	<input type="checkbox"/> Not Operating (<i>No Funcionamiento</i>)
Date (Fecha):		
Time (Tiempo):	A.M.	P.M.

Production Plan – List the ID numbers of items pulled for processing. Initial to confirm the items were processed. (Plan de Produccion - Iniciales para confirmar el procesamiento.)					
ID Number (Numero de ID)	Initial (Iniciales)	ID Number (Numero de ID)	Initial (Iniciales)	ID Number (Numero de ID)	Initial (Iniciales)

Remember: All items pulled from must be processed by the end of the day.
Recuerde: Todos los artículos sacados B debe ser procesado por el final del día.



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

SHIFT REPORT (cont'd):

Processed Glass Containers (Basurero de Vidrio)

How many processed glass containers (Lo Lleno)?

Does a pickup of the glass containers need to be scheduled?

PPE Check and Violations (Verificación de PPE, Cualquier Violaciones Registro)

Are all employees equipped with the necessary PPE (Los empleados cuentan con los PPE necesarios)?

☐ YES

☐ NO

Time of Violation (Momento de la Violación)	Employee Name (Nombre del Empleado)	Details of Violation (Detalles de Violación)

Spills (Derrames) – Note the occurrence of any spills. (Notar la Ocurrencia de Derrames)

Time (Tiempo)	Details & Remedial Actions (Detalles, Medidas Correctivas)	Employees Involved (Los Empleados Involucrados)
Attach additional documentation if necessary. (Adjunte la documentación adicional si es necesario.)		

Incidents and Injuries (Incidentes y Dolores) – Note the occurrence of any incidents. (Nota de la Ocurrencia de Incidentes)

Time (Tiempo)	Details & Remedial Actions (Detalles, Medidas Correctivas)	Employees Involved (Los Empleados Involucrados)
Attach additional documentation if necessary. (Adjunte la documentación adicional si es necesario.)		

Employee Attendance (Empleado de Calendario)

List any absent employees (Los Empleados Ausentes):

List any tardy employees and hours worked (Empleados de Tarde, Las Horas Trabajadas):

Name: _____ Signature: _____ Date: _____ Time: _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

SHIFT INSPECTION SCHEDULE & CHECKLIST

Inspection Item	<input checked="" type="checkbox"/>	Notes	Inspection Frequency
Inventory	<input type="checkbox"/>		Each Shift
Daily Production Plan	<input type="checkbox"/>		Each Shift
Processed Materials	<input type="checkbox"/>		Each Shift
PPE Check and Violations	<input type="checkbox"/>		Each Shift
Spills	<input type="checkbox"/>		Each Shift
Incidents and Injuries	<input type="checkbox"/>		Each Shift
Employee Attendance	<input type="checkbox"/>		Each Shift

Name: _____ Signature: _____

Date: _____ Time: _____



INSPECTION SCHEDULE & CHECKLIST			
Inspection Item	<input checked="" type="checkbox"/>	Notes	Frequency
Monitoring Equipment			
Air Emissions Monitoring Equipment	<input type="checkbox"/>		Every 2 Hours
Health and Safety			
First Aid Kit Contents / Expiration Dates	<input type="checkbox"/>		Monthly
First Aid Kit Locations	<input type="checkbox"/>		Twice Daily
Spill Kit Contents / Expiration Dates	<input type="checkbox"/>		Monthly
Spill Kit Locations	<input type="checkbox"/>		Twice Daily
Wash Stations	<input type="checkbox"/>		Twice Daily
Spill Control Equipment: Brooms, Pans, HEPA / ULPA Vacuums, Absorbents	<input type="checkbox"/>		Twice Daily
Respirators	<input type="checkbox"/>		Twice Daily
Respirator Cartridges	<input type="checkbox"/>		Twice Daily
Emergency Contact List	<input type="checkbox"/>		Twice Daily
Emergency Shower and Eye Wash	<input type="checkbox"/>		Twice Daily
Emergency Shower and Eye Wash	<input type="checkbox"/>		Twice Daily
Hearing Protection	<input type="checkbox"/>		Twice Daily
Protective Eye Glasses	<input type="checkbox"/>		Twice Daily
Fire Extinguisher Status	<input type="checkbox"/>		Monthly or after each use
Fire Extinguisher Locations	<input type="checkbox"/>		Twice Daily
Telephone / Communication Devices	<input type="checkbox"/>		Twice Daily
Emergency Exits	<input type="checkbox"/>		Twice Daily
Facility Signs	<input type="checkbox"/>		Daily
Facility Security			
Door Locks	<input type="checkbox"/>		Daily
Vehicle Locks	<input type="checkbox"/>		Daily
Security Fence and Gate	<input type="checkbox"/>		Daily
Log In / Log Out Procedures at Office	<input type="checkbox"/>		Twice Daily
Area A - Lamp Staging / Storage Area			



INSPECTION SCHEDULE & CHECKLIST			
Inspection Item	<input checked="" type="checkbox"/>	Notes	Frequency
Overall Cleanliness	<input type="checkbox"/>		Twice Daily
Floor Slab	<input type="checkbox"/>		Twice Daily
Signs	<input type="checkbox"/>		Twice Daily
Area Walls and Ceiling	<input type="checkbox"/>		Twice Daily
Aisle Space	<input type="checkbox"/>		Twice Daily
Pallets	<input type="checkbox"/>		Twice Daily
Container Condition	<input type="checkbox"/>		Twice Daily
Container Closures	<input type="checkbox"/>		Twice Daily
Containers Labeled, Dated, and Signed	<input type="checkbox"/>		Twice Daily
Container Stacking/Storage	<input type="checkbox"/>		Twice Daily
Containers Logged In	<input type="checkbox"/>		Twice Daily
Container Status / Retention Time	<input type="checkbox"/>		Twice Daily
Area A - Related Material Handling, Staging, and Management Areas			
Overall Cleanliness	<input type="checkbox"/>		Twice Daily
Load / Unloading Areas			
Battery Sorting / Staging Area			
Area Floors, Walls and Ceiling	<input type="checkbox"/>		Twice Daily
Area B - Lamp Processing Room & Equipment Inspection and Maintenance			
Overall Cleanliness	<input type="checkbox"/>		Daily
Lamp Feed Table	<input type="checkbox"/>		Daily
Broken Glass	<input type="checkbox"/>		Daily
Conveyors	<input type="checkbox"/>		Daily
Conveyor Drawers (remove and empty)	<input type="checkbox"/>		Each Shift
Conveyors Belts (inspect for wear, damage, debris)	<input type="checkbox"/>		Weekly
Universal Rumbler Drawers (check, remove, empty)	<input type="checkbox"/>		Each Shift
Vibrating Flat Bed Grid (check and clear)	<input type="checkbox"/>		Daily



INSPECTION SCHEDULE & CHECKLIST			
Inspection Item	<input checked="" type="checkbox"/>	Notes	Frequency
Flexible Pipework (inspected)	<input type="checkbox"/>		Daily
Internal Inspection (remove rumbler side panels)	<input type="checkbox"/>		Monthly
Rumbler Wheels (inspected)	<input type="checkbox"/>		Daily
Panels	<input type="checkbox"/>		Daily
Floor Sweep	<input type="checkbox"/>		Daily
Tools & Flammables	<input type="checkbox"/>		Daily
Trash & Cardboard	<input type="checkbox"/>		Daily
Phosphor Powder Staging Area	<input type="checkbox"/>		Daily
Floors, Walls, and Ceiling	<input type="checkbox"/>		Daily
Area C – Processed Glass and Supply Storage Room			
Overall Cleanliness	<input type="checkbox"/>		Daily
Floor Slab	<input type="checkbox"/>		Twice Daily
Signs	<input type="checkbox"/>		Twice Daily
Aisle Space	<input type="checkbox"/>		Twice Daily
Pallets	<input type="checkbox"/>		Twice Daily
Glass Container Condition	<input type="checkbox"/>		Twice Daily
Glass Container Closures	<input type="checkbox"/>		Twice Daily
Glass Containers Labeled & Dated	<input type="checkbox"/>		Twice Daily
Glass Container Stacking/Storage	<input type="checkbox"/>		Twice Daily
Glass Containers Logged In	<input type="checkbox"/>		Twice Daily
Glass Container Status / Retention Time	<input type="checkbox"/>		Twice Daily
Supply Storage and Inventory	<input type="checkbox"/>		Daily
Floors, Walls, and Ceilings	<input type="checkbox"/>		Daily
Loading Dock Area			
Overall Cleanliness	<input type="checkbox"/>		Daily
Drainage Grate and Sump	<input type="checkbox"/>		Daily
Pallets	<input type="checkbox"/>		Daily



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INSPECTION SCHEDULE & CHECKLIST			
Inspection Item	<input checked="checked" type="checkbox"/>	Notes	Frequency
Trash & Cardboard	<input type="checkbox"/>		Daily
Aisle Ways / Packaging Storage			
Aisle Ways	<input type="checkbox"/>		Daily
Packaging Storage	<input type="checkbox"/>		Daily
Forklifts & Miscellaneous			
Forklifts	<input type="checkbox"/>		Daily
Receiving & Production Workstation	<input type="checkbox"/>		Daily
Name: _____ Signature: _____			
Date: _____ Time: _____			



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

Daily Air Monitoring Report

Date:

Locations	12 a.m.	2 a.m.	4 a.m.	6 a.m.	8 a.m.	10 a.m.	12 p.m.	2 p.m.	4 p.m.	6 p.m.	8 p.m.	10 p.m.
Inspector Initials												
AM-1												
AM-2												
AM-3												
AM-4												
AM-5												
AM-6												
AM-7												
AM-8												
AM-9												
AM-10												
AM-11												
AM-12												
AM-13												
AM-14												

Note: Readings are to be taken using the Jerome 431 X Mercury Analyzer (or equivalent) and are to be measured in mg/m^3 .

Name: _____ Signature: _____ Date: _____ Time: _____



Daily Activity Report							
RSO Number	Time In	Processing Completed	Mercury Vapor Reading	Mercury Vapor Analyzer Instrument	Location	Time	Temperature
					Office		
					Area A - Receiving & Staging Rm		
					Area B - Lamp Processing Rm		
					Area C - Processed Glass & Supply Rm		
					Input		
					Drums		
					Alum Out		
					Glass Out		
					Office		
					Area A - Receiving & Staging Rm		
					Area B - Lamp Processing Rm		
					Area C - Processed Glass & Supply Rm		
					Input		
					Drums		
					Alum Out		
					Glass Out		
				Powder Drums Level			
				Start / Day		End / Day	
				Drums Check			
				Powder		Hg Debris	
				Drums Check			
				Ballasts		Batteries	



DAILY CLOSING REPORT:

Date:

Time:

I. Security

Item	Satisfactory	Unsatisfactory	Notes
Security System (Functional, Ready to arm?)			
Vehicle Locks (Are all trucks and trailers locked?)			
Doors & Windows (Are all doors and windows closed and locked?)			

II. Area A - Dock Area

Item	Satisfactory	Unsatisfactory	Notes
Overall Cleanliness (Has area been appropriately cleaned, including inside floors / outside bays?)			
Pallets (Have excess pallets been moved to the side lot?)			
Trash & Cardboard (Has all trash been taken to the dumpster? Have cardboard bales been moved to the side lot?)			
Floor Sweep (Has the dock area floor been cleaned using sweeping compound?)			

III. Area A - Staging / Storage, Aisle Ways

Item	Satisfactory	Unsatisfactory	Notes
Aisle ways (Have the aisle ways been cleaned using sweeping compound?)			
Lamp Staging Rows (Are all containers secured, neatly stacked, appropriately labeled?)			
Supply Storage (Has area been organized and supplies placed in appropriate location?)			
Floor Sweep (Has the floor been cleaned using sweeping compound?)			

IV. Area A - Forklifts / Charging Station, Scale, Sweeping / PPE Debris Drums

Item	Satisfactory	Unsatisfactory	Notes
Forklifts (Have the propane lines on each forklift been shut off? Keys removed from the ignition?)			
Forklift Charging Station (Is area clean?)			
Scale (Is area free of debris and clean?)			
Sweeping / PPE Debris Drums (Are the two drums, 1-for sweepings and 1-for spent Tyveks, closed and the immediate area clean?)			



DAILY CLOSING REPORT (cont'd):

V. Area A – Battery Sorting / Staging, MCD Staging, Ballast Staging

Item	Satisfactory	Unsatisfactory	Notes
Battery Sorting / Staging (Has the area been cleaned and organized, and all materials containerized?)			
MCD Staging (Has the area been cleaned and are materials containerized?)			
Ballast Staging (Has the area been cleaned and are materials containerized?)			
Floor Sweep (Has the floor been cleaned using sweeping compound?)			

VI. Area B - Lamp Processing Equipment Shutdown & Decontamination

Item	Satisfactory	Unsatisfactory	Notes
Overall Cleanliness (Has the machine been wiped down?)			
Lamp Feed Table (Has the feed table been thoroughly dusted, vacuumed and wiped down?)			
Lamp Glass Cullet (Has all containerized glass cullet been moved to Area C?)			
Lamp Metals (Has all containerized metals been moved into the dedicated trailer parked outside?)			
Panels (Are all panels securely closed?)			
Phosphor Powder Staging (Is Powder Staging Area clean and secure?)			
Floor Sweep (Has the floor been cleaned using sweeping compound?)			
Tools & Flammables (Have all tools, paints and solvents been returned to their proper places?)			
Trash & Cardboard (Has all trash been taken to the dumpster? Has all cardboard been baled?)			

VII. Area C – Processed Glass and Supply Storage

Item	Satisfactory	Unsatisfactory	Notes
Lamp Glass Cullet (Are all containers secured, neatly stacked, appropriately labeled?)			
Supply Storage (Has area been organized and supplies placed in appropriate location?)			
Floor Sweep (Has the floor been cleaned using sweeping compound?)			

