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Final Report

An Assessment of the Restaurant Grease Collection and Rendering Industry in South Carolina

Prepared for the

South Carolina Energy Office
1200 Senate Street
408 Wade Hampton Building
Columbia, SC 29201

and the

US Department of Energy/Southern States Energy Board
Southeast Biomass State and Regional Partnership

An Assessment of the Restaurant Grease Collection and Rendering Industry in South Carolina

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EXECUTIVE SUMMARY

As oil prices fluctuate, America is beginning to evaluate its options for inexpensive, domestically-produced fuels. One of those options is biodiesel, which has become a particularly attractive option for producers in South Carolina.

One of the key issues facing the biodiesel industry is the identification of feedstocks to support production. Animal or recycled fats represent an attractive option because conventional feedstocks, like soy oil, are not as economically feasible at this time. The purpose of this report is to document the potential for using waste grease as a feedstock, to locate the grease, and to document how much grease is available in South Carolina.

This report looked at two major forms of waste grease: yellow grease and brown grease. Yellow grease is defined as spent cooking oil and other fats and oils collected from commercial or industrial cooking operations. Brown grease is defined as oil collected from grease traps that are installed in commercial, industrial or municipal sewage facilities to separate grease and oil from waste water.

In order to gain a better understanding of the current state of waste grease collection, the South Carolina Energy Office (SCEO) conducted two surveys of the waste grease collectors operating within the state. A survey of six commercial yellow grease collectors in 2007 accounted for 8,957 restaurants and 1,148 institutions that produced 7,908,564 gallons a year. As a result of incomplete collection data from the survey, additional data was gathered from the South Carolina Department of Health and Environmental Control (DHEC). It was estimated 27,183,728 gallons of waste grease could potentially be produced a year. It was also estimated that 70 to 95 percent of the available yellow grease is collected in metropolitan areas.

A second survey was performed in 2010 with brown grease collectors and wastewater treatment plants. According to the survey results, 218,100 gallons of brown grease are collected annually in the state. However, due to the low survey response, the SCEO anticipates more brown grease is collected.

Previous attempts to establish the economic impact of yellow grease and other grease products have met with significant difficulty. The reason cited for this difficulty was the inability of analysts to collect sufficient data on industry income, expenses, employment, and product output to conduct such a study. One possible reason for the lack of data is that the industry is so competitive that company representatives are reluctant to divulge information that might compromise their ability to compete. An examination of the South Carolina Code of Laws and the Department of Health and Environmental Control (DHEC) regulations reveals the extent of current regulation of the hauling and rendering industry. The low level of regulation indicated could have significant consequences with the emergence of biodiesel and the resulting demand for waste grease.

INTRODUCTION

Biodiesel is a clean burning alternative fuel, produced from domestic, renewable resources. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. It can be used in compression-ignition (diesel) engines with little or no modifications. Biodiesel is simple to use, biodegradable, nontoxic, and essentially free of sulfur and aromatics. In comparison to petroleum diesel, biodiesel is better for the environment because it is made from renewable resources and produces lower emissions. It is less toxic than table salt and biodegrades as fast as sugar. Since it is made in the United States from renewable resources, its use decreases our dependence on foreign oil and contributes to our own economy.

One of the key issues facing the biodiesel industry is the identification of inexpensive feedstocks to support production. While making biodiesel from a wide variety of fat and oil products is possible, utilizing virgin soybean oil has been the feedstock of choice in the United States and many biodiesel plants were designed to use this single feedstock. In 2008, soybean oil prices increased dramatically,¹ and fossil fuel prices fell. Oil was as low as \$40/barrel at the end of 2008. Additionally, public approval of the use of soybean oil for biodiesel production waned, after growing concerns of a food crisis.²

In January 2010, the biodiesel industry was hit hard by the expiration of three federal tax credits, including the Biodiesel Income Tax Credit, the Biodiesel Mixture Excise Tax Credit, and the Small Agri-Biodiesel Producer Tax Credit.³ South Carolina still retains the Biofuels Production Tax Credit and the Biofuels Production Facility Tax Credit,⁴ but those credits are only useful if the producer has state tax liability.

Animal or recycled fats cost considerably less than virgin soybean oil and therefore represent an attractive option to increase the supply of biodiesel. As a result, some producers are now using restaurant waste grease to fulfill their feedstock needs. As of March 2010, two facilities claiming the South Carolina Biofuels Production Tax Credit for 2009 used waste grease for biodiesel production, Midlands Biofuels, LLC and Panacea Biofuels, LLC.⁵

Based on data collected, it is estimated that the food service and hospitality industry produce between eight million and twenty-seven million gallons of yellow grease per year in South Carolina and 218,100 gallons of brown grease. This grease

¹ Keith Bradsher, *The Other Oil Shock: Vegetable Oil Prices Soar*, NY TIMES (Jan. 19, 2008), available at <http://www.nytimes.com/2008/01/19/business/worldbusiness/19iht-palmoil.1.9339824.html>.

² Lian Pin Koh, *Biofuels, Biodiversity, and People: Understanding the Conflicts and Finding Opportunities*, 141 BIOLOGICAL CONSERVATION 2450 (2008), available at <http://www.mariana.ativahost.com/biocon/documents/Koh2008.pdf>.

³ Alternative Fuels and Advanced Vehicles Data Center, Federal and State Incentives and Laws (August 11, 2010), available at http://www.afdc.energy.gov/afdc/laws/laws_expired.

⁴ Alternative Fuels and Advanced Vehicles Data Center, Federal and State Incentives and Laws (August 11, 2010), available at http://www.afdc.energy.gov/afdc/laws/state_summary/SC.

⁵ According to the SC Energy Office records from the ETC-40 and ETC-41 form, March 2010.

creates a substantial burden on waste water infrastructure and water treatment facilities throughout the state and makes it important for waste grease to be collected and disposed of properly. In addition, with the rise of biodiesel, waste grease may soon come into higher demand. Proper management of this waste is in the best interest of the waste producer, water treatment facilities, and the State of South Carolina as a whole. The purpose of this report is to analyze the current condition of the restaurant waste grease industry in South Carolina, identify the companies who are collecting it, examine how this competitive industry is being regulated, and determine how the emergence of biodiesel may affect the industry as a whole.

BACKGROUND AND TERMINOLOGY OF FATS, OILS, AND GREASES (FOGs).⁶

In some industry discussions, the word *grease* may refer to yellow grease, choice white grease, or combinations of fat and oil products. A reference to grease by the general population may refer to yellow grease, choice white grease, edible or inedible tallow, lard, trap grease, poultry fat, hydrogenated vegetable oil or other items. In general terms, all greases and oils are classified as fats. Fats are described in Webster's Dictionary as energy-rich esters that occur naturally in animal fats and in plants and are soluble in organic solvents (as ether) but not in water. Chemically, fats are classified as *triglycerides*.

Oils are generally considered to be liquids, while greases are solid. Many animal fats and hydrogenated vegetable oils (Crisco®-type products) tend to be solid at room temperature. Fresh vegetable oils are generally liquid at room temperature and are sometimes referred to as *virgin oils*. Many consider the consumption of non-hydrogenated vegetable oils more favorably than hydrogenated products. Hydrogenated vegetable oils are more stable at cooking temperatures and last longer in frying equipment. For these reasons, both hydrogenated and non-hydrogenated vegetable oils are used in commercial food cooking (frying) operations.

