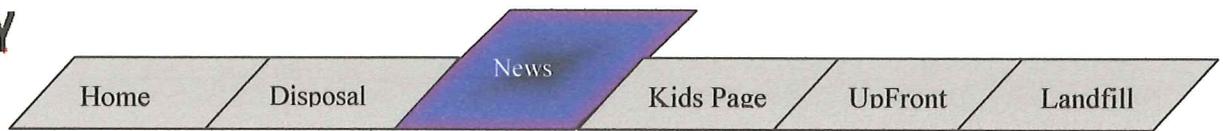


# Waste-to-Energy Facility



## Air Pollution Control (APC)

The Polk County Waste-to-Energy Plant in Fosston is proceeding with an air pollution control retrofit project designed to meet revised air emission rules and regulations. This is a multi-phase effort with the first two phases now complete and the third phase in progress. *Read More below...*

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### Polk County Solid Waste Rotary Presentation March 6, 2002

#### Why a Retrofit Project?

Clean Air Act – EPA guidelines – MPCA Rules.

Revised air quality rules and regulations have recently been released by the EPA for small waste combustors, and are based on requirements of the Clean Air Act. These rules are technology based – not derived from any health risk assessment.

Rules for the small facilities are developed with the intent that plants with electrostatic precipitators can maintain those units in service and meet the new rules.

#### What has changed?

The new rules will add emission limits for lead, cadmium, HCL, and SO<sub>2</sub>, and lower current emission limits for mercury, dioxin/furans, and particulate. Specific record keeping and reporting was also added as well as a requirement for continuous monitoring of sulfur dioxide. Anticipating a retrofit project,

Polk submitted and received a Grant from the OEA in 1996 for \$1,425,000 towards a \$2,950,000 project.

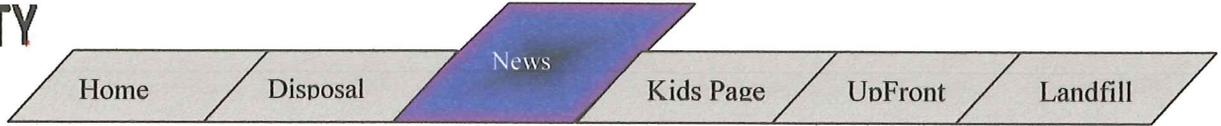
Last year Polk issued a request for proposals to retrofit the plant to meet these new rules. Responses were \$2.0 - \$3.0 million without a building addition. These proposals reflected use of best available control technology – BACT, and proposed to add a scrubber and baghouse to replace the ESP's. The vendors chose this approach because they also had to provide guarantees. This equipment does produce the lowest emission numbers but is also the most expensive for capital costs, and ongoing O & M costs.

#### So where do we go from here?

Polk has performed several stack tests to determine baseline emission rates for all of the pollutants controlled by these rules. From these we have identified the following items that need to be controlled and a possible solution.



# Waste-to-Energy Facility



**Problem**

**Solutions**

Metals -	Now within limits but can be reduced further with the addition of powdered activated carbon (PAC).
Dioxin/furans -	Need to lower the flue gas temp and add PAC.
Acid gas -	Spray inject a dry reagent such as lime or sodium bicarbonate into the flue gas and remove it in the electrostatic precipitators. A building addition is required.
Particulate -	Upgrade the electrostatic precipitators.
SO <sub>2</sub> -	Purchase and install a SO <sub>2</sub> continuous monitor to determine reagent dosage.
Records & reporting-	Procure a data acquisition system.

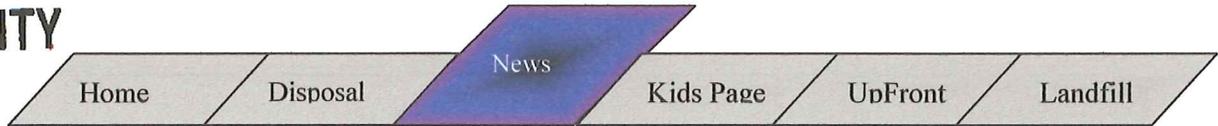
**Decision time:**

Polk has decided to proceed in a phased manner to bring the plant into compliance while incurring significantly less capital dollars and lower ongoing O & M expenses. This does mean that Polk will accept all of the risk.

- Phase I - Add a data acquisition system for reporting and record keeping.
- Phase II - Upgrade to the electrostatic precipitators and perform several stack tests
- Phase III
  - Purchase and install economizers
  - Construct a building addition
  - Purchase and install reagent injection equipment and a reaction chamber
  - Add a sulfur dioxide monitor
  - Perform stack tests
- Phase IV - Add a polisher baghouse to each unit, or remove the electrostatic precipitators and install baghouses. The building addition includes space for the polisher baghouses.



