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"Environmental Protection through Mercury Reclamation"

January 3, 2000

Mr. Bill Kellenberger
Florida DEP
Northwest District
160 Governmental Center
Pensacola, FL 32501

RE: Minor Permit Modification for HO37-272625 (Mercury Containing Lamp and
Device Storage Facility, Mercury Recovery and Mercury Reclamation Facility)

Dear Bill:

The purpose of this letter is to follow-up to today's telephone conversation. As you know, we received a memo from Jack Price dated 12-9-99 addressing Chapter 62-737, F.A.C.: Rule Change Effective Date. I was certainly aware of the impending rule change, and developed a proposal, which was submitted to Jack Price on 11-24-99. I have enclosed a copy for your review and file. We respectfully request that DEP modify Superior Special Services, Inc.'s (formerly RECYCLIGHTS, Inc.) existing Tallahassee facility permit to reflect the enclosed DEP Proposal. If you have any questions, please do not hesitate to call me at 800-831-2852. We look forward to hearing from you. Thank you.

Sincerely,

Brian R. Golob, CHMM
Environmental Manager

CC: Randy Peterson, Superior Special Services, Inc.
Jeff Kirk, Superior Special Services, Inc.

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Northwest Florida
DEP

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"Environmental Protection through Mercury Reclamation"

November 24, 1999

Mr. Jack Price
Florida DEP
2600 Blair Stone Road
M.S. # 4555
Tallahassee, FL 32399-2400

Dear Jack:

The purpose of this letter is to request approval of an alternate program whereby Superior Special Services, Inc. (i.e., RECYCLIGHTS, Inc. and the former P3 operation) will "capture" or collect an amount of mercury that would be recovered and reclaimed under Chapter 62-737.840 (3) (d), F.A.C.

As you know, RECYCLIGHTS, Inc. and P3 were acquired by Superior Special Services, Inc. this year. I have conveyed to DEP that the Tallahassee plant's existing technology is not able to achieve the upcoming 12-week rolling average mercury value of 1 PPM, or the weekly composite sample reflecting process operations at 3 PPM. It is likely that Plant City's equipment will not be able to achieve the upcoming levels either.

Consequently, we have developed and are pleased to submit the enclosed alternate procedure in accordance with 62-737.840 (3)(d) 1 and 2. We are convinced that the environment will be protected and more mercury will be recovered through the successful implementation of this program. If you have any questions regarding this proposal, please call me at 800-831-2852 or Ms. Amy Paikowski at 414-268-9168. We look forward to hearing from DEP regarding this proposal and proceeding with it in 2000.

Sincerely,

Brian R. Golob, CHMM
Environmental Manager

CC: Amy Paikowski, Superior Special Services, Inc.
Randy Peterson, Superior Special Services, Inc.
Jeff Kirk, RECYCLIGHTS, Inc.
Ralph Mann, Superior Special Services, Inc.
Joe Alonge, Superior Special Services, Inc.

Alternate Mercury Management Program

Proposal To:

**Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399**

Prepared By:

**Superior Special Services, Inc.
P.O. Box 1323
Fond du Lac, Wisconsin 54936**

November 24, 1999

Introduction

Chapter 62-737 F.A.C. addresses the management of spent mercury-containing lamps and devices destined for recycling. Chapter 62-737.840(3)(d) F.A.C. states "Effective January 1, 2000, the average mercury content and the weekly composite sample of process operations shall be reduced to one part per million and three parts per million, respectively." RECYCLIGHTS, Inc.'s and Superior Special Services, Inc.'s existing mechanical crushing-separating equipment at the Tallahassee facility, and at the Plant City facility is not able to achieve the upcoming new levels. Consequently, in accordance with Chapter 62-737.840(3)(d) 1 and 2, the company is proposing an alternate strategy or program which would result in an equal or greater quantity of mercury to be recovered compared to the amount of mercury that would be recovered using the new, lower values. The company's alternate strategy will focus on targeting mercury manometers that are commonly used in the dairy industry within the State of Florida.

Program Rationale

In many mercury-containing products such as switches, the mercury is encapsulated and sealed at the factory. Therefore, in normal use, there is little if any opportunity for a mercury release due to operator error or equipment malfunction.

However, for manometers used in dairy barn equipment, the mercury is not encapsulated and sealed at the factory and there are multiple opportunities for accidental release. The manometer and the mercury are shipped separately to a dealer or farmer, and someone must fill the manometer by manually transferring the mercury from a small shipping bottle to the manometer tube. This activity provides an opportunity for mercury to be released into the environment. A spill in a typical dairy barn would be difficult to fully clean up, even if the proper equipment were at hand and used immediately. Spilled elemental mercury will bounce, splash and spread all over. There may also be more mercury in the shipping bottle than is needed in the manometer, and if this material stays on a farm, there is the potential for an accidental release.

The ends of a manometer are equipped with a small valve device to prevent a mercury release under normal conditions. However, if they are not set in the proper position, mercury can be released. Also, if there is an extreme pressure or vacuum situation in the milking system, the mercury could be blown out of or sucked through the manometer, regardless of whether these are positioned properly. This sort of spill or release would be extremely difficult to clean up under the best of conditions. If the mercury was sucked into the system, the entire system could be contaminated, as could any milk in the system.