Recycled grease products are sometimes referred to as *waste grease*, *byproduct grease*, *recycled grease* or *animal fats*. These greases are generally low in cost, well adapted to certain industrial markets and widely used in livestock feed or pet food markets. Greases are generally placed into one of three categories:

- 1) Animal fats are primarily derived as byproducts from animal meat processing facilities. The primary animal fats include edible and inedible tallow from processing cattle, lard and choice white grease from swine processing, and poultry fat from the processing of chicken, turkey or other birds. Since the supply source is fairly concentrated and the markets are well established,

⁶ This general information section adapted from Goshen, Ralph, *The Feasibility of Biodiesel from Waste/Recycled Greases and Animal Fats*, Marketing Services Division, Minnesota Department of Agriculture (October 2002), available at http://www.angelfire.com/ks3/go_diesel/files042803/wastefatsfeasability.pdf.

animal fat may be collected and sold by rendering companies or by the animal processors themselves.

Another source of animal fats is the collection and processing of animal mortalities by rendering companies around the country. Collecting these waste byproducts not only provides valuable products for industrial uses, but also reduces the amount of material that might otherwise end up in landfills, posing pollution problems or a threat to the public health through the spread of disease. Livestock producers not serviced by a renderer may have to compost or bury animal mortalities. The increased demand for animal fats used in the production of biodiesel may help to increase the number of animal mortalities processed by renderers.

The infrastructure for animal fats collection and distribution is well established. Less expensive animal fat products including inedible tallow, choice white grease and poultry fat are promising candidates for biodiesel production.

- 2) Yellow grease is manufactured from *spent cooking oil* and other fats and oils collected from commercial or industrial cooking operations. Other fats may include grease rendered from hamburger, bacon or cooked meat entrees. For purposes of this discussion we will call this unprocessed mix of oils and grease products *restaurant grease*. Spent cooking oil may be vegetable oil or animal fat that has been heated and used for cooking a wide variety of meat, fish or vegetable products. After a period of time, the cooking oil is replaced with fresh product. At that time, the spent cooking oil may be collected by a rendering company or discarded.

Less is known about the amount of yellow grease collected from low-level grease users or in rural areas where restaurants may be smaller or more remote. If the price of yellow grease were to increase, more small businesses might take advantage of the additional income available through renderers. Yellow grease is a relatively low value byproduct, often half the price of soybean oil. This low cost, well-developed collection system makes yellow grease a prime candidate for biodiesel production. Most of the biodiesel not made from soybean oil in the U.S. is produced from yellow grease.

- 3) Trap grease, sometimes referred to as *brown grease*, is collected from grease traps that are installed in commercial, industrial or municipal sewage facilities to separate grease and oil from waste water. Grease traps are sealed containers installed in sewer lines in a manner that allows the lighter grease and oil that is flushed down a drain to float to the top of the trap. These traps allow the water to flow under the grease and through to the main sewer or water treatment area. Grease traps are installed so that the top of the container can be opened, allowing the grease and oil to be removed. If traps are not

periodically emptied, they become full, allowing grease and oil to flow directly into sewer systems.

Given the potential for contamination from soaps and other chemicals, trap grease is not likely to command a premium for use in animal feed products. The water content of trap grease is also very high, resulting in a low yield-per-pound collected. In many locations, water treatment facilities are large enough to process trap grease. In some areas like California, however, policymakers have considered requiring that trap grease be processed in rendering plants.

Uncertainty exists regarding the amount of treatment that would be required to make trap grease suitable for conversion into biodiesel. If it could be collected and processed, however, trap grease's relatively low market value could make it a strong candidate for biodiesel production. Moreover, the prospect of a new market could raise the price of trap grease, thereby providing an incentive for increased collection and use. It is estimated that in the U.S., 13 pounds of trap grease is produced per capita, but less than one-third of that amount is actually collected. All of these waste or recycled grease products have potential for use in the growing biodiesel market.

When not properly disposed of, Fats, Oils and Greases, also known as FOGs, can accumulate in sewage pipes and cause clogs and Sanitary Sewer Overflows (SSOs). FOGs are sticky and collect along the inside of sewage pipes, eventually hardening to a concrete-like substance.⁷ FOG accumulation is one of the primary causes of SSOs.⁸ When FOGs clog sewage pipes and pumping stations, the pipes must be cleaned out or replaced and damages to pumping stations must be repaired.⁹ The cost of cleaning up clogs and SSOs can be quite high, and often, taxpayers will bear the cost in the form of increased water and sewage service rates.¹⁰ It is estimated that 75% of all U.S. sewage systems function at only half capacity due to FOG build-up.¹¹ In 2006, the EPA reported over 20,000 U.S. beach and waterway closures caused by unsafe water. Most of these closures were attributable to E.coli bacteria contamination from SSOs.¹²

In addition to causing SSOs, FOGs also present a problem for wastewater treatment plants (WWTPs). FOGs can build up in settling tanks, digesters, and other surfaces at the plant. The FOG build-up results in decreased treatment efficiency,

⁷ Jeff Tucker, *Grease Clogging City Sewers Arteries*, THE PUEBLO CHIEFTAN (June 20, 2006), available at http://www.chieftain.com/metro/article_1e89171c-3542-5dc1-a48d-dc962935e5c2.html.

⁸ Xavier V. Davis, *Enhancing a Fats, Oils, and Grease Program using ArcGIS*, available at http://www.scdhec.gov/gis/presentations/ESRI_Conference_08/papers/papers/pap_1449.pdf.

⁹ Texas Commission on Environmental Quality, *Keeping Fats, Oils, and Grease out of the Sewer System*, available at http://www.tceq.state.tx.us/assistance/P2Recycle/fog/about_fog.html.

¹⁰ *Id.*

¹¹ James M. Russel, *Grease is Clogging Sewers Nationwide*, 149.3 WATER ENGINEERING AND MANAGEMENT (2002), available at <http://www.aero-life.com/news/documents/GreaseiscloggingsewersNationwide.pdf>.

¹² *Fog Affects Us in Ways We Don't Think*, available at www.fogscience.com.

increased operating costs, and interference and pass-through events.¹³ To combat these issues, WWTPs must be upgraded and outfitted with special equipment.¹⁴ Plants use special screens and recovery equipment to collect and remove brown grease. Solids captured through screening are disposed of in landfills, brown grease can be used by renders for feedstock, and high chemical oxygen demand waste water is separated for anaerobic digestion to produce biogas.¹⁵ These are good ways to deal with FOGs that actually make it to the WWTP, but the best way to combat FOG-related problems is to prevent FOGs from entering the sewage system in the first place.

To prevent FOGs from entering the sewage system, restaurants and other industries producing FOG waste are required to install grease traps, or interceptors, to collect FOGs. As explained by the National Renewable Energy Laboratory,

[a] grease trap works by slowing down the flow of warm/hot greasy water and allowing it to cool. As the water cools, the grease and oil separate and float to the top of the grease trap. The cooler water (less grease) continues to flow down the pipe to the sewer. The grease is actually trapped by baffles, which cover the inlet and outlet of the tank, preventing grease from flowing out of the trap.¹⁶

If these traps are not maintained and emptied, the FOGs collected in the trap will eventually begin to flow into the sewage lines. FOGs in the sewage lines lead to clogs, SSOs, and even booms in the rat population which feeds on the accumulated FOGs in the sewage system.¹⁷ Approximately 3% of the content of a grease trap is grease, and an estimated 3,800 million pounds of waste grease is produced each year. This equates to roughly 500 million potential gallons of biodiesel per year in the US.¹⁸

METHODOLOGY

In order to gain a better understanding of the current state of waste grease collection in South Carolina, the SCEO conducted a survey of the waste grease collectors operating within the state. The first step was to identify the commercial collectors of yellow and brown greases.

