February 2, 2001

TO INTERESTED PARTIES:

RE: Metropolitan Wastewater Treatment Plant Solids Processing Improvements

Enclosed is the Environmental Assessment Worksheet (EAW) for the proposed Metropolitan Wastewater Treatment Plant Solids Processing Improvements, Ramsey County. The Metropolitan Wastewater Treatment Plant, located in St. Paul on the Mississippi River, is owned and operated by the Metropolitan Council. Wastewater solids (sewage sludge) are presently incinerated in six multiple hearth incinerators (MHIs). The proposed project will replace the MHIs with three fluid bed incinerators and an alkaline stabilization system that will produce biosolids for agricultural utilization. The EAW was prepared by the Minnesota Pollution Control Agency (MPCA) and is being distributed for a 30-day review and comment period pursuant to the Environmental Quality Board (EQB) rules. The comment period will begin the day the EAW availability notice is published in the EQB Monitor, which will likely occur in the February 5, 2001, issue.

Comments received on the EAW will be used by the MPCA in evaluating the potential for significant environmental effects from this project and deciding on the need for an Environmental Impact Statement (EIS).

A final decision on the need for an EIS will be made by the MPCA Commissioner after the end of the comment period. If a request for an EIS is received during the comment period, or if the Commissioner recommends the preparation of an EIS, the nine-member MPCA Citizens' Board (Board) will make the final decision. The final EIS need decision will also be made by the Board if so requested by the project proposer, other interested parties or MPCA staff and if this request is agreed to by one or more members of the Board or the MPCA Commissioner. The Board meets once a month, usually the fourth Tuesday of each month, at the MPCA office in St. Paul. Meetings are open to the public and interested persons may offer testimony on Board agenda items. A listing of Board members is available on request by calling (651) 296-7306.

Please note that comment letters submitted to the MPCA do become public documents and will be part of the official public record for this project.

If you have any questions on the EAW, please contact Eric Kilberg of my staff at (651) 296-8643.

Sincerely,

Beth G. Lockwood
District Planning Supervisor
Operations and Planning Sections
North, South, and Metro Districts

BGL:gs

Enclosure

ENVIRONMENTAL ASSESSMENT WORKSHEET

Note to reviewers: The Environmental Assessment Worksheet (EAW) provides information about a project that may have the potential for significant environmental effects. This EAW was prepared by the Minnesota Pollution Control Agency (MPCA), acting as the Responsible Governmental Unit (RGU), to determine whether an Environmental Impact Statement (EIS) should be prepared. The project proposer supplied reasonably accessible data for, but did not complete the final worksheet. Comments on the EAW must be submitted to the MPCA during the 30-day comment period which begins with notice of the availability of the EAW in the *Minnesota Environmental Quality Board (EQB) Monitor*. Comments on the EAW should address the accuracy and completeness of information, potential impacts that warrant further investigation, and the need for an EIS. A copy of the EAW may be obtained from the MPCA by calling (651) 296-7398. An electronic version of the completed EAW is available at the MPCA Web site www.pca.state.mn.us/news/eaw/index.html#open-eaw.

1. PROJECT TITLE Metropolitan Wastewater Treatment Plant Solids Processing Improvements

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4. REASON FOR EAW PREPARATION

_________ **EIS Scoping** _______ **Mandatory EAW** ____ **Citizen Petition**
_________ **RGU Discretion** ___X___ **Proposer Volunteered**

If EAW or EIS is mandatory give EQB rule category number(s)

5. PROJECT LOCATION
East ½ of the SW ¼-NW ¼ of Section 10
Township 28 North **Range** 22 West
County Ramsey **City/Twp.** St. Paul

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6. DESCRIPTION

a. Provide a project summary of 50 words or less to be published in the EQB Monitor.

The Metropolitan Wastewater Treatment Plant, located in St. Paul on the Mississippi River, is owned and operated by the Metropolitan Council. Wastewater solids (sewage sludge) are presently incinerated in six multiple hearth incinerators (MHIs). The proposed project will replace the MHIs with three fluid bed incinerators (FBIs) and an alkaline stabilization system that will produce biosolids for agricultural utilization.

b. Give a complete description of the proposed project and related new construction. Emphasize construction and operation methods and features that will cause physical manipulation of the environment or produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

6.b.1 Project Description

The project location is the Metropolitan Wastewater Treatment Plant (Metro Plant), an advanced secondary wastewater treatment plant (WWTP), located on the east bank of the Mississippi River, approximately three miles south of downtown St. Paul at river mile 836 (Figures 1 through 3). The plant is owned by the Metropolitan Council and is operated by the its Environmental Services Division (MCES). The Metro Plant began treating wastewater and incinerating dewatered sewage solids (sludges) in 1938. By 1984, the Metro Plant had become the largest advanced WWTP on the Mississippi River. In 1997, the annual average daily flow treated at the plant was 225 million gallons per day (mgd). By the year 2005, this flow is projected to be 234 mgd, and by the end of the planning year (2025) the flow to the plant is projected to be 261 mgd. The corresponding solids quantities to be processed are 265 dry tons per day of sludge in 2005 and 299 dry tons per day of sludge in 2025. Treatment capability is maintained during times of flood by a levee and floodwall that protect the Metro Plant treatment processes area.

The proposed Solids Processing Improvements Project (Solids Project) consists of the development of a new solids processing facility to replace the solids processes currently in use at the Metro Plant. The MCES proposes to replace six outdated MHIs with three fluid bed sludge incinerators, state-of-the-art air pollution control systems and an alkaline stabilization system that will produce biosolids for agricultural utilization. This proposal was reached by the MCES following lengthy study with input from interested citizens. The Solids Project will replace equipment that is reaching the end of its useful life, meet future capacity requirements, and decrease odors and the emission of air pollutants. Once implemented in 2005, the Solids Project will reduce incinerator particulate emissions by approximately 60 to70 percent from levels currently emitted at the Metro Plant. Significant reductions will also be achieved in emissions of greenhouse gases, mercury, ozone precursors, and carbon monoxide. The Solids Project site is located in the northeastern portion of the Metro Plant inside of the existing levee and floodwall system (Figures 4 and 5). The Solids Project will include centrifuges to dewater thickened primary and waste activated sludge, and dilute primary scum. Two buildings, a Solids Management Building and, if biosolids are to be stored on site, a Biosolids Storage Building will be constructed (Figure 5). Five new storage silos and three new storage tanks will be added. In addition to new construction, improvements to existing facilities will include aeration modifications to the sludge storage tanks and new sludge transfer pumps. Plant utilities including electricity, water, sanitary sewer, telecommunications, and steam lines will be extended to the facility and the existing maintenance tunnel system will be modified and extended. Existing ash storage silos will be modified to provide alkaline material storage, or incinerator ash storage.

6.b.2 Project Background

Solids management at the Metro Plant has been based on incineration since the original facilities were built in 1938. These original facilities consisted of chemical conditioning with lime and ferric chloride, dewatering with vacuum filters, and incineration in four MHIs. The plant expansion and upgrade to secondary treatment in the 1960s included the expansion of the solids system to handle waste activated sludge. The expansion also included gravity thickeners and sludge holding tanks. In the 1960s, four new MHIs were constructed to replace the original 1938 incinerators. Capital projects in the early/late 1970s and 1980s provided thermal sludge conditioning (Zimpro™), two new MHIs, rehabilitation of the 1960s incinerators, and new sludge dewatering equipment.

The Metro Plant Master Plan (Camp Dresser McKee, December 1996) summarizes an evaluation of projected wastewater quantities and projected residual solids quantities to the year 2040, and the capacity and condition of existing solids processing facilities. That evaluation concluded that the existing solids processing facilities had adequate treatment capacity, but that the remaining useful life of the facilities was approximately ten years, with increasingly greater maintenance costs. Implementation of a new solids processing facility by the year 2005 was a priority recommendation in the Master Plan.

Twelve solids processing alternatives were evaluated in the Metro Plant Master Plan and included variations of the following five conventional solids management technologies:

- Alkaline stabilization,
- Anaerobic digestion,
- Composting,
- Fluid bed incineration, and
- Heat drying.

Based on Master Plan work, two alternative technologies for the management of solids were selected for additional evaluation: fluid bed incineration and heat drying. Following the initial evaluation between fluid bed incineration and heat drying (CH2MHill, January 1998), analyses were also conducted for anaerobic digestion and alkaline stabilization. In total, six alternative treatment systems were developed and evaluated.

- **Alternative 1 -** Four Fluidized Bed Incinerators.
- **Alternative 2 -** Three FBIs combined with alkaline stabilization for peak and downtime loading. (selected alternative)
- **Alternative 3 -** Heat drying to produce a low nitrogen product combined with alkaline stabilization for peak and downtime loading.
- **Alternative 4 -** Heat drying to produce a high nitrogen, high quality product with anaerobic digestion of excess primary solids.
- **Alternative 5 -** Anaerobic digestion with cake storage.
- **Alternative 6 -** Alkaline stabilization.

Both non-monetary and monetary criteria, as well as, extensive public outreach input were considered in these evaluations. Non-monetary criteria included: air emissions (Clean Air Act requirements, mercury reduction, and greenhouse gases), odors, residuals (recycling organics to land), energy use (reliance on fossil fuels), staffing requirements, public acceptance, and risk. Monetary criteria included capital and operating cost, and total life cycle cost. Both monetary and non-monetary factors favored incineration. Many other criteria were evaluated, but did not show a difference between technologies. In addition to the examination of these alternatives, an evaluation for rehabilitating the existing MHIs and an evaluation of supplemental technologies to produce biosolids for agriculture were completed.

6.b.3 Public Participation

Public participation influenced the Metropolitan Council's final selection of solids processing technologies. Public participation from all interested stakeholders was encouraged throughout the facility planning process and technology evaluation and selection. Various meetings were held, information packets developed, individual phone calls made, and mailings distributed. Citizens and city representatives of the outer service areas and the inner metro area were convened to test communications tools and to provide feedback on perceptions regarding wastewater treatment, processing technologies, and impact on rates. More than 200 contacts were made. Forty city administrators or representatives attended the meetings. The MCES also met with the Minnesota Chamber of Commerce Water Quality Committee, the Greater Minneapolis Chamber of Commerce, and the St. Paul Chamber of Commerce to inform and respond to concerns related to the project. Local business groups, such as the East Side Area Business Association and the Concord Street Business Association, were sent information on the project and were informed of opportunities for public input. On December 11, 1997, a meeting was held with various regulatory agency representatives to inform, respond to concerns, and discuss regulatory issues related to the project. Personal contact was made with several environmental groups to inform them of the project. More than 48 environmental groups received information on the Solids Project and were informed of opportunities for public input. An informal neighborhood open house provided an opportunity for neighbors and other interested individuals to learn about the project.

The MCES also held a voluntary public hearing on the technology selection on March 26, 1998. All verbal and written comments were transcribed and distributed to interested individuals. Testimony was also received from interested individuals at a workshop with the Metropolitan Council's Environment Committee on April 28, 1998. A public hearing was also held on November 10, 1998, on the Facility Plan for the purpose of fulfilling loan funding requirements. The MCES staff provided a written response to concerns raised during the hearing and workshop. There were nine major areas in which testimony was given at the hearing or for which written comments were received before the public record closed on April 9, 1998, these were:

- Clean Air Act emissions
- Mercury control
- Greenhouse gas emissions
- Odor control
- Sustainable development
- Market and economic assumptions
- Energy efficiency
- Environmental review
- Miscellaneous

Following the public hearing, the MCES continued to meet with interested individuals and groups. The alternative technologies continued to be studied and the resulting information was provided to the public and Metropolitan Council.

Reduction of odors has been a long-standing goal of the MCES as part of its "good neighbor" policies. Neighbors surrounding the plant, particularly the Dayton's Bluff Community in St. Paul, have expressed concerns and have registered complaints about odors from the Metro Plant for a number of years. Consequently, controlling odors was a significant criterion when selecting the processing technology for the Solids Project.

A number of metro area citizens that provided input during the evaluation process generally favored a technology that would recycle organics to the land. This was recognized as an important factor in support of land application. However, neighborhood residents near the plant expressed their desire to minimize future odor sources; this position supported incineration since incineration provides less opportunity for odors to be generated or released. In addition, the need to minimize costs, to conserve space for future liquids treatment expansion, and to minimize reliance on fossil fuels were important criteria that supported incineration. Therefore, on July 23, 1998, the Metropolitan Council approved the current project consisting of three FBIs, as the primary management technology combined with alkaline stabilization of biosolids for land application.