Name: _____ **Signature:** _____

Date: _____ **Time:** _____



DAILY FORK TRUCK INSPECTION REPORT:

Vehicle Serial Number:	E187V19841A	Inspection Date:	
Current Hour Meter Reading		Inspection Time:	A.M. P.M.
Next Scheduled PM (Hours):		Inspected By:	

I. Damage Inspection

Inspection Item	Condition		Notes & Corrective Actions
Overhead Guard – Check for broken welds, missing bolts or other damaged areas.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Hydraulic Cylinders – check for leaks or damage to lift, tilt and side shift cylinders.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Mast Assembly – Check for broken welds, cracked or bent areas, and worn or missing stops.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Lift Chains & Rollers – Check for wear, squeaking, damage, kinks, and evidence of rust.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Forks – Check for cracks, bending, wear, mismatch or excessive oil or rust.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Tires – Check for missing rubber, separation from tire rim, large cuts or gouges or missing lug nuts.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	

II. Operations

Inspection Item	Condition		Notes & Corrective Actions
Control Levers – Do levers operate properly?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Steering – Is there excessive free play in the steering.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Brakes – Are service and parking brakes fully operational?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	

III. Safety and Warning Equipment

Inspection Item	Condition		Notes & Corrective Actions
Warning Systems – Are warning lights and horn operational?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Propane Tank – Is the tank bracket properly positioned and locked down?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Propane Supply Hose – Is the supply hose damaged, frayed, kinked, pinched or bound?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Propane Connector – Is the connector threaded squarely and tight?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Propane Odor – Is there any scent of propane on or near the propane tank? If yes, close the tank valve and report the problem immediately.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Seat Belts – Are seat belts operational?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Gauges – Are all gauges in working order?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Have all vehicles in unsafe operating condition been properly locked and tagged out?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	



DAILY FORK TRUCK INSPECTION REPORT (cont'd):

Vehicle Serial Number:	E187V22821B	Inspection Date:	
Current Hour Meter Reading		Inspection Time:	A.M. P.M.
Next Scheduled PM (Hours):		Inspected By:	

IV. Damage Inspection

Inspection Item	Condition		Notes & Corrective Actions
Overhead Guard – Check for broken welds, missing bolts or other damaged areas.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Hydraulic Cylinders – check for leaks or damage to lift, tilt and side shift cylinders.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Mast Assembly – Check for broken welds, cracked or bent areas, and worn or missing stops.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Lift Chains & Rollers – Check for wear, squeaking, damage, kinks, and evidence of rust.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Forks – Check for cracks, bending, wear, mismatch or excessive oil or rust.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Tires – Check for missing rubber, separation from tire rim, large cuts or gouges or missing lug nuts.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	

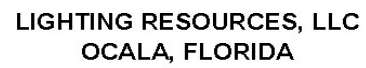
V. Operations

Inspection Item	Condition		Notes & Corrective Actions
Control Levers – Do levers operate properly?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Steering – Is there excessive free play in the steering.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Brakes – Are service and parking brakes fully operational?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	

VI. Safety and Warning Equipment

Inspection Item	Condition		Notes & Corrective Actions
Warning Systems – Are warning lights and horn operational?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Propane Tank – Is the tank bracket properly positioned and locked down?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Propane Supply Hose – Is the supply hose damaged, frayed, kinked, pinched or bound?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Propane Connector – Is the connector threaded squarely and tight?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Propane Odor – Is there any scent of propane on or near the propane tank? If yes, close the tank valve and report the problem immediately.	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Seat Belts – Are seat belts operational?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Gauges – Are all gauges in working order?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	
Have all vehicles in unsafe operating condition been properly locked and tagged out?	<input type="checkbox"/> Satisfactory	<input type="checkbox"/> Unsatisfactory	

Name & Signature: _____ Date: _____ Time: _____



MONTH _____ YEAR _____

[illegible]



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

MCLs (LAMPS) TRACKING FORM - ANNUAL

YEAR _____

MONTH	MCLs by Count (#)										MCLs Crushed (lbs)	Phosphor Powder Drum Count (#)
	4-ft Tubes	8-ft Tubes	U-Tubes	CFLs	Shielded	HID	UV	Incandescent	Short Arc / Projection	TOTALS		
January												
February												
March												
April												
May												
June												
July												
August												
September												
October												
November												
December												
TOTALS:												

Name: _____ Signature: _____ Date: _____ Time: _____



MONTH _____ YEAR _____

NAME: _____ SIGNATURE: _____ DATE: _____ TIME: _____ Page _____ of _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

BALLASTS TRACKING FORM - ANNUAL

YEAR _____

MONTH	Ballast Materials by Weight (lbs)						Ballast Materials by Drum Count (# Drums)		
	PCB	Non-PCB	PCB Caps	Non-PCB Caps	X-Formers	TOTAL Weight	PCB	Non-PCB	TOTAL # Drums
January									
February									
March									
April									
May									
June									
July									
August									
September									
October									
November									
December									
TOTALS:									

Name: _____

Signature: _____

Date: _____ Time: _____



MONTH _____ YEAR _____

* The column labeled above as "Misc.," stands for miscellaneous battery types which will be received in very small limited quantities. Miscellaneous batteries include the following type batteries: NiMH, zinc, gel cells, mercury, silver oxide, and magnesium.

NAME: _____ SIGNATURE: _____ DATE: _____ TIME: _____ Page _____ of _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

BATTERIES TRACKING FORM - ANNUAL						
YEAR _____						
MONTH	Battery Counts (#)					TOTALS
	Lead Acid	Lithium-Ion	NiCad	Alkaline	Misc. *	
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
TOTALS:						

* The column labeled above as "Misc.," stands for miscellaneous battery types which will be received in very small limited quantities.
Miscellaneous batteries include the following type batteries: NiMH, zinc, gel cells, mercury, silver oxide, and magnesium.

Name: _____ Signature: _____ Date:_____ Time:_____



MONTH _____ YEAR _____

TOTALS:

NAME: _____

DATE:_____ TIME:_____

Page ____ of ____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

MERCURY CONTAINING DEVICES (MCDs) & DEBRIS* TRACKING FORM - ANNUAL		
YEAR _____		
MONTH	Materials by Weight (lbs)	
	Debris *	Large Quantities
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		
TOTALS:		

* The column labeled above as "Debris," may include broken MCDs, sweepings, used Tyveks, air filters, etc.

Name: _____ Signature: _____ Date: _____ Time: _____



MONTH _____ YEAR _____

NAME: _____ SIGNATURE: _____ DATE: _____ TIME: _____ Page ____ of ____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

MISCELLANEOUS MATERIALS (E-WASTE) TRACKING FORM - ANNUAL

YEAR _____

MONTH	Materials by Count (#)						
	Computers	Monitors	TVs	Electronics	Other	HID Fixtures	TOTALS
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							
TOTALS:							


Name: _____

Signature: _____

Date: _____ Time: _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

PULSE REPORT							
Logistics	 in / out	# P/U	Route Value	Operations		Branch	
				trailer count		updates	0
				date working		visitors	
				compliance			
				glass capacity %	0		
				head count			
				manifest date working			
				retort / powder inv.	0		
LTL outbound/ inbound	qty.			str. Lamps processed	0		
daily logistics forecast \$				hid's	0		
rescheduled pick ups	0		\$0.00	crushed	0		
RSO's						Sales	
date working				part B capacity	////////		
recent packet \$				Equipment d/t		contacts	
						quotes	
						COD	
						60	
						90 +	

Notes: (open items / issues / general)



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

WASTES AUTHORIZED FOR ACCEPTANCE

Wastes authorized for acceptance and processing at the Lighting Resources, LLC (Ocala, FL) Facility:

For Processing:

- Intact Mercury Containing Lamps (MCLs)
- Broken or Crushed Mercury Containing Lamps (MCLs)

Wastes authorized for acceptance and transfer only at the Lighting Resources, LLC (Ocala, FL) Facility:

For Transfer Only:

- Intact Mercury Batteries
- Mercury Containing Devices (MCDs)
- Non-PCB Lighting Ballasts
- PCB Lighting Ballasts



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

WASTES PROHIBITED FOR ACCEPTANCE

Wastes that are specifically prohibited for acceptance at the Lighting Resources, LLC (Ocala, FL) Facility:

- Radioactive Wastes
- Liquid Wastes
- Biological and Medical Wastes
- Municipal Solid Wastes
- Flammable Wastes
- Explosive Wastes
- Pyrophoric Wastes
- Ignitable Waste
- Corrosive Waste
- Reactive Waste
- Acute Hazardous Waste
- Toxic Waste
- Free Liquids or Leaking Containers



LOAD INSPECTION PROCEDURES

The following action plan details the procedures to follow for conducting the load inspection.

1. Have appropriate safety equipment present near work station (if needed later):

- a. Nitrile rubber gloves,
- b. Dust mask and respirator,
- c. Tyveks,
- d. Safety glasses,
- e. Clean, empty steel 55-gallon drums,
- f. Long handled equipment / tool, and
- g. Any other equipment deemed necessary.

2. Examine for unauthorized wastes and/or safety hazards:

- a. Container and/or label indicate unauthorized waste types.
- b. Moisture, and/or leakage are observed.
- c. Powders, dusts, smoke, vapors, or chemical odor emissions are observed.
- d. Sludges, pastes, slurries, or bright colors are visible.
- e. Placards or other information on delivery vehicle indicate unauthorized waste types.
- f. Material is received from a non-contracted transporter and/or generator.
- g. Manifest or bill of lading is incomplete, inaccurate, or missing.

3. Take following action if unauthorized waste is observed:

- a. Any material that is to be rejected will be marked with a label noting the material as an unauthorized waste, and will remain in the delivery vehicle. If material is unloaded, it will be immediately reloaded into the delivery vehicle in a safe manner using appropriate equipment and PPE as necessary. The Facility Manager and Operations Manager will both be notified.
- b. The transporter and generator will be notified of such delivery being rejected, and arrangements will be made to have the same delivery vehicle return the load to the generator or to an alternate facility that is authorized and permitted to receive such materials.



LOAD INSPECTION PROCEDURES (cont'd)

- c. In the unlikely event, an unauthorized material is discovered after the material has been accepted by the Facility, the transporter and generator will be immediately notified that the material is rejected, and arrangements will be made for the transporter or generator to send a vehicle for pickup and delivery of materials to the generator, or to an alternate facility that is authorized and permitted to receive such materials. The unauthorized material shall be completely containerized and secured in a location of the Facility that is away from the authorized materials and routine operations. If arrangements cannot be made with the transporter or generator, Lighting Resources, LLC will arrange for the proper transport of the rejected materials to an authorized and permitted facility.
- d. All rejected loads will be issued a load reject form with a new bill of lading or hazardous waste manifest form for use in shipping the material back to the generator or to an alternate approved facility.
- e. A written report shall be made documenting the rejected load, actions taken, and final disposition of the rejected load. A copy of the load reject form and report shall be maintained at the Facility for a minimum period of three years.



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

UNAUTHORIZED WASTE – LOAD REJECTION FORM

Transporter Company Name: _____

Address: _____

Phone Number: _____

Vehicle Type / Truck Number: _____

Vehicle License Number: _____

Driver's Name: _____

Generator/Source: _____

Description of Unauthorized Waste:

Actions Taken for Removal:

Parties / Authorities Notified: _____

Inspector's Name (Printed): _____

Inspector's Signature: _____

Date: _____ Time: _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

LOAD REJECTION LOG

Date	Facility Staff Name	Description of Incident and Response Taken

Name (Printed): _____

Signature: _____

Date: _____ Time: _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

EMPLOYEE TRAINING SCHEDULE

Employee Name: _____

Title: _____

Instructions: Describe the employee training program for your facility below. The program should, at a minimum, cover unauthorized waste recognition, removal, and reporting. Provide a schedule for the training program and the list of the employees who attend training sessions.

Training Date	Training Provider	Training Topics	Brief Description of Training Program/Materials

Name (Printed): _____

Signature: _____

Date: _____ Time: _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

RECORD OF FACILITY PERSONNEL TRAINING

Training Date	Training Provider	Training Topic

Name (Printed): _____

Signature: _____

Date: _____ Time: _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

FACILITY EQUIPMENT MAINTENANCE AND SERVICE LOG

Date	Facility Staff / Service Provider Name	Description of Maintenance or Service

Name (Printed): _____

Signature: _____

Date: _____ Time: _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

FACILITY INCIDENT LOG

Date	Facility Staff Name	Description of Incident and Response Taken

Name (Printed): _____

Signature: _____

Date: _____ Time: _____



LIGHTING RESOURCES, LLC
OCALA, FLORIDA

Balcan MP8000 Routine Visual Checks & Maintenance

- 1. Drawers - Remove and Empty at End of Each Shift the Drawers at Each End of the Bottom Flat for Each of the Conveyors:**

Drawers at base of conveyor from Universal /Multi-purpose rumbler:



Drawers at the base of main conveyor to cleaning rumbler (from linear crusher):



Drawer in between the two flatbed conveyors:





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OCALA, FLORIDA

1. Drawers - Remove and Empty at End of Each Shift the Drawers at Each End of the Bottom Flat for Each of the Conveyors: (cont'd)

Flat plate drawers under both flatbed conveyors should be removed every week:



End panel of flatbed conveyor should be removed monthly and any debris cleaned from under the belts:





2. Check Universal Rumbler Drawers at Each Corner Behind Drum Tipper Unit:

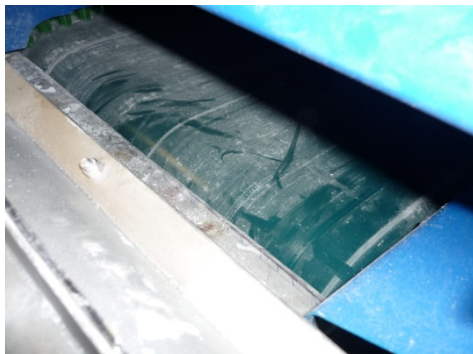
The cleaning rumbler has drawers at each corner. Check the drawers at the **end of each shift** to help reduce any build up of fine glass/powder or debris which may over time reach the nylon rollers which the drums rotate on and cause premature wear. Each drawer is fitted with a small bolt which requires a 10mm spanner to remove it before the drawer can slide out.