Next, a survey was created and distributed to the identified companies. The survey questions for yellow grease collectors included: 1) How many gallons of waste grease do you collect a week? 2) How many restaurants do you currently collect from? 3) Do you collect from other locations besides restaurants? If so, how many? What type? 4) What counties do you collect from? Approximately how many gallons from each county? 5) What do you do with the waste grease? What percentage is sold? Who do you sell it

¹³ City of Bloomington, Indiana Utilities Department, *FAQs about FOG*, available at <http://bloomington.in.gov/media/media/application/pdf/1535.pdf>.

¹⁴ *Wastewater Treatment Plant Takes a Bite Out of Tough Solids*, available at http://www.jwce.com/wp-content/uploads/downloads/2010/03/MFS_Hammonton_NJ.pdf.

¹⁵ URS, *Waste FOG-to-Biofuels*, available at <http://www.waste-to-fuels.com/proceedings/2008/content/pdf/Colona.pdf>.

¹⁶ *Supra* note 20.

¹⁷ *Id.*

¹⁸ *Id.*

to? Over the course of four weeks the surveys were returned. Six out of the seven commercial collectors identified responded to the survey.

The survey questions for brown grease collectors included: 1) What kind of grease do you collect (yellow, brown, both, other)? 2) From where do you get your grease? From what counties do you collect? From what sources (restaurant, industrial, etc)? 3) Approximately how much grease do you collect from those sources on a weekly or monthly basis? How much from each county? How much from each source type? 4) What percentage of your collected grease, if any, is sold? To whom? 5) If your company renders the grease as well, to whom is the final product sold? Of nineteen collectors contacted to participate in the survey, only three participated.

Samplings of wastewater treatment plants (WWTPs) throughout the state were also surveyed. The survey questions included: 1) How have FOGs in wastewater impacted the operation of your facility? 2) What measures have been implemented to deal with FOGs at your facility? 3) How much FOG is intercepted or collected at your facility on a weekly/monthly basis? 4) What is done with FOG collected at your facility? 5) What is the estimated annual cost of dealing with FOG-related issues at your facility? Eighteen WWTPs were contacted for the FOG survey and seven responded.¹⁹

RESULTS

Based on information provided by the six commercial yellow grease collectors, 132,857 gallons of grease are collected each week in South Carolina. This total includes the servicing of 8,957 restaurants and 1,148 institutions (including public and private schools, prisons, and any other state institution that is licensed to prepare food). As a result of incomplete collection data, an average number of gallons for each restaurant were required. It was determined that, on average, each restaurant produced 44 gallons per week. In another brief survey of restaurants, most managers reported using between 35 and 50 gallons per week. Since not all restaurants utilize oil in food preparation, it was assumed approximately 20% did not produce waste grease. Out of 14,851 restaurants licensed by the Department of Health and Environmental Control, it was estimated approximately 11,881 restaurants produce yellow grease. Multiplying this number by 44 gallons a week and 52 weeks a year, the high end of the estimate was found to be 27,183,728 gallons of waste grease produced a year. However, based on the data provided, the SCEO is only able to account for 7,908,564 gallons a year. This discrepancy is possibly attributable to yellow grease losses from spills and/or illegal dumping, i.e. pouring down sink drains, storm drains, or disposing of waste grease on private or public property.

¹⁹ Some data collected through telephone interviews with Chris Griffin, Chief of Legal Affairs, Griffin Industries Inc. (August 7, 2005); Jeff McDermott, Owner, Palmetto Biofuels (July 2006); Trey Dausey, Owner, Dausey By-Products (July 2006); Roger Vlieg, Director of Rendering Division, Allied Proteins/Brown Packing (July 28, 2006); Terry Arant, Owner, Orangeburg Milling (August 2006); representative of the Solid Waste and Reduction and Recycling Division, Department of Health and Environmental Control (August 3, 2006); Carol Fulmer, Fuel Accuracy/Quality, S.C. Department of Agriculture (August 7, 2006); Wally Sheridan, Restaurant Licensing, Department of Health and Environmental Control (August 3, 2006); and Hal Wrigley, President, Green Feedstocks, Inc (June 2010).

Of the three brown grease collectors responding to our survey, it was reported that they collected between 28,600 and 57,200 gallons per year per hauler for an estimated total of 128,700 gallons. However, most of this waste grease was from industrial sources rather than restaurants. It has been suggested that many restaurant owners/managers ignore, or are even unaware of, grease traps at their facilities and the proper maintenance required.²⁰

Of the seven WWTPs surveyed across the state, 57% have reported having no issues with FOG at their facilities. The other 43% reported collecting FOG volumes ranging from approximately 12,000 gallons to 47,600 gallons a year at each facility for an estimated total of 89,400 gallons and costing facilities anywhere from \$10,000 to \$175,000 annually. The high cost may be attributable to plant design features and changes in influent composition. However, FOG causes foaming in aeration basins and storage tanks, damages sewage pumps, clogs aerators and clarifiers, and increases effluent BOD (biochemical oxygen demand) and ammonia. These effects must be countered, and this in turn increases operational costs. Mostly, efforts are focused on isolating FOG at the facility in aeration basins or disposing of FOGs, along with other sludge, in a landfill. One facility reported that the city in which the WWTP is located has in place a ban on FOGs through a Sewer Use Ordinance and that the city is “currently considering implementing a formal FOG Program.”²¹

Based on survey data from the brown grease collectors and WWTPs, the SCEO was able to identify a total of 218,100 gallons of brown grease in the state, but anticipates there is much more that remains unaccounted for.

THE HAULERS AND RENDERERS

It is important to make a distinction between haulers/collectors and renderers. (This distinction will have particular importance later in the report when examining the regulations and laws governing the industry.) Haulers/collectors simply have agreements with restaurants and other food service components to pick-up yellow grease, and sometimes brown grease. Some do this for free and some charge a tipping fee, while others actually buy the restaurant grease from the restaurant. They then take it to a central collection point and sell it in bulk from there.

Renderers, on the other hand, can also be haulers/collectors, but in addition to collecting and transporting the grease they also process it. Renderers filter out the solids and heat the spent cooking oil to drive out moisture until it meets industry specifications for yellow grease. Yellow grease, which may already contain some animal fat from cooked food, may be sold as is or blended with other grease products to meet the specific needs of various customers. As mentioned above, collecting and recycling restaurant grease is not a new industry. For years collectors have collected and hauled off waste

²⁰ K. Shaine Tyson, *Brown Grease Feedstocks for Biodiesel*, National Renewable Energy Laboratory, available at <http://www.nrbp.org/pdfs/pub32.pdf>.

