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Animal Manure and Related Biomass Feedstock Market  
Assessment and Preliminary Feasibility Study for a  
Papermill Biomass/CoGen Facility

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**Task 6 Summary Report**

*for*

**Southern States Energy Board  
SERBEP Program**

*with*

**South Carolina Energy Office**

*Submitted by:*

*Task Completion Date: January 5, 2001*  
*Report Issue Date: January 25, 2001*

**Linpac Paper**

**Task 6 Summary Report**

**Review and Description of Site Specific Facility Permitting Requirements**

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***Linpac Paper***

***Task 6 Summary Report***

**Review and Description of Site Specific Facility Permitting Requirements**

**Task 6 Summary:**

Task 6 involved obtaining state and local regulations related to a potential Biomass/Cogen facility and describing permit requirements for the BTA based process arising from these regulations. The major regulations pertaining to construction, air, water, land and waste permitting have been reviewed, along with some additional requirements. Based on this review, the following report describes the permitting requirements for a BTA biogas cogeneration plant.

Facilities designed to utilize agricultural and organic wastes to produce biogas, and use this biogas to generate steam and electricity, would require appropriate permits for construction and operation. While significant effort is required to acquire the permits for locations in Cherokee County or Spartansburg County, South Carolina, there appear to be no inordinately large hurdles to permit these facilities. It will be important to begin the permitting process early, because some of the permits require 180 days or more from application to issue.

Both biogas and cogeneration facilities would require a permitting process for construction, wastewater disposal, stormwater disposal, air pollution control and solid waste disposal. Permitting procedures and appropriate contact people for most relevant permitting issues are presented in this report. In general, there is a positive attitude toward the utilization of biogas as an energy resource, and governing agencies appear interested in helping the permitting process succeed. With the exception of land use and construction permits, which are regulated locally, most permits are regulated by the State of South Carolina. As a result, most of the procedures described in this document would be similar regardless of whether the facilities are located on site at Linpac, in the town of Cowpens or in greater Spartanburg County or Cherokee County. The permitting process should be started early in the design and planning stages, as several months are required for pollution control permits such as NPDES or air pollution permits to be reviewed and issued.

General site development, land use and construction permits must be obtained from the local authority. The planning commission must review changes in land use and may require a public hearing.

Stormwater disposal for any industrial facility requires a separate NPDES permit. The permit requires provision of basic facility information to regulators and appropriate steps to prevent contamination of disposed stormwater.

Wastewater or liquid residuals from the biogas facility may be disposed of in three ways, each requiring a different permit: 1) Discharge to public sewer; 2) Land application, and/or 3) Discharge to surface waters. To discharge to public sewer, an agreement which outlines limits on flows contaminants and other conditions of disposal must be drawn up with the public sewer authority in Spartanburg County. To dispose of liquid residuals on land, a state permit from the DHEC Bureau of Water would be required. The permit is obtained by an application similar to that for an NPDES permit, including a range of information about the facility and materials likely to be found in the wastewater, as well as the application rates and locations for disposal. To discharge to surface waters, an NPDES permit would be required (separate from the one for stormwater). In all of these cases, the flow, BOD, pathogen and contaminant loading of the wastewater must be controlled and monitored. Effluent from existing BTA plants have

relatively good quality wastewater, low in BOD, pathogens and contaminants; with data from one or more of these plants, it is expected to be easier to obtain a permit for the proposed facility.

Air quality control permitting will require initial establishment of benchmark pollutant production from the facilities. The cogeneration facility will require a fuel-burning permit (Standard 2). Either of the facilities may require a toxic air emissions permit (Standard 8). Current projections of the expected pollutant production during biogas production and combustion (hydrogen sulfide being the main expected listed pollutant) are less than the trigger level of 1000 lb/month to require a Standard 8 permit.

Solid residuals from the biogas generation facility are expected to meet high grade composting standards. A permit must be obtained from the Bureau of Land and Waste Management for compost to be sold as fertilizer or land applied. Information about the raw materials and expected compost quality must be provided initially to regulators, followed by periodic monitoring of product quality.

Electricity from the cogeneration facility may be sold to a utility without a permit, but the state Public Service Commission must approve the price agreed upon between the producer and the utility.

If a pipeline used to convey biogas from its production point to the cogeneration facility travels on public or private land not belonging to the facilities, it must be permitted by the state Public Service Commission's office of pipeline safety. The permit requires appropriate attention to construction standards and pipeline maintenance.

## **1. General Permitting Considerations**

### 1.1. Site Development & Land Use Classification in Spartansburg County

The existing Linpac paper mill is located in Cherokee County just outside the city limits of Cowpens. There are virtually no zoning restrictions in unincorporated Cherokee County, according to Jim Inman, Executive Director of the Cherokee County Development Board (Tel 864-489-5721. Also see Appendix A of this document for other contact information). Building plans must be reviewed for conformity to the 1997 Standard Building Codes. At least two weeks will be required for a review of plans.

For sites in the city of Cowpens, the general application is processed by Spartansburg County, which passes on the land use request to the town clerk of Cowpens (Shirley Reynolds, Tel. 864-463-3201). The town planning commission conducts any necessary public hearings and responds to the zoning request. If there is no request for zoning change, the town planning commission apparently has only the role of review, with the county providing primary oversight.

In unincorporated Spartanburg County, South Carolina, site development and land use are reviewed under a "Unified Land Management Ordinance Permit." In major projects (a 160,000 ton biogas plant qualifies as a "major project"), a public hearing will be required before approval of any development plan. After the public hearing, the permit can usually be processed in about three weeks.

### 1.2. Facility Construction

In Cherokee County, the chief building inspector is Mike Doles (Tel. (864) 487-2561). Building and environmental plans are reviewed and building permits are issued through his office. The plans are evaluated according to the 1997 Standard Building Codes and NFPA 13 fire protection codes. The fee schedule in Appendix B of the 1997 Standard Building Codes is followed for building permits. The application process is described in Appendix B of this report.

To obtain a commercial building permit in the County of Spartansburg (both Cowpens and unincorporated Spartansburg), one must follow several steps, outlined in Appendix B of this document. It includes submission of site and building plans for review, a sewer permit and a site development

application. For questions, contact Spartanburg County. Call (864) 596-2728 for general information. For technical questions related to building codes, contact Laurie Bailey at (864) 596-3173. Until July 1, 2001, The 1997 versions of the Standard Building Codes (also Structural, Mechanical and Plumbing) and the 1999 version of the National Electrical Code are in effect for Cowpens and unincorporated Spartanburg County. After July 1, 2001, The 2000 International Building Codes will be in effect. (This information is from Mike Padget, Tel. (864) 596-3182.)

According to Mike McGrath of Spartanburg County Environmental Services, Tel. (864) 596-3584, the state Department of Health and Environmental Control directly handles environmental permitting for the town of Cowpens. In unincorporated Spartanburg County, permitting is handled by the county Environmental Services. Sam Kokely of the Spartanburg Sewer District was given as a good contact for this. Environmental Services reviews the grading plan for stormwater handling, and looks at the project for compliance with state and local environmental regulations, then sends an approval to Spartanburg County Building Codes Department, which actually issues the building permit. In Cherokee County, environmental permitting would be handled through the Building Inspections and Code Enforcement Department.

### *1.3. Safety in Operation*

Worker and public safety in operations is of paramount importance. South Carolina OSHA safety regulations must be followed in both biogas facility and cogeneration facility, as in other workplaces. Where work hazards exist, appropriate protective equipment and procedures must be implemented, and warnings must be posted to alert personnel to hazards. Proper procedures for emergency response should be prepared and posted.

If the biogas generation facility is permitted as a Solid Waste Processing Facility, it will be subject to regulations in S. Carolina Code of Regulations (S.C. COR) 61-107.6F. Other regulations may also apply.