3. Other Areas to Check:

- a. Vibrating flat bed grid
Daily – Check no end caps are stuck in the grids and clear if necessary.
- b. Flexible Pipework
Daily / Weekly – Due to the different densities of powder and the airflow it is possible powder will begin to settle. The flexible pipe should be checked initially daily to make certain maximum flow is maintained.
- c. Internally
Monthly – After the first month it is advisable to remove a side panel from each of the rumblers to check for debris build up inside. This can be done without the need of excessive protective clothing by leaving the Airmaster extractors running thereby creating negative pressure. Remove a side panel and using a torch check the inside of the casing for any build up. If the draws have been emptied regularly then this build up will probably be minimal. In the case of the Multi-Purpose the powder build up on the floor of the casing can be pushed down the chute. The floor is angled near the join to allow this. After the first two months you should be able to gauge the frequency required for doing this in the future and you may be able to extend the inspection period.
- d. Rumbler Wheels
The rumbler drums run on nylon wheels. These can be checked with the machine isolated and the drawers at the infeed of the rumbler removed. The wheels can be felt for grooving and flat spots, but everyday maintenance should prevent excessive wear. If a noise develops from the rumblers, e.g. slight banging/knocking it may be the wheel requires changing.
- e. Conveyors
The conveyor belts should be checked regularly for wear and damage. In the case of the infeed crusher belt this should be checked to see if anything is trapped between the conveyor and breaker plate which could cause damage to the belt if not removed. With the Airmasters running for negative pressure lift the lid and check the belt. A hand brush can be used to clear away loose debris. If anything is trapped it can be removed by hand or a pair of pliers may be needed to gently free it. It may be by running the conveyor in reverse for a few seconds is enough for it to free itself.



APPENDIX E

SAMPLING AND ANALYSIS STANDARD OPERATING PROCEDURES

LIGHTING RESOURCES, LLC
SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

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LIGHTING RESOURCES, LLC

SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

1.0 INTRODUCTION

This Sampling and Analysis Standard Operating Procedures (SOP) has been prepared for the Lighting Resources, LLC Florida Department of Environmental Protection (DEP) Permit Application for a Mercury Recovery Facility in accordance with Chapter 62-737 F.A.C. This SOP addresses the required sampling and analysis that must be performed to demonstrate quality assurance and quality control for the following two facility phases:

- Mercury recovery facility processing operations, and
- Mercury recovery facility closure activities.

This SOP has been prepared to strictly comply with all of the requirements contained in DEP's "Quality Assurance Standard Operating Procedures for Sampling at Facilities Permitted Under Chapter 62-737, Florida Administrative Code," dated November 1997 and reformatted April 2010.

1.1 Background and Overview

In accordance with 62-737.800 F.A.C., a mercury recovery facility must perform certain sampling and testing on the glass and metals produced from the processing of mercury containing lamps (MCLs) — specifically, if the facility intends to ship these materials to a facility other than a mercury reclamation facility. Further, the results of such testing must show that any levels of mercury detected must be below the levels specified in 62-737.840(3) F.A.C.

Processed Material Sampling and Testing

Pursuant to 62-737.840(3)(c) F.A.C., a mercury recovery facility is required to perform daily sampling of the processed lamp glass and metal materials, individually, collect and test a composite sample of the daily samples each operating week (again individually), and maintain a 12-week calculated rolling average of the mercury content for these materials.

Daily Sampling and Weekly Composite Testing. A mercury recovery facility is required to take daily physical samples of the processed glass and metal materials, individually, at the point at which the materials exit the MCL processing equipment. Collected samples must be representative of the materials processed during the day they were collected. At the beginning of each week, the prior week's daily samples will be consolidated into one weekly composite sample and submitted for chemical analysis of total mercury content using an approved EPA methodology. The weekly composite sample is prepared by thoroughly mixing equal amounts of the daily samples into a single container. Sampling and testing will be performed for both processed glass and metals individually. A minimum of three (3) separate daily samples shall be taken in order to obtain a weekly sample. When a facility is not operating at least three (3) days during a given week, that week will be dropped out of the 12-week rolling average. However, all daily samples that are in a week that has been dropped out shall be counted towards the very next weekly sample that is included in a 12-week rolling average. The result of this analysis shall be considered the *weekly composite sample of process operations*. The **total mercury content of the weekly composite sample of process operations must be less than 3 parts per million (ppm)**, if the tested materials are to be shipped to a facility other than a mercury reclamation facility.



LIGHTING RESOURCES, LLC
SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

Twelve (12)-Week Average of Mercury Content. A mercury recovery facility is also required to maintain a 12-week average value of the levels of mercury contained in the processed glass and processed metals. The 12-week average is a rolling average calculated using the most recent 12-weekly test results obtained from the weekly tested composite samples. The **12-week average for total mercury content must be less than 1 ppm**, if the tested materials are to be shipped to a facility other than a mercury reclamation facility.

Quality Control Plan

The mercury recovery facility shall use an approved method for sampling and testing of the processed lamp glass and lamp metals; specifically, either USEPA Method SW846 – 1311 / 7470A (TCLP mercury) or 7471B (total mercury). Further, the Facility shall use approved recordkeeping forms for all sampling and testing activities and such forms will include a space for the name and signature of the person performing the sample collection, and the date and time of the collection inspection.

The Facility will ensure that materials are not shipped offsite until the required analytical results are received and indicate the materials are acceptable for shipping to the destination facility.

1.2 Organization of Sampling and Analysis SOP

This Sampling and Analysis SOP has been broken down into the following two sections:

- Facility Process - Operational Sampling and Analysis, and
- Facility Closure Sampling and Analysis.



LIGHTING RESOURCES, LLC
SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

2.0 FACILITY PROCESS - OPERATIONAL SAMPLING AND ANALYSIS

This section addresses the sampling and analysis that will be performed during the operational phase of the Lighting Resources, LLC Facility (Facility). This section is organized into the following parts:

- Chain of Custody Record,
- Sampling Equipment and Containers,
- Sampling Equipment and Containers Decontamination, and
- Sampling Methodology,

2.1 Chain of Custody (COC) Record

The possession or custody of samples must be traceable from the time samples are obtained until the time the samples are received at the laboratory for analysis. Lighting Resources personnel will use Chain of Custody (COC) Records and sample container labeling procedures to ensure that this occurs. Lighting Resources personnel that collect the samples will label each sample container with a sample tag (i.e., an adhesive label). The label will be filled out using waterproof ink at the time of sample collection and prior to placing it with other samples. The sample label will contain the following information:

- Name of person collecting sample,
- Unique sample identification number or code for each sample source and container,
- Time and date of the sample collection,
- Location from which sample was taken and process name,
- Weight or other information identifying quantity of subsample (e.g., one level scoop), and
- Chemical analysis which is to be performed on the sample.

Note: When daily samples are being collected in a single sample container in order to produce a "weekly sample composite of process operations," the name of sampler, collection date/military time and quantity of each sample must be recorded on a permanent daily sampling log.

The person collecting the sample will complete a COC record for each sampling event. Lighting Resources will use COC forms provided by its servicing and DEP approved laboratory to avoid duplication and potential recording errors. Two copies of the chain of custody form will accompany the sample to the laboratory. Once the laboratory receives the samples and signs the COC, a copy will be returned to Lighting Resources. All parties accepting the custody of the samples, including the sampler, coordinator, transporter, laboratory custodian, etc. must provide signatures with date and time of sample receipt on the COC form. Upon receipt of the completed COC form, Lighting Resources shall retain the completed paper copy in a loose leaf binder with the Sample Log. These forms shall be retained on site for a minimum of three (3) years.



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SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

The COC record or form will specifically contain the following information:

- Unique sample identification number or code for each sample source and container,
- Sampling site name and address,
- Name of person collecting sample,
- Time and date when final weekly sample is composited,
- Clear indication of number of sample containers,
- Chemical analysis which is to be performed on the sample,
- Appropriate places for signatures of sampler and all subsequent persons accepting custody and identification of common carriers,
- Time of day expressed in military time and calendar date of all custody transfers, and
- Comments or remarks section, e.g., unusual ambient conditions or other circumstance that may affect test results.

Note: If samples are transported via integrated intermodal air/ground transporters of small packages (e.g., Federal Express, UPS, etc.), the driver is not required to sign the COC. However, the parcel tracking number must be recorded on the COC by the sending party.

Copies of the COC records will be maintained for a period of at least 3 years in a loose-leaf binder or bound notebook.

2.2 Sampling Equipment and Containers

Samples shall be obtained using a stainless steel scoop or shovel. A stainless steel spatula or similar device shall be used for raking off excess sample. Sample containers shall be glass with screw top lids..

2.3 Sampling Equipment and Sample Container Decontamination

Lighting Resources has ordered all stainless steel instruments and sampling jars with screw-on lids for sampling at their Ocala, Florida Facility. All instruments and containers will be cleaned with ES7X® Laboratory detergent (or approved equivalent). The steps outlined below shall be followed to decontaminate sampling equipment and containers.

1. Disassemble equipment if possible.
2. Wash thoroughly with ES7X® Laboratory detergent (or approved equivalent) and hot tap water using a brush to remove any particulate matter or surface film.
3. Rinse thoroughly with deionized water and allow to air dry.
4. Wrap completely with plastic ("shrink") wrap to prevent contamination during storage or prior to use.



LIGHTING RESOURCES, LLC
SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

2.4 Sampling Methodology

Facilities running more than one process line shall conduct required process (operational) sampling on each process line. The steps outlined below will be followed to collect samples for analytical laboratory testing of mercury.

Daily Samples

The steps outlined below will be followed to collect daily samples.

1. Daily samples will be collected in individual containers and composited later into the weekly composite sample or as equal daily aliquots into a single container which will then become the weekly composite sample. Samples will be collected in containers supplied by the laboratory authorized to perform the analytical testing of the samples.
2. A minimum sample size of 50 grams will be collected for the daily samples in order to ensure that the minimum required 150-gram weekly composite sample is collected during weeks when equipment may not be operational every day. Smaller daily samples may be used as long as the required 150-gram weekly composite sample can be obtained from equal size daily samples. (*Note: On days when equipment is not operational, no daily sample shall be taken. Daily samples shall not be "doubled up," i.e., two daily samples collected on the same day, to make up for daily samples when equipment is not operational*). The weekly composite shall consist of equal aliquots of daily samples collected on days when equipment is operational. For example, if the equipment is operational for only three days during a particular week, that week's weekly composite sample shall consist of equal aliquots of the daily samples collected during the three days when the equipment was operational.
3. Daily samples will typically be collected during maximum daily throughput and when equipment has been operating for at least 30 minutes. However, daily samples shall be collected if the equipment is operated for any period of time during that day. If the equipment is operational for only 2 days or less in a particular week, no weekly composite sample shall be required for that week. However, the daily samples for those one or two days shall still be collected and used as part of the next weekly composite sample.
4. Representative Sampling:
 - a. Processed metal endcap assembly material - daily sample material shall be collected using one of the following three procedures listed below.
 - Procedure 1: Representative sampling of processed metal endcap assembly materials as the material exits the process line.
 - Processed metal endcap assembly material as it exits the process line may not be ground, milled, sized or sieve-separated in any way prior to daily sample collection unless such grinding, milling, sizing or sieve-separation is a part of the Facility's material processing operational procedures.
 - Lab aliquots must include portions of all components of the end cap assembly as contained in the 150-gram weekly composite sample



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SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

required in the SOP. For example, if the weekly 150-gram composite sample contains at least one whole endcap which includes aluminum outer cap material, pins and filaments, then the lab aliquot must be taken from a whole endcap which includes aluminum outer cap material, pins and filaments and must contain portions of the aluminum outer cap material, pins and filaments.

- Material shall be collected between the point at which the material exits the equipment and the bin or container which accumulates the material.
 - Procedure 2. Representative sampling of endcap assembly processed material after the material exits the process line.
 - Grind to particle size which passes through a #4 sieve using a grinder or mill. This particle size makes the individual parts of the endcap assembly (i.e., aluminum outer cap material, pins and filaments) indistinguishable from each other. Grinding may be performed by either the facility owner/operator or the testing laboratory.
 - The lab aliquot shall be selected from the ground particles.
 - Procedure 3. An alternate representative sampling procedure for sampling endcap assembly processed material that can be requested by a mercury recovery facility for approval by the DEP prior to implementation.
 - At a minimum, this procedure must include representative sampling of endcap assembly processed material (NOTE: metal end caps will be whole and intact — no grinding will be performed). For example, if the weekly 150-gram composite sample contains at least one whole end cap which includes aluminum outer cap material, pins and filaments, then the lab aliquot must be taken from a whole end cap which includes aluminum outer cap material, pins and filaments and must contain portions of the aluminum outer cap material, pins and filaments.
 - The procedure must comply with the SOP unless the DEP approves equivalent alternate procedures not specified in the SOP.
 - b. Processed glass material shall be collected between the point at which the material exits the process equipment and the bin or container which accumulates the material.
5. Sampling equipment and containers shall be decontaminated according to specified protocols in **Section 2.3**. Permanent (non-disposable) sampling equipment shall be decontaminated at least once per week with daily decontamination recommended.
 6. Overfill of sampling equipment (e.g., scoop, with material collected): rake off the excess material with a spatula or knife. Empty into pre-cleaned sample container.
 7. Repeat Step 5 until the required quantity is obtained. Record subsample information in permanent daily sampling log (see Chain of Custody Record, Section 2.1 - "Note") if daily samples are being collected in a single sample container as part of weekly composite sample.



LIGHTING RESOURCES, LLC
SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

Weekly Composite Samples

The steps outlined below will be followed to composite weekly samples for analytical laboratory testing of mercury.

1. Place all previous daily subsamples (whether collected in separate containers or as equal daily aliquots collected in a single container) in a stainless steel, glass or aluminum (or plastic, unless sample is too hot) tray. The sample containers shall be cleaned according to protocols listed in the laboratory's current DEP approved comprehensive Quality Assurance Plan.
2. The sample in the tray shall be homogenized thoroughly by alternately mixing, dividing, and remixing the sample.
3. After thorough mixing, transfer sufficient sample to the appropriate sample container(s) leaving minimal headspace.
4. Clean the outside and rim of the sample container to remove excess material.
5. Affix sample label and complete the COC forms.
6. Holding time shall not exceed 28 days.



LIGHTING RESOURCES, LLC
SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

3.0 FACILITY CLOSURE SAMPLING AND ANALYSIS

3.1 Notification

The DEP District Office Waste Program Administrator must be notified in writing by certified mail that the Facility is being closed at least 30 days prior to initiation of any closure activities.

3.2 Documentation

The closure documentation shall consist of a field log(s). The field log(s) must be maintained for the Facility closure and made available to the DEP upon request. The field log(s) must be maintained for a period of at least 3 years in a loose-leaf binder or bound notebook. All entries shall be made in the Facility or in the field, not from a remote office. Entries shall be made in waterproof ink and all mistakes shall have one line drawn through and initialed. The field log(s) shall include the information list below.

General Information:

- Site name and address and DEP facility permit number,
- Dates and military times of all closure activities,
- Names of all personnel on-site and company affiliation,
- Ambient conditions (e.g., temperature and humidity inside, weather outside).
- Signature of sampler(s), and
- Site sketch indicating location of facility and sampling points.