²¹ Jo Ellen Trueblood, Camden WWTP Supervisor.

grease from restaurants and transported it to rendering plants. Yellow grease is often sold to livestock feed and pet food manufacturers. All of the six collectors who completed the survey answered that they sell 100 percent of their restaurant grease to the feed industry. Currently, processed restaurant grease sells for approximately 25¢ per pound, but can climb higher in the winter because of the increased demand for feed to keep the livestock warm.²²

As a result of this demand by the feed industry, the infrastructure for the collection of yellow grease is well established. It is estimated that 70 to 95 percent of the available yellow grease is now being collected in metropolitan areas.²³ According to the Institute of Shortening and Oils and the National Renderers Association, previous attempts to establish the economic impact of yellow grease and other grease products have met with significant difficulty. The reason cited for this difficulty was the inability of analysts to collect sufficient data on industry income, expenses, employment, and product output to conduct such a study. One possible reason for the lack of data is that the industry is so competitive that company representatives are reluctant to divulge information that might compromise their ability to compete. Most of the companies the SCEO contacted were hesitant to provide any information. All but one of the companies released their information on the condition that no particularized or company specific data would be published for public release. As one company representative stated, “This restaurant grease is a cut-throat business, and we can’t take a chance of letting this information out”. The SCEO has identified seven commercial yellow grease haulers operating in South Carolina. Of these seven, only one appears to be only a hauler while the other six maintain rendering plants both inside and outside the state. As a result of the information they provided, the SCEO believes these seven haulers collect at minimum a total of approximately eight million gallons of restaurant grease a year.

The problem with recycling yellow and brown grease arises in that the capital cost necessary to upgrade facilities to process these greases can be prohibitive. Collectors empty grease traps and are paid a tipping fee (up to 11 cents/gal) to dispose of the brown grease at a treatment site. For renderers, brown grease cannot be used to produce animal feed because of its high concentration of free fatty acids (FFA),²⁴ as well as other contaminants such as detergents, cleaning solutions, and pesticides.²⁵ FFA concentrations in yellow grease typically range from 4-15%, whereas FFA concentrations in brown grease can be anywhere from 50-100%.²⁶ Contaminants must be separated from brown grease along with water and solids in order to render biodiesel. The water can be disposed of via the sewer system, and the solids can be disposed of through combustion or in a landfill.²⁷ The process for rendering brown grease is much more involved than the

²² Refined yellow grease price according to USDA (June 14, 2010), available at http://www.ams.usda.gov/mnreports/nw_ls442.txt.

²³ J. Edward Hunter and Thomas H. Applewhite, *Correction of Dietary Fat Availability Estimates for Wastage of Food Service Deep-Frying Fats*, 70.6 JOURNAL OF THE AMERICAN OIL CHEMISTS SOCIETY 613 (June 1993).

²⁴ *Supra* note 20.

²⁵ *Supra* note 20.

²⁶ *Supra* note 20.

²⁷ *Id.*

process for virgin oils or even yellow grease. First, degumming is required, especially if high levels of phosphatides are present. Next, bleaching is necessary to absorb trace metals, moisture, insolubles, and pigments. Bleaching also reduces oxidation products and absorbs by products of the degumming process. Third, deodorizing and deacidification is needed to remove aldehydes, ketones, and odorous products. This process also removes 92-95% of FFA. Next, FFAs are esterified. This process converts FFAs to fatty acid methyl esters (biodiesel) by adding methanol. Finally, triglycerides are converted to biodiesel through transesterification.²⁸ Processing plants must be upgraded to convert FFA and triglycerides into biodiesel, and recovery systems to capture methanol must be installed. Yet, this capital cost can be offset over time because yellow and brown greases are low-cost, and in some cases, no-cost feedstocks for biodiesel production.

Since companies will pay to have trap grease taken away, brown grease is an extremely low cost feedstock. Still, few people can make brown grease recycling work. Collection and rendering require a high level of skill and proper equipment. Additional testing of the final biodiesel product is also required to ensure that it is free of contamination from aflatoxins, trace metals, and pesticides, and to measure polycyclic aromatic hydrocarbons (PAH) and chlorinated polycyclic hydrocarbons.²⁹ Alternatively, if trap grease is not properly collected and disposed of, it poses a \$25 billion threat to sewers each year, creating booms in rat populations, sewage back-ups, and private property damage.³⁰

REGULATING THE INDUSTRY

An examination of the South Carolina Code of Laws and the Department of Health and Environmental Control (DHEC) regulations shows that there is little regulation of this competitive industry. By looking at the actual text of the regulations and the applicable laws, it becomes apparent that waste grease collectors have not been regulated to the full extent of the law.

A full text search of the South Carolina Code of Regulations reveals that DHEC does not regulate, license, or issue permits to the grease haulers in the yellow grease industry. In addition, the regulations pertaining to brown grease do not regulate the haulers themselves. The regulations simply state that “commercial food preparation establishments shall be required to have a grease trap on the kitchen waste line preceding the individual sewage treatment and disposal system. The grease trap shall be designed in accordance with standards established by the Health Authority.”³¹ This regulation demonstrates the Department’s concern with the condition of the waste water infrastructure, but this concern does not extend to the disposal methods of the waste producers or their haulers.

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Grease Clogging Sewers a Nationwide Problem*, available at www.fogscience.com. See also *id.*

³¹ S.C. Code Ann. Regs. 61-56 section IX.

After being unable to locate any regulations pertaining to the collection, transportation, or disposal of restaurant waste grease, DHEC was contacted and asked to explain the extent of their involvement in the waste grease collection industry. A representative of the Solid Waste Reduction and Recycling Division of DHEC stated that there was “no regulation of restaurant waste oils or greases” by his division, and suggested that the Food Protection Division be contacted because of their involvement with restaurant inspections. A representative of the Food Protection Division referenced the applicable regulations for their inspections, but stated that they “are not involved with the waste grease once it is disposed of into the collection container.”³² The regulations the representative referenced only mention grease collection once in the 74-page document. The Regulation states that:

Outside storage areas or enclosures shall be large enough to store the garbage and refuse containers and shall be kept clean. Garbage and refuse containers located outside, excluding dumpsters and grease containers, shall be stored on a rack or on concrete or asphalt that is kept clean and maintained in good repair.³³

After reviewing the South Carolina Code of Regulations and speaking with representatives in two separate divisions at DHEC, it was concluded that DHEC does not regulate the restaurant grease collection industry. If there is any regulation of the industry, it is not codified in the Code of Regulations. Therefore, the search must be extended into the South Carolina Code of Laws.

A search of the Code of Laws immediately returned the applicable act: The South Carolina Rendering Act of 1998. The Rendering Act was passed to establish certain guidelines in the rendering industry, and to grant authority in the State Livestock-Poultry Health Commission to administer and enforce the duties provided in the Act. The Act also gives the commission the authority to promulgate new regulations in order to carry out the purposes of the new law. Before analyzing the body of the Act itself, it is important to understand some of the definitions set forth at the beginning of the Act. The Act defines ‘raw material’ as “livestock or poultry carcasses and inedible parts thereof, fats, oils, and other inedible animal byproducts, and *used fats and oils collected from restaurants.*”(emphasis added).³⁴ The Act goes on to define ‘rendering operations’ as “the processing of all or part of the inedible portions of livestock or poultry carcasses and other *raw material, and includes the collection and transportation of raw material for the purpose of processing*”(emphasis added).³⁵

After reviewing these two statutory definitions, it appears that all restaurant grease haulers fall within the scope of the Act. This Act is applicable because the haulers are all transporting raw material for the purpose of processing. The law does not distinguish between those haulers who process it themselves or sell it to another entity that processes it. In addition, Section 47-22-40 mandates that every person who engages

³² Telephone Interview with Carnice Johnson, Food Protection Division, Department of Health and Environmental Control (August 3, 2006).