## **2. Biogas Plant Permit Requirements**

### *2.1. Raw Materials Permitting*

Commercial farms would be required to change their waste handling permit to include transport and “disposal” at a waste processing facility such as the potential biogas plant. (COR 61-43.100.30, 61-43.200.30) The Waste Processing Facility permit required for the biogas plant may also have written into it commercial farms from which it anticipates receiving animal waste, as well as businesses and organizations from which it expects other kinds of waste approved by the permit. A procedure would be required for dealing with waste arriving at the facility not allowed under the Solid Waste Processing Facility permit issued by DHEC.

Transportation of raw materials to the site should follow Dept. of Transportation guidelines. In all cases, spillage of materials from transport vehicles must be avoided. Odors emitted from the vehicle should be minimized by covering or enclosing the material. Incoming material should be removed from transport vehicles within 24 hours of arrival at the facility.

Special attention should be paid to keeping all organic materials inside the facility to avoid mixing with stormwater. The tipping floor must be cleaned regularly. If an NPDES permit is issued for the facility, it will most likely require monitoring of the stormwater system for presence of materials from the biogas facility, and a plan for preventing spillage of materials into the stormwater system.

## 2.2. Solid Waste Facility site assignment and operating permit

The biogas facility is expected to process a large quantity of materials which would be considered solid waste if they were not processed by the facility. As mentioned in Section 2.1, commercial agricultural facilities must acquire a solid waste permit for handling of manure and other organic materials. Since such materials are part of the input to the biogas generation facility, it is possible that the facility will be considered a “Solid Waste Facility” by regulating officials. It is quite possible that the facility will also fall under the categories of “Materials recovery facility” or “Recovered Materials Processing Facility.”

If the facility is considered to be a “Solid Waste Facility,” it will be required to follow regulations and permitting requirements in S. Carolina Code of Regulations 61-107.6. The permit application, which must be signed by an engineer licensed in South Carolina, must include:

- An engineering report including descriptions of the site, facility, processes and equipment, types and quantities of waste to be processed, as well as a list of disposal or recycling facilities which will receive the processed waste.
- Complete construction plans and specifications
- A personnel training program
- Identification of possible paths of pollution by the facility
- A waste control plan, including procedures for dealing with waste not allowed by the permit.
- A contingency plan during periods of non-operation

## 2.3. Air Pollution Control Permitting

The biogas generation plant is expected to pose very little air pollution problem. With the exception of the tipping floor, all of the material processing is carried out in enclosed, airtight vessels. Air from the tipping floor area is ventilated through a biofilter, which removes most of the organic odor-causing compounds both inside and outside of the facility. Composting pathogens are contained in the enclosed methane generation tank, and materials are pasteurized before and after the methane generation process. As a result pathogen levels in the air are expected to be low and similar to background levels. This leaves only the gaseous product of the process, biogas, which contains 60-80% methane, 20-40% carbon dioxide and trace amounts of hydrogen sulfide. Hydrogen sulfide is a toxic gas, and its level in the biogas should be monitored, as it could enter the air as a product of combustion in the cogeneration facility, or as the possible result of the unlikely event of a biogas leak. Operating experience at the CCI Newmarket plant suggests that levels of hydrogen sulfide in the biogas are typically well below dangerous levels, on the order of 50 ppm in the gas.

The main requirements related to air pollution control permitting are described in S. Carolina Code of Regulations section 61-62.

One of the eight standards given in S.C. COR 61-62 which may apply to a biogas generation facility is Standard 8. Standard 8 (given in S.C. COR 61-62.5) requires a permit for facilities which emit more than 1000 lbs/month of any toxic air pollutant. For amounts less than this, a permit may or may not be required. The list of maximum allowable concentrations of specific toxic pollutants are given in Appendix C. Hydrogen sulfide is the only major known toxic substance in the biogas. Assuming projected production of biogas for a 160,000 ton organic waste processing facility and biogas composition similar to biogas produced in European BTA plants, the hydrogen sulfide is expected to be on the order of 100 lbs per month, about a tenth of the trigger level for mandatory air permitting. Since biogas is not expected to be released to the air, the hydrogen sulfide is only expected to be released if some sort of leak occurs in the facility, or when the biogas is burned in the cogeneration facility. See Section 3.2 for further consideration of air quality permitting connected with the cogeneration facility.

#### 2.4. Permit Requirements for Liquid Residuals and Wastewater

Options for dealing with wastewater and liquid residuals include 1) discharge to the Spartanburg County sewer system with a county sewer permit; 2) land application with a DHEC land application permit, and 3) discharge to surface waters with an NPDES permit. These options are described in greater detail below.

##### 2.4.1. Discharge to public sewer system:

The first option for discharge of liquid residuals and wastewater is discharge to the public sewer within constraints of sewer operating authority. In and near the Town of Cowpens, this authority is the Spartanburg County Water System. The county currently operates a 1.5 million gallons per day (1.5 MGD) capacity sewage treatment plant, of which 300,000 gallons per day is currently utilized. An industrial facility must obtain a Spartanburg County Water System sewer permit in order to discharge into the sewer system. For further information, contact John Holcomb (Tel. 864-582-3250).

The permit application requires information about the quantity of water discharged on average, basic parameters of the wastewater such as biochemical oxygen demand (BOD), total suspended solids (TSS) and pH, as well as information about possible toxic materials which may appear in the wastewater. The permit will include standard constraints, given below, as well as additional constraints on problem materials expected in the wastewater. Problem materials would include heavy metals and toxic organics.

Standard constraints on wastewater are as follows: pH must be between 6 and 8.5, though special arrangement can be made for water with pH higher than this range. The basic limit on BOD is 250 mg/l, with surcharges of \$16.74 per 100 lbs BOD for greater amounts, with the concentration in no case exceeding 2000 mg/l. Likewise, the basic limit on TSS is 300 mg/l, with surcharges of \$15.05 per 100 lbs TSS for greater amounts, with the concentration of TSS in no case exceeding 2000 mg/l. Oil and grease content in the wastewater must be less than 100 ppm, with no exceptions. For wastewater flows greater than 52 gpm or 75,000 gpd, there is a flow equalization requirement, such that the wastewater flow is constant 24 hours per day, 7 days per week.

##### 2.4.2. Land Application:

A second option for disposal of liquid residuals from the biogas facility is application of these residuals to land. In this case, liquid residuals are sprayed or in some fashion spread on land as irrigation and fertilizer. The South Carolina DHEC regulates land application through a land application permit, which is roughly analogous in content to the NPDES permit, except wastewater contact is eventually with groundwater rather than surface water.

It may be possible to market liquid residuals from the biogas plant as liquid fertilizer via a land application permit. It is possible that eventual users of the residuals would need to be registered in the land application permit. The details of this option remain to be investigated further.

To obtain a land application permit, an application package including information prescribed in S.C. COR61-9.505.21 must be submitted to DHEC. Information required includes name and location of the facility, a description of the industrial process, expected amounts and quality of wastewater to be discharged, and a plan for how the wastewater will be land applied. Maps must be included to show topography near the site. Any hazardous substances which may be in the wastewater must be described, and plans for groundwater monitoring (if applicable) must be included.

##### 2.4.3. Discharge to surface waters:

A third option for disposing of liquid residuals from the biogas plant is discharge into a stream or other surface water near the facility. An NPDES permit is required for this disposal option. For further information, contact Melinda Vickers at DHEC Bureau of Water (Tel. 803-898-4186).

To obtain an NPDES permit, the requirements in S.C. COR61-9.122. Included in the requirements are information about the nature of the industrial activity; quantity of wastewater to be discharged; a basic

water mass balance for the industrial process, including any treatment carried out on site; amount of “sludge” generated from the process and its disposal method, and other information as described in the regulation. The application must be submitted at least 180 days before discharges are to begin, although applicants are encouraged to leave more time to ensure a timely issue of permit.