6.b.4 Process Description

FBIs equipped with waste heat boilers for energy recovery is the proposed primary technology at the Metro Plant. The alkaline stabilization process will be combined with fluidized bed incineration to manage wastewater solids that exceed the capacity of the FBIs and to produce a biosolids product suitable for agricultural application. These processes will achieve the primary goals of public health protection, environment protection, and the control of objectionable odors. A process flow schematic of the proposed Metro Plant solids processing facilities is shown on Figure 8.

The Metro Plant must continuously receive and treat wastewater. This results in the continuous production of unstabilized wastewater solids and the need for on-line solids processing facilities. Wastewater solids processing facilities will handle the thickened primary sludge, thickened waste activated sludge, and dilute primary scum. Upstream solids thickening facilities are being incorporated in the Solids Management Building as part of the Metro Plant Liquids Project. Wastewater solid residuals from primary sedimentation and the secondary treatment process are continually produced in large quantities at the Metro Plant.

Solids processing equipment that will be installed in the Solids Management Building upstream of the FBI and alkaline stabilization processes include sludge holding and dewatering. Sludge holding provides consistent solids characteristics for the downstream processes, including dewatering. Effective dewatering reduces operational costs, improves energy recovery, and improves the handling characteristics of the alkaline stabilization product.

6.b.4.1 Sludge Storage

Thickened primary sludge, primary scum, waste activated sludge, and secondary scum streams will be pumped to one of eight existing sludge storage tanks. Each tank has a functional capacity of 700,000 gallons. Thickened sludge will be stored in the existing tanks as required to feed the dewatering process with a uniform stream. Sludge will be continuously pumped from the storage tanks to one of two dewatering feed tanks located in the new Solids Management Building.

6.b.4.2 Dewatering

Wastewater solids include primary scum, primary sludge, waste activated sludge, and secondary scum. The primary objective of the dewatering process is to reduce the water content using physical processes instead of the existing thermal technology. Physical processes include flotation and centrifugal force.

6.b.4.3 Sludge Dewatering

Thickened primary and waste activated sludge will be continuously pumped from the sludge storage tanks to two sludge holding tanks in the new Solids Management Building. The equalized solids streams will be pumped from the sludge holding tanks to the high solids dewatering centrifuges, which increase the solids concentration from five percent to approximately 30 percent.

To aid in the dewatering process, a dilute polymer solution will be added to the solids stream before being dewatered in the centrifuges. Polymers facilitate the separation of water from the sludge mass in the dewatering process. The number of operating dewatering centrifuges needed depends upon the quantity and characteristics of the solids stream. With an allowance for maintenance, eight dewatering centrifuges will ultimately be needed.

6.b.4.4 Solids Feed

Dewatered sludge, referred to as dewatered cake, will discharge from the bottom of the centrifuge enclosure into storage bins. The dewatered cake will be pumped into the FBIs at near constant rates to maintain a stable combustion process. Reciprocating piston sludge pumps, with sufficient capacity to feed the three FBIs at the nominal capacity of 315 dry tons per day, will be used.

6.b.4.5 Fluid Bed Incinerators

While operating within design conditions, the three FBIs will sustain combustion without the addition of supplemental fuel, such as natural gas or fuel oil. Supplemental fuels will be used during incinerator start-up. Air pollution control is described in Section 23.

Wastewater sludge has fuel value. Each pound of volatile sludge has a heat value of approximately 10,000 British Thermal Units (BTUs). Typically, 77 percent of the Metro Plant's wastewater solids are volatile. Based on these heat values and projected annual average solids quantities for the year 2005, the total heat value of the sludge feed is estimated to be 172 million BTUs per hour. The projected associated water load at 30 percent dry solids will require approximately 90 million BTUs per hour for water evaporation. Consequently, the fuel in wastewater sludge and primary scum has sufficient energy for sustainable combustion and the recovery of some surplus heat.

6.b.4.6 Energy Recovery

The FBI process will have a design processing capacity of 315 dry tons per day. The design capacity of the alkaline stabilization process is 188 dry tons per day. A maximum of about 10,000 dry tons of alkaline stabilized product is projected for 2005. On an annual basis, it is anticipated that the FBIs will handle 90 percent of the Metro Plant's wastewater sludge. Energy recovery will be accomplished by capturing the heat of combustion from the FBI process to generate electricity and heat Metro Plant buildings.

Two air-to-air heat exchangers and one waste heat boiler per FBI train will be used for heat recovery. The first (or primary) heat exchanger will capture heat from the FBI exhaust stream to preheat the FBI supply air. A waste heat boiler will extract additional exhaust stream heat from the primary heat exchanger. Steam from the waste heat boilers will be harnessed to produce about 3,000 kilowatts (kW) of electrical power.

Exhaust air from the waste heat boiler will pass through a dry electrostatic precipitator (dry ESP) for removal of dry ash and then enter the secondary air to air heat exchanger. This heat exchanger will transfer heat from the exhaust air stream upstream of the wet scrubbers to downstream of the wet scrubbers. Wet scrubbing will decrease the exhaust stream temperature, which can result in moisture condensing in the exhaust stack. By capturing some of the residual heat in the exhaust stream upstream of the wet scrubbers, that heat added back to the air stream downstream of the wet scrubbers will elevate the air stream temperature. This addition of heat and heat produced in the induced draft fan will effectively increase the exhaust stream temperature to about 250º F as it enters the discharge stack. The higher stack temperature will promote plume dispersion, significantly reduce corrosion in the stack, and reduce the appearance of a steam plume from the stack.

6.b.4.9 Ash Handling

Dry particulates collected in the waste heat boiler and the dry electrostatic precipitator (ESP) will be pneumatically conveyed to the existing ash silos. The silos are equipped with a baghouse for capture of the fine ash dust. Four of the existing eight silos, each with an effective volume of 15,000 cubic feet, will be converted from ash storage to alkaline material storage. Approximately 30 days of ash storage, at the projected year 2005 annual average plant loadings, will be provided. The MCES has a contract for the utilization of the incinerator ash as a component of building products or soil amendments. Beneficial re-use of ash will continue and is discussed further under Section 23.1.2.2.

6.b.4.10 Alkaline Stabilization

During periods of peak solids loading or when an FBI is out of service, residual wastewater solids not incinerated will be mixed with alkaline materials to raise the pH and temperature of the mixture to levels that achieve the U.S. Environmental Protection Agency (USEPA) and MPCA criteria for agricultural application of the biosolids. Since the elevated pH will release odorous ammonia and hydrogen sulfide, alkaline material production areas will be enclosed. Odorous gases will be captured and returned to the liquid treatment process.

Alkaline stabilization is a chemical process designed to convert solids into a biosolids product suitable for agricultural application. Alkaline and other admixtures that may be mixed with the dewatered cake include lime and/or cement kiln dust. The alkaline stabilization facility will have the capacity to stabilize approximately 188 dry tons per day of dewatered cake. Alkaline stabilization storage, feeding and mixing, product storage monitoring, and odor control facilities are described in the following paragraphs. Air pollution and odor control are described in Section 23.

6.b.4.11 Alkaline Material Storage

As described, four of the existing silos will be allocated to ash storage and four will be allocated to alkaline admixture storage. At projected peak alkaline stabilization loading conditions of 188 dry tons per day of solids, these four existing storage silos will provide four days of storage capacity.

6.b.4.12 Feeding and Mixing System

Alkaline admixtures will be pneumatically conveyed from the existing silos to 1,500 cubic foot feed bins located in the new Solids Management Building. Screw feeders will transfer the admixture from the feed bins to one of two mixers, where the solids and alkaline materials will be mixed and then conveyed to the truck loadout facility. Gases from the mixing process and conveyors will be collected and ducted to the odor control facility.

6.b.4.13 Biosolids Storage and Loading

If biosolids are to be stored on site, a new Biosolids Storage Building (Figure 9) will include an enclosed truck loading bay and three enclosed storage cells with dimensions of 70 feet in width, 200 feet in length, and a clear interior height of 24 feet. Alkaline product could then be stored in any of the three cells in either the truck trailers or in bulk storage. Each cell will have the bulk capacity to store approximately 1,125 tons of an alkaline product. The building would provide storage for up to 45 days of biosolids production.

6.b.4.16 Miscellaneous Equipment

Two auxiliary boilers, each capable of producing 85,000 pounds of steam per hour, will be installed in the Solids Management Building. The existing auxiliary boilers will be decommissioned. Approximately 500 kW of emergency stand-by diesel-driven electric generator capacity will also be provided as back-up power for critical building process functions.

6.b.5 Facility Layout

6.b.5.1 Solids Management Building

The proposed facilities will be located east of the East Primary tanks as shown on Figures 4 and 5. The new Solids Management Building will be approximately 360 feet long and 168 feet wide. The proposed building height is 68 feet. All solids treatment processes will be performed within the building with the exception of biosolids loading and storage. Noise and odor control will be implemented as needed to prevent off-site impacts. The exhaust stacks from the energy recovery process will be located at the north end of the building to avoid the St. Paul Downtown Airport (Holman Field) approach air space to the extent possible. The Federal Aviation Administration (FAA) has approved a stack height of 105 feet in the location shown, and the building heights fall within FAA requirements.

Figure 6 provides a cross-sectional view of the new Solids Management Building from the west side of the building looking east. As shown, the south end of the building will house the centrifuge dewatering part of the plant's liquids process equipment on the upper floor. The dewatered cake will be discharged from the bottom of the centrifuges to cake bins on the lower floor with the ability to transfer the cake to either the alkaline mixing equipment or to the FBIs. The FBIs, downstream heat recovery, and air pollution control equipment will be located on the north end of the building (Figures 6 and 7), with the process flow going from south to north. Ash collection equipment will be located in the basement below the waste heat boilers and dry ESPs. Figure 5 presents the extension alternatives for the maintenance tunnel system.

6.b.5.2 Biosolids Facilities

These facilities will include a truck loading complex, any required biosolids storage, and an odor and air emission control facility. Truck loading facilities will include two bays for parallel loading of biosolids trucks. A biosolids storage bin will be located above each bay to facilitate truck loading. The truck loading area will be approximately 35 feet wide by 168 feet long and will be enclosed for odor and air emission control. Truck access into the storage cells will be located on the east side of each cell. If constructed, biosolids storage facilities will consist of three enclosed cells, each 200 feet long and 70 feet wide, with a clear height of approximately 24 feet. Each cell will be isolated to provide optimum air ventilation and capture control. The odor and air emission control facility will collect air from the biosolids mixers and conveyors, truck loading area, and the biosolids storage complex. The building will be approximately 200 feet wide and 210 feet long. The odor and air emission control portion of the building will be adjacent to the truck loading and storage facilities. Air flows within the storage cells will be directed from east to west, with workers within a cell to be primarily on the fresh air side of the stored material. The building heights of 30 feet for the Biosolids Storage Building, with a height of 46 feet for the odor and air emission control portion of the building, fall within FAA requirements.

6.b.6 Construction Schedule

Construction is scheduled to start in 2001 and be substantially complete in 2005.

6.b.7 In-Plant Mechanical Work

In-plant mechanical work will primarily consist of extending utilities to the Solids Management Building, modifying piping and ventilation ducting within existing plant tunnels (Figure 5) to accommodate the added utility services, upgrading sludge storage facilities, and constructing facilities to convey sludge to the new facilities and return recycle streams to the existing plant processes. Because plant effluent water will continue to be used for the wet air pollution control devices, the supply lines will be moved from the existing 408 Complex to the new facilities.

Existing sludge storage facilities will be upgraded to provide equalization of sludge feed to the dewatering equipment. It is anticipated that four of the existing eight sludge storage tanks will be converted to sludge equalization basins. This will require reconstruction of the aeration system within each 700,000-gallon tank, new aeration blowers, and pumps to convey the equalized sludge to the solids screens and dewatering feed tanks located in the Solids Management Building. Dewatering centrate and underflow from the scum concentration tanks will be conveyed from the new facilities back to the existing plant primary effluent channels.