Sampling Information:

- Date and military time of sample collection,
- Specific description of sample location (e.g., along north process room wall, outdoor trailer storage area, etc.)
- Type of sample (e.g., soil to depth of 15 cm, first wash down rinsate, vacuum residuals, etc.), and
- Unique sample identification number or code for each sample source and container.

3.3 Chain of Custody (COC) Record

The possession or custody of samples must be traceable from the time the samples are obtained until final disposal of the sample. Lighting Resources will ensure the sample container is secured to prevent tampering, it is placed in a designated, secured area, or it is in actual physical possession of the sampler.

The sampler shall label the sample container with a sample tag (i.e., an adhesive label). The label shall be filled out using waterproof ink at the time of sample collection prior to placing it with other samples. The label shall contain the following information:

- A unique sample identification number or code for each sample source and container,



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SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

- The date and military time of sample collection, and
- The chemical analysis that is to be performed on the sample.

The sampler shall complete a chain of custody record concurrent with the sampling event. Two copies of the chain of custody form shall accompany the sample to the laboratory. Once the sample transporter signs out and receiver signs in, one copy shall be retained by the laboratory and one copy shall be retained by the transporter who will deliver it to the party collecting the sample. All parties except a common carrier accepting the custody of the samples, including the sampler, coordinator, transporter, laboratory custodian, etc. shall provide signatures with the date and time of sample receipt on the chain of custody form. The COC record shall specifically contain the following information:

- Unique sample identification number or code for each sample source and container,
- Sampling site name and address,
- Name of personnel collecting sample,
- Time and date of the sample collection when final weekly sample is filled,
- Clear indication of number of sample containers,
- Chemical analysis which is to be performed on the sample,
- Appropriate places for signatures of sampler and all subsequent persons accepting custody and identification of common carriers,
- Time of day and calendar date of all custody transfers, and
- Comments or remarks section, e.g., unusual ambient conditions.

Note: If samples are transported via integrated intermodal air/ground transporters of small packages (e.g., Federal Express, UPS, etc.), the driver is not required to sign the COC. However, the parcel tracking number must be recorded on the COC by the sending party.

3.4 Sampling Equipment and Containers

Only pre-cleaned glass with screw tops shall be used for sample containers. All other sampling equipment used (e.g., spoons, scoops, shovels, hand bucket augers, mixing trays, bailers, etc.) shall be constructed of stainless steel or Teflon . . Sampling equipment shall be used for the sampling of liquid residuals, solid residuals, and soils. Sample container decontamination shall follow the procedures outlined below in **Section 3.5**.

3.5 Sampling Equipment and Sample Container Decontamination

The steps outlined below shall be followed to decontaminate sampling equipment and containers.

1. Disassemble equipment if possible.
2. Wash thoroughly with reagent grade detergent (Alconox, Liquinox or approved equivalent) and hot tap water using a brush to remove any particulate matter or surface film.
3. Rinse thoroughly with hot tap water.



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SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

4. Rinse thoroughly with 10% nitric acid (HNO_3) solution or approved equivalent. Note, 10% nitric acid solution is made by adding one part concentrated nitric acid to five parts deionized water.
5. Rinse thoroughly with deionized water and allow to air dry.
6. Wrap completely with plastic wrap to prevent contamination during storage or prior to use.

Note: Step #4 is not necessary for ferrous (e.g., stainless steel, sampling equipment). Since closure sampling, testing, and decontamination activities will be performed by a third party contractor, the contractor will utilize equipment and methods approved by both DEP and Lighting Resources.

3.6 Sampling Methodology

The Facility closure involves sampling and analysis of four (4) different types of materials:

- Decontamination solid residuals,
- Decontamination liquid residuals,
- Surface wipes, and
- Soils.

The procedures for sampling of these four types of materials are presented in the following paragraphs.

Sampling of Decontamination Solid Residuals

For the purposes of this subsection, decontamination solid residuals refer to floor and equipment sweepings or vacuum residuals, PPE, wipes, or other solid materials resulting from decontamination of the Facility process equipment and the Facility building. The protocol and procedures outlined below shall be followed for the sampling of decontamination solid residuals.

- The minimum sample size shall be 200 grams.
- Sampling equipment shall be decontaminated according to the specified protocols in **Section 3.5** above.
- Collect composites of randomly collected samples of residuals. The number of aliquots shall vary depending upon the quantity of materials being analyzed and subject to the approval of the DEP project engineer.
- Sample collection (e.g., overfill scoop and rake off excess), record subsample information, and mixing procedures shall all follow procedures listed in **Section 2.4** - "Daily Samples" and "Weekly Composite Samples."
- After thorough mixing (if required), place or transfer the sample into the appropriate sample container(s) leaving minimal headspace.
- Clean the outside and rim of the sample container to remove excess material. Cap sample container.
- Affix sample label and complete the chain-of-custody record / form.
- Holding time shall not exceed 28 days.



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Sampling of Decontamination Liquid Residuals

For the purposes of this subsection, pits, ponds, and lagoons refer to any basin, pit, or open tank (lined or unlined) which contains or is suspected of containing unknown concentrated liquid, solid, or sludge chemical wastes. There are no pits, ponds, lagoons, basins, or open tanks on the Lighting Resources Facility property. There is a holding tank located in the sump area of the loading / receiving dock area. For purposes of this subsection, the liquid contained within this holding tank shall be deemed to be decontamination liquid residuals. The protocol and procedures outlined below shall be followed for the sampling of these decontamination liquid residuals.

- Sampling locations shall be representative. All phases (liquid phases, floating solids, and sludge) in the holding tank shall be sampled.
- Because of the dangers involved with container sampling, the sampling of either unknown materials or known hazardous materials shall be considered a hazardous duty assignment. Additional information regarding container sampling is available in the draft USEPA *Safety Manual for Hazardous Waste Site Inspections*, USEPA, Draft 1979. Safety procedures for container sampling shall be in accordance with the USEPA Region IV *Field Health and Safety Manual*, USEPA, Region IV, 1990 Edition (or latest edition).
- All equipment shall be decontaminated according to the specified protocols in contained in **Section 3.5**
- Holding time shall not exceed 28 days. Water samples shall be preserved with nitric acid (HNO_3) or approved equivalent. Solid waste and concentrated waste samples have no preservative requirements. Soil samples must be preserved at 4°C.
- The following equipment shall be used for field use in collecting liquid waste samples from the holding tank: sampling containers affixed to a piece of conduit pipe, stainless steel scoop affixed to a piece of conduit pipe with a scoop bracket, stainless steel spoon affixed to a conduit pipe, peristaltic pump and tubing arrangement, and Bacon-Bomb samplers. For sludge sampling, stainless steel scoops attached to conduit pipe, stainless steel push tubes and corers shall be available.

The protocol and procedures for the sampling of the **three (3) phases — liquid, floating solids, and sludge**, of decontamination liquid residuals are presented in the following paragraphs.

Liquid Waste Sampling Protocol / Procedures. The protocol and procedures outlined below shall be followed for the sampling of the liquid phase of decontamination liquid residuals.

- Minimum sample size is 100 ml.
- Discrete samples shall be collected and containerized / labeled separately to distinguish potential contaminant levels for each affected area. Phase Separation or Stratification of Container Contents:
 - When this condition occurs, or is suspected, care must be taken to insure that the sample collected is representative of the container contents. If only one layer or phase is sampled, this should be noted and taken into account when interpreting analytical results.
 - Determine whether phases are present by using a peristaltic pump.



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- The tubing attached to the pump is strapped to a piece of conduit pipe and slowly lowered to the bottom of the unit to be sampled.
- The pump discharge (and the intake tubing) is examined to determine if phases are present.
- If phases are present, collect a sample of all phases.
 - The top liquid phase can be sampled by direct dipping with the sample container, or dipping with the sample container attached to the conduit pipe - either directly or by way of a fishing pole type arrangement, or dipping the sample with a stainless steel scoop attached directly to conduit pipe with a scoop bracket.
 - Alternatively, all liquid phases can be sampled with a peristaltic pump and tubing arrangement with the tubing attached to a conduit pipe and held at the desired depth.
- If phases are not present, samples may be composited by depth (i.e., collected throughout the entire depth of the container or at several different depths) to provide a representative sample. Samples shall not be composited across containers. Composite samples may be collected using a coliwasa sampler or a glass profile tube.
 - *Coliwasa Sampler.* The coliwasa sampler is a single use glass sampler, consisting of an outerglass tube with one end tapered, and a separate inner glass tube with a small bulb on one end.
 1. Slowly lower the outer tube into the unit being sampled, tapered end first. This must be done slowly for two reasons. One, the drum may contain solid material which might break the tube and injure the sampler. Second, slowly lowering the tube allows the liquid phases in the unit to stay in equilibrium with the coliwasa sampler, ensuring a representative sample.
 2. Insert the inner glass tube (bulb end first) into the outer tube. This may be done very slowly after the outer tube is fully inserted into the unit or the inner tube may be inserted prior to immersing the outer tube. In the latter case, the bulb tip of the outer tube must be pulled back several inches from the tapered end of the outer tube.
 3. After both inner and outer tubes are inserted into the unit to be sampled, press the inner tube bulb end gently against the tapered end of the outer tube, forming a seal.
 4. Withdraw both tubes from the pit, pond, or lagoon and the ends of the tubes are held over the sample container.
 5. Place the sample in the sample container. By manipulating the inner tube, the sampler can control the rate of flow of the sampled liquid into the sample container.
 - *Glass Profile Tube Sampler.* Samples can also be collected using a four-foot length of glass tube with a ½-inch or less inside diameter.
 1. Insert the tube into the opening of the pit, pond, or lagoon as far as possible.



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2. Seal the open end either with the thumb or a rubber stopper to hold the sample in the tube while removing the tube from the container.
 3. Place the sample in the appropriate container.
 4. Repeat the procedure until an adequate amount of sample is collected.
- *Optional Samplers.* Other sampling procedures including the use of automatic samplers, pumps, siphons, multiple valves and ports, etc., may be used depending on the specific container involved.

Floating Solids Sampling Protocol / Procedures. Floating Solids can be sampled directly or with a stainless steel scoop or with a spoon attached to a piece of conduit pipe, if necessary.

Sludge Sampling Protocol / Procedures. The protocol and procedures outlined below shall be followed for the sampling of the sludge phase of decontamination liquid residuals.

- Minimum sample size is 200 grams.
- If the sampling technique involves multiple aliquots, or if the final sample will consist of aliquots from several different locations in the unit to be sampled, all aliquots should be placed into a Pyrex dish, a large glass sample container or other suitable container and mixed thoroughly before containerization.
- A stainless steel push tube or stainless steel scoop may be used to collect the sample.
 - *Stainless Steel Push Tube.* If a stainless steel push tube is used to collect the sample, the following steps shall be taken:
 1. Push the stainless steel push tube into the sludge.
 2. Empty the tube contents into a Pyrex dish, a large glass sample container or other suitable container. “Emptying” may include shaking to remove sludge or extrusion of thick or gummy sludges with a new wooden dowel. A disadvantage of this technique is the need for multiple insertions of the tube into the sludge to collect sufficient sample volume.
 3. Repeat the procedure until an adequate amount of sample is collected.
 - *Stainless Steel Scoop.* If a stainless steel scoop is used to collect the sample, the following steps shall be taken:
 1. Insert the scoop into the sludge. Attach a scoop to a piece of conduit pipe with a scoop bracket, if necessary. The scoop bracket has a decided advantage in that it allows sampling personnel to adjust the angle between the scoop and the conduit pipe.
 2. Empty the scoop contents into a Pyrex dish, a large glass sample container or other suitable container.
 3. Repeat the procedure until an adequate amount of sample is collected.



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Sampling of Surface Wipes

The protocol and procedures outlined below shall be followed for the sampling of surface wipes.

- Equipment. The following equipment shall be used:
 - Wipe filter papers (Whatman Quantitative Grade 41 or 42 Filter Papers or equivalent),
 - 5% nitric acid (HNO₃) or approved equivalent, and
 - Scintillation vials, 20-ml with polypropylene or Teflon cap liners. Metal cap liners should not be used.
- Sampling Methodology. The following sampling methodology shall be utilized:
 1. If multiple samples are to be taken, prepare a rough sketch of the area(s) that are to be wipe sampled.
 2. Use a new set of clean impervious gloves with each individual sample. This avoids contamination of the filter by the hand and the subsequent possibility for false positives and prevents contact with the substance.
 3. Moisten the filter with 5% nitric acid (HNO₃) or approved equivalent.
 4. Wipe a section of the surface to be sampled using a template with an opening exactly 100 cm². For irregular surfaces, the wiped area shall be as close as possible to 100 cm², estimated as accurately as possible and documented.
 5. Maximum pressure shall be applied when wiping.
 6. To insure that all portions of the area are wiped, start at the outside edge and progress toward the center making concentric squares of decreasing size.
 7. If the filter dries out during the wiping procedure, discard the filter, reduce area to be wiped by half, document the reduced area size and repeat wiping procedure with a new filter.
 8. Without allowing the filter to contact any other surface, fold the filter with the exposed side in, then fold it over again. Place the filter in a sample vial, cap the vial, number it, place a corresponding number at the sample location on the sketch. Then complete the sample label and COC record.
 9. At least one blank filter treated in the same fashion, but without wiping, shall be submitted for each sample area.

Sampling of Soils

The protocol and procedures outlined below shall be followed for the sampling of soils.

- General Sampling Requirements. The following protocol / procedures shall be followed:
 - All equipment shall be decontaminated according to specified protocols in **Section 3.5**.
 - Sample containers shall be glass with screw top lids..
 - Holding time shall not exceed 28 days. The sample containers shall be cleaned according to protocols listed in the laboratory's current DEP approved comprehensive Quality Assurance Plan.
 - The minimum sample size shall be 200 grams.