³³ S.C. Code Ann. Regs. 61-25-6 Paragraph F(2).

³⁴ S.C. Code Ann. Regs. 47-22-20.

³⁵ *Id.*

in rendering operations must possess a valid and current permit issued by the division. As of August 2010 there were only five companies in the state that have applied for and been issued this required permit.³⁶ After contacting the Senior Compliance Officer for the commission in 2006, he stated that the commission's main concern was the quality of the food for the livestock population.³⁷ Therefore, they concentrate their attention on haulers who are actually renderers too. However, our survey results indicated that several of the haulers are actually renderers and do not have the required permit to conduct rendering operations. (The list of renderers included in Appendix D was sent to the Senior Compliance Officer in 2006 and to the Director in 2010.)

It appears from the language of the South Carolina Rendering Act of 1998 that both haulers and renderers are required to be issued a permit by the State Livestock-Poultry Health Commission. However, after speaking with the commission and talking to various haulers and renderers, it appears that for all intents and purposes the industry as a whole is not being regulated. While one renderer was required to make \$10,000 worth of improvements on his facility in order to receive his permit, other haulers and renderers were not even identified by the commission as part of the industry. This lack of consistent regulation could have significant consequences with the emergence of biodiesel and the resulting demand for restaurant grease.

In March of 2010, the EPA amended its Renewable Fuels Standards (RFS), effective July 1, 2010. The change, as explained in 75 FR 26026, requires additional record-keeping for renewable fuel producers using food waste as a feedstock:

M. Additional Recordkeeping Requirements for Renewable Fuel Producers Using Separated Yard and Food Waste as a Feedstock Section 80.1454(d)(3) currently requires that domestic renewable fuel producers using feedstock other than planted trees or tree residue from actively managed tree plantations, slash or pre-commercial thinnings from nonfederal forestland, biomass from areas at risk of wildfire, crops or crop residue covered by the aggregate compliance approach under § 80.1454(g), or any feedstock covered by an alternative biomass tracking approach under § 80.1454(h) must maintain documents from their feedstock supplier certifying that their feedstocks meet the definition of renewable biomass. While separated yard and food waste falls into this category, parties using these feedstocks are also subject to the additional recordkeeping requirements in § 80.1454(j). Therefore, EPA is revising § 80.1454(d)(3) to clarify that renewable fuel producers that use separated yard and food waste as a feedstock are subject to the additional requirements in § 80.1454(j).

The code section relevant to renewable fuel producers utilizing food waste as a feedstock is 40 CFR 80.1454(j). This section requires that these producers maintain “[d]ocuments demonstrating the amounts, by weight, purchased of separated yard and food waste for use as a feedstock in producing renewable fuel.”³⁸ The amended RFS requires record-keeping to be made available to the Administrator upon request.³⁹

³⁶ Telephone interview with Clyde Hoskin, Director, S.C. Meat and Poultry Commission (August 20, 2010).

³⁷ Telephone Interview with Terry Dempsey, Senior Compliance Officer, S.C. Meat and Poultry Commission (July 27, 2006).

³⁸ 40 CFR 80.1454(j)(1)(i) (2010).

³⁹ 40 CFR 80.1454(n) (2010).

Municipalities are also regulating waste grease from restaurants, especially trap grease, which can clog municipal sewer lines. The City of Columbia recently assigned three environmental technicians with the sole task of visiting food service locations connected to the City's sewer lines to inspect the businesses' grease traps.⁴⁰ The City's objective is to decrease the FOGs in the sewer lines that contributed to 460 SSOs in 2009.⁴¹ While the City cannot issue fines, violators can be disconnected from City water and sewer lines if problems are not corrected in a timely manner.⁴²

Other cities around the country have also developed regulatory programs to monitor FOG waste from restaurants and other industrial sources. Columbus, Ohio has instituted mandatory grease trap installation and development of a Best Management Practices Guide for each source. Violators are subject to a minimum \$1,500 fine for clean-up costs incurred by the City.⁴³ Santa Ana, California has also adopted a strict FOG ordinance. The ordinance prohibits discharge of certain types of waste; requires adoption of Kitchen Best Management Practices; imposes interceptor installation & maintenance and record-keeping requirements; and requires monitoring of grease traps and interceptors and reporting of findings.⁴⁴ Penalties for violations under the Santa Ana program include fines up to \$500.⁴⁵

Regulations, such as these, drive the need for collectors and haulers of brown and yellow greases. Accounting of FOGs from restaurants and industrial facilities aids in limiting the amount of waste grease that is spilled or improperly disposed of in municipal sewage systems. Reduction in spills and illegal dumping in turn leads to fewer incidences of water system contamination and resultant NPDES violations under the Clean Water Act (CWA). According to the EPA's Enforcement and Compliance History database, 527 facilities in South Carolina have NPDES permits under the CWA. One hundred fifty-nine of those permitted facilities have had one or more permit violations in the last three years. Ninety-six of those violators were wastewater treatment facilities with fines totaling almost \$380,000.⁴⁶

EMERGENCE OF BIODIESEL

Even before the advent of biodiesel, the waste grease collection industry was very competitive. Haulers are continually trying to find new customers and to convince their competitors' customers to switch to their service. Every hauler spoken to by the SCEO

⁴⁰ Adam Beam, *City's Mission: Decrease Grease*, The State, May 21, 2010, available at <http://www.thestate.com/2010/05/21/1296082/citys-mission-decrease-grease.html>.

⁴¹ *Id.*

⁴² *Id.*

⁴³ City of Columbus, Department of Public Utilities, *City of Columbus Fats, Oils, and Grease Control Program*, available at <http://utilities.ci.columbus.oh.us/DOSD/fog.htm>.

⁴⁴ City of Santa Ana Public Works Agency, *FOG Control Program*, available at <http://www.ci.santa-ana.ca.us/pwa/documents/FOGRulesandRegulations-English.pdf>.

⁴⁵ *Id.*

⁴⁶ EPA, *Enforcement and Compliance History Online*, available at <http://www.epa-echo.gov/cgi-bin/ideaotis.cgi>.

expressed concern for the security of their product. Many grease containers are robbed of their grease before the service provider can empty the container. Some haulers believe this theft is committed by commercial competitors, while others believe private citizens are taking the grease to fuel their own biodiesel cars. The July 13, 2006 edition of the *Charleston Post and Courier* ran an article about a Columbia man who “goes around to restaurants filling a 275-gallon vat on the back of a trailer” to fuel his Volkswagen Passat.⁴⁷ It is unclear from the article whether or not these restaurants were aware that he was taking the grease, or whether the restaurants already had agreements with commercial haulers. Either way, this situation clearly shows how the emergence of biodiesel has the potential to cause tension within the already competitive waste grease collection industry.