The NPDES would require monitoring of wastewater flows and particular contaminants defined in the permit. Toxic materials which may be expected in the wastewater will likely require monitoring, as may pathogen levels.

#### 2.5. Permit Requirements for Stormwater.

Any industrial facility located in or near Cowpens will require an NPDES permit for stormwater, separate from any permit for wastewater disposal from the biogas facility. Contact Harvey Daniel (803-898-4033) of DHEC’s Bureau of Water for further information on stormwater permitting.

The NPDES permit application for a new industrial facility must be submitted at least 180 days before commencement of the project. The application should include standard Forms 1, 2D and 2F. In addition, a site topographical map, drainage structure drawings, pollution reduction measures for the facility and an estimate of impervious land area should be included. Other information may also be required. Regulations for stormwater permitting are described in S.C. COR 61-9.122.26. NPDES Forms 1 and 2F for stormwater permitting are included in Appendix E.

#### 2.6. Biogas Plant Operator Certification

Some operators in the biogas plant may be required to obtain state certification if their duties fall into regulated categories. Part or all of the biogas plant may be designated as a Wastewater Treatment Plant (WWTP). Operators whose duties include operation of the designated WWTP equipment must be certified at the level required to run that equipment. Certification is carried out through the S.C. Dept. of Labor, Licensing and Regulation, Environmental Certification Board. Information on classes of WWTP operator (physical and biochemical) and certification regulations can be found at the board’s website:

<http://www.llr.state.sc.us/POL/Environmental/Default.htm>.

Second, part or all of the biogas generation facility may be designated as a Solid Waste Processing Facility. While no special certification is required under this designation, the following guidance is offered by state regulations:

#### *61-107.6.I. Personnel Training Requirements [for Solid Waste Processing Facilities].*

*Solid waste processing facility personnel training programs shall, at a minimum:*

- 1. [Reserved]*
- 2. identify the positions which will require training and a knowledge of the procedures, equipment, and processes at the facility;*
- 3. describe how facility personnel will be trained to perform their duties in a way that ensures the facility’s compliance with the regulations, including the proper procedures that shall be followed in the processing and handling of solid waste not authorized by the Department to be received at the facility; and,*
- 4. be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency and safety equipment, emergency procedures and emergency systems.*

### **3. Cogeneration Plant Permit Requirements**

If the biogas and cogeneration facilities are located at different sites, then most of the permit requirements must be met separately for the two facilities. If the two operations are located on the same site, then some additional permits will be required for the cogen capability beyond those permit requirements for the biogas facility described in Section 2. Some of the permit requirements discussed in Section 2 will apply to the cogeneration facility as well, corresponding to the construction, operation and material wastestreams of that facility. Additional permit requirements for the cogeneration facility are given in this section.

### 3.1. Fuel Transport & Pipeline Safety Permitting

If the biogas and cogeneration facilities are at different locations, a pipeline will be required to transport biogas to the cogeneration plant. Transport of flammable gas is governed by the federal and state departments of transportation.

Pipeline safety certification would be accomplished through the South Carolina Public Service Commission, Utilities Department, Pipeline Safety Section. They would evaluate the pipeline plan for compliance with federal standards and regulations. These regulations are given for the most part at the Federal Office of Pipeline Safety website, *ops.dot.gov*. In particular, CFR Title 49, Chapter 1, Part 192 gives detailed guidelines for pipeline materials, construction, control, testing, inspection, operation and maintenance.

### 3.2. Air Pollution Control Construction & Operating Permits

The cogeneration facility is potentially subject to at least two air quality standards as given in S. Carolina Code of Regulations (COR)61-62.5. As with the biogas generation facility (see Section 2.3), the cogeneration facility may require a permit under Standard 8: Hazardous Air Pollutants. A list of hazardous air pollutants with their concentration limits in air is given in Appendix C. If any of the listed pollutants is emitted at a rate of more than 1000 lbs. per month, a permit is mandatory. If emissions are lower than this, a permit may or may not be issued at the discretion of DHEC.

The cogeneration facility is also subject to Standard 1: Emissions from Fuel-Burning Operations. This standard places limits on opacity, particulate content and sulfur dioxide content for exhaust stack emissions. It prescribes monitoring procedures and protocols by which it can be assessed whether the Standard is being met. These restrictions on emissions vary somewhat with the location of the facility. In particular, if the facility is located in a heavily populated industrial area, the allowable emissions, especially for sulfur dioxide, are smaller. All of Spartanburg County is in the least restrictive class of locations in South Carolina, because of its low population density and relatively high ambient air quality. With attention to proper operation of the boiler, gas turbine or engine which runs utilizes the biogas, pollution control measures required to comply with Standard 8 will be minimal.

### 3.3. Wastewater Permitting

The cogeneration facility is expected to generate only minimal wastewater associated mainly with cleaning of facilities and employee restrooms. On occasion the facility may discharge heating system water.

A sewer permit with Spartanburg Sanitary Sewer District should provide the necessary services for this type of wastewater handling. An application form for a sewer permit is given in Appendix E. The biggest issue will be how a large discharge, such as flushing of the cogen heating system water, is handled, so that the sewer district does not get a large slug flow from the cogen facility which disrupts the operation of the wastewater treatment plant.

If the cogen and biogas facilities are permitted as a single unit, the wastewater from the biogas system will most likely hold the largest influence over which method(s) of wastewater disposal is (are) chosen. See also section 2.4 of this document, on biogas facility liquid residuals and wastewater permitting.

### 3.4. Stormwater Permitting

A stormwater system for an industrial facility requires an NPDES permit, issued by S. Carolina Department of Health and Environmental Control (DHEC). If the biogas system and cogen facility are co-located on the same site, a single stormwater permit would most likely be developed for both facilities. If the cogen facility is located on site at Linpac, stormwater permitting may be achieved through a modification of the existing facility permit. See also Section 2.5 of this document, on stormwater permitting for the biogas facility. Some relevant NPDES permit application forms are included in Appendix E.

### *3.4 Sale of Electricity to Utilities*

S.C. PSC Utilities Department would approve energy price rates agreed on between facility and utility. Beyond this, the department is not involved with an electrical generation facility smaller than 75 megawatts.

Under the Public Utilities Regulatory Policies Act of 1978 and The National Energy Policy Act of 1992 (EPACT) the federal government authorizes states to develop competition in the utilities marketplace. Guaranteed markets and special pricing for power from renewable energy and are treated in this legislation. Utilities are required to purchase electricity from Qualifying Facilities at a price equivalent to their avoided cost for generating power themselves. South Carolina has not adopted electricity market restructuring legislation yet, so the precise impact of these federal acts is not clear.

Some tax incentives and cash subsidies for generators of renewable energy may be available from the U.S. Dept. of Energy as a result of the Energy Policy Act of 1992 through the Renewable Energy Production Incentive (REPI). These apply only if the plant begins operations by September 2003.

### *3.5. Cogeneration Facility Operator Permits*

Unlike in some states, S. Carolina appears to have no boiler operator certification program. Minimum training standards should be developed for operators to ensure safe operation of all power generation facilities.

## **4. Alternative Siting and Permitting Scenarios**

While a great number of potential locations for a biogas/cogen plant exist, the connection of the outputs from these facilities to a particular paper mill restricts locations to those near that mill. The high cost of gas transport through pipelines or other means precludes sites which are more than a few miles away. This leaves three basic siting and permitting scenarios, all of which are very similar in terms of the permitting process.

On site at Linpac, some of the permits, such as stormwater, may be tied in with the existing paper mill through a modification of the existing permit. The new liquid and solid residuals streams would undoubtedly still require their own permitting process. The Linpac land use assignment would likely remain unchanged.

In town of Cowpens, a land use classification which allows construction and operation of a biogas/cogen facility would be needed. A public hearing may be required in the town if a change in land use from current classification is proposed. Permits other than the land use permit will be obtained through Spartanburg County or state DHEC, as described in earlier sections.