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SAMPLING AND ANALYSIS - STANDARD OPERATING PROCEDURES

- Sample Handling Protocols. The following sample handling protocols shall be followed after sample acquisition:
 1. Breakdown the sampler (e.g., split spoon) if necessary. This shall be done with the appropriate tools.
 2. At this time, any portion of the sample that has been disturbed shall be identified, removed with a stainless steel spatula and discarded.
 3. Slice the sample using a clean, decontaminated spatula from the center portion of the sampler (e.g., corer, split spoon or bucket auger head) and place in a stainless steel, glass or aluminum foil-lined tray.
 4. The sample in the tray shall be homogenized thoroughly by alternately mixing, dividing, and remixing the sample.
 5. After thorough mixing, transfer the sample to the appropriate sample container(s) leaving minimal headspace.
 6. Clean the outside of the sample container to remove excess soil.
 7. The container rim shall also be cleaned of soil and sand particles so that the lid can be sealed.
 8. Affix sample label, seal and complete the chain-of-custody forms.
 9. Liners:
 - a. If properly used, liners may be inserted into the sampler and used as the actual sample container.
 - b. Be aware that USEPA Test Methods for Evaluation of Solid Waste, SW-846, has mandated that all solid samples must be transported in containers that have screw tops. This also means that all container and lid requirements are still in effect.
 - c. The ends of the liner shall be covered with polyethylene, Teflon or aluminum foil sheeting. The sheeting shall be secured by placing an end cap over the sheeting.
 - d. With any sample containerized this way, specific instructions shall be sent with the sample so that the laboratory will know how to handle the sample. All non-volatile samples shall be homogenized by the laboratory prior to analyses. Also, any disturbed portions of the sample shall be discarded prior to mixing.
- Composite Soil Sampling. If more than one soil sample is required at a given location (i.e, at various interval depths, or within a few feet of each other), composite soil samples only from the same collection depth may be composited, and the following protocols shall be followed:
 1. Sample aliquots (of identical size) to be composited shall be placed in a mixing tray and thoroughly mixed with a cleaned spoon, or spatula. The sample shall be thoroughly blended by mixing, and dividing into sections. Each section shall then be mixed separately. Recombine all mixed sections and mix thoroughly. Repeat sectioning and mixing process to ensure proper homogenization.
 2. The origin and size of each (sub)sample or aliquot that is used to make the composite shall be documented in the field notebook along with the other important sampling details. Although the size of these subsamples is important and should be documented, it is critical that these subsamples be of equivalent



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size, so that the composite sample is not biased by unequal aliquoting. Aliquoting should be done in a systematic manner.

3. Clean the outside of the sample container to remove excess soil, affix label, seal, and complete the COC record.
- Discrete Soil Sampling. If a relatively small site area is to be investigated for contamination, discrete sampling shall be performed and the following protocol / procedures shall be followed:
 - Soil sampling locations should be selected such that a representative portion of the soils are collected with minimal disturbance with the concurrence of the DEP closure project engineer.
 - Surface soil sampling (ground surface to 6-inches below ground surface):
 - Leaves, grass and surface debris shall be removed from the area to be sampled using a clean stainless steel spoon or shovel.
 - Surface soil samples shall then be collected using a pre-cleaned stainless steel scoop or spoon.
 - Shallow subsurface soil sampling (6 inches to 2 feet below ground surface):
 - Shallow subsurface samples shall be collected by digging a hole or trench to the required depth with a stainless steel shovel.
 - Some situations may require a trench or pit to be dug with a backhoe. Depending upon the equipment available at the site or the soil type to be penetrated, this option is acceptable. Note that any OSHA requirements for in-trench sampling shall be followed. In these situations, the trench shall be first dug to the appropriate depth, and then the sample shall be exposed by using one pre-cleaned spoon, spatula, or equivalent to clean away the soil that came in contact with the backhoe bucket, and a second pre-cleaned spoon shall be used to collect the sample.
 - Alternatively, shallow subsurface soil samples may be collected with a 2 to 4-inch steel hand auger which would minimize the soil to be removed in order to reach the desired depth. Using this method, a sampling depth of up to 2 feet shall be obtained.
 1. A soil sample shall be obtained by pushing and rotating the auger into the soil until the bucket is filled.
 2. The sample shall be removed from the bucket by pushing or scraping with an appropriate pre-cleaned stainless steel tool.
 3. The addition of a sleeve may be used to allow an undisturbed soil sample to be obtained.
 4. The device shall consist of a standard auger head with a removable non-contaminating sleeve which is inserted into the auger barrel.
 5. The soil sample is obtained in the normal manner by pushing and rotating the auger into the soil. In this case it is the sleeve which fills with soil. After auger retrieval, the sleeve, which is readily removed from the auger, is capped.



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6. If the auger hole is prone to collapse, due to low cohesion in some soils, a temporary rigid PVC casing should be inserted into the hole. The casing prevents hole collapse and minimizes cross-contamination between soil zones as the auger is advanced. Upon sample collection, the temporary casing (if used) must be removed and the hole filled with the excavated soil. If a confining layer has been breached during sampling, the hole shall be grouted to land surface with Type-1 Portland Cement. Note, this requirement may be different throughout Florida — contact the local Water Management District office for local requirements.



APPENDIX F

CLOSURE COSTS BACKUP DATA

F.1 COST DATA ON DISK

F.2 SERVICE PROVIDER COSTS

F.1 COST DATA ON DISK

F.2 SERVICE PROVIDER COSTS



2700 Missouri Avenue
Granite City, IL 62040
www.tmrusa.com
Toll Free: 866.470.5763
Local: 618.877.0585
Fax: 618.877.0591



March 19, 2012

Lighting Resources, Inc.
1007 SW 16th Lane
Ocala, FL 34471

To Whom It May Concern:

TOTALL Metal Recycling (TMR) currently receives metal end caps, non-PCB ballasts, e-waste, dry-cell batteries and lead acid batteries from Lighting Resources in Ocala, FL. TMR has a buyback agreement with Lighting Resources for metal end caps which includes free pickup and transport of the metal end caps from Lighting Resources' Ocala, FL facility to TMR's facility in Granite City, IL. TMR will continue to receive these materials from Lighting Resources and will accept all of these materials from them in the event of a closure at no cost. In the event of facility closure, TMR will also provide free pickup and transport of the metal end cap materials from Lighting Resources' Ocala, FL facility to TMR's Granite City, IL facility.

Regards,

Matt VanDoren
TOTALL Metal Recycling
matthewvandoren@tmrusa.com



info@tmrusa.com
www.tmrusa.com

Fax Cover Sheet



Wisconsin Ballast Inc.
W193 S6817 Hillendale Dr.
Muskego, WI 53150
Phone: (262)679-2080 Fax: (262)679-4748
www.wiballast.com | info@wiballast.com

Send to: *Lighting Resources LLC*From: *John Kronshage*Attention: *Bonnie + Pamela*Date: *4/3/12*Fax Number: *352-509-3012*Phone Number: *262-679-2080*☐ Urgent☐ Reply ASAP☐ Please Comment☐ Please Review☒ For Your InfoTotal Pages, Including Cover: *3*

Comments

*Letters follow -**Thanks,
John*



W.193 S.6817 Hillendale Dr. Muskego, WI 53150

Phone: 262-679-2080 | Fax: 262-679-4748 | E-mail: info@wiballast.com

April 2, 2012

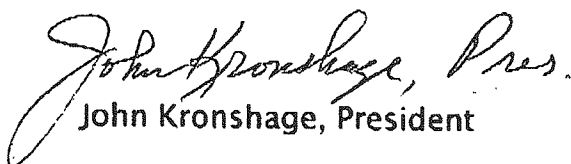
Attention: Bonnie Bishop Clark
Lighting Resources, LLC
1007 SW 16th Lane
Ocala, FL 34471
email: bonnie@lightingresourcesinc.com

Subject: Current pricing for regulated lighting ballast going to regulated burial

To: Lighting Resources, LLC

The current price Wisconsin Ballast Inc. can offer Lighting Resources, LLC, Ocala, FL is \$.28 per total pound for the recycling/destruction of the fluorescent lighting ballast. This price is firm for the next 60 days. This does not include containers or the transport to us. It does include all associated disposal costs with the shipping to regulated burial.

Sincerely,

A handwritten signature in cursive script that reads "John Kronshage, Pres." Below the signature, the name "John Kronshage, President" is printed in a standard sans-serif font.

John Kronshage, President

Helping you to meet all of your "lighting management" recycling and disposal needs.



W.193 S.6817 Hillendale Dr. Muskego, WI 53150

Phone: 262-679-2080 | Fax: 262-679-4748 | E-mail:
info@wiballast.com

April 2, 2012

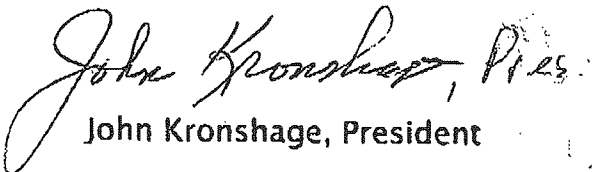
Attention: Bonnie Bishop Clark
Lighting Resources, LLC
1007 SW 16th Lane
Ocala, FL 34471
email: bonnie@lightingresourcesinc.com

Subject: Current pricing for regulated lighting ballast going to incineration

To: Lighting Resources, LLC

The current price Wisconsin Ballast Inc. can offer Lighting Resources, LLC, Ocala, FL is \$.36 per total pound for the recycling/destruction of the fluorescent lighting ballast. This price is firm for the next 60 days. This does not include containers or the transport to us. It does include all associated disposal costs with the shipping to incineration.

Sincerely,


John Kronshage, President



AERC Recycling Solutions
1475 Crocker Ave. Hayward, CA 94544
(510) 429-1129 (tel) • (510) 429-1498 (fax)

Universal Waste Recycling Pricing Schedule (Schedule B)
Lighting Resources on September 29, 2011

Material Type	Unit Price
Lamps: Straight Fluorescent (linear) per ft	\$0.035/ft
Lamps: Incandescent	\$0.10/ea
Lamps: U-Tube, Compact, Circular	\$0.25/ea
Lamps: Shattershields/Coated	\$0.80/ea
Lamps: High Intensity Discharge - <i>High Pressure Sodium, Mercury Vapor, Metal Halide</i>	\$0.65/ea.
Lamps: broken fluorescent in a 55 gallon drum metal	\$350/ea.
Phosphor Powder in a 55 gallon Drum metal	\$450/ea.
Ballasts: PCB	\$0.41/lb.
Ballasts: Non-PCB Ballasts	\$0.23/lb.
PCB Capacitors	\$2.00/lb
Batteries: Category 1 <i>Lead Acid (Pb)</i>	\$0.25/lb.
Batteries: Category 2 <i>Alkaline</i>	\$0.65/lb
<i>Nickel Cadmium</i>	\$1.25/lb
<i>Nickel Metal Hydride</i>	0.60/lb
Batteries: Category 3 <i>Silver Oxide (Button) Cells</i>	\$6.25/lb
Batteries: Category 4 <i>Lithium Ion(Li)</i>	\$0.60/lb.
<i>Lithium (Primary)</i>	\$3.50/lb
Mixed Battery Sorting Fee <i>(per 5gal container)</i>	\$3.50
Mercury (Per Lb.)	
Mercury Devices (Thermometers/switches)	\$10.00/lb
Mercury (Liquid/Elemental)	



AERC Recycling Solutions
1475 Crocker Ave. Hayward, CA 94544
(510) 429-1129 (tel) • (510) 429-1498 (fax)

Terms: Pricing valid for 90 days from Schedule date and subject to change without notice. Invoices Net 30. Credit cards accepted. \$200.00 minimum invoice for drop offs; \$450.00 for pick -up.

Administrative Support Service: Administrative fee of \$75.00 per hour will be assessed for Additional copies or reports as requested.

Brokers Billing Fee: As a service to our Universal Waste broker customers, AERC Recycling Solutions offers administrative services to support your multiple customers: separate job orders, correspond incoming materials with separated Bills of Lading, separate Materials Receiving tickets, and separate line items on invoices.

As these services require supplemental AERC administrative response, an administrative fee of \$35.00 per job order will be assessed effective on your next order. To avert this administrative fee, universal waste materials must be presented to AERC as single loads of oncoming materials (i.e., single job order, single load, single materials receiving ticket, single invoice).

Shipping Containers. (Shipping and packaging guidelines are available for all materials).

- Lamps should be packaged in original manufacturers' boxes, or in AERC's boxes or fiber drums. Do not tape lamps together.
- Ballasts should be packaged in a UN-Spec poly pail, poly drum or steel drum.
- Batteries should be packaged in a UN-Spec poly pail, poly drum or steel drum. Mixing batteries of different categories prohibited.
- Mercury-containing devices should be packaged individually in zipper plastic bags and then collectively in a UN-Spec poly pail, poly drum or a lined steel drum.
- Electronic scrap should be stretch-wrapped to a pallet or packed in a cardboard Gaylord box. In California, PC monitors and televisions must be separated from other electronic materials.

Mercury-Containing Devices: An additional transportation charge per container will be added for handling mercury-containing devices: \$95.00/5-gallon, \$175.00/greater than 5-gallon container. An AERC Hazardous Waste profile must be approved prior to shipment.

Demurrage: After the first half-hour of loading/unloading materials, a demurrage charge of \$40.00 per half-hour labor, one-hour minimum, prorated in half-hour increments will be assessed.

Cancellation Charge: If a pickup or drop off is scheduled but customer or materials are not ready at the scheduled location and time, a minimum transportation fee equal to the dispatch fee may be assessed.

On-site Delivery: Drop off of universal waste materials are accepted at AERC Hayward facility by appointment only, minimum one business day advance notice required. \$250.00 per incident fee assessed for the following situations:

- "No Show" at scheduled appointment time.
- Appointments cancelled less than one business day in advance.
- Same day drop off without appointment.

"Recovery Fee" - Insurance, State Permits, Security Surcharge & Taxes.

- 11% of invoice, for all invoices

Additional Labor: Additional labor fees may be assessed for collection and/or processing of wet boxes, broken lamps, sorting of contaminated or improperly comingled loads of lamps or batteries, or sorting/consolidating electronic wastes at one or more sites. \$40.00 per half-hour labor, one-hour minimum, prorated in half-hour increments.