As a result of the increased demand for restaurant waste grease, and the continued effort to protect the waste water infrastructure, some states have enacted stricter regulations on the restaurant waste grease collection industry. Georgia, for example, passed a law in 2004 that requires waste grease haulers to register with the Georgia Environmental Protection Division or the local governing authority.⁴⁸ The law also requires that the truck be inspected and permitted annually by the same authority where it is registered (i.e. county government). This registration and permit is valid for operation across the entire state. In addition, the law also authorizes certain facilities to receive the waste grease and requires the haulers to maintain a 30-day manifest that certifies that the waste grease was disposed of in accordance with the law. These manifests must be kept in each truck and available for inspection by the local authorities. Violations of these provisions can result in a civil penalty not to exceed \$2,500, and are to be enforced through the Magistrate Court system.⁴⁹

In 2006, a Georgia Senate Bill was introduced that would have amended the commercial waste (grease) manifest law, allowing a local health department to inspect and issue permits for trucks hauling grease. Presently, only local government authorities are allowed to issue these permits. A permit issued by any local government authority or health department is good throughout the state. Concerns were raised that this bill would have allowed haulers to avoid paying the statutory permit fees, avoid having to be bonded, and that the bill blurred the issues of hauling waste and hauling septage. Governor Perdue vetoed this bill in May 2006.

Georgia has taken a proactive approach to regulating the restaurant grease industry. This regulation allows the state to track the amounts of waste grease being generated, ensure its proper disposal, and monitor its demand. Because many of the commercial collecting companies in South Carolina are already collecting from consumers in Georgia and are already having to comply with their laws,⁵⁰ it is possible

⁴⁷ Dave Munday, *French Fry One Chevy Cookin' Without Gas*, POST AND COURIER (July 13, 2006) available at <http://archives.postandcourier.com/archive/arch06/0706/arc07133263224.shtml>.

⁴⁸ GA. Code Ann. § 12-15-21 (2005).

⁴⁹ GA. Code Ann. § 12-15-21 (2005). See also Georgia FOG Alliance, <http://www.georgiafog.com>.

⁵⁰ Telephone Interview with Diane Wonik, North Georgia Processing (August 1, 2006).

that if South Carolina were to enact similar regulations or more strictly enforce the current regulations, this would not be a significant additional burden on the industry.

Some states and municipalities are also proactively collecting waste grease from households through municipal recycling programs. The City of Hoover in Alabama for example instituted a household waste grease-to-biodiesel program in 2006. By September 2009, the city produced over 25,000 gallons of biodiesel and uses the B100 in municipal vehicles including Hoover trolleys and trucks.⁵¹ Marketing was an essential part of building public awareness about the effort. The City of Hoover was recognized for its aggressive alternative fuels program with a Certificate of Achievement by the *100 Best Fleets in North America* program. Similar programs could be implemented at local municipalities in South Carolina with a very quick return on investment due to fuel savings.

CONCLUSION

The alternative transportation fuels movement has reached South Carolina. Citizens have demonstrated that they are willing to try alternative fuels, and production facilities and infrastructure have been built. State policymakers have given their support for the biodiesel industry by creating production incentives and tax credits for producers and retailers.⁵² However, feedstock continues to be a key concern for biodiesel manufacturers.

It is clear that unregulated disposal of waste grease from restaurants and other commercial users represent a costly problem across South Carolina. Municipalities often charge this cost back to municipal water and sewer customers when the source of damage-causing FOG is unknown. In order to protect waterways and the general public from resulting contamination from SSOs, South Carolina should institute a state-wide FOG program that provides guidance to municipalities and business on how to control and monitor waste grease. Regulation that requires accounting of greases and oils used in commercial facilities would also drive demand for haulers and renderers of the waste products. This could create jobs within the state and increase domestic, renewable fuel production in addition to providing an environmental benefit by keeping FOGs out of sewers and waterways.

While this possible shift from a solely petroleum-based transportation fuel economy is exciting and potentially beneficial for the state, policymakers must also consider the economic ramifications of such a shift. How will a higher demand for restaurant grease affect the livestock feed markets? How will an already competitive and unregulated industry react to the strains and pressures of increased demand? What is the state's role in all of this? These are the types of questions that must be addressed by

⁵¹ Alabama Clean Fuels Coalition, *Hoover's Biodiesel Program Presentation* (September 2009), available at <http://www.alabamacleanfuels.org/latestarchive.cfm>.

⁵² South Carolina Energy Office, *Biomass Energy Potential in South Carolina: A Conspectus of Relevant Information* (April 2007), available at <http://www.energy.sc.gov/publications/Biomass%20Conspectus%204-10-07.pdf>.

policymakers. It is important for the success of the biodiesel industry that these questions be answered, and that adequate steps are taken to confront these issues before they develop into problems. The following is a list of recommendations that will begin to address some of the concerns outlined in this report.

RECOMMENDATIONS

1. Educate the general public and commercial businesses and institutions about recycling waste grease. A public awareness program should be initiated about FOGs and the potential applications for biodiesel utilization through online resources and guides. Additionally, PSAs for TV and radio could be utilized to educate the public and promote awareness of environmental problems with FOG and how waste grease can be recycled for alternative fuel use. Moreover, as part of routine inspection of food establishments, inspectors should provide information about state and federal regulations and best practices for waste grease and brown grease disposal.

2. Model language from Columbus, Ohio should be utilized to institute a mandatory grease trap program for restaurants and industrial users of cooking oils and develop a Best Management Practices Guide. The grease trap program could include additional guidance about the minimum specs for interceptors and maintenance requirements. All food establishments should be required to have permits stipulating that grease levels of no more than 200mg/liter of water may be discharged into the sewer systems. Grease levels should be tested periodically by a designated state agency at grease trap outlet pipes to insure compliance.

Additionally, model language from Georgia should be utilized to establish minimum requirements for waste grease receivers and interceptors for the collection of used cooking oils. As part of the routine inspection of restaurant facilities, inspectors should be trained to verify that receptacles are properly sealed and maintained and that the surrounding areas are also spill and leak-free and do not represent a hazard to human or animal health.

There should be reporting requirements for restaurants and industrial users of cooking oils to regularly record and report volumes of waste cooking oil that are removed from their establishments, including yellow grease collected in receivers and brown grease pumped from grease traps/interceptors. A designated state agency could electronically provide and collect simple forms for this information, which could be stored in a central database for easy access and analysis.

Compliance and enforcement measures should be bolstered under current South Carolina statute and fines increased for entities with multiple documented cases of noncompliance.

3. Establish additional regulations for collectors/haulers of waste grease and brown grease. These regulations should include reporting on the volume of material removed, either from yellow grease receivers or trap grease interceptors, and provide receipts to clients documenting the same. Additionally, collectors/haulers should be required to

maintain a minimum of 30 day manifest on the collection truck that is available at any time for inspection and report the volume of and location where collected waste grease is discharged. This reporting may also be done using electronic forms provided by and submitting to a designated state agency. Data collected from submissions should also be organized and stored on the central database.

4. Establish a model voluntary residential waste grease recycling program that would provide reusable containers, such as heavy plastic jugs and receptacles at municipal recycling collection stations. Similar to the City of Hoover in Alabama, municipalities could utilize the recycled oils for biodiesel to reduce petroleum costs.

5. Create state-wide recognition for permitted restaurants and industrial users of waste grease and brown grease through an award, certificate and/or label that notifies a customer that the establishment is regularly within permitted discharge limits. Other designations may be appropriate for establishments that recycle waste greases for use in production of animal feed or biofuels.