In Spartanburg County, outside of Cowpens, land use is overseen by a county board. A public hearing at the county level may be required. All other permits will be obtained through Spartanburg County or state DHEC, as described in earlier sections.

While the permitting process will not differ greatly anywhere in Spartanburg County, some sites may have particular features which will play a role in shaping the permits. For example, solid waste and wastewater operations are required to maintain certain buffer zones between the facility and residences, surface waters, etc. A site must be chosen which meets these buffer criteria. Geographical features may influence design choices, such as how to dispose of wastewater.

## 5. Conclusion

With sufficient time and proper attention to detail and providing information to regulators, permits for construction and operation of biogas and cogeneration facilities should be readily achieved. The permitting process for both construction and operation of biogas and/or cogeneration facilities should be begun as early in the project as possible. Construction permits may require public hearings and a few months for the review process. A minimum of six months should be allowed to obtain operating permits.

In order to obtain land use and construction permits, public hearings may be required by the local authority. Questions about safety, possible odors, vectors or mess may be addressed with data and experience from other BTA/CCI facilities and small scale cogeneration plants. While both biogas and cogen facilities are expected to pose no significant danger or discomfort to the public, all effort to address public concern with understanding as well as data can be expected to improve chances of approval.

In the biogas facility, the permitting of disposal of liquid and solid residuals is probably the most critical aspect of the permitting process. Data on contaminants and pathogen levels in residuals should show that these materials are safe for disposal or sale as fertilizer. A permit will be required for stormwater disposal, and permits for air quality control and raw materials may also be necessary. Operators in the biogas facility may require certification as Wastewater Treatment Plant Operators, depending on their scope of duties.

In the cogeneration facility, permitting for air pollution control is probably the most critical aspect. Some estimate of potential pollutant emission may be possible based on an analysis of the biogas and the fuel burning process. With attention to proper design of the fuel burning system and exhaust stacks, the facility may well be within restrictions for non-urban South Carolina without further pollution control measures. If biogas is brought to the cogeneration site via an offsite pipeline, the state Office of Pipeline Safety must issue a certification permit for the pipeline. A permit will be required for stormwater disposal. As the cogeneration plant is below the size threshold for a "major facility," the electricity generated in the facility may be sold without a specific permit; however, the Public Service Commission must approve the price of electricity sold to a utility.

The locations of the biogas and cogeneration facilities must be quite close to Linpac, almost certainly not more than a few miles away, so that biogas and/or steam may be cost effectively delivered to Linpac. As a result, essentially all potential locations will be within Spartanburg County. This is advantageous especially for air quality permitting, since Spartanburg County is in the least restrictive class of air quality regions. The limited choice of location reduces the potential variables in the permitting process. Either the facilities will be located in Cowpens proper, or in unincorporated Spartanburg County. Thus, some local permits such as land use and construction may be channeled through one or the other of these. All other permits will ultimately be approved by DHEC at the state level, regardless of the site(s) chosen. The proximity of the facilities to surface waters and residences may require some attention and particular safeguards.

## References

Orlando, J. A., *Cogeneration Design Guide*, Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1996, pp. 183-185 (on permitting requirements for cogeneration facilities).

South Carolina State House Network 1999 Code of Regulations 61-9: Water Pollution Control Permits. Of particular interest are subsections 122 (NPDES), 124 (Decisionmaking), 403 (Pretreatment), 504 (Industrial Sludge) and 505 (Land Application).

South Carolina State House Network 1999 Code of Regulations 61-43: Standards for the Permitting of Agricultural Animal Facilities.

South Carolina State House Network 1999 Code of Regulations 61-62: Air Quality Permits. Of most interest is section 61-62.5 (Air Pollution Control Standards), particularly Standard 1 (Emissions from fuel burning operations) and Standard 8 (Toxic Air Pollutants).

South Carolina State House Network 1999 Code of Regulations 61-107: Solid Waste Management. Of particular interest are subsections 61-107.5 (Collection, Temporary Storage and Transportation of Municipal Solid Waste), 61-107.6 (Solid Waste Processing Facilities), 61-107.10 (Research, Development and Demonstration Permit Criteria), and 61-107.15 (Land Application of Solid Waste).

South Carolina DHEC Website (Environmental Agencies and Regulations):  
<http://www.scdhec.net/eqc/>

South Carolina State House Network Website (Laws and Regulations):  
<http://www.lpittr.state.sc.us/homepage.htm>

South Carolina Environmental Certification Board (Operator Certification):  
<http://www.llr.state.sc.us/POL/Environmental/Default.htm>

Spartanburg Sanitary Sewer District Website: <http://www.sws-sssd.org/>

Spartanburg County Website: <http://www.spartanburgcounty.org/govt/>

## **Appendix A**

### **Contact List for Permitting Agencies**

#### Federal

DOT, Office of Pipeline Safety, <http://www.ops.dot.gov/>

#### State of South Carolina

DHEC, Bureau of Water

Melinda Vickers – 803-898-4186 Wastewater

Harvey Daniel -803-898-4033 Stormwater

DHEC, Bureau of Air Quality and Control

Larry Ragsdale 803-898-3840

DHEC, Bureau of Land and Waste Management

General Information, 803-896-4000

John Schnabl, Wood Waste Composting, 803-896-4216

Henry Gibson, Ag Waste Composting, 803-898-4230

April Grunsky, Research, Development and Demonstration Composting,  
803-896-4214

Willie Morgan, Ombudsman, 803-898-3432

DHEC, Appalachia III District

Barney Harmon – 864-596-3800

Public Service Commission

Utilities Department – 803-896-5125

Wayne Burdett, Utilities Dept. Mgr. – 803-896-5171

Randy Watts, Utilities Dept.

Brent Sires, Utilities Dept., Pipeline Safety, Landfill Gas Program –

803-896-5147, [brent.sires@psc.state.sc.us](mailto:brent.sires@psc.state.sc.us)

#### County of Spartanburg

Dept. of Environmental Services

Mike McGrath, 864-596-3584

Spartanburg Sanitary Sewer District

Sam Kokely, 864-580-5685

Building and Fire Codes

Mike Padgett, 864-596-3182

Laurie Bailey

#### County of Cherokee

Cherokee County Development Board

Jim Inman, Exec. Director, (864) 489-5721, [ccdevbrd@innova.net](mailto:ccdevbrd@innova.net)

Cherokee County Building Inspections and Code Enforcement Dept.

Michael Doles (864) 487-2561

#### Town of Cowpens

City Hall 864-463-3201

Shirley Reynolds, Town Clerk (# same as above)

## **Appendix B**

### **Site Development in Spartanburg County and Cherokee County**

To obtain a commercial permit in Cherokee County, the following are required:

1. Confirm 911 addressing.
2. Submit 3 sets of site and construction drawings.
3. If the structure will occupy more than 5,000 square feet or if the use is assembly, educational, or institutional purposes, the plans must be sealed by a state licensed architect or engineer.
4. The site will be reviewed for compliance with current land development regulations.
5. Have septic or sewer provider letter.
6. Plan review process will be approximately two weeks. Once plans are reviewed, a building permit can be issued.
7. Plan review and building permit fees must be paid before permit is issued.
8. If you are submitting architectural or engineered plans, please submit code-check letter from architect or engineer. We currently recognize the 1997 Standard Building Codes.
9. For permits over 30,000 dollars a state licensed contractor is required.
10. The contractor will need to have the following in order to be issued a permit:
  - cost of project
  - size of project
  - use of structure
  - contractor number and card.

The building may be occupied or used only after a final inspection and a certificate of occupancy is issued by the Building Codes Department.

For further information, call (864) 487-2561.