Lighting Resources

AERC RECYCLING SOLUTIONS

Name (print)

Name (print)

01.2011

Name (sign and date)

Name, (sign and date)



Hub Group, Inc.
The Knowledge-Driven Logistics Company

Highway St. Louis
721 Emerson Rd, Suite 600
Saint Louis, MO 63141
Tel: 800-264-8632
Fax: 314-993-0918

HighwayStLouis@hubgroup.com

RATE QUOTATION

Page 1 of 1

To: LIGHTING RESOURCES LLC
Attention: EVAN S

Prepared By: Bryan Trauterman - HCSO
Salesperson: HOUSE ACCOUNT - CENTRAL

Origin City	L/ St D	Destination City	L/ St D	Mode	Srv	Miles	Trans Days	Rate/ Mile	Minimum	Total Price	Effective Date	Expiration Date
OCALA	FL L	WEST MELBOURNE	FL L	VAN	SING	133.00		FLAT		\$525.00	11/16/2011	12/16/2011
Comment:		RATE IS ALL IN FOR 525.00										

Comments:

- * Listed rates do not include fuel surcharges (FSCs) and are subject to the FSCs which are in place at the time of dispatch. Any FSCs that apply will appear as a separate line item on invoices. By tendering a shipment to Hub, you agree to pay any such FSCs applicable to such shipment. Hub's default fuel surcharge schedule is available upon request.
- * FSCs are subject to change every Tuesday, based on Monday's Department of Energy diesel fuel index. If Monday is a holiday, then such changes will occur on Wednesday.
- * Unless noted, the quoted price does not apply to shipments involving Hazardous Materials. An additional surcharge shall apply to shipments of Hazardous Materials.
- * In addition to the quoted rates, shipments are also subject to accessorial, detention and storage charges. By tendering a shipment to Hub, you agree to pay any such accessorial, detention and storage charges applicable to such shipment. Hub's standard accessorial, detention and storage charge schedule is available upon request.
- * Rates offered by this letter are good for 30 days from the effective date stated (or if none stated, the date of this letter) unless otherwise noted.
- * Rates into Mexico do not include any border crossing, brokers or duty fees, or Mexican IVA Transportation Tax.
- * Weight of shipments tendered to Hub's underlying carriers cannot exceed legal limits.
- * All shipments are tendered freight released to Hub's underlying carriers for cargo loss or damage at an amount not in excess of \$250,000 for Intermodal/Rail loads and \$100,000 for Over the Road Truck loads. Absent Hub's direct negligence, Hub has no liability for cargo loss or damage (though Hub will assist the shipper in prosecuting any claims for freight loss or damage against the underlying carriers) and in no event shall Hub's liability per shipment for cargo claims exceed \$100,000. Shipper may obtain greater levels of cargo liability from the underlying carriers for an additional fee. Notwithstanding the foregoing, Hub and/or its underlying carriers shall not be liable for any loss or damage to cargo if or when a shipment is in transit in or is located in Mexico. The minimum claim amount is \$250 on all shipments. In no event shall Hub be liable for incidental, consequential or special damages.
- * All values are set forth in U.S. Dollars.
- * All shipments are subject to Hub's standard terms and conditions, which are available on its website, www.hubgroup.com
- * The rates set forth above replace any existing rates in these lanes starting from the effective date on the rate. Tendering loads to Hub on or after the effective date of the rate signifies your agreement that these new rates will apply for transportation in these lanes.

**Official Minutes of
MARION COUNTY
BOARD OF COUNTY COMMISSIONERS**

June 17, 2011

The Marion County Board of County Commissioners met in a workshop session in Commission Chambers at 9:40 a.m. on Friday June 17, 2011 at the Marion County Governmental Complex located in Ocala, Florida.

Upon roll call the following members were present: Chairman Stan McClain, District 3; Vice-Chairman Charlie Stone, District 5; Commissioner Mike Amsden, District 1; Commissioner Kathy Bryant, District 2; and Commissioner Carl Zalak, District 4. Also present were County Attorney Matthew G. Minter and County Administrator Lee Niblock.

The meeting opened with the Pledge of Allegiance to the Flag of our Country.

Garbage/Landfills/Litter Control/Solid Waste – Solid Waste Director Mike Sims presented a 1 page agenda as well as an 8 page handout entitled, “Board of County Commissioners Solid Waste Disposal Workshop” and a 12 page handout entitled, “Marion County BOCC Workshop – June 17, 2011” to follow along with the PowerPoint presentations.

(Ed. Note: BOCC is the acronym for Board of County Commissioners.)

Chairman McClain requested that Commissioner Stone, as liaison, provide the Board with an update in regard to the progress being made to resolve some of the solid waste issues facing Marion County.

Commissioner Stone addressed the importance, as a Board, to review and explore the options and alternatives regarding a long term solution for disposal of solid waste. He noted although there was some life left at the Baseline Landfill it was not a long term solution. Commissioner Stone stated one of the options being presented today was to become involved in a new landfill in Sumter County that would offer a solution for the next 50 years.

Mr. Sims provided a brief background on the issues Marion County faced regarding the disposal of solid waste, noting at the January 4, 2011 Board of County Commissioner (BCC) meeting, staff presented several viable options for consideration. He noted at that meeting Board direction was for staff to: 1) review maximizing the existing capacity at the Baseline Landfill; 2) continue to research the possibility of regional partnerships and 3) consider the possibility of a waste to energy option.

Mr. Sims referred to page 2 of the handout entitled, “Board of County Commissioners Solid Waste Disposal Workshop” and advised that disposal capacity at the Baseline Landfill, with the inclusion of the east side slope modifications and excavated soil, was approximately 11.5 years or until December 2021.

Mr. Sims addressed page 3, which provided a comparative overview of the tonnage of commercial and residential solid waste flowing into the Baseline Landfill from fiscal year (FY) 2007-08 through FY 2009-10 as well as the projected tonnage for FY 2010 through 2012. He stated commercial waste coming into the landfill would generate a tipping fee across the scale of \$48 per ton (\$42 per ton for franchise haulers) and the residential waste stream under the Marion County solid waste assessment was \$87 per residential unit, per year. In response to Commissioner Bryant, Mr. Sims stated staff

Metal Conversion Technologies, LLC

1 East Porter Street, P.O. Box 1026, Cartersville, GA 30120, ph: 678-721-0022, fax: 678-721-0266

Lighting Resources, LLC

Battery Recycling Pricing Schedule

October 6, 2011

Mr. David Gillespie
1007 SW 16th Lane
Ocala, FL 34471
Ph: (909) 923-3132
Email: david.gillespie@lightingresourcesinc.com

Dear Mr. Gillespie:

Please find below our battery recycling pricing schedule.

<u>Battery Type</u>	<u>Pricing (\$/lb)</u>
Nickel-Cadmium, Sealed Cells & Power-Packs	Pay \$0.20
Nickel-Metal Hydride, Sealed Cells & Power Packs	Pay \$0.80
Lithium-Ion, Cobaltate Technology, High Yield	Pay \$0.75
Lithium-Ion, Cobaltate Technology, Low Yield	Pay \$0.25
Lithium-Ion, Polymer	No Charge
Nickel-Cadmium, Wet, Aviation, Sintered & Fiber Plate	Pay \$0.10
Lead Acid, including SSLA	Pay \$0.05
Nickel-Zinc	No Charge
Nickel-Cadmium, wet, industrial	Charge \$0.25
Lithium Technologies, Drill Rods	Charge \$5.97
Lithium Technologies, Commercial (C, D, Power Packs)	Charge \$4.29
Lithium Technologies, Consumer Sealed Cells (Button, AAA, AA)	Charge \$3.72
Alkaline Sealed Cells, Zinc Air, Zinc Carbon	Charge \$0.28
Excessive Contact Insulation & Wiring on Battery Packs	Charge \$0.05
DOT Certified Haz-Mat Repackaging	Charge \$0.13

Freight Terms: F.O.B., MCT, Cartersville, GA
Invoicing/Payment Terms: Net 45 Days from MCT's Material Receipt Date
MCT pricing subject to change based upon Metal Market Fluctuation.

Sincerely,

Steve Pledger – National Accounts Manager
steve@metalconversion.com

Date: 10/14/2011

Bonnie Bishop-Clark
LIGHTING RESOURCES LLC
1007 SW 16TH LANE

OCALA, FL 34471

Re: Quotation 140554

Thank you for allowing the Electronics Recycling Division of Veolia ES Technical Solutions, L.L.C. (Veolia ES) the opportunity to provide a price quotation for the below listed waste material(s). Veolia ES is the leading lighting and electronics recycling company in North America.

As you may be aware, over the past few years, federal, state and local regulations concerning spent lighting and electronic equipment have become increasingly complex, affecting a wide range of commercial and industrial businesses. Much of today's lighting and electronic equipment contains hazardous materials such as mercury, lead or PCBs.

Concerns over releases into the air and water are driving stricter disposal regulations. Federal, state and local laws may prohibit the disposal of these items in municipal solid waste. As a result, you may be faced with the challenging task of meeting these regulations in the most cost-effective manner. Managing this waste stream is not just the responsible thing to do; it is the only way to avoid potential legal action and regulatory fines.

By recycling with Veolia ES, we can offer you a unique combination of comprehensive environmental services that provide the best risk management and liability protection available, including: a national service network; advanced treatment and recycling technologies; financial strength and stability; environmental compliance; technical experience and expertise; and a proven track record delivering successful recycling programs.

We believe no other recycling company in North America can offer the same level of service and support!

The rates listed below are based on information provided by the customer and include all labels, shipping documents and certificates of recycling, disposal, or destruction. Processing occurs at a fully permitted Veolia ES approved processing facilities. Material(s) received will be placed in computerized inventory and processed in accordance with all current local, state and federal rules and regulations pertaining to each type of waste material(s) listed.

To accept this quote, please sign the last page, and the enclosed Agreement, and return via fax at (850) 878-3349.

Energy and Security Surcharge

DESCRIPTION	UNIT PRICE	CONTAINER MIN	VOLUME QTY
13% Energy and Security Surcharge	\$0.1300 Percent		

Mercury Containing Articles & Apparatus

Recycle - Phosphorus Powder	\$225.0000 Drum	55 DM	
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Transportation Charges

Transportation	\$50.0000 Drum	55 DM	
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Additional Services

Veolia ES Technical Solutions, L.L.C. (Veolia ES), through its Electronics Recycling Division, provides a complete range of services for customers recycling lighting and electronic waste that contain toxic and hazardous materials and waste. For information on any of the services listed below, contact Veolia ES toll-free at 1-866-877-8299 or visit Veolia ES on the web at www.veoliaes.com. Veolia ES recycles the following items:

- * Fluorescent lamps and ballast
- * Electronic equipment
- * Computer equipment
- * Batteries

=====

Special Instructions / Notes

The Terms and Conditions described in the enclosed ENVIRONMENTAL SERVICES AGREEMENT ("Agreement") shall govern any Services performed by Veolia ES. To accept this quotation, please sign below as well as the

\$50 Trans fee includes manifest fee. There are no other Trans fees as this is a flat rate.

=====

Prepared by: Linda Dunwoody

Date: 10/14/2011

Authorized Representative: Linda T. Dunwoody, Operations Manager

Signature:



Accepted By: _____

Date: _____

Title: _____

Print Name: _____

Purchase Order #: _____

Quote Number 140554



WM LampTracker Inc.

October 14, 2011

CUSTOMER PICK UP ADDRESS:

Lighting Resources

1007 SW 16th Lane
Ocala, FL 34471
Attn: Bonnie Bishop-Clark
email: bonnie@lightingresourcesinc.com
Phone: 904-881-2229 Fax: 352-509-3012

CUSTOMER INVOICE ADDRESS (if different from pick up):

Lighting Resources

1007 SW 16th Lane
Ocala, FL 34471
Attn: Bonnie Bishop-Clark
email: bonnie@lightingresourcesinc.com
Phone: 904-881-2229 Fax: 352-509-3012

Job Scope: Waste LampTracker Inc. (WMLT) is proposing to manage universal Waste, commodities and materials for recycling as part of the closure fund at the **Lighting Resources Inc facility in Ocala Florida**. All materials are managed in accordance with applicable local, state and federal laws, rules and regulations.

FOB: Customer pays all freight charges.

TERMS: NET 30 DAYS

MATERIALS GROUP PRICING	PRICE	UNIT	COMMENTS
Lamp Group A (see detailed description below)	\$1.05	LB	Charge Item
Lamp Group B (see detailed description below)	\$3.05	LB	Charge Item
Phosphate Powder (mercury contaminated)	\$1250.00	Cubic Yard	3.5 drums per CY
Mercury Devices/Debris (intact non-leaking)	\$2500.00	Cubic Yard	3.5 drums per CY

MATERIALS GROUP DESCRIPTION

Lamp Group A – Includes: all **NON-COATED FLUORESCENT** straight lamps/circular lamps/U-Bent lamps/UV lamps/suntan lamps/Fluorescent crushed or broken lamps. This group also includes all LED lamp types.

Lamp Group B – Includes: all HID lamps/low pressure sodium/high pressure sodium/metal halide bulbs/shielded or coated lamps/power groove lamps/Arc tube lamps/Ignitron lamps/projection lamps/mercury lamps/ultraviolet/black light lamps/Germicidal/NEON/Compact Fluorescent (CFL)/Incandescent lamps/spot lamps/PAR/Quarts/Halogen. This pricing also includes any of the above lamps in a broken form.

ADDITIONAL SERVICES	PRICE	UNIT	COMMENTS
Transportation Group A (Full Truck Load)	\$ quote	Per Shipment	Charge Item
Transportation Group B (Less Than Truckload)	\$ quote	Per Pallet	Charge Item
Transportation Group C (Special handling services)	\$150.00	Per Hour	One Hour Minimum
Transportation Group D (Hazardous Waste transport)	\$ quote	Per Drum	Charge Item
Transportation Group E (Packaging Materials)	\$ quote	Per Pallet	Charge Item
Transportation Group B (Customer Delivery)	\$No Charge	Per Pallet	Schedule dock Time
Certificate of Recycling	\$0.00	Load	one per shipment
Manifest/Bill Of Lading	\$15.00	Each	
Sorting/Repackaging Labor	\$150.00	per hour/ per person	One Hour Minimum

CONTAINER SERVICES	PRICE	UNIT	COMMENTS
4 foot box (holds 25 T12, 56 T8, 125 T5)	\$ quote	each	Charge Item
8 foot box (hold 25 T12, 56 T8)	\$ quote	each	Charge Item
55-gallon steel drum	\$quote	each	Charge Item

Destination Facility: WM LampTracker Inc. 109 Twenty Nine Ct. Williamston, SC 29697

Phone: 888-537-4874

Subsidiary of Waste Management, Inc. www.lamptracker.com



WM LampTracker Inc.