6.b.8 Existing Solids Process

The objectives of the Solids Project are to reduce air emissions, odor levels, maintenance costs, and operating costs associated with the existing solids processes. This section describes the existing solids processing facilities at the Metro Plant. The existing solids process diagram is shown in Figure 10. A detailed description of the existing solids processing facilities can be found in the Metro Plant Master Plan (Camp Dresser McKee, December 1996).

Approximately one-half of the annual operation and maintenance costs of the plant are attributed to the solids processing facilities. This is partly due to aging equipment, which requires frequent maintenance, and the overall operational complexity of the existing unit processes. When the proposed Solids Project operating period begins in year 2005, the majority of the existing solids unit processes will be at least 25 years old. For some of the oldest equipment, it will be 25 years since it was last rebuilt. Although these existing solids processing facilities have adequate capacity to meet the solids processing requirements through the planning period and projected useful life of the Solids Project (year 2025), the increasing frequency of equipment failures require major unit processes to be taken out of service for repair or replacement. This, in turn, will jeopardize the plant’s ability to meet projected peak loading conditions through the planning period. The existing solids processing train consists of thickened sludge storage, sludge conditioning, dewatering, and incineration.

6.b.8.1 Solids Storage Tanks

The sludge storage tanks currently receive flotation thickened waste activated sludge and gravity thickened primary sludge. Combined sludge from these tanks is normally pumped to thermal conditioning. In service since the early 1980s, the eight sludge storage tanks are located adjacent to the thermal conditioning facilities. The function of these tanks will be modified as described in Section 6.b.4.1. Some concrete rehabilitation may be required for these tanks.

6.b.8.2 Sludge Conditioning

Prior to dewatering, the sludge must be conditioned to flocculate the solids particles and release the free water. Polymer is used to condition the centrifuge feed sludge and the roll press feed sludge is conditioned through a thermal process known as Zimpro™. Eight Zimpro™ wet air oxidation units currently perform thermal sludge conditioning. Thickened waste activated sludge and thickened primary sludge are gravity fed from storage tanks to grinders. The ground sludge is then fed to centrifugal pumps which deliver sludge to high-pressure pumps. Each high-pressure pump discharges the ground sludge to a series of stainless steel heat exchangers and a thermal treatment unit. High-pressure steam and air are added to the sludge in the thermal treatment unit to achieve operating conditions. Conditioned sludge is transferred to decant tanks prior to dewatering. The decant tank overflow represents side stream treatment prior to its discharge into the main flow stream. Because of the implementation of centrifuge dewatering, reduced demand on thermal conditioning decant overflow can be sent directly to primary treatment. Decant sidestream treatment was able to be decommissioned, thereby eliminating a high maintenance process that was also a significant odor source. Zimpro™ will no longer be in service with the proposed Solids Project.

6.b.8.3 Dewatering

Dewatering is necessary to produce a dry solids cake suitable for incineration by the MHIs. Most of the thermally conditioned sludge is blended with gravity thickened primary sludge for dewatering by roll presses. A portion of the thickened waste activated sludge and thickened primary sludge is polymer conditioned and is dewatered by centrifuges. The new solids process will consist exclusively of polymer conditioning and centrifuge dewatering.

6.b.8.4 Multiple Hearth Incineration System

The incineration system for dewatered cake currently includes six MHIs, four of which are equipped with waste heat recovery boilers. The furnaces are numbered sequentially from 5 through 10. Furnace Nos. 5, 6, and 7 were originally constructed in the mid-1960s as 11-hearth units. Furnace No. 8 was constructed in the late 1960s as an 11-hearth unit. Furnace Nos. 9 and 10 were constructed in the early 1980s as 9-hearth units and were supplied with waste heat boilers and venturi scrubbers/subcoolers. At this time, furnace Nos. 5, 6, 7, and 8 were also converted to 9-hearth units, and waste heat boiler systems were added to furnace Nos. 7 and 8. These existing MHIs will be replaced by three FBIs as part of the proposed Solids Project.

Two auxiliary boilers, both equipped to fire natural gas or fuel oil, were installed in the early 1980s as back-up units to the waste heat boilers. These boilers are operated intermittently to supplement the steam produced in the waste heat boilers, and will be decommissioned as part of the Solids Project.

c. Explain the project purpose: if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the project is to develop a new solids processing facility that will replace old equipment and outdated technology used at the current facilities. As the facilities have aged since initiation of operation in the early 1980s, assuring consistent and effective operation has become increasingly difficult. Improvements in technology, specifically in electronic control systems, air pollution control equipment, and dewatering equipment, have made replacement of the existing facilities a viable option. The new facility will meet future capacity requirements and decrease odors and the emission of air pollutants from the Metro Plant. The Metro Plant Master Plan's (Camp Dresser McKee, December 1996) evaluation of alternatives confirmed significant opportunities to reduce emissions from the plant through the replacement of the existing solids processing facilities. As part of the proposed project, the six existing MHIs will be replaced with three new FBIs combined with an alkaline stabilization system to handle peak loads and accommodate FBI maintenance downtime. The alkaline stabilization system will produce biosolids for application to agricultural land for up to ten percent of the raw solids produced at the Metro Plant on an annual basis.

d. Are future stages of this development, including development on any outlets planned or likely to happen?

________ Yes ____X____ No

If yes, briefly describe future stages, relationship to present project, timeline and any plans for environmental review.

Several projects are underway at the Metro Wastewater Treatment Facility that are related to the proposed Solids Processing Improvements Project. The Liquids Processing Project, which does not require EAW preparation, will be completed in about two years. The Centrifuge Dewatering Project, which requires no EAW, will be completed in the fall of 2001. It will entail the purchase and installation of two new sludge dewatering centrifuges. Subsequently, and as part of the Solids Processing Improvements Project (the subject of this EAW) these centrifuges and one existing centrifuge will be moved to the Solids Management Building. Four additional dewatering centrifuges will be purchased and installed. A separate Environmental Summary will be prepared on the purchase of six centrifuges and the moving of two.

e. Is this project a subsequent stage of an earlier project?

________ Yes ____X____ No

If yes, briefly describe the past development, its timing, and any past environmental review.

The MCES is continually upgrading the Metro plant. Construction of the Solids Project will overlap with a separate project to upgrade the liquid wastewater treatment systems. The liquid treatment improvement project includes decommissioning the existing West Pre-treatment and West Primary Treatment systems. The liquid treatment system project does not result in an increase in plant capacity and does not trigger environmental review requirements.

The original Metro Plant facilities were built in 1938. These original facilities included chemical conditioning, dewatering, and incineration in four MHIs. The plant was expanded and upgraded to secondary treatment in the 1960s, and four new MHIs were constructed. Capital projects in the early/late 1970s and 1980s provided thermal sludge conditioning (Zimpro™), two new MHIs, rehabilitation of the 1960s incinerators, and new sludge dewatering equipment. No environmental review has been performed on these facilities, either because none was required at the time or because the expansion in question was less than threshold values for EAW preparation.

7. PROJECT MAGNITUDE DATA

Total project acreage: 6 Acres

Number of residential units: **unattached** none **attached** none

Commercial, industrial or institutional building area (gross floor space) total square feet. Indicate area of specific uses (in square feet):

Office Service Shop	NA	**Manufacturing**	NA
Retail	NA	**Other industrial**	174,750 to 229,000 square feet (see Note 1 below).
Warehouse	NA	**Institutional**	NA
Light industrial	NA	**Agricultural**	NA
Other commercial (specify)	NA		

Building height(s) (feet): See below. **If over 2 stories, compare heights of nearby buildings.**

Solids Management Building 68 feet, Biosolids Storage Building and Truck Loading Area Maximum 46 feet, Exhaust Stacks 105 feet.

Note 1: Solids Management Building = 165,750 square feet (sf)
172 feet x 360 feet
Basement = 61,920 sf
Level 1 = 41,208 sf
Level 2 = 30,456 sf
Level 3 = 32,166 sf

Biosolids Storage Building = 54,250 sf (Constructed only if biosolids are stored on site)
200 ft x 210 ft
Level 1 = 42,000 sf
Level 2 = 12,250 sf

If there is no on site biosolids storage, Biosolids Storage Building will not be constructed and only the Truck Loading Area will be built.

Truck Loading Area = 9,000 sf
50 feet x 90 feet
Level 1 = 4,500 sf
Level 2 = 4,500 sf

8. PERMITS AND APPROVALS REQUIRED. List all known local, state, and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

A number of environmental permits and approvals must be obtained to authorize construction and operation of the new solids processing facility. The primary regulatory review processes include:

- A major amendment to the Metro Plant Air Emission Permit issued by the MPCA.
- The Metro Plant's existing National Pollution Discharge Elimination System and State Disposal System (NPDES/SDS) permit allows for the land application of biosolids. This permit may need to be modified and state regulations must be met as codified in Minn. R. ch. 7041.
- Facility Plan Final Approval and Plans and Specifications Final Approval.

Additional known permits and approvals that may be required are identified in Table 1.

8.1 MPCA AIR EMISSIONS PERMIT

The MCES submitted an application in January 1999 to the MPCA for a major amendment to the Metro Plant's air emission operating permit to authorize construction and operation of the Solids Project. A major amendment is required in accordance with Minn. R. ch. 7007.1500, subps. 1.C and D because:

- The project will be classified as a "synthetic" minor modification under the federal and state Prevention of Significant Deterioration and nonattainment New Source Review (PSD/NSR) regulations.
- The new FBIs are subject to National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR, Part 61, Subpart E, which governs mercury emissions from a variety of sources, including sewage sludge incinerators.

The permitting process is described further in Section 23.0, Stationary Source Air Emissions.

8.2 USEPA PART 503 SEWAGE SLUDGE INCINERATION REGULATIONS

Regulations promulgated in accordance with the Clean Water Act and set out in 40 CFR Part 503, Subpart E, require that daily concentration limits for seven metals found in sewage sludge must be established for incinerators once the incinerators are operational. The regulations also limit the amount of total hydrocarbons emitted.

TABLE 1

POTENTIAL PERMITS, PLANS OR APPROVALS
Solids Processing Improvements Project

Unit of Government	Type of Application	Status
FAA	Notification of Proposed Construction or Alteration	Completed
Metropolitan Airport Commission	Notification of Proposed Construction or Alteration (Coordinates with FAA)	Completed
EPA	Spill Prevention, Control, and Countermeasure Plan	Will need to be revised
National Park Service (NSP)	Plan review and coordination under Mississippi National River and Recreation Area (MNRRA)	In process
MPCA	Plan and Specification approval	Will obtain prior to initiating construction
MPCA	Facility Plan approval	MPCA review in process
MPCA	Minnesota State Loan Funding approval	If requesting Minnesota State Loan funding
MPCA	Air Emissions Permit Amendment	MPCA review of amendment in process
MPCA	NPDES/SDS Permit	Will obtain if construction groundwater dewatering discharge is not routed through plant
MPCA	Modification of NPDES/SDS permit to meet the requirements of 40 CFR Part 503, Subpart B (sludge management), and Minn. R. ch. 7041	Completed

TABLE 1
(Continued)

POTENTIAL PERMITS, PLANS OR APPROVALS
Solids Processing Improvements Project

Unit of Government	Type of Application	Status
MPCA	Above ground storage tank registration for tanks over 110 gallons	Will obtain registration
MPCA	Above ground storage tank rule requirements (Minn. R. ch. 7151)	May apply to some tanks over 1,100 gallons
MPCA	Construction Stormwater Permit	Will obtain prior to initiating construction
MPCA	Stormwater Plan	May need to revise current plan
MPCA	Toxic Pollution Prevention Plan	May need to revise current plan
Minnesota Emergency Response Commission and Local Fire Department	SARA Title III Chemical Notification, Planning, and Reporting	May need to revise current notification, planning, reporting
Department of Natural Resources (DNR)	Water Appropriation Permit amendment may be required for dewatering if more than 10,000 gpd or one million gpy is proposed	Will amend existing permit prior to initiating dewatering
State Historic Preservation Officer (SHPO)	National Historic Preservation Act Section 106 and the Archaeological Resources Protection Act Review and Coordination. Office of the State Archaeologist coordinates with the SHPO	In process
Ramsey County	Hazardous Waste Generator License	May need to revise license due to changes in waste generation
Ramsey County	Hazardous Waste Contingency Plan	May need to revise current plan
Ramsey-Washington County Watershed District	Grading Permit	Will obtain prior to initiating construction
City of St. Paul	Plan review coordination regarding compliance with St. Paul Critical Area River Corridor Plan and Ordinance	In process
City of St. Paul	Building Permit	Will obtain prior to initiating construction

8.3 LAND APPLICATION OF ALKALINE STABILIZED BIOSOLIDS

Land application of the alkaline products will be governed by federal regulations codified at Title 40 of the Code of Federal Regulations Part 503, Subpart B (40 CFR Part 503) and by state regulations codified at Minn. R. ch. 7041. These regulations specify requirements that apply to:

- The MCES, as a treatment works treating domestic sewage.
- Commercial companies that may distribute and apply the alkaline products.
- Individuals who apply alkaline products to their own land.