To obtain a commercial building permit in the County of Spartansburg (both Cowpens and unincorporated Spartansburg), the following steps are specified on the county website (<http://www.co.spartanburg.sc.us/govt/depts/adm/bfc/permitting/>):

1. Obtain an address for the new building location from the Addressing Dept.
2. Submit two (2) sets of site plans and construction drawings to the permitting department. If the structure will occupy more than 5,000 square feet or if the use is to be used for assembly, educational, or institutional purposes the plans must be sealed by a state licensed architect or engineer. The Plan Review Coordinator and Fire Marshal's Office will review your construction plans while the site development application is being checked for compliance.
3. Make a site development permit application so the site may be checked for compliance with the Development Standards Ordinance.
4. Make an application for a septic system or have a letter from the sewer service provider.
5. After approval of the site plan, the sewage disposal system and the construction drawings must be approved before the permit for construction can be issued. For permits over 5,000 dollars a state-licensed contractor is required.
6. The contractor will need to have the following information in order for the permit clerk to issue the building permit: cost of project, size of project, use of structure, contractor number.
7. The building may be occupied only after a final inspection and a certificate of occupancy is issued by the Building Codes Department.

For questions, contact Spartanburg County. Call (864) 596-2728 for general information. For technical questions related to building codes, contact Laurie Bailey at (864) 596-3173.

Until July 1, 2001, The 1997 versions of the Standard Building Codes (also Structural, Mechanical and Plumbing) and the 1999 version of the National Electrical Code are in effect for Cowpens and unincorporated Spartanburg County. After July 1, 2001, The 2000 International Building Codes will be in effect. (This information is from Mike Padgett, Tel. (864) 596-3182.)

The following items may be necessary in the pre-construction phase:

1. If the property is to be leased, a written authorization letter is required from the Property Owner.
2. Site Plan at a scale of not less than 1" = 20' or more than 1" = 100' with a recorded plat.
3. Location and Use of adjacent buildings or land parcels to the proposed development (including future development – if known)
4. Square Footage and height of all structures.
5. Proposed location, arrangement and Setback Dimensions of all buildings from the property lines and street or road right-of-way lines
6. Arrange the locations of the required Bufferyards, with a required landscaping plan with plant materials identified (determined at time of site inspection)
7. The location and number of all Off-Street Parking (identify handicapped)
8. Street name(s) and road right-of-way width(s)
9. The location and dimension of all existing and proposed Vehicular Drives, entrances, exits, and traffic circulation patterns
10. \$200.00 Development Permit Application Fee – Major Project

The items below must be submitted and approved after the Development Permit is approved and issued, but before the BUILDING PERMIT can be obtained:

1. Submit grading, storm water management plans and encroachment permit application to Environmental Services (Mike McGrath or Ray Sistare 596-3586);
2. Submit Building Plans/Mechanical (2 sets) to Building Codes Plan Review Department (Linda Parr or Kris Brannon – Plan Review Coordinators – 596-2727);
3. A sewer letter of DHEC approval must be obtained;
4. Fire Marshal's approval must be obtained (Rick Butts – 596-3612).

Source: Spartanburg County Website

## Appendix C

### Maximum Allowable Concentrations of Toxic Air Pollutants

(Adapted from SCCOR 61-62.5, Standard 8, Section II.E. Please refer to the actual standard for verification of numbers.)

E. The allowable ambient air concentrations of a toxic air pollutant beyond the plant property line as determined by modeling under Part A shall be limited to the value listed in the following table. The pollutants are divided into three categories based on chronic exposure as follows: Category 1: Low Toxicity - Those pollutants which cause readily reversible changes which disappear after exposure ends. Category 2: Moderate Toxicity - Those pollutants which may cause chronic reversible or irreversible changes that are not severe enough to result in death or permanent injury. Category 3: High Toxicity - Those pollutants which may cause chronic effects that result in death or permanent injury after very short exposure to small quantities.

CHEMICAL NAME	CAS NO.	CATEGORY	Max $\mu\text{g}/\text{m}^3$	
Acetaldehyde	75-07-0	2	1800.00	
Acetamide	60-35-5	3	TBD	
Acetic Anhydride	108-24-7	1	500.00	
Acetonitrile	75-05-8	1	1750.00	
Acetophenone	98-86-2	3	TBD	
2-Acetylaminofluorene	53-96-3	3	TBD	
Acrolein	107-02-8	3	1.25	
Acrylamide	79-06-1	2	0.30	
Acrylic Acid	79-10-7	3	147.50	
Acrylonitrile	107-13-1	3	22.50	
Aldicarb	116-06-3	2	6.00	
Allyl Chloride	107-05-1	2	30.00	
p-Aminodiphenyl (4-Aminobiphenyl)	92-67-1	3	0.00	
Ammonium Chloride	12125-02-9	1	250.00	
Aniline	62-53-3	3	50.00	
o-Anisidine	90-04-0	3	2.50	
p-Anisidine	104-94-9	3	2.50	
Antimony Compounds	>	1	2.50	
Arsenic Pentoxide	1303-28-2	3	1.00	
Arsenic	7440-38-2	3	1.00	
Benzene	71-43-2	3	150.00	
Benzidine	92-87-5	3	0.00	
Benzotrichloride	98-07-7	3	300.00	
Benzyl Chloride	100-44-7	3	25.00	
Beryllium Oxide	1304-56-9	3	0.01	
Beryllium Sulfate	13510-49-1	3	0.01	
Beryllium	7440-41-7	3	0.01	
Biphenyl	92-52-4	TBD	6.00	
Bis(Chloromethyl) Ether	542-88-1	3	0.03	
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7		3	25.00
Bromoform	75-25-2	3	25.85	
1,3-Butadiene	106-99-0	3	110.50	
1-Butanethiol (n-Butyl Mercaptan)	109-79-5	2	15.00	
n-Butylamine	109-73-9	3	75.00	
Cadmium Oxide	1306-19-0	3	0.25	
Cadmium Sulfate	10124-36-4	3	0.20	

Cadmium	7440-43-9	3	0.25
Calcium Cyanamide	156-62-7	3	2.50
Caprolactam, vapor	105-60-2	1	500.00
Caprolactam, dust	105-60-2	1	25.00
Captan	133-06-2	3	25.00
Carbaryl	63-25-2	3	25.00
Carbon Disulfide	75-15-0	3	150.00
Carbon Tetrachloride	56-23-5	3	150.00
Carbonyl Sulfide	463-58-1	3	12250.00
Catechol	120-80-9	3	297.00
Chloramben	133-90-4	3	TBD
Chlordane	57-74-9	3	2.50
Chlorine	7782-50-5	1	75.00
Chloroacetic Acid	79-11-8	3	900.00
2-Chloroacetophenone	532-27-4	1	7.50
Chlorobenzene	108-90-7	3	1725.00
Chlorobenzilate	510-15-6	3	TBD
Chloroform	67-66-3	3	250.00
Chloromethyl Methyl Ether	107-30-2	3	TBD
p-Chloronitrobenzene	100-00-5	3	5.00
Chloroprene	126-99-8	3	175.00
Chromium(6) Compounds	>	3	2.50
Cobalt Compounds	>	3	0.25
Coke Oven Emissions	>	3	
Cresols/cresylic acid and mixture	1319-77-3	3	220.00
m-Cresol	108-39-4	3	110.50
o-Cresol	95-48-7	3	110.50
p-Cresol	106-44-5	3	110.50
Cumene	98-82-8	2	9.00 #
Cyanamide	420-04-2	1	50.00
Cyanic Acid	420-05-3	1	500.00
Cyanide	57-12-5	1	125.00
Cyanide compounds [FN1]	>	1	TBD
Cyanoacetamide	107-91-5	1	125.00
Cyanogen	460-19-5	1	500.00
2,4-D,salts and esters	94-75-7	3	50.00
DDE	3547-04-4	3	TBD
Diazomethane	334-88-3	3	2.00
Dibenzofuran	132-64-9	3	TBD
1,2-Dibromo- 3-chloropropane	96-12-8	3	0.05
Dibutylphthalate	84-74-2	3	25.00
p-Dichlorobenzene	106-46-7	2	4500.00
3,3-Dichlorobenzidine	91-94-1	3	0.15
1,3-Dichloropropene	542-75-6	3	20.00 #
Dichlorvos	62-73-7	3	4.52
Diethanolamine	111-42-2	2	129.00
n,n-Diethylaniline (n,n-Dimethylaniline)	121-69-7	2	250.00
Diethyl Phthalate	84-66-2	3	25.00
Diethyl Sulfate	64-67-5	3	TBD
Diisodecyl Phthalate	2671-40-0	2	50.00
3,3-Dimethoxybenzidine	119-90-4	3	0.30
3,3'-Dimethyl Benzidine	119-93-7	3	TBD