ADDITIONAL TERMS AND CONDITIONS

Packaging:

- Material should be packaged in accordance with all Department of Transportation regulations for TSCA/Universal Waste/Hazardous waste requirements and must be on pallets, in containers (no exposed materials), and in such a manner as to allow loading and unloading using a motorized forklift. Materials should be sorted into the following categories:
 - Lamps: all lamps must be sorted by the type of lamp (sorting fee applies to mixed lamp combinations).
 - Batteries: all batteries must be sorted by the battery type (sorting fee applies to mixed battery combinations).
 - Labeling: Universal Waste Lamps, Batteries, and Mercury Containing Devices must have appropriate labels affixed to each container. PCB-Ballast must have a TSCA label affixed to the container and an out-of-Service date assigned on each container.
 - All pallets are to be shrink-wrapped to stabilize them for shipment.
 - If not packaged/sorted according to specifications, sorting labor charges may apply.
 - Customer is responsible for all packaging materials unless otherwise noted.

ADDITIONAL TERMS AND CONDITIONS CONTINUED

Transportation:

- If customer is providing transportation, customer will need to contact the WM Tracker destination facility prior to sending material; this is required to schedule dock time for unloading, processing, and documentation of the material.

Other Items:

- This quote will be valid through December 31, 2012. All additions, subtractions, or changes to the quote must be done with the written approval of WM LampTracker Inc.
- WMLT reserves the right to adjust the quoted price upon receipt of material, reflecting any increase or decrease in the quantity, quality, or conditions of the received material(s).
- Customer agrees to pay all fees associated with the collection of past due accounts.
- Market pricing to be reviewed and adjusted on a quarterly basis based on acceptance date unless otherwise noted.
- Customer warrants that no liquid or unacceptable wastes will be shipped to WM LampTracker Inc.
- This document contains confidential information and cannot be duplicated or transmitted to other parties without the written approval of WM LampTracker Inc.
- **All material will be processed in the United States. No export of unprocessed end-of-life material.**

WE ARE PLEASED TO QUOTE THE ABOVE PRICES. THANK YOU FOR YOUR BUSINESS.

Subject to WM LampTracker Inc. terms and conditions listed on pages 4 and 5 of this quote.

Customer Authorized Signature / Accepted By: _____

Date: _____

Destination Facility: WM LampTracker Inc. 109 Twenty Nine Ct. Williamston, SC 29697

Phone: 888-537-4874

Subsidiary of Waste Management, Inc. www.lamptracker.com



WM LampTracker Inc.

WM LampTracker Bulk Program Recycling Program TERMS AND CONDITIONS

These Terms and Conditions ("Terms") govern (a) your use WM LampTracker ("WMLT") bulk recycling programs (the "Recycling Program"); and (b) the relationship between WMLT and the user of the Recycling Program ("You" or "Customer"). If you have any questions regarding these Terms, consult WMLT Web Site (currently: www.wmlamptracker.com) or call 1-888-537-4874.

USE OF THE RECYCLING PROGRAM CONSTITUTES ACCEPTANCE OF THESE TERMS AND CONDITIONS.

1. **SERVICE REQUIREMENTS.** Service arrangements will be agreed by the parties. Changes in the frequency of collection service, schedule, number, capacity and/or type of equipment may be agreed to in writing or by the actions and practices of the parties.
2. **LIMIT ON PROGRAM AVAILABILITY.** The Recycling Programs are available to Customers located in the 50 United States and Puerto Rico.
3. **NON-CONFORMING WASTE.** Customer represents and warrants that it shall provide only acceptable recycling materials as indicated on the Acceptable Universal Waste sheet (the "Acceptable Waste"). A detailed list of the Acceptable Waste also may be obtained from WMLT. Material will be considered nonconforming if it has constituents, characteristics, components or properties not included within the definition of Acceptable Waste, and Acceptable Waste specifically excludes, and Customer agrees not to deposit or permit the deposit for collection of, any waste tires, radioactive, volatile, flammable, explosive, biomedical, infectious, biohazardous, regulated medical waste, toxic substance or material, as defined by, characterized or listed under applicable federal, state, or local laws or regulations, or other waste not approved in writing by WMLT (collectively, "Non-Conforming Waste"). Title to and liability for Non-Conforming Waste shall remain with Customer at all times. Title to Acceptable Waste shall vest in WMLT at time of pick-up or delivery. If WMLT determines that there is any Non-Conforming Waste, WMLT may, at its sole discretion, and at Customer's sole cost and expense: (a) return the Non-Conforming Waste to Customer; or (b) process the Non-Conforming Waste and Customer shall pay for any and all costs associated with processing the Non-Conforming Waste.
4. **PACKAGING.** Customer shall properly pack, seal and label material in accordance with the WMLT Bulk Packaging Instructions which can be obtained on the WMLT Web Site or by calling WMLT. Any packaging or repackaging of material to meet DOT or other regulations will be invoiced at the hourly rate indicated on the WMLT price quotation.
5. **TRANSPORTATION.** Customer shall have lamps packaged/palletized and at their loading dock prior to WMLT (or 3rd party) truck's arrival. Customer shall be available to assist the driver with loading. Customer may be charged a trip cancellation fee in any instance where WMLT is scheduled to pick-up and the pick-up is cancelled, or rescheduled with less than 72 hours advance notice, or material is unavailable for pickup. One hour of loading/unloading time is allocated for each stop, and any additional time will be charged at the hourly rate indicated on the WMLT price quotation.
6. **CHARGES FOR FAILURE TO COMPLY WITH TERMS AND INSTRUCTIONS; NON-CONFORMING WASTE; CHANGED CONDITIONS; AND ADDITIONAL SERVICES.** WMLT reserves the right to bill additional amounts for any of the following: (a) any container exceeding its specified maximum weight; (b) costs associated with handling any Non Conforming Waste; (c) shipping materials in the wrong container or mixing materials in a container; (d) any costs or expenses incurred by WMLT other than the usual and ordinary costs of WMLT in the performance of the Recycling Program; or (e) any costs related to changes in applicable law.
7. **PAYMENT TERMS.** Payments are due within 30 days of the invoice date. WMLT reserves the right to charge a late fee no greater than that allowed by law on balances not paid within thirty (30) days of the date of the invoice. Prices are subject to change at any time upon notice.
8. **WARRANTY.** WMLT warrants that it will handle, manage, treat, process and dispose of the Acceptable Waste in a safe and workmanlike manner and in full compliance with all valid and applicable statutes, ordinances, orders, rules and regulations of the federal, state and local governments in whose jurisdictions such Recycling Program is performed under these Terms. Other than as expressly warranted herein, WMLT disclaims all warranties, express or implied, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose.
9. **INDEMNITY.** WMLT will indemnify, defend and save Customer harmless from and against any and all liability which Customer may be responsible for or pay out as a result of bodily injuries (including death), property damage, or any violation or alleged violation of law, to the extent caused by any negligent act, negligent omission or willful misconduct of WMLT or its employees, which occurs (1) during the collection or transportation of Customer's Acceptable Waste, or (2) as a result of the disposal of Customer's Acceptable Waste in a facility owned by a subsidiary of Waste Management, Inc., provided that WMLT's indemnification obligations stated herein will not apply to any occurrences involving or related to Non-Conforming Waste. Customer agrees to indemnify, defend and save WMLT harmless from and against any and all liability which WMLT may be responsible for or pay out as a result of bodily injuries (including death), property damage, or any violation or alleged violation of law to the extent caused by Customer's breach of these Terms or by any negligent act, negligent omission or willful misconduct of the Customer or its employees, agents or contractors in the performance of these Terms or Customer's use, operation or possession of any equipment furnished by WMLT, or any occurrences related to Non-Conforming Waste. Neither party shall be liable to the other

Destination Facility: WM LampTracker Inc. 109 Twenty Nine Ct. Williamston, SC 29697

Phone: 888-537-4874

Subsidiary of Waste Management, Inc. www.lamptracker.com



WM LampTracker Inc.

for special, consequential incidental or punitive damages arising out of the performance of the Recycling Program. This Section will survive any termination of the parties' relationship.

10. **LIMITATION ON LIABILITY.** Other than the obligations of WMLT set forth in these Terms: (a) in no event shall WMLT be liable or responsible for any matter beyond WMLT's reasonable commercial control; and (b) in no event shall WMLT be liable to Customer for any amount in excess of the amount received by WMLT for the Recycling Program.

11. **GOVERNING LAW AND VENUE.** These Terms will be interpreted in accordance with the laws of the State of Texas, without regard to its choice of law provisions, as though all acts and omissions occurred in the State of Texas. All disputes arising under these Terms will be brought in a state or federal court in Houston, Texas, and, in such instance, Customer: (a) waives any objection which it might have now or hereafter to the exclusive venue of any such litigation, action or proceeding, (b) irrevocably submits to the exclusive jurisdiction of any such court, (c) waives any claim or defense of inconvenient forum; and (d) waives any right to trial by jury of any claim or cause of action by or against WMLT.

12. **FORCE MAJEURE.** WMLT shall not be in default for its failure to perform or delay in performance caused by events or significant threats of events beyond its reasonable control, whether or not foreseeable, including, but not limited to, strikes, labor trouble, riots, imposition of laws or governmental orders, fires, acts of war or terrorism, acts of God, and the inability to obtain equipment, acts or omissions of shippers or carriers, and WMLT shall be excused from performance during the occurrence of such events.

13. **ENTIRE AGREEMENT; CONSTRUCTION.** These Terms constitute your entire agreement with WMLT with respect to the Recycling Program superseding all prior communications, agreements or correspondence between the parties or their representatives for these Recycling Program; provided, however, obligations which apply to the Packing Instructions or on the Web Site are hereby incorporated herein. If any provision in these Terms is determined to be illegal, invalid or unenforceable, the remainder of these Terms will nonetheless survive and govern the rights and obligations of the parties hereto. No provision of the Terms will be deemed waived, amended, or modified by either party unless such waiver, amendment, or modification is in writing signed by the party against whom enforcement is sought. Any additional or different terms or conditions contained in any document furnished by Customer are hereby objected to and rejected by WMLT. No representation or statement made by any employee, agent, or representative of WMLT shall be binding on WMLT to the extent such representation or statement differs from these Terms.

Destination Facility: WM LampTracker Inc. 109 Twenty Nine Ct. Williamston, SC 29697

Phone: 888-537-4874

Subsidiary of Waste Management, Inc. www.lamptracker.com

Thomas, Pamela

From: Sweeney, Jennifer [JSweene1@wm.com]
Sent: Tuesday, September 27, 2011 3:09 PM
To: Thomas, Pamela
Cc: Reynolds, Susan
Subject: FW: Shaw env. needs approximate pricing this afternoon.
Importance: High

Budgetary pricing for you.... all prices pending profile approval.

Disposal

PCB ballasts per 55 gallon drum:
\$155 per drum disposal, tax, and Env fee

liquids for stabilization
\$215 per drum disposal, tax, and Env fee

Rags for Macro-encapsulation
\$280 per drum disposal, tax, and Env fee

Approval fees

\$170 per profile ADEM fee
\$50 per profile WM approval fee

Transportation (55 gallon drums)

\$65 per drum transportation (includes current fuel)
3 drum minimum transportation fee
\$150 stop fee per pick-up

Thanks,

Jennifer Sweeney, CHMM
Waste Management - Industrial Sales
Phone 904-588-3081
Fax 866-844-1560
TSR/Susan Reynolds 205-652-8166
E-mail jsweene1@wm.com
www.wmdisposal.com

Did you know that.... Waste Management's 100 landfill gas to energy projects create enough energy to replace nearly seven million barrels of oil per year.

From: Reynolds, Susan
Sent: Tuesday, September 27, 2011 11:12 AM
To: Sweeney, Jennifer
Subject: Shaw env. needs approximate pricing this afternoon.
Importance: High

By this afternoon, if possible, she just needs a ball park price.

Shaw Environmental
Pam Thomas
630-762-3323
Pamela.thomas@shawgrp.com

Susan Reynolds

Waste Management

Industrial Technical Service Representative
36964 Alabama Hwy 17 Emelle, AL 35459
1-205-652-8166-Office
1-866-844-1560-Fax
smreynol@wm.com

Visit www.wmsolutions.com for additional information.

Visit www.wmlamptracker.com for Universal Waste Recycling.

Waste Management's landfills provide over 17,000 acres of protected land for wildlife habitats and 15 are certified by the Wildlife Habitat Council.

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.



W.193 S.6817 Hillendale Dr. Muskego, WI 53150

Phone: 262-679-2080 | Fax: 262-679-4748 | E-mail:
info@wiballast.com

September 28, 2011

Attention: Bonnie Bishop Clark
Lighting Resources, Inc.
1007 SW 16th Lane
Ocala, FL 34471
email: bonnie@lightingresourcesinc.com

Subject: Current pricing for regulated lighting ballast going to regulated burial

To: Lighting Resources Inc.

The current price Wisconsin Ballast Inc. can offer Lighting Resources Inc., Ocala, FL is \$.28 per total for the recycling/destruction of the fluorescent lighting ballast. This price is firm for the next 60 days. This does not include containers or the transport to us. It does include all associated disposal costs with the shipping to regulated burial.

Sincerely,

John Kronshage, President



W.193 S.6817 Hillendale Dr. Muskego, WI 53150

Phone: 262-679-2080 | Fax: 262-679-4748 | E-mail:
info@wiballast.com

September 28, 2011

Attention: Bonnie Bishop Clark
Lighting Resources, Inc.
1007 SW 16th Lane
Ocala, FL 34471
email: bonnie@lightingresourcesinc.com

Subject: Current pricing for regulated lighting ballast going to incineration

To: Lighting Resources Inc.

The current price Wisconsin Ballast Inc. can offer Lighting Resources Inc., Ocala, FL is \$.36 per total pound for the recycling/destruction of the fluorescent lighting ballast. This price is firm for the next 60 days.

This does not include containers or the transport to us. It does include all associated disposal costs with the shipping to incineration.

Sincerely,

John Kronshage, President



Programs

[Waste Home](#)
[Petroleum](#)
[Storage](#)
[Systems](#)
[Solid and](#)
[Hazardous](#)
[Waste](#)
[Waste](#)
[Cleanup](#)

Information

[Division](#)
[& Bureau](#)
[Contacts](#)
[Data Reports](#)
[DEP Public](#)
[Notices](#)
[Division](#)
[Public](#)
[Notices](#)
[Forms](#)
[News](#)
[Publications](#)
[and Reports](#)
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Navigation

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[Map](#)
[Division Site](#)
[Map](#)

Annual Adjustment of Cost Estimates

Owners or operators of facilities regulated by the Solid Waste Financial Assurance office shall annually adjust their facility closure cost estimates for inflation and submit updated information to the Department. Outlined below are Rule 62-701.630(4), Florida Administrative Code (F.A.C.), requirements for submission of closure cost estimates.