These regulations specify:

- Criteria for classifying the sewage sludge.
- Risk-based limits on the concentration of toxic metals that can be present in the biosolids and limits on the amount of metals that can be land-applied.
- Technology-based standard to minimize pathogens.

- Technology-based standard to minimize vector attraction (i.e., characteristics that attract rodents, insects, or other organisms that can transport infectious agents).
- Monitoring, record keeping, and reporting requirements.

Provisions of these rules are designed to ensure that any biosolid produced from domestic sewage is:

- Applied at agronomic rates based on the nutrient needs of the soil and crops to be grown.
- Applied at rates that limit the amount of toxic metals added to the soil.
- Treated to reduce the potential for human or animal exposure to pathogens or applied in a manner that restricts the exposure of humans or animals to pathogens.
- Treated to reduce vector attraction (i.e., sludge characteristics that attracts rodents, flies, or other organisms that can transport infectious agents) or applied in a manner that reduces vector attraction.

The MPCA has issued to the MCES, a NPDES/SDS permit regulating the land application of biosolids. At this point in the project, the MCES has not yet identified actual application sites, but several farmers have expressed interest in the product. The MCES expects that the alkaline product will be used for agricultural purposes.

Federal Part 503 regulations and Minn. R. ch. 7041 restrict the amount of metals that can be land applied with biosolids produced from domestic wastewater sludges and establish suitable site conditions at the land application sites.

The biosolids, or alkaline product, will be classified as either Class A or Class B based on the level of treatment it receives and the application methods utilized. The criteria that defines the class of product is summarized in Table 2. Lime stabilization is Alternative 2.5 for producing a Class B product. To produce a Class A product, further steps would be taken to meet the pathogen and vector attraction reduction requirements.

This two-class approach is designed to protect human and environmental health either through treatment or treatment and restricting exposure to the product. If a Class B product is manufactured, site restrictions are stated to ensure that pathogens are not transmitted from the site. These restrictions are summarized in Table 2. If a Class A product is manufactured using the more rigorous treatment alternatives, there are no site restrictions.

8.4 OTHER PERMITS AND APPROVALS

A list of known permits, plans or approvals that may be required as part of this project are presented in Table 1.

TABLE 2

PATHOGEN AND VECTOR REDUCTION REQUIREMENTS FOR LAND APPLICATION
Solids Processing Improvements Project

PATHOGEN AND VECTOR ATTRACTION REDUCTION REQUIREMENTS FOR PREPARERS OF SEWAGE SLUDGE			
Class A Pathogen Reduction		**Vector Attraction Reduction**	
Alternative 1	Time and temperature	Option 1	38 percent volatile solids reduction
Alternative 2	pH, temperature and time	Option 2	Lab demonstration of volatile solids reduction anaerobically
Alternative 3	One-time demonstration correlating pathogen levels and operating parameters	Option 3	Lab demonstration of volatile solids reduction aerobically
Alternative 4	Concentrations of enteric viruses and helminth ova		SOUR ≤ 1.5 mg O_2/hour/g total solids
Alternative 5	Processes to Further Reduce Pathogens (PFRP) 1. Composting 2. Heat drying 3. Heat treatment 4. Thermophilic aerobic digestion 5. Beta ray irradiation 6. Gamma ray irradiation 7. Pasteurization	Option 4 Option 5 Option 6 Option 7 Option 8	Aerobic process for 14 days at > 40^{o} C pH to ≥ 12 and retain at 11.5 ≥ 75 percent solids for stabilized solids ≥ 90 percent solids for unstabilized solids
Alternative 6	Equivalent to PFRP		
In addition all six alternatives include pathogen levels for fecal coliform or *Salmonella*			
Class B Pathogen Reduction			
Alternative 1	Density of fecal coliform		
Alternative 2	Processes to Significantly Reduce Pathogens (PSRP) 1. Aerobic digestion 2. Air drying 3. Anaerobic digestion 4. Composting 5. Lime stabilization		
Alternative 3	Equivalent to PSRP		
PATHOGEN AND VECTOR ATTRACTION REDUCTION REQUIREMENTS FOR APPLIERS OF SEWAGE SLUDGE			
Class B pathogen Reduction		**Vector Attraction Reduction**	
Class B	Sludge Site Restrictions	Option 9 Option 10	Injection below land surface Incorporation into soil
§ 503.32(b)(5)	Site Restrictions		
i.	Food crops with harvested parts above ground but touching the sewage sludge/soil mixture shall not be harvested for 14 months after application.		
ii.	Food crops with harvested parts below the surface shall not be harvested for 20 months after application when the sewage sludge remains on the surface for 4 months or longer prior to incorporation into the soil		
iii.	Food crops with harvested parts below the surface shall not be harvested for 38 months after application when the sewage sludge remains on the surface for less than 4 months prior to incorporation into the soil		
iv.	Food/feed/fiber crops shall not be harvested for 30 days after application.		
v.	Animals shall not be grazed on land for 30 days after application		
vi.	Turf grown where sewage sludge is applied shall not be harvested for 1 year after application when the harvested turf is placed on land with a high potential for public exposure or on a lawn, unless otherwise specified by the permitting authority.		
vii.	Public access to land with a high potential for public exposure shall be restricted for 1 year after application.		
viii.	Public access to land with a low potential for public exposure shall be restricted for 30 days after application.		

9. LAND USE. Describe current and recent past land use and development on the site and on adjacent lands. Discuss the project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past land uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

9.1 GENERAL

The Metro Plant is located in an I-2 (industrial) zoned area. The area north of the Metro Plant property is primarily vacant. A portion of this area north and northeast of the Metro Plant is occupied by the former Pigs Eye Dump, now a state superfund site (Figure 3). The Minnesota Department of Natural Resources (DNR) Metro Region 6 offices and fish hatchery are located north of the dump. The city of St. Paul Parks Division wood chipping operation is located north of the Metro Plant. Pigs Eye Park encompasses much of the open area south and southeast of the Metro Plant site. A narrow tract of land just north of the plant, along Childs Road and the Mississippi River is owned by the St. Paul Port Authority and includes heavy industrial parks, barge terminals, land used by the Holman Field, and numerous shipping and barge tie-ups along the river. Industries along Childs Road include Westway Trading Corporation, Koch Materials Company, Lafarge Corporation, Hawkins Chemical, Incorporated, CAMAS Incorporated (Sheily Division), and Morton Salt. The Chicago Northwestern Transportation railyards are located approximately one-half mile northeast of the Metro Plant with railroad trackage and associated rights-of-way that run through the Metro Plant site. To the west, across the river from the plant is the Holman Field, an "intermediate" public airport. NSP maintains several power lines in the area, some of which cross the Metro Plant site. The remaining area zoned I-2 around the Metro Plant consists of vacant land or open space.

Other zoned areas in the vicinity of the site consist of residential zoning (R-1). A small R-1 area is located at the southern boundary of the Metro Plant site and to the east, along Pigs Eye Lake. These R-1 areas are vacant and are reported by the city of St. Paul to remain as parkland, per subdivision regulations. These areas are part of the recently formed Pigs Eye Park.

Five recorded contaminated sites are located in the vicinity of the Metro Plant, including Pigs Eye Dump, MCES Ash Disposal Site (on Pigs Eye Dump), Fish Hatchery Dump, Burlington Northern Surface Impoundments, and Burlington Northern Dayton's Bluff Yard. Since the proposed Solids Project site is within the existing Metro Plant levee and floodwall, it will not affect these sites.

At the Metro Plant, petroleum-contaminated soils were investigated and subsequently treated following removal of underground storage tanks (USTs) in 1990; the MPCA has closed the file on this incident (MPCA Site No. LEAK 00003096). The file for a separate release (MPCA Site No. LEAK 00004071) has also been closed. No further investigation has been required of organics detected when four USTs were upgraded in 1993 (MPCA Site No. LEAK 00007015). There are no other environmental hazards known to be associated with past activities at the proposed project location.

9.2 ST. PAUL DOWNTOWN AIRPORT

The FAA, under the auspices of the U.S. Department of Transportation, is required to review and comment on the compatibility of disposal facilities, including wastewater treatment plants, within five miles of the end of a runway. The FAA has reviewed the "Notification of Proposal Construction or Alteration" for construction within the approach path to the St. Paul Downtown Airport public airport (Figure 5). The FAA also approved the height of 105 feet for the stacks. Building heights of 68 feet for the Solids Management Building, 30 feet for the Biosolids Storage Building, and 46 feet for the Odor Control Area fall within FAA requirements (Appendix A).

9.3 DISTRICT 1 PLAN

The “Eastview-Conway-Battle Creek-Highwood District 1 Plan” (City of St. Paul, Division of Planning 1985) provides recommendations and guidelines for development within District 1. Specific planning items associated with the Metro Plant are addressed in the Pigs Eye sub-district section. The item of primary concern noted in the District 1 Plan is the district council’s support of Ramsey County’s plan to establish an open area around Pigs Eye Lake, currently Pigs Eye Park, as a managed preserve. The Plan states that the park should be designed to optimize education and interpretive uses, as well as to protect the Pigs Eye Scientific and Natural Area. The Metro Plant property abuts Pigs Eye Park (Figure 3).
St. Paul’s “Plan for Bicycles” (1978) recommends a bike path along Highway 61-Point Douglas and a bike route on Upper Afton Road (some of which is in place). Proper soils and watershed management techniques were also emphasized in the Plan. The proposed project is entirely within the existing Metro Plant levee and floodwall, designed to protect the facility from the 100-year flood event, and is not anticipated to conflict with District 1 Plan goals.

See also the response to Item 14 of this document regarding water-related land use management districts.

10. COVER TYPES. Estimate the acreage of the site with each of the following cover types before and after development.

	Before	After		Before	After
Types 2 to 8			Urban/Suburban	0	0
Wetlands	0	0	Lawn Landscaping	1.5	0.7
Wooded/Forest	0	0	Impervious Surface	1.5	5.3
Brush/Grassland	0	0	Other (describe)	3	0
Cropland	0	0	(Other consists of compacted gravel)		

11. FISH, WILDLIFE, AND ECOLOGICALLY SENSITIVE RESOURCES

a. Identify fish and wildlife resources and habitats on or near the site and discuss how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

The Mississippi River flows along the western edge of the Metro Plant. Lands designated for Pigs Eye Park, around Pigs Eye Lake, are located to the south and southeast of the Metro Plant property (Figure 3). Further to the southeast is the Pigs Eye Lake Scientific and Natural Area (SNA). The undeveloped character of much of the land near the Metro Plant, particularly to the south and east, provides a range of habitat, which includes wetlands, floodplain forest, and grasslands.

All project activity will be confined within the existing levee and floodwall for the Metro Plant. Buildings, treatment tanks, roads, and storage areas occupy most of the area inside of the levee. With the exception of a storm-water treatment basin colonized by common wetland plants, plant communities inside of the levee and floodwall are limited to landscaped areas planted with grass. Neither project construction nor operation will affect nearby sensitive resources.

b. Are there any state-listed (endangered, threatened, or special-concern) species; rare plant communities or other sensitive ecological resources such as native prairie habitat; colonial waterbird nesting colonies; native prairie or other rare habitat or regionally rare plant communities on or near the site?

___X___ Yes ________ No

If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the MNDNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: ES#(19)980157**. Describe measures to be taken to minimize or avoid adverse impacts.**

The Pigs Eye SNA heron rookery is located less than one mile south of the Metro Plant (Figure 3). A rookery is a nesting bird colony. Approximately 1,500 great blue herons, great egrets, yellow-crowned night herons, black-crowned night herons, and double-crested cormorants nest colonially at the rookery (personal communication, Steve Djupstrom, DNR). American bald eagles have nested south of the Metro Plant since 1987. The Mississippi River corridor is a significant migratory route for waterfowl, raptors, and passerine species.