A dairy barn manometer holds much more mercury compared to other mercury products such as switches. A typical dairy barn manometer holds an estimated three-quarters to

one pound (approximately 340 to 450-grams) of mercury, whereas most switches contain just a few grams.

The use of mercury near the point of milk production raises two concerns related to contamination. One, a mercury release could directly contaminate milk in the milking system. Two, a mercury spill could expose the dairy cows to mercury in air or possibly in their feed. Such a mercury exposure to the cows could result in mercury being passed into their milk, and could also cause neurological damage to calves exposed in the womb. Humans can be profoundly disabled in utero at mercury levels that do not produce toxicity symptoms in the mother. Though no research had been done on cows (that the author of this proposal is aware of), it seems reasonable to conservatively assume that the same thing could happen.

Mercury released in a dairy barn would most likely be cleaned out with the manure and bedding material. This material is, in all likelihood, land applied as fertilizer to increase crop production and replenish the soil. Presumably a spill would end up in a small load of manure, and create a high level of contamination in that load and in the soil where it is applied. Or, the manure may be pumped into a storage lagoon prior to application. The mercury would contaminate this large quantity of manure at a lower level, and it would be land applied over a large area. Manure lagoons are very active biologically, and there is a significant potential for mercury methylation in a manure lagoon. Mercury would likely be released to the environment if a catastrophic event, such as a tornado, hurricane or fire destroys the dairy barn.

The potential for spills, and the potential for milk contamination and release to the environment and agricultural lands can be prevented very simply by removing old mercury manometers from dairy farms in the state of Florida. Non-mercury replacement devices are readily available at nominal cost, especially in comparison to the potential costs of cleanup and contamination.

Proposed Work Plan

The company intends to accomplish the following objectives with this program:

- Comply with Chapter 62-737.840(3)(d) 1 and 2, F.A.C.;
- Establish a new program to collect dairy manometers;
- Ensure that manometers are collected in an environmentally safe manner; and
- Work with the Florida Dairy Association (FDA) and dairy equipment suppliers.

The following text describes the proposed work plan in detail.

Task One: Project Initiation Meeting

The objective of this task is to contact the Florida Dairy Association to schedule an introductory meeting regarding the proposed new program. Company representatives will meet with FDA staff. The purpose of the meeting is to explain the rationale for the new program, what the company intends to accomplish with the new program, and solicit the support and participation of the Florida Dairy Association and dairy equipment suppliers.

Deliverable(s): Schedule meeting with FDA representatives

Task Two: Develop Educational Information

The objective of this task is to develop educational information (e.g., a program fact sheet, a program issues paper, and a fact sheet describing packaging and shipping information for elemental mercury and dairy manometers) which can be distributed either directly to dairy equipment suppliers or to the Florida Dairy Association itself.. Company employees have extensive experience developing technically related educational material which is oriented toward a lay audience. In this case, written materials will address the program itself, packaging, labeling, on-site storage, safe handling, and transportation of mercury-containing devices and elemental mercury. The company's employees are well versed with federal regulations that address the shipment of hazardous materials. For example, a package that contains one or more pounds of liquid mercury is subject to DOT regulations as a hazardous material. In this case, the proper shipping paper would be a Hazardous Material Bill of Lading. An appropriate DOT shipping name would be Mercury Contained in Manufactured Articles which falls in Hazard class 8. Hazard class 8 means that a corrosive label must be placed on the package. In addition to the corrosive label, additional DOT information must be placed on the package such as: the proper shipping name, hazard class, identification number, packaging group and quantity. This technical information must and will be conveyed to all shippers ensuring DOT compliance.

Deliverable(s): Develop written literature to facilitate program understanding and manometer recycling.
Attend and present at meetings, seminars or conferences

Task Three: Provide Technical Assistance

The objective of this task is to provide technical assistance to the Florida Dairy Association and or dairy equipment suppliers on an ongoing basis to facilitate the recycling of dairy manometers. Company employees have years of experience providing written and verbal instructions to customers regarding the management of mercury-

containing devices and lamps. Technical assistance will likely consist of providing information via telephone conversations, plus faxing pertinent transportation and packaging related information to FDA members and dairy equipment suppliers.

Deliverable(s): Provide ongoing expertise to FDA members and dairy equipment suppliers

Task Four: Collection Logistics

The objective of this task is to work with dairy equipment suppliers to facilitate the collection of dairy manometers and or excess elemental mercury. The company has extensive experience in scheduling, coordinating and transporting mercury-containing lamps and other devices such as relays and switches in Florida. The company will designate a contact person who will work with individual dairy equipment suppliers and or the Florida dairy Association to ensure that the manometers are collected in a timely fashion. The company will ensure that adequate measures are taken to prevent a mercury release from the time the manometer/mercury leaves the possession of the dairy equipment supplier until the time the manometers are recycled.