Dimethyl Carbamoyl Chloride	79-44-7	3	TBD	
Dimethyl Formamide	68-12-2	2	300.00	
1,1-Dimethyl Hydrazine	57-14-7	3	5.00	
1,2-Dimethyl Hydrazine	540-73-8	3	5.00	
Dimethyl Phthalate	131-11-3	3	25.00	
Dimethyl Sulfate	77-78-1	3	2.50	
4-Dimethylaminoazobenzene	60-11-7	3	125.00	
m-Dinitrobenzene	99-65-0	2	10.00	
4,6-Dinitro-o-cresol and salts	534-52-1	2	2.00	
2,4-Dinitrophenol	51-28-5	3	TBD	
2,4-Dinitrotoluene	121-14-2	3	1.50	
Dioctyl Phthalate	117-84-0	2	50.00	
1,4-Dioxane	123-91-1	3	450.00	
1,2-Diphenylhydrazine	122-66-7	3	TBD	
Epichlorohydrin	106-89-8	3	50.00	
1,2-Epoxybutane	106-88-7	3	TBD	
Ethaneithiol	75-08-1	2	10.00	
Ethanolamine	141-43-5	1	200.00	
Ethyl Acrylate	140-88-5	3	102.50	
Ethyl Benzene	100-41-4	2	4350.00	
Ethyl Chloride	75-00-3	2	26400.00	
Ethylene Dibromide	106-93-4	2	770.00	
Ethylene Dichloride	107-06-2		3	200.00
Ethylene Glycol	107-21-1	3	650.00	
Ethylene Oxide	75-21-8	3	10.00	
Ethylene Thiourea	96-45-7	3	TBD	
Ethylene Imine	151-56-4	3	5.00	
Ethylidene Dichloride	75-34-3	3	2025.00	
Formaldehyde	0-00-0	2	15.00	
Formamide	75-12-7	1	750.00	
Formic Acid	64-18-6	1	225.00	
Furfural	98-01-1	1	200.00	
Furfuryl Alcohol	98-00-0	2	400.00	
Glycidaldehyde	765-34-4	3	75.00	
Glycol Ethers [FN2] (mono- and di-ethers of diethylene glycol or triethylene glycol)	>	1	TBD	
Glycol Ethers [FN2] (mono- and di-ethers of ethylene glycol)	>	3	TBD	
Heptachlor	76-44-8	3	2.50	
Hexachlorobenzene	118-74-1	3	TBD	
Hexachlorobutadiene	87-68-3	3	1.20	
Hexachlorocyclohexane (multiple isomers)	608-73-1	2	5.00	
Hexachlorocyclopentadiene	77-47-4	3	0.50	
Hexachloroethane	67-72-1	3	48.50	
Hexachloronaphthalene	1335-87-1	3	1.00	
Hexamethylene-1, 6-diisocyanate	822-06-0	2	0.34	
Hexamethylphosphoramide	680-31-9	3	14.50	
Hexane	110-54-3	3	900.00	
Hydrazine	302-01-2	3	0.50	
Hydrochloric Acid	7647-01-0	1	175.00	
Hydrogen Cyanide	74-90-8	1	250.00	

Hydrogen Sulfide	7783-06-4	2	140.00
Hydroquinone	123-31-9	2	20.00
Isophorone	78-59-1	2	250.00
Isopropylamine	75-31-0	1	300.00
Kepone (Chlordecone)	143-50-0	3	0.00
Ketene	463-51-4	3	4.50
Lead Arsenate	7645-25-2	3	0.75
Lead(2) Arsenate	7784-40-9	3	0.75
Lindane	58-89-9	3	2.50
Malathion	121-75-5	2	100.00
Maleic Anhydride	108-31-6	2	10.00
Manganese Compounds	>	3	25.00
Mercury	7439-97-6	3	0.25
Methanol	67-56-1	3	1310.00
Methoxychlor	72-43-5	3	50.00
Methyl Bromide	74-83-9	3	100.00
Methyl Chloride	74-87-3	3	515.00
Methyl Chloroform (1,1,1-Trichloroethane)	71-55-6	3	9550.00
Methylene Biphenyl Isocyanate	101-68-8	2	2.00
4,4-Methylene Bis(2-chloroaniline)	101-14-4	3	1.10
4,4-Methylenedianiline	101-77-9	3	4.00
Methyl Ethyl Ketone (2-Butone)	78-93-3	1	14750.00
Methyl Hydrazine	60-34-4	3	1.75
Methyl Iodide	74-88-4	3	58.00
Methyl Isobutyl Ketone	108-10-1	2	2050.00
Methyl Isocyanate	624-83-9	3	0.23
Methyl Mercaptan	74-93-1	2	10.00
Methyl Methacrylate	80-62-6	1	10250.00
Methylamine	74-89-5	1	300.00
Methylene Chloride	75-09-2	1	8750.00
Methyl-t-Butyl Ether	1634-04-4	1	TBD
Mineral Fibers, Fine [FN3]	>	3	TBD
Mineral Oil Mist (Paraffin Oil)	8012-95-1	3	25.00
Mirex	2385-85-5	3	4500.00
Naphthalene	91-20-3	1	1250.00
a-Naphthylamine	134-32-7	3	0.00
b-Naphthylamine	91-59-8	3	0.00
Nickel Carbonyl	13463-39-3	3	1.75
Nickel Oxide	1313-99-1	3	5.00
Nickel Sulfate	7786-81-4	3	5.00
Nickel	7440-02-0	3	0.50
Nitric Acid	7697-37-2	1	125.00
p-Nitroaniline	100-01-6	3	15.00
Nitrobenzene	98-95-3	3	25.00
4-Nitrobiphenyl	92-93-3	3	0.00
Nitrogen Mustard	51-75-2	3	0.00
Nitroglycerin	55-63-0	2	5.00
p-Nitrophenol	100-02-7	3	0.00
1-Nitropropane	108-03-2	1	2250.00
2-Nitropropane	79-46-9	3	182.00