An extensive survey of the resources on and near the Metro Plant property, outside of the levee and floodwall, was completed during 1994. To prepare for the survey, the DNR Natural Heritage Database was reviewed, and discussions were held with the U. S. Fish and Wildlife Service (USFWS), to identify rare species in the vicinity of the Metro Plant. The bird resources noted above were reported. The closest terrestrial resources reported through the DNR database were at the Battle Creek Regional Park, approximately 2.5 miles from the Metro Plant site. The database reported the fox snake, a special concern species, and kitten-tails, an endangered species. The following habitat types were listed in the Metro Plant vicinity: mixed oak forest, gravel prairie, and proglacial river. Snapping turtles, a state species of concern, have been observed along the outfall channel by Metro Plant staff.

The 1994 Environmental Inventory of the Metro Plant environs found that portions of the Metro Plant property outside the existing levee and floodwall provide foraging and critical wintering habitat for the American bald eagle, a state and federally threatened species, and foraging habitat for herons and egrets. The area is part of a flight/breeding area for peregrine falcons, a state and federally endangered species. A pair of peregrines forage in the Metro Plant and vicinity. If artificial nests were to be established, there is potential for osprey, a state special concern species, to breed in the area. During migratory seasons, the area around the Metro Plant property has the potential to attract some birds species of concern. No other threatened and endangered or special concern plants, mammals, reptiles, amphibians, or breeding birds were found to be present on the Metro Plant property.

11.b.1 Agency Coordination

A meeting was held on December 11, 1997, with various regulatory agency representatives to inform them of the project, respond to concerns, and discuss regulatory issues related to the project. In addition, letters were sent to the USFWS, DNR, and Natural Resource Conservation Service (NRCS).

Appendix A contains copies of the response letters. There are no known occurrences of rare species or natural communities in the Solids Project site vicinity, the USFWS had “no objections” to the project as reviewed, and the NRCS responded that no conversion of prime or unique farmland would occur.

11.b.2 Potential for Adverse Impacts

All project activity will be confined within the existing levee and floodwall for the Metro Plant. Neither project construction nor operation will directly affect nearby resources or species that use these areas. Trees on islands in the Mississippi River near the Metro Plant and its outfall channel offer perch sites and roosting sites for American bald eagles. Floodplain forest south of the Metro Plant has potential to provide future nesting sites as trees in this area mature. State and federal agencies recommend a one-fourth mile buffer from American bald eagle nesting and roosting sites. Of the roost sites currently used, only a small area within the levee and floodwall near the Metro Plant outfall is within the outer edge of the buffer zone. No disturbance of this buffer zone is anticipated as part of the Solids Project. The Metro Plant is also outside of the one-half mile buffer zone from nests recommended for minimizing human disturbances during the March through October nesting period.

12. PHYSICAL IMPACTS ON WATER RESOURCES. Will the project involve the physical or hydrologic alteration - dredging, filling, stream diversion, outfall structure, diking, impoundment - of any surface waters such as a lake, pond, wetland, stream, drainage ditch?

________ Yes ___X___ No

If yes, identify water resource affected and give the MNDNR Protected Waters Inventory number(s) if the water resources affected are on the PWI: NA. **Describe alternatives considered and proposed mitigation measures to minimize impacts.**

13. WATER USE

a. Will the project involve the installation or abandonment of any wells?

___X___ Yes ________ No

Wells for temporary construction dewatering will be installed. These wells will be abandoned after construction is complete.

b. Will the project require an appropriation of ground or surface water (including dewatering)?

___X___ Yes ________ No

If yes, indicate the source, quantity, duration, purpose of the appropriation, and DNR water appropriation permit number of any existing appropriation. Discuss the impact of the appropriation on ground water levels.

It is anticipated that dewatering will be required during construction and that a DNR Water Appropriation Permit will be required. The design elevation of the basement floor for the Solids Management Building is approximately 684 feet, about 20 feet below ground surface. Allowing for a four-foot thick floor slab, supporting gravel and some extra allowance, site dewatering can be expected to approximate an elevation of 670 feet or about 30 feet below ground surface. The anticipated construction schedule will call for 12 to 18 months of dewatering.

The necessary discharge rate was estimated using a Thiem equation combined with a flow to a drainage trench equation (Powers, 1981, eqn. 6.12, p. 108). The equation represents a simple ground-water flow model based on the following assumptions:

- The aquifer is isotropic and homogeneous, of equal thickness and infinite extent.
- The water table is level with negligible hydraulic gradient before construction dewatering and, during dewatering, outside the cone of depression.
- The ground-water flow system is in a steady state condition; there is no change in head with time at any point of the analyzed ground-water system.

During storm events surface water runoff from the drainage area and direct precipitation will need to be pumped out in addition to the seeping ground water. A peak runoff rate was estimated using the rational equation. The selected runoff coefficient value of 0.65 represents a light industrial area (Van der Leeden, et al., 1990). A 10-acre drainage area was assumed. The peak runoff rate was calculated for 1, 2, 5, 10, 25, 50, and 100-year 24-hour rain events. Rate of precipitation data for these storm events were obtained from Hydrology Guide for Minnesota (U.S. Department of Agriculture-Soil Conservation Service, St. Paul, Minnesota).

The dewatering calculations are described in Appendix B. The results are very approximate and based on a limited amount of a site-specific data. The analysis assumed that the aquifer's thickness, H, around the dewatering site is about 20 feet. Since the water table in that area is about ten feet below a ground surface, a drawdown of 20 feet will need to be created. A hydraulic conductivity, K, of 2.6 x 10^{-3} cm/sec was used in the model. This value was obtained from slug-tests conducted on monitoring well MW-211A.

A radius of influence, also referred to as a radius of cone of depression, Ro, was calculated to be 306 feet using the Sichart equation. Considering a schematic geometry of the modeled system the cone of depression will be roughly 615 feet along the east-west axes and 1015 feet along the north-south axis. Since the created cone of depression may reach various hydraulic barriers the calculated average discharge of 63 gallon per minute is considered an upper estimate of possible discharge. The barrier nearest to the Solids Project site is the levee structure north and east of the area. The presence of these nearby barriers to ground-water flow will result in a lower hydraulic head at the radius of influence. This will decrease hydraulic gradients and significantly lower the dewatering discharge rate.

Construction dewatering discharge water will most likely be routed through the Metro Plant storm sewer system and the existing DNR water appropriation permit may need to be amended.

c. Will the project require connection to a public water supply?
________ Yes ___X___ No

If yes, identify the supply, the DNR water appropriation permit number of the supply, and the quantity to be used.

This facility is connected to the existing plant service water system, DNR water appropriation permit No. 65-0271 will be amended if necessary.

14. WATER-RELATED LAND USE MANAGEMENT DISTRICT. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district)?
___X___ Yes ________ No

If yes, identify the district and discuss project compatibility with district land use restrictions.

The Metro Plant is located within the designated Critical Area for the Mississippi River and the MNRRA corridor. The Solids Project site is located within the Metro Plant's existing levee and floodwall that are designed to protect the facility from the 100-year flood.

14.1 FLOODPLAIN

The Solids Project site is within the existing levee and floodwall. The Metro Plant property falls within the 100-year floodplain according to the Federal Emergency Management Agency (FEMA) 1989 Flood Insurance Rate Map. The Metro Plant is located in the flood fringe zone as opposed to the floodway. The base flood elevation is shown as 705 feet National Geodetic Vertical Datum (NGVD). The Metro Plant's existing levee and floodwall are designed to protect the facility from the 500-year flood. The levee elevation is approximately 716 feet NGVD.

14.2 RIVER CORRIDOR ZONING

The location of the Metro Plant within the Mississippi River floodplain and Critical Area requires compliance with the City of St. Paul River Corridor District Zoning Code (the Code). The Code utilizes hydrologic information provided by the Flood Insurance Study for St Paul, completed under the direction of FEMA. The project area is located within District RC-4-Urban Diversified District and is subject to applicable River Corridor ordinance provisions in Chapter 65. The project is a permitted use in the RC-4 District since it is a permitted use in the underlying I-2 District. Permitted uses are subject to the standards specified in Section 65.400 et. seq, including provisions for grading and filling, protection of wildlife and vegetation, and protection of water quality.

14.3 ST. PAUL MISSISSIPPI RIVER CORRIDOR PLAN/CRITICAL AREA PLANNING

The St. Paul Planning Commission prepared the St. Paul Mississippi River Corridor Plan as part of Critical Area Planning that was adopted by the city of St. Paul in 1981 and was amended in 1987. The Plan recognized the Mississippi River as a multiple-use corridor comprised of open space, river-related industrial and commercial use, residential mixed use, public facilities, and mixed use. The Pigs Eye Floodplain Segment, including the Metro Plant site, was targeted as an area deserving immediate attention. The Metro Plant and its continued operation are provided for in this river segment. The proposed project should be consistent with the plan because it will be constructed within the existing levee and floodwall.

14.4 MISSISSIPPI RIVER CRITICAL AREA CORRIDOR

Under the Critical Area Program, Executive Order 79-19 establishes Standards and Guidelines for state and regional agencies with regard to permit regulation and in developing plans within their jurisdiction, and for the Metropolitan Council regarding plan review, regulations, and development permit applications. In addition, regional and state agencies are directed to develop a capital improvement program or public facilities program, which specifies the sequence of actions consistent with the standards and guidelines. Standards and Guidelines that are particularly applicable to this project include the following:

- Minimize runoff and improve runoff quality.
- Minimize site alteration.
- Manage vegetation cutting.
- Address standards for site plans:
  - Approval of site plans to determine that plans adequately assess and minimize adverse effects and maximize beneficial effects.
  - Include measures that address adverse environmental effects.
  - Include standards to ensure that structures, roads, screening, landscaping, construction placement, maintenance, and storm-water runoff are compatible with characteristics and use of corridor in that district.
  - Provide opportunities for establishment of open space and public viewing where applicable, and specific conditions with regard to buffering, landscaping, and revegetation.
- Address standards for structure site and location to ensure riverbanks, bluffs and scenic overlooks remain in their natural state and minimize interference with views of and from the river, except for specific uses requiring river access.
- Include provisions to retain existing vegetation and landscaping.

The final Critical Area Standards and Guidelines recognize that certain reaches of the river can be utilized as a receiving stream for properly treated sewage. The MCES will coordinate with the city of St. Paul to comply with Critical Area Program requirements.

14.5 MISSISSIPPI NATIONAL RIVER AND RECREATION AREA

In November of 1988, Public Law 100-696 established the MNRRA as a unit of the National Park System (NPS). Congress established MNRRA to:

- Protect, preserve and enhance the significant values of the Mississippi River Corridor through the Twin Cities Metropolitan area.
- Encourage coordination of federal, state, and local programs.
- Provide a management framework to assist the State of Minnesota and units of local government in the development and implementation of integrated resource management programs and to ensure orderly public and private development in the area.

The MNRRA Plan recognizes the role of appropriate river-related industry along the river, but does not specifically address wastewater treatment plants. The MCES met with the NPS in January of 1994 as part of the Environmental Inventory process. During this meeting, the NPS staff indicated that wastewater treatment facilities are recognized as an appropriate use along the riverfront since water quality is an important issue and the facility is river related. The MCES will coordinate with MNRRA regarding this project.

15. WATER SURFACE USE. Will the project change the number or type of watercraft on the water body?

________ Yes   ___X___ No

If yes, indicate the current and project watercraft usage and discuss any potential overcrowding or conflicts with other users or fish and wildlife resources.

16. EROSION AND SEDIMENTATION. Give the acreage to be graded or excavated and the cubic yards of soil to be moved: 6 Acres 200,000 Cubic Yards

a. Describe any steep slopes or highly erodible soils and identify them on the site map.

There are no steep slopes or highly erodible soils associated with the project.

b. Describe the erosion and sedimentation measures to be used during and after construction of the project.