# Waste-to-Energy Facility



## Project Costs:

	<u>Polk</u>	<u>Grant</u>	<u>Total</u>
Phase I & II	\$194,500	\$185,500	\$ 380,000
Phase III	\$665,000	\$605,000	\$1,270,000
Sub-total	<u>\$859,500</u>	<u>\$790,500</u>	<u>\$1,650,000</u>
Phase IV	\$600,000	\$450,000	\$1,050,000
Grand Total	<u>\$1,459,500</u>	<u>\$1,240,500</u>	<u>\$2,700,000</u>

## Timing:

The plant must be in compliance by June 6, 2003. This includes installation and startup of all retrofit equipment, and compliance stack testing.

## How to fund the project:

Favorable operations have allowed Polk to fund Phase I & II out of reserves. In December 2002, Polk will make the last house payment on the incinerator and the materials recovery facility. However the contracts with the four counties do not end until August 15, 2003. By maintaining the tip fee at the current rate of \$70.00 per ton through the end of the contracts, Polk will accumulate over \$450,000 in reserves that otherwise would have been set aside for debt service. These dollars plus some additional monies currently in reserves will allow funding of the project through Phase III. If Phase IV is required it may be necessary to seek other funding options.

## Contracts:

Polk has now entered into new waste supply contracts with the four partner counties of Beltrami, Clearwater, Mahanomen, and Norman that will extend through December 31, 2008. Without any additional debt service Polk is projecting a reduction in the tip fee from \$70.00 to \$55.00 per ton beginning August 16, 2003 for the extent of the waste supply contracts. The fee could increase to \$59.00 per ton if Phase IV is necessary. The four partner counties are in agreement with this plan.

Air Pollution Control (APC)  
Part II

## Air Pollution Control Retrofit Project Polk County Waste-to-Energy Plant

The Polk County Waste-to-Energy Plant in Fosston is proceeding with an air pollution control retrofit project designed to meet revised air emission rules and regulations. This is a multi-phase effort with the first two phases now complete and the third phase in progress. A fourth and final phase may or may not be necessary.

The phases now completed consisted of data acquisition equipment for new recording and reporting requirements, and stack testing to establish base levels for various pollutants affected by the revised rules. The electrostatic precipitators have been upgraded to new technology controls and modified electrodes to improve overall particulate collection efficiency.

Phase three consists of incorporating economizers into the flue gas stream to reduce the temperature of the flue gas for control of dioxin/furans, and dry sorbent injection equipment to control acid gas emission levels. A building addition is required (4,000 sq ft) to provide space for the new equipment as well as future space for the last phase.

Economizers have been purchased through Victory Energy, manufactured by E-Tech of Tulsa, OK, and were installed by Wrigley Mechanical of Fargo. The breeching (duct work) from the economizer outlet to the electrostatic precipitators has been extended to allow sufficient retention time for the sorbent to react and neutralize acid content in the flue gas. Downtime for the economizer and breeching installation was about one week for each unit. Considering the amount of work required this was excellent. Both economizers are working properly and as designed. An added benefit from the economizers is that steam flows have been increased by about 500 to 1000 pounds per hour from each boiler.

The building addition is under contract to Mark II of Fosston, and to date footings and foundation walls have been poured and backfilled. The building has been subcontracted to Sand Buildings of Emarado, ND, and the steel is on site.

Building erection is scheduled to begin the week of August 12<sup>th</sup>. The mechanical contract was awarded to Lee Plumbing and Heating of Thief River Falls and all underground piping is complete. The under floor heating has been installed and the floor was poured the week of August 5<sup>th</sup>. Electrical work is being handled by Al's Electric of Lengby, and rough-ins for this work is complete. Widseth Smith Nolting (Bemidji office) handled the engineering design work for the building addition.

Two vendors have submitted proposals for the dry sorbent injection equipment and a decision for the procurement is pending evaluation. A stack test will be performed the week of August 19<sup>th</sup> to measure compliance with dioxin/furan emissions. The lower flue gas temperatures afforded by the economizers should reduce dioxin/furan levels substantially.

All work is proceeding satisfactorily with only slight delays due to inclement weather and material deliveries. The building addition including offices, and the dry sorbent injection equipment should be installed and completed by the end of this year. The proposed deadline to be in compliance with the revised air rules is December 31, 2003. This allows sufficient time to evaluate the new equipment through stack testing, and to determine if the fourth phase of the project is necessary. The fourth phase plans the installation of a polisher baghouse after the electrostatic precipitators on each unit as a final pollution control device. Sufficient space for these units is included in the new building addition