The company will provide (at no cost) suitable inner shipping containers to a dairy equipment supplier who decides to participate in this program. The containers will meet DOT standards for transporting hazardous materials. The company will also provide (at no cost) all required shipping documents and labels for storage and shipping. Finally, the company will either collect the dairy manometers directly , or arrange for another company to actually pick-up the manometers and excess mercury.

Deliverable(s): Coordinate and schedule pick-ups
Provide inner shipping container
Provide shipping documents and labels

Task Five: Manometer Management

Mercury-containing manometers plus liquid mercury will be transported either to our Tallahassee or Plant City facilities. Company personnel will conduct standard operating procedures regarding incoming shipments. For example, containers will be inspected and weighed, and internal documentation procedures will be initiated. Information listed on the paperwork will be entered into the company's computer database system.

After the initial receiving procedures are completed, the shipping containers holding the mercury-containing manometers will either be placed into a storage area or into a

distillation unit depending on the facility. In either case, the concrete floor is sealed with an epoxy coating. Operation's employees will use Level C personal protective equipment (e.g., respirator, coveralls, safety glasses and shoes) while removing liquid mercury from each tube. The mercury will be poured into a sealable DOT approved metal container. This activity will be conducted only in the distiller room. The empty manometer tube will be placed into the distillation unit to remove residue mercury molecules from the tube. The company has been processing different mercury-containing devices since 1996. Written documentation will be sent to each customer specifying that their manometer was managed by the company.

Deliverable(s): Certificate of Conversion issued to each customer

Program Justification

In order for the company to comply with Chapter 62-737.840(3)(d) 1 and 2, F.A.C., it must demonstrate that the amount of mercury recovered under the new program will equal or exceed the total amount of mercury that would have been recovered under Chapter 62-737.840(3)(d), F.A.C. The company is aware that the quantity of mercury to be recovered must be based on data representing 1999 for the Tallahassee and Plant city sites. Data covering January through October is available as of the proposal submittal date. Appendix I presents calculations which indicate how many dairy manometers must be collected to equal the total amount of mercury that is supposed to be captured through recovery and reclamation activities.

Calculations and Rationale

Tallahassee Location

The Tallahassee plant received 1,241,142 fluorescent lamps through the first ten months of 1999. The monthly average is equivalent to 124,114 lamps. If that monthly average continued through the end of the year, the plant would have received approximately 1,489,000 fluorescent lamps.

$$1,489,000 \text{ lamps/year} \times 0.6 \text{ lbs./1 lamp} \times 90\%(\text{the weight of the glass}) = 804,060 \text{ lbs.glass/year}$$

$$804,060 \text{ lbs. glass/year} \times 454\text{g/1 lb} \times 1\text{Kg/1000g} = 365,043 \text{ Kg glass/year}$$

$$365,043 \text{ Kg glass/year} \times 3\text{mg Hg/Kg glass} \times 1\text{g/1,000mg} = 1,095\text{g Hg/year} \quad \{\text{Old value}\}$$

$$365,043 \text{ Kg glass/year} \times 1\text{mg Hg/Kg glass} \times 1\text{g/1,000mg} = 365\text{g Hg/year} \quad \{\text{New value}\}$$

The difference between the new and the old value is 730 g Hg/ year. That is the total amount of mercury that must be collected from dairy manometers in order to equal the amount of mercury that would have been collected if the company's mercury total was regulated based on an average weekly value of 1mg Hg/Kg of glass.

Since a typical dairy manometer contains an estimated 0.75 pounds to one pound of mercury (i.e. 340 to 454 grams), this site must collect three dairy manometers. The following calculation illustrates the logic:

$$730 \text{ g Hg/year} \times 340\text{g/manometer} = 2.1 \text{ dairy manometers}$$

Plant City Location

We estimate that the Plant City facility will receive approximately 1,862,000 fluorescent lamps during 1999

$$1,862,000 \text{ lamps/year} \times 0.6 \text{ lbs./1 lamp} \times 90\%(\text{weight of the glass}) = 1,005,480 \text{ lbs. glass/year}$$

$$1,005,480 \text{ lbs.glass/year} \times 454\text{g/1 lb} \times 1\text{Kg/1000g} = 456,488 \text{ Kg glass/year}$$

$456,488 \text{ Kg glass/year} \times 3\text{mg/ Kg glass} \times 1\text{g}/1,000\text{mg} = 1,369\text{g Hg/year} \{\text{Old value}\}$

$456,488 \text{ Kg glass/year} \times 1\text{mg/kg glass} \times 1\text{g}/1,000\text{mg} = 456\text{g Hg/year} \{\text{New Value}\}$

The difference between the old and the new value is 913 g Hg/year. That is the total amount of mercury that must be collected from dairy manometers in order to equal the amount of mercury that would have been collected if the company's mercury total was regulated based on an average weekly value of 1 mg Hg/Kg of glass.

Since a typical dairy manometer contains an estimated 0.75 pounds to one pound of mercury (i.e., 340 to 454 grams), this site must collect three dairy manometers. The following calculation illustrates the logic:

$913 \text{ g Hg/ year} \times 340\text{g/manometer} = 2.7 \text{ manometers}$