Temporary erosion controls will be implemented in an effort to curtail erosion and sediment transport and to maintain slope stability until permanent erosion controls have been adequately established. Erosion control will be maintained throughout the construction period by removing accumulated sediment, and by repairing or replacing damaged and deteriorated erosion control devices. Temporary erosion control devices typically include silt fence, straw bales, and storm sewer inlet protection.

Post-construction erosion and sedimentation control is typically accomplished by establishing turf. Turf establishment will primarily consist of seeding and mulching. Sod may be placed to restore areas adjacent to maintained lawns, and in areas that may be determined to be particularly susceptible to erosion. Suitable temporary erosion control devices will be placed and maintained until permanent turf has been adequately established.

17. WATER QUALITY - SURFACE WATER RUNOFF

a. Compare the quantity and quality of site run-off before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

Site runoff will continue to discharge to the WWTP storm-water system with the exception of runoff from biosolids loadout areas. Because of the potential for minor tracking of biosolids on truck tires, etc., runoff from these areas will be captured in an on-site retention pond and discharged to the plant for treatment.

b. Identify the routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact of runoff on the quality of the receiving waters.

The project site is a wastewater treatment plant enclosed within a levee and floodwall. Site runoff is governed by the General Stormwater Discharge NPDES/SDS Permit No. MN G610000 and the Stormwater Pollution Prevention Plan developed in accordance with the requirements of that permit.
As described in the application for Permit No. MN G610000, storm water from inside of the levee and floodwall discharges into the pump station to the chlorine contact channel and into the Mississippi River.

18. WATER QUALITY - WASTEWATERS

- **Describe sources, composition, and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.**

The proposed project is a planned improvement project within the Metro Plant site. This plant is the principal wastewater treatment plant for the Twin Cities Area, serving more than 80 percent of the metro area's population as well as the commercial, institutional, and industrial wastewater generators in the Metro Plant service area.

- **Describe waste treatment methods or pollution prevention efforts to be used and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on site sewage systems, discuss the suitability of site conditions for such systems.**

The Metro Plant is an advanced secondary wastewater treatment plant providing removal of chemical biological oxygen demand, five-day, total suspended solids, phosphorus, and ammonium nitrate, as well as disinfection. The project is proposed to improve the Metro Plant and, directly or indirectly, the quality of effluent discharged from that facility to the Mississippi River in accordance with NPDES/SDS Permit No. MN 0029815. The project's Facility Plan, submitted to the MPCA in January 1999, provides a full description of the project and its specific objectives.

- **If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pre-treatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying improvements necessary.**

Not applicable.

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

Not applicable.

19. GEOLOGIC HAZARDS AND SOIL CONDITIONS

- **Approximate depth to ground water:** Minimum at 2 ft., average 6 to 10 ft.
  To bedrock: Minimum at 14 ft., average at 80 to 120 ft.

  Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to these hazards.

None.

- **Describe the soils on the site, giving NRCS (SCS) classification, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.**

The soil survey of Washington and Ramsey Counties, Minnesota (Vinar 1980) shows most of the soils on the Metro Plant property to consist of Unorthadents-wet substratum and Urban Land. The Chaska Silt Loam and Kerston Muck cover a small portion of the plant property. Soils are generally fine-grained, including silty sand, silt, clay, and organic materials. It is assumed that the buildings would require pilings to an estimated depth of 50 feet.

20. SOLID WASTES, HAZARDOUS WASTES, STORAGE TANKS

- **Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.**

20.a.1 General

The Metro Plant facility collects, separates, or generates a number of solid wastes as a result of routine operations and maintenance. The facility recycles several materials, such as white paper, aluminum cans, cardboard, scrap metal, etc. General refuse is collected in dumpsters and removed from the site.

Screenings are materials removed from the incoming wastewater as it passes through screens at the head of the plant. Screenings are a nonhomogeneous mixture of materials, such as, rags, sticks, and similar materials that are too large to pass through the bar screens. These headworks screenings are collected and taken to a local landfill. Grit is composed of small, heavy particulate matter, such as sand, which settles out of the wastewater in various treatment units. Grit is also taken to a local landfill. General refuse is collected in dumpsters and roll-off boxes at several locations at the Metro Plant. A hauling contractor then takes the refuse to a recycling facility where recyclable materials are removed. The remaining unrecyclable material is sent to a landfill for disposal. This refuse is similar to refuse that would be associated with a commercial business. The Metro Plant changes-out the plastic media in the packed tower odor control equipment about once a year. This material is also landfilled.

The existing MHIs for burning sludge also burn scum removed from the wastewater clarifiers and some activated carbon from odor control units from the Metro Plant and other MCES wastewater treatment facilities. The on-site incineration of wastewater treatment sludge, wastewater scum, and activated carbon forms ash.

The Metro Plant generates approximately 13,500 dry tons of ash annually. Herzog Environmental, Inc., headquartered in St. Joseph, Missouri with local offices, is under contract to be the material broker for the ash until the year 2005. Currently, the primary use of the ash is in construction products.

20.a.2 Proposed Project

Heat and ash are the residuals from the FBIs and air pollution control equipment. Recovered heat will be converted into steam to heat Metro Plant buildings and to generate electricity. Headworks screenings and grit will continue to be landfilled. The MCES has a contract for the utilization of the incinerator ash as a component of building products or soil amendments. Beneficial re-use of ash will continue and is discussed further under Section 23.1.2.2. Biosolids from the alkaline stabilization process will be stored until they can be applied to agricultural land.

20.a.2.1 Solid and Hazardous Waste License Status

Currently permits related to the facility include MPCA Solid Waste Permit No. SW-292 for ash utilization (by Herzog); SW-390 for utilization as NutraLime; and MN0060852 for the N-Viro Horticultural Use permit. N-Viro and NutraLime production has been discontinued at this time. The Metro Plant has a Hazardous Waste Generator license from Ramsey County. A small quantity hazardous waste generator (SQG) is a facility that generates less than 1,000 kilograms (2,200 pounds) of hazardous waste per month. Depending upon future facility changes associated with the Solids Project, it is possible that the facility could be reclassified from a SQG to a large quantity hazardous waste generator. Should this occur, the facility would come under more stringent regulation regarding the requirements for contingency planning, frequency of hazardous waste shipment, and other operational aspects. The facility would also be subject to the waste minimization requirements.

- **Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.**

A number of wastes generated as a result of Metro Plant operation and maintenance activities are classified as hazardous wastes by Minn. R. ch. 7045. These include items such as spent lead-acid batteries, used oil and oil filters, paint thinner, paint arrester/dust, corrosive laboratory chemicals, heavy metal lab wastes, chrome solution, nonchlorinated lab solvent, chlorinated solvent, degreasing solvent, carburetor cleaner, paint sludges, fluorescent tubes, and PCB ballasts. In addition to these hazardous wastes, the Metro Plant collects, separates, or generates several wastes that are covered under the MPCA's Special Hazardous Waste Pilot Project. This pilot project reduces the level of regulation on a few specific hazardous wastes that are commonly recycled, in order to encourage further recycling of these wastes. Such special wastes include household batteries, light ballasts, small capacitors, mercury contaminated material and elemental mercury. In addition, the MCES developed a Voluntary Mercury Reduction Agreement (VMRA) and submitted it to MPCA on December 28, 2000.

c. Indicate the number location, size and use of any above or below ground storage tanks to

store petroleum products or other materials except water. Describe any emergency response containment plans.

Three new storage tanks will be added as shown in Table 3. Fuel oil service will be extended from the F&I1 Building area to the Solids Management Building in the tunnel.

TABLE 3

STORAGE TANKS
Solids Processing Improvements Project

Location	Number of Tanks	Volume/Material Stored
Biosolids Storage Building	One	500 to 10,000 gallon storage tank-H_2SO_4
Biosolids Storage Building	One	500 to 10,000 gallon storage tank-NaOH
Biosolids Storage Building	One	500 to 10,000 gallon storage tank-NaOCl

21. TRAFFIC. Parking spaces added: NA. **Existing spaces (if project involves expansion):** NA. During construction, temporary parking will be provided in the construction material storage area (Figure 4).

Estimated total average daily traffic (ADT) generated: 10 trucks per day.

Estimated maximum peak hour traffic generated (if known) and its timing: Temporary construction traffic will vary, depending upon construction stage, from an estimated _10_ to _30_ vehicles per day.

Provide an estimate of the impact on traffic congestion on affected roads and describe any traffic improvements that are necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

The current traffic volume on Childs Road averages about 3,100 vehicles per day (Personal Communication, city of St. Paul, December 1998). The minimal increase in traffic in this industrial area due to the Solids Project is not anticipated to significantly impact traffic flow or patterns or require any traffic improvements.

22. VEHICLE-RELATED AIR EMISSIONS. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

This minimal increase in truck traffic is not anticipated to significantly impact air quality, including carbon monoxide (CO) levels.

23. STATIONARY SOURCE EMISSIONS. Describe the type, sources, quantities, and compositions of any emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult EAW Guidelines for a listing) and any greenhouse gases such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chloro-fluorocarbons, hydrofluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

23.1 AIR EMISSIONS SOURCES AND CONTROLS

The Solids Project will yield significant reductions in actual air emissions compared with the current emission levels. These reductions result from the decommissioning of several emission sources and from the application of state-of-the-art processing and pollution control technologies to the new equipment.

23.1.1 Emissions Sources

The following emission sources will be decommissioned:

- Six MHIs.
- MHI ash handling system.
- Rotating biological surfaces (currently not operating).
- Zimpro™ thermal solids conditioning.
- Two auxiliary boilers.

Decommissioning some of these sources will reduce the total amount of odorous air emissions from the facility. The rotating biological surfaces (RBS) and the RBS settling basins emit hydrogen sulfide (H_2S) and are some of the larger contributors of odorous emissions at the plant. Because of the low odor detection threshold of H_2S, these sources can be significant contributors to the perceived odor levels while having relatively low mass emission rates. Actual H_2S emissions are approximately 800 pounds per year from these two sources. Although the Zimpro™ system is an insignificant source of regulated air pollutant emissions, its operation results in large amounts of odorous emissions. The majority of these odorous emissions are organics.

Emission sources with the proposed Solids Project include the following:

- Three FBIs.
- FBI ash handling systems.
- Alkaline stabilization and material handling systems.
- Two auxiliary boilers.
- One emergency diesel-driven generator.

Table 4 identifies the regulated pollutants associated with each source. The project will result in a decrease in actual emissions due to the decommissioning of several emission sources and the application of state-of-the-art processing and control technologies to the new emission sources.

TABLE 4

EMISSION SOURCES
Solids Processing Improvements Project

Emission Sources with Proposed Project				Existing Emission Sources to be Decommissioned			
Pollutant	**Fluidized Bed Incinerators**	**Ash Handling Systems**	**Alkaline Stabilization**	**Multiple Hearth Incinerator**	**Ash Handling Systems**	**Zimpro™ Thermal Conditioning**	**Rotating Biological Surfaces**
PM	●	●	●	●	●		
PM_{10}	●	●	●	●	●		
SO_2	●			●			
NO_X	●			●			
VOC	●			●		●	
CO	●			●	●		
Lead	●	●	●	●	●		
H_2S			●			●	●
H_2SO_4	●			●			
HAP Metals	●	●	●	●	●		
Volatile Organic HAPs	●			●			
HCl	●			●			

● Indicates pollutants associated with each source.

23.1.2 Emissions Controls

Emissions from the new dewatering, incineration, and alkaline stabilization equipment will be reduced using state-of-the-art control technologies.

23.1.2.1 Dewatering Emissions Control

The centrifuge discharge hoppers and the sludge bins will be vented through ducting to the FBIs through fluidizing air blowers. All emissions of odorous compounds from dewatering and sludge cake handling will be contained and will be treated in the incinerators by thermal oxidation. There will normally be at least one FBI in operation at all times, therefore during start-up of an FBI, the potential odorous emissions will be treated by the operating FBI. However, during initial dewatering start-up, it may be necessary to divert the sludge to alkaline stabilization until the first FBI is brought on line. This start-up period, during which time a portion of the potentially odorous air stream is not treated, is temporary and is not expected to last more than two months.