p-Nitrosophenol	104-91-6	3	0.00
n-Nitroso-n-methylurea	684-93-5	3	TBD
n-Nitrosodimethylamine	62-75-9	3	0.00
n-Nitrosomorpholine	59-89-2	3	5000.00
p-Nitrotoluene	99-99-0	3	5.50
Octachloronaphthalene	2234-13-1	3	0.50
Oxalic Acid	144-62-7	2	10.00
Paraquat	1910-42-5	3	0.50
Parathion	56-38-2	3	0.50
Pentachloronitrobenzene (Quintobenzene)	82-68-8	3	TBD
Pentachlorophenol	87-86-5	2	5.00
Phenol	108-95-2	2	190.00
p-Phenylenediamine	106-50-3	2	1.00
Phenylhydrazine	100-63-0	2	200.00
Phosgene (Carbonyl Chloride)	75-44-5	2	4.00
Phosphine	7803-51-2	3	2.09
Phosphoric Acid	7664-38-2	1	25.00
Phosphorus	7723-14-0	2	0.50
Phthalic Anhydride	85-44-9	3	30.30
Picric Acid	88-89-1	2	1.00
Polychlorinated Biphenyls (PCB) (multiple compounds)	>	3	2.50
Polycyclic Organic Matter [FN4]	>	3	160.00
1,3-Propane Sultone	1120-71-4	3	TBD
b-Propiolactone	57-57-8	3	7.50
Propionaldehyde	123-38-6	1	TBD
Propoxur	114-26-1	3	2.50
Propylene Dichloride	78-87-5	3	1750.00
Propylene Oxide	75-56-9	3	250.00
1,2-Propylenimine	75-55-8	3	23.35
Pyrethrin I	121-21-1	3	25.00
Pyrethrin II	121-29-9	3	25.00
Pyrethrum	8003-34-7	2	50.00
Quinoline	91-22-5	3	TBD
Quinone	106-51-4	3	2.00
Rotenone	83-79-462	2	50.00
Selenium Compounds	>	3	1.00
Sodium Hydroxide [FN5]	1310-73-2	1	50.00
Styrene	100-42-5	1	5325.00
Styrene Oxide	96-09-3	3	TBD
Sulfuric Acid	7664-93-9	2	10.00
Tetrachlorinate Dibenzo-p-dioxins	1746-01-6	3	0.00
1,1,2,2-Tetrachloroethane (Acetylene Tetrachloride)	79-34-5	3	35.00
Tetrachloroethylene (Perchloroethylene)	127-18-4	2	3350.00
Titanium Tetrachloride	7550-45-0	1	2500.00
Toluene	108-88-3	3	2000.00
2,4-Toluenediamine	95-80-7	3	TBD
Toluene Diisocyanate	26471-62-5	2	0.40

Toluene-2,4- diisocyanate	584-84-9	2	0.40
o-Toluidine	95-53-4	3	43.85
Toxaphene	8001-35-2	3	2.50
1,2,4-Trichlorobenzene	120-82-1	2	400.00
1,1,2-Trichloroethane	79-00-5	3	273.00
Trichloroethylene	79-01-6	1	6750.00
2,4,5-Trichlorophenol	95-95-4	3	TBD
2,4,6-Trichlorophenol	88-06-2	3	TBD
Triethylamine	121-44-8	3	207.00
Trifluralin	1582-09-8	3	TBD
2,2,4-Trimethylpentane	540-84-1	1	8750.00
Urethane (Carbamic Acid Ethyl Ester)	51-79-6	2	5000.00
Vinyl Acetate	108-05-4	3	176.00
Vinyl Bromide	593-60-2	3	100.00
Vinyl Chloride	75-01-4	3	50.00
Vinyl Fluoride	75-02-5	2	19.00
Vinylidene chloride	75-35-4	3	99.00
Xylene	1330-20-7	2	4350.00
m-Xylene	108-38-3	2	4350.00
o-Xylene	95-47-6	2	4350.00
p-Xylene	106-42-3	2	4350.00
Xylidine	1300-73-8	3	50.00

[FN\*] For the purpose of this standard, these values shall be rounded to the nearest hundredth of a  $\mu\text{g}/\text{m}^3$ . For example, a test or modeled value of 0.005 through 0.01 would be rounded to 0.01 but values less than 0.005 would be rounded to 0.00.

TBD to be determined

> No CAS number.

# Verified reference concentration(RfC) established by the United States Environmental Protection Agency.

1. XCN where X = H or any other group where a formal dissociation may occur. For example KCN or  $\text{Ca}(\text{CN})_2$ .

2. Includes mono- and di-ethers of ethylene glycol, diethylene glycol and triethylene glycol  $\text{R}-(\text{OCH}_2\text{CH}_2)_n-\text{OR}'$ , where:  
n = 1, 2, or 3

R = alkyl or aryl groups

R' = R, H, or groups which, when removed, yield glycol ethers with the structure:  $\text{R}-(\text{OCH}_2\text{CH}_2)_n-\text{OH}$

Polymers are excluded from the glycol category.

Mono- and di-ethers of ethylene glycol are category 3 air toxics; mono- and di-ethers of diethylene glycol and triethylene glycol are category 1 air toxics.

3. Includes mineral fiber emissions from facilities manufacturing or processing glass, rock, and slag fibers (or other mineral derived fibers) of average diameter 1 micrometer or less.

4. Includes organic compounds with more than one benzene ring and which have a boiling point greater than or equal to 100  $^\circ\text{C}$ .

5. The use of sodium hydroxide in a scrubber for air pollution control purposes is exempt from this standard.

Note: For all listings above that contain the word "compounds" and for glycol ethers the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named element (i.e. antimony, arsenic, etc.) as part of that chemical infrastructure

## **Appendix D**

### **Excerpts from S.C. COR61-107.6: Solid Waste Processing Facilities**

*61-107.6. Solid Waste Management: Solid Waste Processing Facilities.*

*A.1. This regulation establishes the procedures, documentation, and other requirements which must be met for the proper operation and management of all solid waste processing facilities, including the processing activities involving the unrecoverable solid waste at a Materials Recovery Facility. However, this regulation does not apply to Recovered Materials Processing Facilities.*

*A.2. Waste tire processing facilities and composting facilities shall comply with their respective regulations, unless otherwise specified by the Department.*

*B.10. "Materials recovery facility" means a solid waste management facility that provides for the extraction from solid waste of recoverable materials, materials suitable for use as a fuel or soil amendment, or any combination of such materials.*

*B.16. "Recovered materials processing facility" means a facility engaged solely in the recycling, storage, processing, and resale or reuse of recovered materials. The term does not include a solid waste handling facility; however, any solid waste generated by such facility is subject to all applicable laws and regulations relating to the solid waste.*

*B.17. "Solid waste" means any garbage, refuse, or sludge from a waste treatment facility, water supply plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. This term does not include solid or dissolved material in domestic sewage, recovered materials, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to NPDES permits under the Federal Water Pollution Control Act, as amended, or the Pollution Control Act of South Carolina, as amended.... Also excluded from this definition are application of fertilizer and animal manure during normal agricultural operations..., which will not have a significant adverse impact on the environment.*

*B.20. "Solid waste processing facility" means a combination of structures, machinery, or devices utilized to reduce or alter the volume, chemical, or physical characteristics of solid waste through processes, such as baling or shredding, prior to delivery of such waste to a recycling or resource recovery facility or to a solid waste treatment, storage, or disposal facility and excludes collection vehicles.*

*C.4. No permit for construction, or expansion of an existing solid waste processing facility shall be issued until a demonstration of need is submitted to and approved by the Department in accordance with Code Section 44-96-290. This does not apply to industrial facilities managing solid waste generated in the course of normal operations on property under the same ownership or control as the solid waste management facility if the industrial facility is not a commercial solid waste management facility.*

*C.6. A permit shall be required for each site or facility although the Department may include one (1) or more different types of facilities in a single permit if the facilities are collocated on the same site.*

*D. Permit Application Requirements and Design Criteria.*

*1. Prior to construction, modification, or operation of a solid waste processing facility a permit shall be obtained from the Department. The application shall be signed by an engineer duly licensed and registered under the laws of the State of South Carolina.*

*2. Any person wishing to obtain a permit from the Department to operate a solid waste processing facility, shall submit to the Department three (3) copies of the following documents:*