Form [62-701.900\(28\)](#) is used to prepare and submit closure cost estimates. Contact your permitting office for assistance with this form. Annual cost estimate adjustments may be made either by recalculating the maximum cost of closure in current dollars or by using the [current year inflation factor](#).

For owners or operators using an escrow account to demonstrate financial assurance, cost estimates must be submitted between July 1 and September 1 of each year.

For owners or operators using an alternate financial mechanism to demonstrate financial assurance, cost estimates must be submitted between January 1 and March 1 of each year.

Please submit Form 62-701.900(28) to the appropriate permitting office with a copy to:

Solid Waste Financial Coordinator
 Department of Environmental Protection
 2600 Blair Stone Road MS 4565
 Tallahassee, Florida 32399-2400
 (850) 245-8732 FAX (850) 245-8811

Calculation of the Inflation Factor

The annual inflation factor is derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its Survey of Current Business, pursuant to Rule 62-701.630 (4)(a)(2), F.A.C.

To calculate the current inflation factor, divide the latest published annual Deflator by the Deflator for the previous year.

Implicit Price Deflator data is published by the U.S. Department of Commerce, Bureau of Economic Analysis on their website, <http://www.bea.gov>.

The data necessary to calculate the inflation factor is released by the U.S. Department of Commerce in April. Therefore, it is appropriate to use the previous year's factor when inflation adjusting cost estimates due between January 1 and March 1.

Current Year Inflation Factors:

1.010	for estimates due between January 1 and March 1, 2012
1.010	for estimates due between July 1 and September 1, 2011

Recent Inflation Factors:

Last Approved Cost Estimate (Year)		Select Appropriate Inflation Factor			New Cost Estimate (Year)
		Estimate due 1/1 - 3/1	Estimate due 7/1 - 9/1		
2005	x	1.020	1.030	=	2006
2006	x	1.030	1.030	=	2007
2007	x	1.030	1.025	=	2008
2008	x	1.025	1.020	=	2009

Highlights

[SWFA Main Page](#)

[Cost Estimates](#)

Facility Lists:

[Solid Waste](#)

[Management](#)

[Facilities](#)

[Used Oil](#)

[Processing](#)

[Facilities](#)

[Forms](#)

[Provider Companies](#)

[Rules & Related Laws](#)

[Workshop](#)

2009	x	1.020	1.010	=	2010
2010	x	1.010	1.010	=	2011
2011	x	1.010	Available in May '12	=	2012

Last updated: November 03, 2011

Bureau of Solid & Hazardous Waste #850-245-8707 MS #4550

Division of Waste Management #850-245-8705 MS #4500
2600 Blair Stone Road, Tallahassee, Florida 32399-2400

[Questions & Comments Form](#)

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APPENDIX G

FINANCIAL ASSURANCE FORM

DEP Form # 62-730.900(4)(e)
Form Title HW Facility Trust Fund
Effective Date January 5, 1995
DEP Application No. _____

**STATE OF FLORIDA
HAZARDOUS WASTE FACILITY TRUST FUND AGREEMENT
TO DEMONSTRATE FINANCIAL ASSURANCE
FOR**

☒ Closure ☐ Postclosure ☐ Corrective Action
Check Appropriate Box(es)

TRUST AGREEMENT, the "Agreement", entered into as of April 16, 2012 _____ Date

by and between Lighting Resources, LLC _____

a California _____ Name of the Owner or Operator
Name of state Limited Liability Company _____, the "Grantor,"
Insert "corporation," "partnership," "association," or "proprietorship"
and J P Morgan Chase Bank, National Association _____
420 W Van Buren, Mail Code IL 1-0113; Chicago, IL 60606 _____
Name and Address of Corporate Trustee
a national bank. _____, the "Trustee."
Insert "incorporated in the state of _____" or "a national bank"

WHEREAS, the Florida Department of Environmental Protection, "FDEP", an agency of the state of Florida, has established certain regulations applicable to the Grantor, requiring that an owner or operator of a hazardous waste management facility shall provide assurance that funds will be available when needed for "Required Action" of the facility,

WHEREAS, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein,

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee,

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

- (a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.
- (b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.
- (c) The term "FDEP" means the Florida Department of Environmental Protection, an Agency of the state of Florida or any successor thereof.
- (d) The term "Required Action," as used in this document means closure, post-closure care, or corrective action, or any combination of these, which is checked above.

Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule A

On Schedule A, for each facility list the EPA/DEP Identification Number, name, address, and the current "Required Action" cost estimates, or portions thereof, for which financial assurance is demonstrated by this Agreement.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a trust fund, the "Fund," for the benefit of the FDEP. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the

Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by the FDEP.

Section 4. Payment for Closure, Post-Closure Care, and Corrective Action . The Trustee shall make payments from the Fund as the FDEP Secretary shall direct, in writing, to provide for the payment of the costs of "Required Action" of the facilities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the FDEP Secretary from the Fund for "Required Action" expenditures in such amounts as the FDEP Secretary shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the FDEP Secretary specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 5. Payments Comprising the Fund. Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

- (a) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the federal or a state government;
- (b) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the federal or a state government; and
- (c) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

- (a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and
- (b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

- (a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;
- (b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the federal or a state government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the Secretary of the FDEP a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the FDEP Secretary shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor Trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, FDEP Secretary, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the FDEP Secretary to the Trustee shall be in writing, signed by the FDEP Secretary, or the designee, and the

Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or the FDEP hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or the FDEP, except as provided for herein.

Section 15. Notice of Nonpayment. The Trustee shall notify the Grantor and the FDEP Secretary, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

Section 16. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the FDEP Secretary, or by the Trustee and the FDEP Secretary if the Grantor ceases to exist.

Section 17. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the FDEP Secretary, or by the Trustee and the FDEP Secretary, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 18. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the FDEP Secretary issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the state of Florida.

Section 20. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written. The parties below certify that the wording of this Agreement is substantially identical to the wording specified in 40 CFR 264.151(a)(1), as adopted by reference in Section 62-730.180, Florida Administrative Code, as such regulations were constituted on the date first above written.

Daniel H. Gille

Signature of Grantor

Cynthia M. Mc

Signature of Trustee

Member

Vice President

Title

Title

Susan Richard

Signature of Witness or Notary

Susie Moy

Signature of Witness or Notary



Seal



**CERTIFICATION OF ACKNOWLEDGMENT FOR
HAZARDOUS WASTE MANAGEMENT FACILITY TRUST FUND AGREEMENT**

State of California

County of San Bernardino

On April 6, 2012 before me, Naveed Jattala, Notary Public, personally appeared Daniel P. Gillespie as Member for Lighting Resources, LLC, the Limited Liability Company described herein, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the entity upon behalf of which the person acted executed the instrument..

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.



Signature of Notary Public



NAVEED JATTALA

Print, Type, or Stamp Commissioned Name of Notary Public

Produced Identification C.D.L.-N9016400

Type of Identification Produced: California Drivers License

CERTIFICATION OF ACKNOWLEDGMENT FOR
HAZARDOUS WASTE MANAGEMENT FACILITY TRUST FUND AGREEMENT

State of Illinois

County of Cook

The foregoing instrument was acknowledged before me this 16th day of April, 2012, by
Cynthia Reis as Vice President

Name of person

Type of authority, e.g., officer, trustee, etc.

for JPMorgan Chase Bank, National Association, the corporation described in and which
Name of party on behalf of whom instrument was executed

executed the above instrument.


Signature of Notary Public

Susie Moy

Print, Type, or Stamp Commissioned Name of Notary Public

Personally Known Personally Known or Produced Identification _____

Type of Identification Produced _____

SCHEDULE A

This Agreement demonstrates financial assurance for the following cost estimate for the following facility:

EPA/DEP I.D. No: FLR000070565

NAME: Lighting Resources, LLC

ADDRESS: 1007 SW 16TH Lane
Ocala, FL 34471

COST ESTIMATES:

Closure \$108,240.00

TOTAL: **\$108,240.00**

SCHEDULE B

The Fund is established initially as consisting of the following property:

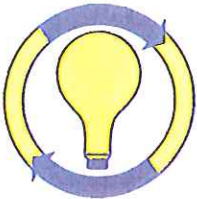
A check #31496 in the amount of \$21,648.00 (1/5 of the total of \$108,240) will be used to establish the fund. Payments will be made annually in 2013, 2014, 2015, and 2016.

LIGHTING RESOURCES, LLC

Lighting Resources, LLC
DEP Permit Application_Revision No. [1]
April 2012

31496

REFERENCE NO.	DESCRIPTION	INVOICE DATE	INVOICE AMOUNT	DISCOUNT TAKEN	AMOUNT PAID
1ST OF 5		12/6/11	21,648.00		21,648.00
CHECK DATE	CHECK NO.	PAYEE	DISCOUNTS TAKEN	CHECK AMOUNT	
4/4/12	31496	JPMORGAN CHASE BANK, N.A.		\$21,648.00	



LIGHTING RESOURCES, LLC

805 EAST FRANCIS STREET
ONTARIO, CALIFORNIA 91761
(909) 923-3132

JP MORGAN CHASE BANK, N.A.
WASHINGTON MUTUAL BRANCH
MIRA LOMA-EASTVALE FINANCIAL CENTER
MIRA LOMA, CA 91752
90-7162/3222

31496

DATE

Apr 4, 2012

AMOUNT

\$

21,648.00

PAY
TO THE
ORDER
OF:

Twenty-One Thousand Six Hundred Forty-Eight and 00/100 Dollars

JPMORGAN CHASE BANK, N.A.
WSS GLOBAL FEE BILLING
P.O.BOX 26040
NEW YORK, NY 10087-6040

David L. Kelly

AUTHORIZED SIGNATURE

Security features. Details on back.

⑈031496⑈ ⑆322271627⑆ 3591432089⑈

LIGHTING RESOURCES, LLC

31496

REFERENCE NO.	DESCRIPTION	INVOICE DATE	INVOICE AMOUNT	DISCOUNT TAKEN	AMOUNT PAID
1ST OF 5		12/6/11	21,648.00		21,648.00
COPY					
CHECK DATE	CHECK NO.	PAYEE	DISCOUNTS TAKEN	CHECK AMOUNT	
4/4/12	31496	JPMORGAN CHASE BANK, N.A.		\$21,648.00	

EXHIBIT A

All orders, request and instructions by the grantor to the Trustee shall be in writing and signed by one of the following persons:

Name: Lighting Resources, LLC
Daniel P. Gillespie
Title: Member
Telephone: 909-923-3132

A handwritten signature in blue ink, reading "Daniel P. Gillespie", written over a horizontal line.

Name: Lighting Resources, LLC
Bonnie Bishop-Clark
Title: Regional Facility Manager, Florida
Telephone: 352-509-3001

A handwritten signature in blue ink, reading "Bonnie Bishop-Clark", written over a horizontal line.

Name: Lighting Resources, LLC
Susan Richard
Title: Controller
Telephone: 909-923-3132

A handwritten signature in blue ink, reading "Susan Richard", written over a horizontal line.

APPENDIX H

CERTIFICATE OF INSURANCE

ACORD™

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

10/03/2011

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER J. Smith Lanier & Co Knoxville 413 Northshore Drive, SW Knoxville, TN 37919 865 588-7200	CONTACT NAME: PHONE (A/C, No, Ext): 865 588-7200 FAX (A/C, No): 865 588-7224 E-MAIL ADDRESS:														
INSURED Lighting Resources, LLC LRT Lighting Resources Texas, LLC 805 E. Francis Street Ontario, CA 91761	<table border="1"> <thead> <tr> <th data-bbox="812 430 1421 462">INSURER(S) AFFORDING COVERAGE</th> <th data-bbox="1421 430 1544 462">NAIC #</th> </tr> </thead> <tbody> <tr> <td data-bbox="812 462 1421 493">INSURER A: Westchester Surplus Lines Ins.</td> <td data-bbox="1421 462 1544 493">10172</td> </tr> <tr> <td data-bbox="812 493 1421 525">INSURER B: National Union Fire Insurance</td> <td data-bbox="1421 493 1544 525">19445</td> </tr> <tr> <td data-bbox="812 525 1421 556">INSURER C: ACE American Insurance Company</td> <td data-bbox="1421 525 1544 556">22667</td> </tr> <tr> <td data-bbox="812 556 1421 588">INSURER D:</td> <td data-bbox="1421 556 1544 588"></td> </tr> <tr> <td data-bbox="812 588 1421 619">INSURER E:</td> <td data-bbox="1421 588 1544 619"></td> </tr> <tr> <td data-bbox="812 619 1421 636">INSURER F:</td> <td data-bbox="1421 619 1544 636"></td> </tr> </tbody> </table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A: Westchester Surplus Lines Ins.	10172	INSURER B: National Union Fire Insurance	19445	INSURER C: ACE American Insurance Company	22667	INSURER D:		INSURER E:		INSURER F:	
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INSURER D:															
INSURER E:															
INSURER F:															

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.


INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR BI/PD Ded:5,000 GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC			G23832161005	10/01/2011	10/01/2012	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$100,000 MED EXP (Any one person) \$25,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$5,000,000 PRODUCTS - COMP/OP AGG \$5,000,000 \$
	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS			HO8416266005	10/01/2011	10/01/2012	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> EXCESS LIAB DED <input type="checkbox"/> RETENTION \$			G23832173005	10/01/2011	10/01/2012	EACH OCCURRENCE \$5,000,000 AGGREGATE \$5,000,000 \$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? <input checked="" type="checkbox"/> Y/N <input checked="" type="checkbox"/> N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below		N/A	WC5319870 WC5319869	10/01/2011 10/01/2011	10/01/2012 10/01/2012	<input checked="" type="checkbox"/> WC STATU-TORY LIMITS <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$1,000,000 E.L. DISEASE - EA EMPLOYEE \$1,000,000 E.L. DISEASE - POLICY LIMIT \$1,000,000
A	Pollution Legal Liability			G23832161005	10/01/2011	10/01/2012	\$1,000,000/\$5,000,000 \$10,000-Deductible

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Umbrella Liability Extends to Pollution Coverage

CERTIFICATE HOLDER

CANCELLATION

Lighting Resources, LLC Attn: Bonnie Bishop 1007 SW 16th Lane Ocala, FL 34471	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
--	--