23.1.2.2 FBI Air Pollution Control System

All FBI exhaust gases will be treated in a four-step process consisting of a mercury control system, dry ESP, wet scrubbing, and wet ESP. The mercury control system is expected to be comprised of an activated carbon injection system. The dry ESP will remove up to 99 percent of the particulates in the exhaust stream including the activated carbon granules onto which mercury is absorbed. Wet scrubbing will lower the temperature of the gas stream to condense volatile compounds and remove acid gases, such as sulfur dioxide (SO_2) and hydrogen chloride. The wet ESP will remove volatile compounds condensed in the wet scrubbers and the remaining particulates and heavy metals, such as lead (Pb) and cadmium. The exact details of the air pollution control system may vary depending upon which contractor is selected to design and build the FBIs. However, any design alternatives proposed by the FBI design/build contractor must meet the same performance specifications.

Products of the process will be exhaust gas that will comply with regulatory requirements, dry ash, and a minor amount of wet solids collected in the wet processes. Exhaust air will be pulled through the air pollution control processes and discharged into the stack by the induced draft fan on each train. Each exhaust stack will extend vertically to an elevation of 105 feet above grade. The three stacks will be encased in one stack housing. Each stack will be four feet in diameter.

The MCES has a contract for the utilization of the incinerator ash as a component of building products or soil amendments for land application. Almost all of the mercury removed from the FBI stack gas will be recovered with the dry ash in the ESP. Mercury concentrations in the ash will comply with the ash utilization permits described in Section 20.a.2.1. Should ash be mixed with sludge for land application, the biosolids product will comply with the limits established by 503 regulation. Beneficial re-use of ash will continue. Re-use will not include any heating process unless flue gas mercury control is provided. Little or no mercury is expected to be collected in the wet ash. Any minor amount of mercury in the wet scrubber will recycle back through the liquid treatment process and be recaptured. The MCES will continue to meet both effluent and air emission permit requirements for mercury.

23.1.2.3 Alkaline Stabilization Air Pollution and Odor Control

Odor control will be provided for the truck-loading bay, alkaline mixers, and (if constructed) the three storage cells to control the release of odors. Air collected from the alkaline stabilization facilities will be passed through cartridge filters to remove particulates to remove in excess of 99 percent of particulates. Collected particulates will either be landfilled or recycled through the solids load-in facility and fed to the FBIs.

Downstream of the cartridge filters, the air will pass through four parallel packaged odor-scrubbing units. The scrubbers will be single pass, three-stage packaged absorption systems. Acid treatment in the first stage will remove ammonia, followed by two stages to treat H_2S and other compounds. This scrubbing system will be designed to achieve 99 percent removal of ammonia and H_2S in the untreated air stream.

23.2 AIR EMISSIONS SOURCES AND CONTROLS

Improvements in the processing and control technologies associated with the Solids Project will result in overall reductions in air pollutant emissions. Modeling performed to evaluate the impacts of the project emissions indicate that the emissions from the Solids Project sources will not cause adverse health effects.

23.2.1 Criteria and New Source Review Pollutants

Estimated potential emissions from the proposed Solids Project emission sources are listed in Table 5. Further refinements of these estimated emissions may occur as part of the air emission permitting process. Potential emissions are calculated assuming that the equipment is operated 24 hours a day and 365 days a year at the maximum capacity and at the maximum allowable emission rate. While potential emissions are important for determining air emission permitting requirements, they conservatively overstate the actual emissions.

TABLE 5

POTENTIAL EMISSIONS FROM THE PROPOSED SOLIDS PROCESSING IMPROVEMENTS PROJECT SOURCE Solids Processing Improvements Project

Pollutant	Potential Emissions (tpy) Proposed Solids Processing Technology				
	FBI and Ash Handling Emissions	**Alkaline Stabilization Emissions**	**Boiler Emissions**	**Generator Emissions**	**Total Facility Emissions**
PM	41.7	9.2	3.8	0.4	55.1
PM_{10}	27.3	9.2	3.8	0.4	40.7
SO_2	39.6	0.00	13.6	0.2	53.4
NO_x	205.8	0.00	30.8	13.4	250.0
VOC	15.5	0.00	1.4	0.4	17.3
CO	120.6	0.00	21.2	3.1	144.9
Pb	0.15	0.01	$1.3e^{-4}$	0.0	0.16
TRS	1.0	0.4	0.0	0.0	1.4
H_2S	0.0	0.4	0.0	0.0	0.4
H_sSO_4	6.9	0.0	0.0	0.0	6.9

The proposed FBI technology will result in a decrease in actual emissions in comparison with the current MHI technology. Table 6 shows the expected air emissions associated with the selected technology compared with the emissions that would result from processing the same solids volume with the existing technology. The comparison is based on the projected solids processing rate in the year 2005. The expected emissions from the proposed technology are lower than projected emissions from the existing technology for all air pollutants, except SO_2.

TABLE 6

COMPARISON OF EXPECTED EMISSIONS FOR THE PROPOSED TECHNOLOGY WITH THE EXISTING TECHNOLOGY[1]

Solids Processing Improvements Project

Pollutant	Proposed Solids Processing Technology			Existing Technology	Actual Emission Change (tpy)
	Expected FBI and Ash Handling Emissions (tpy)	Expected Alkaline Stabilization Emissions (tpy)	Total Expected FBI and Stabilization Emissions (tpy)	Projected Multiple Hearth Incinerator Emissions (tpy)	
PM	14.6	10.4	25.0	48.3	-23.3
PM_{10}	14.6	10.4	25.0	37.1	-12.1
SO_2	29.3	0.00	29.3	13.7	15.6
NO_X	164.1	0.00	164.1	499.3	-335.2
VOC	12.4	0.00	12.4	14.9	-2.6
CO	96.2	0.00	96.3	900.7	-804.5
Pb	0.07	0.03	0.1	0.25	-0.15
TRS	0.8	0.4	1.2	11.2	-10.0
H_2S	0	0.4	0.4	0	0.4
H_2SO_4	5.5	0.0	5.5	20.4	-14.9

Notes:

- Annual emissions, except for alkaline stabilization, are normalized to the estimated sludge-processing rate of 279 dry tons per day in the year 2005. The alkaline stabilization system's emissions cannot be reliably normalized to a throughput rate; therefore, the maximum potential controlled emissions are shown. There is no appreciable change in emission associated with the new boilers and standby generator; therefore emission from these sources are not included in the values shown.

Air dispersion modeling was performed to evaluate the potential ambient concentrations of carbon monoxide (CO), nitrogen oxides (NO_x), SO_2, and particulate matter less than ten microns (PM_{10}) that would be predicted to result from the Metro Plant emissions after implementation of the Solids Project**.** Table 7 presents the highest criteria pollutant ambient concentrations that are predicted to result from all of the Metro Plant emission sources for all of the applicable averaging periods to facilitate comparison with the ambient air quality standards. Modeled concentrations following the implementation of the Solids Project are below the National and Minnesota Ambient Air Quality Standards.

TABLE 7
CRITERIA POLLUTANT AMBIENT AIR IMPACTS AND AMBIENT AIR QUALITY STANDARDS
Solids Processing Improvements Project

	CO		SO_2				NO_2	PM_{10}	
	1-Hour Average Second High (µg/m³)	**8-Hour Average Second High (µg/m³)**	**1-Hour Average Second High (µg/m³)**	**3-Hour Average Second High (µg/m³)**	**24-Hour Average Second High (µg/m³)**	**Annual Average (µg/m³)**	**Annual Average (µg/m³)**	**24-Hour Average Second High (µg/m³)**	**Annual Average (µg/m³)**
Metro Plant Impact	446	278	765	643	274	34	30	66	11
Ambient Air Quality Standards									
National Ambient Air Quality Standard	40,000	10,000	---	1,300	365	80	100	150	50
Minnesota Ambient Air Quality Standard	35,000	10,000	1,300	915	365	60	100	150	50

23.2.2 Toxic Air Contaminants

The air pollution control systems to be applied to the FBIs will result in lower emissions of metals and other particulates. Further, the decommissioning of the Zimpro™ and RBS systems will result in reduced emissions of H_2S.

Ammonia and H_2S emissions generated by the new alkaline stabilization processes will be controlled by a three-stage scrubber. The first stage acid scrubber will control ammonia gases. More than 99 percent of the H_2S emissions, which are also generated by the alkaline stabilization processes, will be eliminated by the last two stages.

Sources other than the solids processes also generate toxic air pollutant emissions at the plant. In addition to the emission reductions that will be achieved with the Solids Project, the MCES also plans to modify the primary liquid treatment processes, which will result in additional capture and control of H_2S and other toxic air contaminants.

Mercury is a toxic air contaminant that has received much attention in recent years. Most of the mercury in the wastewater influent ends up in the sludge and can end up in the incinerator emissions. The mercury emission rate is, and will continue to remain, far below the regulatory limit. During the past several years, the average mercury loading in the sludge fed to the MHIs has been decreasing to the current average of less than 250 grams per day, resulting in actual annual emissions of less than 0.1 tons per year (tpy). The total mass of mercury in the sludge, even before reductions achieved with the stack emission control system, is less than the regulatory limit of 3,200 grams per day (1.3 tpy). The MCES has been an active participant in the Minnesota Mercury Contamination Reduction Initiative and supports the Advisory Council recommendations that resulted from that effort. The MCES submitted a Voluntary Mercury Reduction Agreement (VMRA) on December 28, 2000. The VMRA summarizes MCES' past actions, current activities, and future plans for reductions, which go well beyond any current regulatory requirements, including the enhanced mercury removal system referenced in Section 23.1.2.2.

The MCES prepared an Air Toxics Review (ATR) to assess the potential health risks from operation of the Metro Plant after construction of the proposed solids processing facility. The analysis quantifies the inhalation pathway cancer risks and chemical hazards associated with the Metro Plant's air emissions after the proposed project is completed, to show that the proposed facility emissions will conform with all current and proposed applicable MPCA and Minnesota Department of Health (MDH) air toxics health criteria and standards.

The MCES' VMRA, as it pertains to the proposed project, and the results of the ATR are discussed in the following sections.

23.2.2.1 Voluntary Mercury Reduction Agreement

The MCES has maintained an active mercury reduction program. The MCES is committed to further reducing mercury emissions and discharges to the environment. To that end, the MCES has developed a VMRA.

Two elements of the VMRA directly relate to reducing mercury air emissions from the Metro Plant:

- Reducing mercury in the wastewater influent
- Reducing stack emissions from sewage sludge incineration

Reducing Mercury in the Wastewater Influent

Efforts to control sources of mercury discharges to the wastewater received at the Metro Plant have resulted in a reduction of mercury concentrations in sewage sludge from approximately 3.0 milligrams per kilogram (mg/kg) in 1990 to 1.25 mg/kg in 1999. Programs focussed on the control of industrial sources, significant commercial sector sources, and domestic discharges will help to achieve further reductions in the future.

Control of Industrial Sources

The MCES administers the federally delegated pre-treatment program which includes establishing limits, permitting, monitoring, and inspection of discharges to the Metropolitan Disposal System (MDS). Every five years, as part of the pre-treatment program, the MCES reviews the discharge limitations, including mercury, that it places on the users of the MDS. Based on the results of the evaluation, the limits that dischargers to the MDS are required to meet may need to be changed.

Evaluation of Dental Discharges

Survey information gathered in 1995-96, estimated mercury contributions to the collection system from dental clinics may represent up to 80 percent of the total mercury discharged. As a result, the MCES entered into a partnership with the Minnesota Dental Association (MDA) to further evaluate the contributions of mercury from the dental community and to test advanced amalgam removal equipment. The MCES, in conjunction with MDA, has designed and implemented two extensive studies to achieve this objective.

The first study is designed to evaluate the removal efficiency and associated costs of a variety of amalgam removal equipment. The ultimate objective of the evaluation is to give the information to dentists so that they can make informed choices about the best removal equipment for their type of clinic setting.

The second study is referred to as the "community-wide study." The purpose of the community-wide study is four-fold:

- Collect all dental amalgam waste in the area tributary to the Cottage Grove and Hastings WWTPs,
- To quantify the mercury removed in the equipment at the clinics,

- To evaluate whether the mercury removed results in a measured reduction of mercury at the two WWTPs, and
- To determine relative contributions of mercury from dental activities to WWTPs.

Evaluation of Domestic Sources of Mercury

The MCES is a member of the Association of Metropolitan Sewerage Agencies (AMSA). The MCES helped establish the AMSA Mercury Workgroup in July 1998, to develop data and information about mercury discharges to publicly owned treatment works (POTWs) in order to develop effective control programs. The MCES will continue to participate in the AMSA Mercury Work Group in order to share data and information nationally.