*a. A completed permit application, on a form provided by the Department;*

*b. An engineering report which shall include the following:*

*(1) an overall description of the facility;*

- (2) a description of the process and equipment to be used;
  - (3) a description of the proposed service area;
  - (4) a description of the types and quantities of waste to be processed;
  - (5) a description of the existing site;
  - (6) a description of the security measures, including but not limited to fences, gates, signs; and,
  - (7) the location of disposal or recycling facilities which will accept the processed waste;
- c. Complete construction plans and specifications that at a minimum address the following:
- (1) loading and unloading areas;
  - (2) access roads;
  - (3) processing areas;
  - (4) actual or calculated weight of all solid waste accepted at the facility;
  - (5) storage areas for incoming solid waste; and,
  - (6) a map showing the specific location, land use, and zoning within one-fourth ( 1/4 ) mile of the boundaries of the proposed facility;
- d. All tipping areas shall be located within an enclosed building or covered area and all waste shall be contained in the tipping area.
- e. A design report for the facility which shall provide the technical details and specifications necessary to support the design plans;
- f. A complete description of the personnel training program;
- g. An identification of possible air releases and groundwater and surface water discharges that may occur;
- h. A waste control plan describing the manner in which waste from the processing activities will be managed. The plan shall, at a minimum, address the following:
- (1) ensure that the facility processes only waste specifically authorized by the Department;
  - (2) provide a program to identify, control, separate out, record, and prevent waste not authorized by the Department to be processed at the facility from being accepted at the facility. The plan shall include a description of how these wastes will be handled and disposed if received at the facility and shall include provisions to notify the Department by inclusion in the annual monitoring report of the receipt and disposal of such wastes. No permit will be issued until a waste control plan has been approved by the Department; and,
  - (3) identify the facilities approved by the Department that will receive the processed waste and a certification that such facilities have adequate capacity to manage the processed waste;
- i. A quality assurance and quality control report. The facility owner or operator shall institute a control program (including measures such as signs, monitoring, alternate collection programs, passage of local laws, etc.) to assure that only solid waste authorized by the Department is being processed at the facility;
- j. A written contingency plan. This plan shall set forth operating procedures to be employed during periods of non-operation (e.g. equipment breakdown) which will require standby equipment, extension of operating hours, or diversion of solid waste to other facilities;
- k. A narrative description of the general operating plan for the facility, including the origin, composition and weight or volume of solid waste that is to be processed at the facility, the process to be used at the facility, the daily operational methodology of the process, the loading rate, the proposed capacity of the facility and the expected life of the facility. The plan shall include a descriptive statement of any materials recycling or reclamation activities to be operated in conjunction with the facility on incoming solid waste. The plan shall describe how the facility will meet all applicable regulatory requirements;
- l. An operation and maintenance manual describing how the facility shall be maintained and operated in accordance with the intended use of the facility. Equipment in use at the facility shall be maintained in good working order;
- m. A detailed closure plan which shall identify the steps necessary to close the facility. The plan may be amended at any time during the active life of the facility with Department approval. The plan shall be amended whenever changes in operating plans or facility design affect the closure plan, or whenever there is a change in the expected year of closure;
- n. A description and explanation of any restrictions the facility places on the materials it receives for processing; and,

*o. A demonstration of financial responsibility. The owner or operator of each facility shall establish sufficient financial assurance to ensure satisfactory maintenance, closure, and post-closure of the facility; or to carry out any corrective action which may be required as a condition of a permit. Consideration shall be given to mechanisms which would provide flexibility to the owner or operator in meeting its financial obligations. The owner or operator shall be allowed to use combined financial responsibility mechanisms for a single facility and shall be allowed to use combined financial responsibility mechanisms for multiple facilities, utilizing actuarially sound risk-spreading techniques.*

*COR 61-107.6.F. Operations Criteria [for Solid Waste Processing Facilities]*

*A solid waste processing facility shall be designed and operated according to the minimum criteria listed in this section.*

- 1. Access Controls. The operator shall restrict the presence of, and shall minimize the possibility of any unauthorized entry onto the facility site. A statement of the days and hours of operation shall be posted at the entrance of the facility and access, except for Department and/or emergency personnel, shall be limited to those times when authorized personnel are on duty.*
- 2. Reporting and Record Keeping Requirements. All facilities shall:*
  - a. Notify the Department's District Director, in the district in which the facility is located, if an unscheduled total facility shutdown exceeds twenty-four (24) hours;*
  - b. Prepare and submit to the Department an annual report in a form provided by or acceptable to the Department by October 15, for the previous fiscal year; and,*
  - c. Maintain a copy of all required reports at the facility for a period not less than five (5) years, and make these reports available to Department personnel upon request.*
- 3. Receipt and Handling of Solid Waste.*
  - a. The facility is authorized to process only solid waste specified by Department permit. The weight and/or volume of all solid waste processed at the facility shall be recorded and incorporated into the annual report.*
  - b. All delivered solid waste shall be processed and contained at a facility designed in a way to minimize the effects of weather, wind, and precipitation. External storage of putrescible solid waste is prohibited. No putrescible waste shall remain at the site at the end of each working day unless it is stored in a manner to promote vector control. Solid waste identified as nonputrescible recyclables or oversized, bulky, or untreatable solid waste may be temporarily stored outside, on the premises for a period not to exceed one (1) week unless an extension is requested and approved by the Department. Any solid waste that is stockpiled or remains in storage shall be maintained so as to not create a nuisance or a sanitary or environmental problem. Litter, odors, rats, insects, flies, mosquitos, and other vectors shall be prevented and controlled at the facility.*
  - c. The tipping areas shall be constructed of low permeability materials (e.g. concrete, asphalt), provided with a water supply for cleaning purposes, and equipped with drains, pumps, or equivalent means to facilitate the removal of water for proper disposal.*
  - d. The transfer structures, buildings, and ramps shall be constructed of materials that can be easily cleaned.*
  - e. Leachate and washwater from a solid waste processing facility shall not be allowed to drain or discharge into waters of the State unless an effluent disposal permit (e.g. land application, or NPDES) is approved by the Department.*
  - f. Solid waste processing facilities shall comply with all applicable Federal, State, and local air quality standards.*
  - g. The processing facility shall arrange for delivery of any residual or other waste resulting from the processing to a disposal facility which is:*
    - (1) permitted by the Department if located in South Carolina; or,*
    - (2) permitted by the appropriate environmental regulatory agency if located in another state.*
- 4. Process changes. The owner or operator shall receive approval from the Department in writing of all process changes before they are implemented. Process changes such as those made to increase the recovery of recyclable materials do not require approval. Permit modifications shall be required as deemed necessary by the Department.*
- 5. Emergency preparedness. In addition to requirements set forth in the contingency plan, all processing facilities shall at a minimum:*

- a. Provide adequate aisle space to allow for emergency equipment;*
- b. Be equipped with the following:*
  - (1) an internal communications system capable of providing immediate emergency instruction to facility personnel and an alarm system to notify facility personnel of an emergency condition;*
  - (2) a device, such as a telephone (immediately available at the scene of operations) or a hand-held two-way radio, capable of summoning emergency assistance from local police departments, fire departments, and State or local emergency response teams;*
  - (3) portable fire extinguishers, fire control equipment and spill control equipment; and,*
  - (4) water available at adequate volume and pressure to supply water hose streams, automatic sprinklers, or water spray systems;*
- c. Test and maintain as necessary to assure its proper operation, all facility emergency equipment including, but not limited to, communications or alarm systems, fire protection equipment, spill control equipment, and personal safety equipment;*
- d. Provide immediate access for all personnel involved in the facility operation to an internal alarm or emergency communication device; and,*
- e. Provide for an emergency coordinator.*
- 6. Guidelines for identifying items or materials that may not be accepted for processing. The guidelines shall ensure that the facility accepts and processes only waste specifically authorized by the Department to be processed at the facility.*
- 7. Trained personnel shall be present at all times during the operation of the facility.*

*61-107.6.L. A permit issued pursuant to this regulation shall be effective for the design and operational life of the facility, to be determined by the Department. At least once every five (5) years, the Department will review the environmental compliance history of each permitted solid waste processing facility.*

## **Appendix E**

### **Necessary Project Permitting Application Forms**

NPDES Form 1  
NPDES Form 2D  
NPDES Form 2F  
(Spartanburg Wastewater System Industrial User Application)