

**Taylor Recycling Facility Pre-Development of Montgomery Site for
Biomass Energy Generation**
Final Report

Prepared for

**The New York State
Energy Research and Development Authority**
Albany, New York
Contract 8997

Prepared by

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ABSTRACT

The work performed under this contract with NYSERDA broke the project into three distinct parts A-B-C. The A designated the sorting separating and processing of incoming material extracting the biomass element. Part B is the biomass gasification and Part C was designated to entail the electric power generation system.

The project was qualified under the New York State Renewable Portfolio Standard (RPS) for sorted and separated biomass from various sources of fuel such as Construction and Demolition (C&D) material as well as Mixed Solid Waste (MSW). Qualification requires sorting and separating along with gasification with emissions that are less than or equal to unadulterated biomass.

It has been determined that a 250,000 resident population center, Orange County New York as used in this assessment, will generally support a 300 dry ton per day gasification system producing electric supply that will support 25,000 homes. With these parameters and current tipping fees such an installation will produce positive returns.

Taylor has developed a site plan design, which meets the requirements for this type of process. The design includes site work, buildings, a new traffic pattern, and equipment arrangements on the site. This design has been submitted to the Town of Montgomery and updated as a result of this continuing review by the Town.

A SEQR application has been prepared and discussed with the New York Department of Environmental Conservation. The application includes, land use and zoning, a traffic study, geology and topography, wet lands and ecology, storm water management, project

construction, municipal services, historical and archeological resources, air quality and noise, etc.

Taylor has initiated all preliminary applications for the biomass and energy processes. These permits in addition to SEQR with the Town of Montgomery, NYDEC, and the New York Independent System Operator include site plan special use, storm water, water quality, solid waste, air quality, and power transmission interconnection etc.

As part of this effort Taylor has been available to meet with interested parties and has made presentations on site as well as off site. These presentations consisted of a review of the gasification technology and the integration of this technology into the sorting, separating, recycling and disposal of solid waste, reduction in green house gases and combined cycle power generation.

Taylor has made preparations throughout the development of this project to provide information updates to NYSERDA's project manager and interested parties. During the next 5 years Taylor will provide NYSERDA with annual operation and construction information on the gasification system, sorting and separating facilities, and power production. This information shall include the quantity of the biomass sorted and separated, the amount of fossil energy displaced and an estimate of the resultant gas and emission reductions achieved.

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Attachments

Attachment

- I. Full Environmental Assessment Form
- II. Draft Scoping Document
- III. Draft Environmental Impact Statement

SUMMARY

The project consists of three parts labeled A-B-C. The A Part consists of handling of incoming materials. In addition to removing all hazardous wastes, there is sorting, and separating of this material to extract recyclables such as metals and unadulterated papers. The remaining after initial extraction of hazardous and recyclable materials is biomass suitable for gasification.

Part B consists of a gasifier designed to handle 300 dry tons per day of biomass coming from the initial sorting and separating process. The gasifier is comprised of two circulating fluidized bed reactors with similar dimensions. The reactors have a heat transfer material circulating between them. In the presence of this heated material the biomass releases a volatile fuel synthesis gas consisting predominately of hydrogen, carbon monoxide, carbon dioxide, methane, and ethane. Upon release of the synthesis gas from the biomass the remaining char is used to reheat the heat transfer material.

The synthesis gas produced in Part B is directly used in Part C a combined cycle electric generating plant after gas cleaning to remove low level condensable tars. The net output of the facility is exported to the bulk transmission system and sold through the competitive market-place administered by the New York Independent System Operator.

The Taylor Recycling Facility has a long history of utilizing construction and demolition (C&D) materials as well as waste woods to produce other manufactured recycled products such as mulch, alternate daily cover, and soil substitutes. Taylor has studied the market-place for additional sources of biomass other than C&D and has concluded in these studies that the refuge from a population center of 250,000 people could support the biomass required to supply a 300 dry ton per day facility. The waste in the Orange County New York area has been analyzed and characterized as to hazardous material and energy content. This type of waste provides an excellent source of biomass that after sorting and separating may be used directly as a source of fuel.

The studies have also concluded that the waste can be acquired based upon a positive tipping fee, which allows for partial cost off-set of operations and the processing, gasification, and power equipment installed. The remaining off-sets come from revenues generated by the sale of recyclables and power output.

Taylor has developed a site plan design, which meets the requirements for this type of process. The design includes keeping the processing and operations within buildings. The traffic patterns are established so that vehicle backing has been minimized. The site will also have an observation location to facilitate visitors coming and observing the operations being conducted. In actuality the most substantial requirements for the site are for the processing and handling of the materials coming in. The area required for gasification and power island is 20% of the total area required for the project at

Montgomery. This design has been submitted to the Town of Montgomery and updated as a result of the continuing review by the Town.

A SEQR application has been prepared and discussed with the New York Department of Environmental Conservation (DEC). The application includes, land use and zoning, a traffic study, geology and topography, wet lands and ecology, storm water management, project construction, municipal services, historical and archeological resources, air and noise quality, etc. Taylor's first meeting with the DEC established an ongoing dialog about the application as it developed. The DEC indicated that it was preferable to be briefed upon developments as opposed to receiving a completed application. This allowed adjustment to be made along the way avoiding major changes that might be required if a completed application was received in its entirety. This ongoing dialog with the DEC also includes the solid waste permit and the air quality permit.

Taylor has initiated all preliminary applications for the biomass and energy processes. These permits in addition to SEQR with the Town of Montgomery, NYDEC, and the New York Independent System Operator include site plan special use, storm water, water quality, solid waste, air quality, and power transmission interconnection etc.

As part of this effort Taylor has been available to meet with interested parties and has made presentations on site as well as off site. These presentations consisted of a review of the gasification technology and the integration of this technology into the disposal of solid waste, reduction in green house gases and combined cycle power generation. These meetings have also provided a learning experience for the Taylor organization. Taylor in the process has developed a better understanding of the regulatory environment under which the project must proceed and the availability and use of various technologies that are part of the project.

Taylor has made preparations throughout the development of this project to provide information updates to NYSERDA's project manager and interested parties. During the next 5 years Taylor will send NYSERDA annual operation and construction information on the gasification system, sorting and separating facilities, and power production. This information shall include the quantity of the biomass sorted and separated, the amount of fossil energy displaced and an estimate of the resultant gas and emission reductions achieved.