Appendix A:

DHEC Retail Food Establishments Regulation 61-25, Chapter 6, Paragraph F

F. Garbage and Refuse.

1. Containers.

- a. Garbage and refuse shall be kept in durable, easily cleanable, insect-proof, and rodent-proof containers that do not leak and do not absorb liquids. Plastic bags and wet-strength paper bags may be used to line these containers. The containers may be used for storage inside the retail food establishment.
- b. Containers used in food preparation, food processing, equipment-washing, and utensil-washing areas shall be kept covered when filled or stored or when not in continuous use.
- c. Containers, other than dumpsters, stored outside the establishment shall be cleanable, provided with lids, doors, or covers, and shall be kept covered.
- d. There shall be a sufficient number of containers to hold all the garbage and refuse that accumulates.
- e. Soiled containers shall be cleaned at a frequency to prevent insect and rodent attraction. Each container shall be thoroughly cleaned on the inside and outside in a way that does not contaminate food, equipment, utensils, or food preparation areas. Liquid waste from compacting or cleaning operations shall not create a nuisance.

2. Storage.

- a. Garbage and refuse shall be stored in a manner that does not create a nuisance. Cardboard or other packaging material not containing garbage or food wastes need not be stored in covered containers.
- b. Garbage or refuse storage rooms, if used, shall be kept clean, and shall be insect-proof and rodent-proof.
- c. Outside storage areas or enclosures shall be large enough to store the garbage and refuse containers and shall be kept clean. Garbage and refuse containers located outside, excluding dumpsters and grease containers, shall be stored on a rack or on concrete or asphalt that is kept clean and maintained in good repair.

3. Disposal.

- a. Garbage and refuse shall be disposed of often enough to prevent the development of odor and the attraction of insects and rodents.
- b. Where garbage or refuse is burned on the premises, it shall be done in such a manner that does not create a nuisance. Areas around incineration facilities shall be kept clean.

4. Returnables and recyclables.

Storage areas, enclosures, and containers for returnables and recyclables shall be clean and maintained in good repair.

Appendix B:

The South Carolina Rendering Act of 1998

TITLE 47. ANIMALS, LIVESTOCK AND POULTRY

CHAPTER 22. RENDERING OF LIVESTOCK AND POULTRY RAW MATERIAL

SECTION 47-22-10. Short title. [SC ST SEC 47-22-10] This chapter may be cited as the "South Carolina Rendering Act of 1998".

SECTION 47-22-20. Definitions. [SC ST SEC 47-22-20]

As used in this chapter, the term:

- (1) "Transfer center" means a facility where raw materials are collected for loading into approved vehicles for delivery to a rendering plant.
- (2) "Commission" means the State Livestock-Poultry Health Commission.
- (3) "Director" means the Director, Division of Livestock-Poultry Health Programs, Clemson University.
- (4) "Division" means the Division of Livestock-Poultry Health Programs at Clemson University and its agents, employees, and officials.
- (5) "Inspector" means an employee or official of the division authorized by the director to carry out inspections or investigations required or authorized by law.
- (6) "Livestock" means all classes and breeds of animals, domesticated or feral.
- (7) "Permit" means official authorization to engage in a specified activity.
- (8) "Poultry" means all avian species including wildfowl and domestic fowl.
- (9) "Raw material" means livestock or poultry carcasses and inedible parts thereof, fats, oils, and other inedible animal byproducts, and used fats and oils collected from restaurants.
- (10) "Rendering operation" means the processing of all or part of the inedible portions of livestock or poultry carcasses and other raw material, and includes the collection and transportation of raw material for the purpose of processing.
- (11) "Rendering plant" means a building or buildings in which raw material is processed, and includes the premises upon which buildings used in connection with processing are

located.

(12) "State Veterinarian" means the Director, Division of Livestock-Poultry Health Programs, Clemson University.

SECTION 47-22-30. Duties of commission and director. [SC ST SEC 47-22-30]

The commission is the governing and policymaking body for the department, and is authorized to promulgate regulations that are necessary and proper to carry out the purpose and provisions of this chapter. The commission must delegate the administrative and enforcement duties provided for in this chapter to the director. The director, acting through the division, must administer the provisions of this chapter, enforce the required minimum standards set forth in Section 47-22-60, and all other laws pertaining to rendering livestock, poultry, and raw material in this State.

SECTION 47-22-40. Permit required for operation of transfer center and rendering processes. [SC ST SEC 47-22-40]

No person shall operate a transfer center or rendering plant, or engage in rendering operations, unless he possesses a valid and current permit issued by the division.

SECTION 47-22-50. Permit applications; information required; permit valid until revoked, relinquished, or abandoned. [SC ST SEC 47-22-50]

Application for a permit required by this chapter must be made to the director on forms provided by the division. The application must set forth the name and address of the applicant, the present or proposed place of business, the particular method used or to be used in the collection, transportation, processing, disposition, and disposal of raw material, and all other information as the director may require. Plant flow diagrams of any existing or proposed rendering plant and of equipment used in rendering operations must be available at the plant for review by division inspectors. A permit is valid until revoked pursuant to Section 47-4-130, or until relinquished or abandoned by the person to whom the permit was issued.

SECTION 47-22-60. Location and equipment requirements for transfer centers, rendering plants, and vehicles used to transfer raw materials. [SC ST SEC 47-22-60]

(A) Transfer centers must:

(1) be located on a site in compliance with local zoning ordinances and have a potable water supply, wastewater and solid disposal, and air pollution facilities as required by any governmental authority having jurisdiction over the site;

(2) be covered by a metal roof or other permanent type covering with sufficient screened ventilators to allow air flow, yet preventing the entrance of rodents, birds, and insects;

(3) have walls, floors, and ceilings made of durable, nonabsorbent materials that can be cleaned and maintained in a sanitary condition;

(4) have adequate drains in an impervious floor with a supply of hot water sufficient to thoroughly clean the transfer center's building, equipment, and all vehicles transporting raw material to the transfer center;

(5) be cleaned and sanitized at the end of each daily operation;

(6) hold inedible materials no longer than allowed by good manufacturing practices, and dispose of all product and unused raw material in a lawful manner;

(7) be operated in such a manner that objectionable odors are not detected off site of the transfer center.

(B) Rendering plants must:

(1) be located on a site in compliance with local zoning ordinances and have a potable water supply, wastewater and solid disposal, and air pollution facilities as required by any governmental authority having jurisdiction over the site;

(2) utilize buildings of sufficient size and shape to accommodate all phases of actual processing, with partitions installed therein sufficient to prevent any contact between raw materials and finished product, and to prevent contamination of finished product;

(3) utilize buildings constructed with materials and in a manner that will ensure adequate drainage and sanitation in all phases of operation, and that contain walls, floors, and ceilings constructed with durable, nonabsorbent materials that can be cleaned and maintained in a sanitary manner;

(4) have a supply of hot water and cleaning agents sufficient to facilitate cleaning of the building, equipment, and vehicles used to move and handle raw material and product in a sanitary manner;

(5) be operated using reasonable precautions while handling, storing, or preparing raw material to prevent objectionable odors from being discharged beyond the boundaries of the permittee's property, to ensure that raw material does not remain on site any longer than allowed by good manufacturing practice, and to dispose of all product and unused raw material in a lawful manner;

(6) be operated using appropriate and properly-functioning rendering equipment including, but not limited to, working, efficient, and effective odor-control systems to prevent the emission of objectionable odors;

(7) diligently practice rodent and vermin control in buildings and keep surrounding grounds clean and free of refuse, trash, and manure;

(8) mark all barrels used for transportation and storage of raw materials with the word "inedible" in letters clearly visible and not less than two inches in height; and

(9) have a control and recontamination program, as approved by the director, that specifically provides for the prevention of cross-contamination between raw material and finished product.

