

PROJECT SUMMARY

I. Introduction

A construction permit application has been submitted by North Shore Sanitary District (NSSD) to build a sewage sludge processing facility in Zion, Illinois. The construction permit will have federally enforceable limitations on the emission units. These limits would prevent the facility from triggering 35 IAC 203, Major Stationary Sources Construction and Modification (MSSCAM) and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The proposed limits would be accompanied by testing, monitoring, recordkeeping, and reporting requirements.

II. Source Description

Handling Process

Wet sludge from the North Shore Sanitary District's Waukegan, Clavey Road, and Gurnee sewage treatment plants will be delivered by truck and dumped into one of two receiving pits within an enclosed building. The wet sludge will be conveyed from the pits to one of two wet sludge silos for storage until processing. Both the sludge receiving room and the wet sludge silo vents will be routed to the facility's odor control system (two stage packed tower scrubbers).

Drying Process

The sludge dryer is designed to yield a dried granulate of approximately 5% moisture. The dryer is heated indirectly, via a hot oil heat recovery loop from the melter. The dryer exhaust will be routed through a condenser and vented into the dry granulate silo. Dry granulate will be conveyed from the dryer, through a cooler, to a silo. The dry granulate silo will be vented to the odor control scrubbers.

Melter Process

Dry granulate is taken from the dry granulate silo, through a surge hopper, and introduced into the melter. Oxygen is supplied from an electrically driven air separation unit to support combustion. The approach of using oxygen versus air to support combustion reduces nitrogen oxides (NO_x) emissions because the nitrogen (otherwise in air) is not present. In the melter, the combustible fraction of the dry granulate burns, while the mineral portion forms molten glass. The glass flows through a drain port where it drops into a quench tank, forming a glass aggregate product. The melter exhaust gas passes through a heat exchanger where recovered energy heats the oil transfer fluid that is used to heat the sludge dryer. After the heat recovery unit, the exhaust passes through an initial filter and scrubber. The exhaust flow is then split with most of the flow recirculated to the melter. The remainder of the gas flow passes through a final particulate filter/fixed bed activated carbon filter (mercury adsorption system) and then vented to atmosphere. Spent carbon from the activated carbon filter will be sent for recycling or land disposal.

Auxiliary Heater

A 20 million Btu/hr natural gas-fired auxiliary heater will be used for unit start-up and back-up if the melter is not in operation. The heater will be equipped with a low-NO_x burner.

III. Emissions

The proposed facility will be a source of emissions due to potential of loss during the handling and processing of sewage sludge and from combustion of dried granulate and natural gas. The following emission limits are in the draft permit:

- Emissions of volatile organic material (VOM), particulate matter (PM), nitrogen oxides (NO_x), carbon monoxide (CO), and sulfur dioxide (SO₂) as follows:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Lb/Hr)</u>	<u>(Ton/Yr)</u>
VOM	0.28	1.25
PM	0.51	2.25
NO _x	19.54	85.61
CO	0.49	2.15
SO ₂	7.58	33.22

- Emissions of mercury from the melting process as follows: 0.0066 lb/ton dried sludge and 1.77 pounds/year.
- Emissions from the auxiliary heater as follows:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Lb/Hr)</u>	<u>(Ton/Yr)</u>
VOM	0.11	0.48
PM	0.15	0.67
NO _x	2.00	8.76
CO	1.68	7.36
SO ₂	0.01	0.05

- Emissions from the sludge receiving and storage area (bins, silos) and the drying process (sludge dryer, double cyclone, condensers, dry granulate silo, truck loadout) all controlled by two stage packed tower scrubbers as follows:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Lb/Hr)</u>	<u>(Ton/Yr)</u>
VOM	1.65	7.22
PM	0.30	1.30
NO _x	0.16	0.72
CO	0.40	1.73

IV. Applicable Emission Standards

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The Board has standards for sources of nitrogen oxides, carbon monoxide, volatile organic material,

particulate matter and sulfur dioxide. The application indicates that the proposed facility readily complies with all applicable Board standards.

The proposed facility would also be subject to various USEPA regulations, including the federal New Source Performance Standards for sewage sludge incinerators, 40 CFR Part 60 Subpart O, and the federal National Emission Standards for Hazardous Air Pollutants for Mercury, 40 CFR Part 61, Subpart E. The application indicates that the facility will comply with these standards.

V. Regulatory Programs

As proposed by the NSSD, this facility would not be subject to regulating programs that apply to major sources of emissions. In this regard, the NSSD has proposed measures so that the VOM emissions of the facility would be less than 25 tons/year, so that it would not be subject to 35 IAC Part 203, Major Stationary Sources Construction and Modification (MSSCM). Emissions of other pollutants are also controlled so that the facility would not be a major new source for purposes of 40 CFR 52.21, Prevention of Significant Deterioration (PSD).

The facility also would not be a pollution control facility, subject to local siting approval under Section 39.2 of the Environmental Protection Act. This is because the sewage sludge processed at the facility would be generated at the NSSD's existing treatment plants.

VI. Proposed Permit

The conditions of the permit would contain limitations and requirements that are intended to assure that this facility will not trigger the requirements of MSSCAM and PSD. The permit sets limitations on production rates for the sludge dryer and melter and emissions of nitrogen oxides, carbon monoxide, volatile organic material, particulate matter and sulfur dioxide. The permit conditions also establish appropriate compliance procedures, including testing requirements, operational monitoring requirements, recordkeeping requirements, and reporting requirements. The Permittee must carry out these procedures on an on-going basis to demonstrate that the facility is operating within the limitations set by the permit and it is properly controlling emissions.

VII. Request for Comments

It is the Illinois EPA's preliminary determination that the application for the proposed facility meets all applicable state and federal air pollution control requirements, subject to the conditions proposed in the draft permit. The Illinois EPA is therefore proposing to issue a permit for this project.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit.