

Metro Plant Solids Management

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Facilities cut fuel use, costs and emissions

For years to come, the Twin Cities metropolitan area will reap the benefits of a \$160 million project at the Metro Wastewater Treatment Plant in St. Paul that reduces pollutant emissions, cuts fuel consumption and lowers operating costs.

The facilities, which began initial operations in late 2004, improve the way wastewater solids, or sludge, are processed at the giant plant.

The project was planned and developed by Metropolitan Council Environmental Services (MCES), a division of the Metropolitan Council.

What's new

The new Solids Management Building includes:

- **Three fluid-bed incinerators** that replace an aging and outdated system of six multiple-hearth incinerators.
- **Energy recovery and pollution control systems** that operate much more efficiently and effectively than previous systems.
- **New solids-dewatering equipment** that operates with reduced odors.

More efficient incinerators

• **Less natural gas consumed to burn the solids.** The new process uses about 80 percent less natural gas than the old incinerators. Based on natural gas price estimates in late 2005, this will mean a savings of about \$3 million a year.

Solids are burned in a single chamber at 1,400 degrees F. Once that temperature is reached, the incinerators keep burning on the heat value contained in the solids. There's no need to stoke it with more natural gas.

• **Significantly more heat recovered and electricity generated for plant's needs.** More heat from the combustion process means more steam production for winter heating and electrical generation produced by the plant's turbine generator.

The generator can produce up to five megawatts of electricity. Daily production averages about three megawatts, enough to meet about 20 percent of the plant's power demand and save \$500,000 to \$600,000 annually in avoided electricity costs. Three megawatts of electricity would be enough to power about 1,000 homes.

• **A more stable process.** The new combustion system is simpler and, as a result, more stable and efficient.

• **Reduced labor costs.** The highly automated process will reduce labor costs.

Less air pollution

Enhanced air pollution control equipment removes greater amounts of such pollutants as particulates, metals (including mercury), carbon monoxide, and nitrogen and sulfur oxides. The equipment is performing as expected, **achieving upward of 90 percent reduction** from 2004 emission levels for each of these pollutants.

Reduced odors

Before the sludge can be incinerated, its water content must be reduced from 95 percent to 70 percent – giving it the consistency of damp soil.

To accomplish this, four new high-speed centrifuges were added to the three existing centrifuges. This allowed the plant to discontinue a second and quite odorous dewatering process.

Odors are better contained in the centrifuges, and then neutralized through chemical and biological processes.

Planning process ensured success

The new Solids Management Building was nearly a decade in the making. MCES began master planning for the Metro Plant in the mid-1990s and identified the need to replace the aging and increasingly inefficient incinerators.

After an extensive analysis of a variety of solids processing technologies, the Council chose the fluid-bed incinerator option in 1998.

Following further planning and detailed design, three years of construction commenced in fall 2001.

Partners in success

Major companies involved in the project included:

- Von Roll Inc. – design/build contractor
- CH2MHILL – overall project designer
- Knutson Construction Services – general contractor
- Shank Constructors Inc. and Harris Mechanical – mechanical contractors
- Premier Electric – electrical contractor

Low-rate financing was obtained from the State of Minnesota’s Public Facilities Authority (PFA).

Two local equipment manufacturers played a key role in developing improvements to the solids-handling process.

Schwing America Inc. of White Bear Township modified its cement pumping system used at construction sites to one that can convey sludge at the plant.

The modifications enable pumping of the dewatered sludge through enclosed pipes to the incinerators, reducing odors that used to come from open-air conveyor belts.

Dynamic Air Inc. of Vadnais Heights developed a fully enclosed system for conveying ash from the incinerators to the storage facilities. The result is improved building air quality and better process reliability.

The biggest plant

The plant is the largest of eight wastewater treatment plants that the Council operates for the Twin Cities area.

In 2006, it treated an average of 185 million gallons of wastewater each day. That amounts to about three-fourths of the region’s daily total and would be enough to fill the Metrodome in less than two days.

The solids in the wastewater amount to about 220 tons per day – enough to fill about 10 railroad boxcars.

For more information

- To learn more:
 - Visit www.metrocouncil.org/environment/environment.htm.
 - Or call 651-602-1005.
- Related fact sheets
 - [Environmental Services](#)
 - [Wastewater Services](#)
 - [Water Resources](#)

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