(C) Vehicles used to transport raw materials must:

(1) be so constructed and maintained as to prevent any dripping, seeping, discharge, or escape of raw material from the truck, and have body sides of such height that no portion of the raw material transported therein is subject to spillage under normal circumstances; provided, on a case-by-case basis, the director may require the complete covering of a load of raw material for biosecurity purposes.

(2) after unloading, be cleaned with hot water and a suitable cleansing agent to prevent a buildup of grease, solids, or other raw material residue, and no vehicle used to transport raw material may be taken out or operated on a public road or highway without first being thoroughly cleaned.

(3) be licensed by the division as suitable for the purpose of transporting raw material.

SECTION 47-22-70. Inspections; hours; information required to be available. [SC ST SEC 47-22-70]

Every transfer center, rendering plant, rendering operation and vehicle used to transport raw material is subject to inspection by the division inspectors during normal operating hours and at such other times as the director may deem necessary for the enforcement of this chapter. Each rendering plant must keep and furnish the director information required by law concerning the collection, transportation, processing, distribution, disposition, and disposal of raw material.

SECTION 47-22-80. Violations; penalties. [SC ST SEC 47-22-80]

Any person who violates any provision of this chapter or any regulation promulgated hereunder shall be subject to the criminal and/or civil penalties as provided by Section 47-4-130 of this title.

Appendix C:

Georgia's 2004 Law Regulating Grease Haulers

Georgia Code 12-15-21

(a)(1) Removal of commercial waste from any grease interceptor, sand trap, oil-water separator, or grit trap that is not connected to an on-site sewage management system for the purpose of transporting such waste to a disposal site shall be accomplished in a clean and sanitary manner by means of a vacuum hose or pump that shall remove the entire contents of the holding tank or pretreatment system being serviced; and such waste removed shall be received, unmingled with any hazardous waste or septic waste, into a leakproof tank truck approved and permitted for such service as provided by paragraph (2) of this subsection. Any commercial waste spilled, leaked, discharged, or otherwise released or removed from a grease interceptor, sand trap, oil-water separator, or grit trap that is not connected to an on-site sewage management system to any location other than a licensed leakproof tank truck shall be deemed a violation of this Code section.

(2) Any transporter shall register with the division or the local governing authority or its designee of any county or municipality in this state in which the transporter receives or disposes of commercial waste, and registration with the division or any such local governing authority shall be valid for operation throughout the state. Such registration shall be made on a standard form prescribed by rule or regulation of the department.

(3) Any commercial waste tank truck which receives or disposes of commercial waste in this state shall be inspected and permitted annually for purposes of compliance with the requirements of this subsection by the local governing authority or its designee of any county or municipality in this state in which the tank truck receives or disposes of commercial waste, and a single permit issued by any such local governing authority shall be valid for operation of such truck throughout the state. Such permit shall be on a standard form prescribed by rule or regulation of the department. The permit applicant shall be required to identify the facilities at which waste carried by such truck will be disposed, and such facilities shall be identified on and be a condition of such permit. For any transporter, the amount of such annual permit fee shall be \$250.00 for the first truck and \$100.00 for each additional truck.

(b) Commercial waste vacuumed or pumped from any grease interceptor, sand trap, oil-water separator, or grit trap that is not connected to an on-site sewage management system and which waste is carried by tank trucks and disposed there from in this state shall be disposed only at a facility which is authorized by law to receive and process such waste. No person shall dispose of commercial waste from a tank truck at any location in this state other than the place inside the property boundaries designated for such waste by the authorized facility's owner.

(c) Any originator in this state, transporter, or disposal site operator in this state of any load of commercial waste vacuumed or pumped from any grease interceptor, sand trap, oil-water separator, or grit trap that is not connected to an on-site sewage management system shall be each responsible for maintaining a manifest system for such load of

commercial waste, and the transporter shall certify on its manifest that such load of commercial waste is disposed in accordance with subsection (b) of this Code section or in accordance with the law of such other state in which it is disposed. The forms for such manifests shall be prescribed by rule or regulation of the department. Such manifests shall be maintained at the principal places of business of the originator, transporter, and disposal site operator for not less than three years from the date of waste removal, transport, or disposal; except that the transporters' manifests covering not less than the immediately preceding 30 day period for a particular truck shall be kept in the transporter's tank truck at all times when operating in this state. Such manifests shall be made available at any time for inspection by the division or any local governing authority or the designee thereof.

(d) Any person who violates any provision of this article, the rules and regulations adopted pursuant to this article, or any permit condition or limitation established pursuant to this article shall be liable for a civil penalty not to exceed \$2,500.00 per violation. For the purpose of enforcing the provisions of this article, notwithstanding any provision in Code Section 36-35-6, any other provision of law, or any municipal charter to the contrary, municipal courts shall have jurisdiction in cases of violations committed within municipalities and shall be authorized to impose a civil penalty not to exceed \$2,500.00 for each violation. Magistrate courts shall have jurisdiction in cases of violations of this article committed within unincorporated areas of counties and shall be authorized to impose a civil penalty not to exceed \$2,500.00 for each violation.

Appendix D:

Waste Grease Collectors Operating in South Carolina

Allied Premium Protein (A Division of Brown Packaging Co.)

Gaffney, SC
Phone: (864) 489-5723
Fax: (864) 487-3210
Contact: Roger Vlieg

AWS

Cayce, SC
Phone: (803) 767-3037

Carolina By-Products

Ward, SC
Phone: (803) 685-2590
Fax: (803) 685-2591
Contact: Dale Robertson, Plant Manager

C.E. Taylor and Son, Inc.

Columbia, SC
Phone: (803) 359-6163

Coastal Biodiesel LLC

Myrtle Beach, SC
Phone: (843) 796-0506
Contact: Mark Hefner

Commercial Waste Management, Inc.

Atlanta, GA
Phone: (770) 623-6979

Connor Plumbing

Martinez, GA
Phone: (706) 863-2564

Dreher Septic Service

Columbia, SC
Phone: (803) 600-5496

Gene Love Contracting

Columbia, SC
Phone: (803) 252-2888

Griffin Industries Inc.

Marshville, NC
Phone: (704) 624-9140
Fax: (704) 624-9143
Contact: Mike Otte

Lucas Septic Tank & Utility Service

Gaston, SC
Phone: (803) 755-2260

Mac Service & Plumbing

Irmo, SC
Phone: (803) 407-9300

Midlands Biodiesel LLC

Winnsboro, SC
Phone: (803) 718-9741
Contact: Brandon Spence

Moye Construction

Hopkins, SC
Phone: (803) 776-3543

Orangeburg Milling

Orangeburg, SC
Phone: (803) 534-3095
Fax: (803) 534-2939
Contact: Terry Arant

Panacea Biofuels LLC

Spartanburg, SC
Phone: (864) 809-8272
Contact: Wayne Bobo

PASCON

Lexington, SC
Phone: (803) 359-9334
Fax: (803) 359-0628

Providence Environmental, Inc.

Columbia, SC
Phone: (803) 754-1175

Sharpe's Plumbing Service

Gilbert, SC
Phone: (803) 892-3266

Sikes Septic Tank & Plumbing

Columbia, SC
Phone: (803) 353-8510

TK Tank Service

Sumter, SC
Phone: (803) 494-4593

Tidwell Septic Tanks

Sumter, SC
Phone: (803) 481-2966

WVO LLC (Oil 2.0)

Hardeeville, SC
Phone: (843) 689-9889
Contact: Bill DeTorre