Reducing stack emissions from sewage sludge incineration

The MCES will install a system to control mercury emissions from the new fluidized bed boilers-probably using an activated carbon system. This technology is expected to reduce annual mercury emissions to the air by approximately 70 percent compared to existing emission estimates. We are not aware of other sewage sludge incinerators using activated carbon to control mercury emissions. The cost for the carbon injection technology and the enhanced particulate removal technology, which is integral to the enhanced mercury removal, is approximately $5.7 million.

The MCES has committed to conduct quarterly stack tests for three years following the installation and operation of the new air pollution control systems to determine the amount of mercury in the stack exhaust gases. The MPCA is planning to incorporate the quarterly testing into the air emissions permit for the sludge incinerators.

Additional elements of the VMRA address mercury in the environment on a more regional basis. These elements include the following programs and initiatives:

- Revised employee dental insurance policy to encourage the use of mercury-free dental cavity fillings.
- Grant programs to study nonpoint sources, groundwater infiltration, and storm-water inflow reductions.
- External pollution prevention education and outreach through printed information to communities and industrial users, website postings, and presentations to MCES' customer communities, industry, and other interest groups.
- Internal pollution prevention including inventorying, removal, and recycling of mercury switches and other mercury-containing devices, and experimentation with procurement policies to restrict the use of mercury-containing devices.
- Product substitution including elimination of mercury containing thermometers in the MCES laboratory and in sample refrigerators at the WWTPs and a mercury fever thermometer exchange program for employees.
- Research and development activities including several ongoing regional water quality monitoring studies.
- Evaluation of technology-based controls for mercury removal from municipal wastewater effluents and prevention of mercury emissions from coal-fired utility power generation achieved through energy efficiency innovations at the Metro Plant.

The VMRA is a flexible program designed to allow changes to be made to respond to changing conditions or new data.

23.2.2.2 Air Toxics Review

The MPCA required the completion of an ATR by MCES to evaluate the potential human health impacts related to the inhalation of chemicals known or expected to be emitted from the proposed facility. Potential health risks were quantified for chemicals emitted to the air from the facility that had calculable emission rate estimates and State or Federal health criteria for the inhalation pathway of exposure.

Only incremental human health risks from the MCES facility have been quantified, (i.e., risks from neighboring sources of air pollution are not represented in the analysis). In addition, the current ATR process, by policy, does not evaluate ecological risks. Accordingly, an environmental risk assessment was not required as part of this ATR.

The purpose of the ATR was to assess the potential human health risks from the operation of the proposed facility. To be consistent with the current MPCA ATR guideline (March 2000) and with an approved scoping document for this study, MCES quantified the inhalation pathway cancer risks, along with acute and chronic chemical hazards associated with the proposed facility's "maximum potential-to-emit" air emissions.

The major components, as well as a summary of the results of the analysis, are provided below. Details regarding methodology and the results of the analysis were presented in the ATR Final Report (December 22, 2000).

Toxicity Assessment

MCES identified 91 chemicals emitted to the air from their facility. Of those, 58 chemicals had State or Federal inhalation health criteria approved by MPCA for use in the ATR. These 58 chemicals were quantitatively evaluated for potential health effects in the study (i.e., risk estimates were calculated for these 58 chemicals). The 58 chemicals that were quantitatively evaluated are referred to as chemicals of concern (COC). Fifty-seven COCs were evaluated for chronic (i.e., long-term) non-cancer and cancer health effects and 21 COCs were evaluated for acute (i.e., short-term) non-cancer health effects. Potential risks were calculated for the maximum permitted air emissions of COCs from the facility under the proposed operating conditions.

The MPCA policy does not require criteria pollutants (e.g., nitrogen dioxide, sulfur dioxide, carbon monoxide) to be quantitatively evaluated in the ATR as they are regulated by health based State and Federal ambient air quality standards. Emissions of criteria pollutants could represent human health inhalation risks alone or in combination with other chemical emissions. Consistent with MPCA's current ATR guidance, emissions of criteria pollutants from the MCES facility were compared to their respective State or Federal ambient air quality standard as part of the ATR. It is important to note that this analysis was conducted independently from the air toxics analysis, and therefore, potential health effects from the criteria pollutants are not represented in ATR's quantitative evaluation of health risks.

Exposure Assessment

MCES prepared an inhalation-only exposure analysis corresponding to the facility after the solids project is implemented. The maximum potential-to-emit air emission rates were quantified for each operable emission source under the guidance of MPCA air quality staff. Maximum potential-to-emit rates represent the likely maximum emission rates for the COCs from each emission source. These maximum potential-to-emit rates were calculated in this study assuming that each emissions unit, process, or activity would operate continuously at its maximum design capacity and/or at its maximum emission rate allowed by State or Federal standards/permit limits. For those units or specific COCs not currently subject to a State or Federal emission limit or standard, maximum potential-to-emit emission rates were derived from statistical evaluations of available published scientific data on identical/similar units. All of these maximum potential-to-emit emission rates were critically reviewed and accepted by the MPCA staff. Both short-term (one hour average) and long-term (annual average) emission rates of the COCs were estimated for this study.

Following ATR protocols approved by the MPCA, air dispersion modeling was used to predict ambient concentrations of COCs in the air at receptor points beyond the facility's property boundary. The modeled ambient air concentrations were based on the maximum potential-to-emit rates defined above.

The health risk assessment involves hypothetical population receptors, (i.e., it was assumed that human receptors were present at locations with the highest modeled air concentrations of COCs). Since the highest modeled air concentrations were found to occur on or near the facility's northern and western boundaries, the assessment evaluated a nearby (e.g., off-site, non-MCES) worker receptor population. These impact areas are currently zoned industrial and are likely to remain so for the foreseeable future. This hypothetical worker population was assumed to be present at these locations 8 hours/day, 250 days/year for 25 years (i.e., the default industrial exposure scenario used by MPCA in developing the Tier II Industrial Soil Reference Values).

To estimate the potential health risks to nearby residents, MCES identified the locations that were predicted to experience the maximum ambient air concentrations of chemicals where residential and/or agricultural activity currently occurs or could occur in the foreseeable future. These locations were evaluated as residential exposure sites, (i.e., exposure was assumed to occur at these locations 24 hours/day, 365 days/year for 70 years).

Quantitative Risk Characterization

Risk characterization is the step in the ATR that combines information on toxicity and exposure to calculate the probability of a health risk to an exposed individual or population.

Potential cancer related health risks were characterized by estimating the increased probability that an individual will contract cancer due to lifetime exposure to potential cancer-causing chemicals. Excess cancer risk from each carcinogenic COC is calculated for each receptor, then excess cancer risk is summed for each receptor. The receptor with the highest estimated summed excess cancer risk is considered the maximally impacted off-site receptor for cancer risk. Excess cancer risk is defined as the probability for an individual to contract cancer after being exposed to specified chemicals for a specific exposure period. For example, an excess cancer risk of 1×10^{-5} means that the probability for an individual to contract cancer over a lifetime is 1 in 100,000.

Potential non-cancer acute and chronic risks were characterized by comparing the highest modeled ambient air concentration of each COC to a chemical-specific inhalation toxicity value (i.e., concentration below which adverse health effects are not expected to result). The ratio of the modeled ambient air concentration of a chemical to its corresponding inhalation toxicity value is called a hazard quotient (HQ).

To account for exposure to multiple chemicals, the chemical-specific HQs are summed to determine a hazard index (HI). A separate HI is determined for each toxic endpoint of concern (e.g., respiratory system, liver). HIs are determined separately for acute and chronic exposure. It has been the policy of the Minnesota Department of Health and MPCA that excess lifetime cancer risks below 1×10^{-5} and hazard indices below 1.0, when calculated in an ATR, are considered negligible.

Risk/Hazard Results (Detailed risk calculations are provided in Section 9.0 of the Air Toxics Review.)

The cancer risk/chemical hazard results calculated for the off-site worker and residential receptor populations affected by the facility are summarized below. All of these risks/hazards were calculated using either State or Federal health criteria. With respect to the results of this study, the only significant risks/hazards calculated in the project were for acute exposure to adjacent workers.

Excess Lifetime Cancer Risks

Receptor Population	Risk Level	Comment
Off-site Workers	7E-07	Less than MDH's *de minimus* risk level of 1 x 10^{-5}
Off-site Residents	2E-06	Less than MDH's *de minimus* risk level of 1 x 10^{-5}

Chronic Chemical Hazards

Receptor Population	Hazard Index	Comment
Off-site Workers	0.4	Less than MPCA's *de minimus* HI of 1.0
Off-site Residents	0.2	Less than MPCA's *de minimus* HI of 1.0

Acute Chemical Hazards

Receptor Population	Hazard Index	Comment
Off-site Workers (Receptor 8)	4	Greater than MPCA's *de minimus* hazard index of 1.0
Off-site Workers (Receptor 4)	2	Greater than MPCA's *de minimus* hazard index of 1.0
Off-site Residents	0.6	Less than MPCA's *de minimus* hazard index of 1.0

Hydrogen sulfide (H_2S) is the chemical primarily contributing to the potential chemical hazards at the worker 4 and worker 8 locations.

The predicted exceedences of the *de minimus* (Defined: The risk level at or below which adverse noncancer health effects are not expected and the excess lifetime cancer risk is considered to be insignificant.) hazard index of 1.0 are believed by the MPCA staff to be an artifact of the very conservative and precautionary assumptions that are inherent to the ATR, which is a screening level analysis. Given these conservative assumptions, it is presumed that when a hazard index below the *de minimus* level is predicted, the facility may be permitted with confidence. When (as in this case) a hazard index above the *de minimus* level is predicted, the facility may still be permitted with confidence. However, since the ATR indicated an exceedence of the *de minimus* hazard index, it is appropriate to verify that the result was conservatively high by additional work. MCES has already completed a refined analysis of acute chemical hazards that does not include some of the more conservative assumptions of the ATR. The MPCA will evaluate this analysis. Both the analysis and the MPCA's evaluation thereof will be available for public review. Additionally, MCES has agreed to a permit condition that will require them to monitor for H_2S when the Solids Processing Improvements are completed in 2005. It is expected that monitored levels of H_2S in the ambient air will be lower than the levels predicted in the ATR.

Analysis of Background Air Quality

Overall, when a comparison was made between the maximum modeled ambient air concentrations of chemicals from the proposed facility to existing background air quality data (i.e., at Holman Field), it was revealed that this facility is not a major contributor to air toxics in the area, with a few exceptions.

On an individual chemical basis, the maximum predicted facility air impact level ranged from 0.01 percent (carbon tetrachloride) up to a high of 684 percent (trimethylbenzene) of measured background concentrations. Excluding trimethylbenzene, the average air contribution to background for the 16 VOC analytes examined was 4.4 percent. Since there is no acute health criteria for trimethylbenzene, it could not be quantitatively evaluated in this report. Trimethylbenzene was evaluated for its chronic toxicity and was not found to be of concern. Rather than regulating trimethylbenzene in a conventional way, the MCES and the MPCA have agreed to utilize a pollution prevention approach. The project permit will include a requirement that the MCES submit a pollution prevention plan and annual pollution prevention progress reports to the MPCA. The format for the plan and the reports will be consistent with the requirements of the Minnesota Toxic Pollution Prevention Act (Minn. Stat. § 115D). The plan would establish goals and identify strategies for developing alternative paints that would not contain toxic chemicals, including trimethylbenzene. MCES participates in the Interagency Pollution Prevention Advisory Team (IPPAT). Provided the reports that the MCES provides to IPPAT are consistent with the requirements of Minn. Stat. § 115D, the IPPAT report will suffice.

Supplementary Analyses

As there was no standard MPCA guidance nor agreed upon methodology for conducting the following supplementary analyses, the MPCA required that they be presented in a "Proposer's Comment Section" of the ATR. The analyses that were conducted by MCES in the Proposer's Comment Section of the ATR were not critically reviewed by MPCA technical staff. Consequently, the results and conclusions below as they pertain to these supplementary analyses have not received MPCA approval. This information is being provided so that a more complete picture of the potential health risks from the MCES facility is presented.

<u>Pre-modification Scenario Results</u>

MCES also conducted an inhalation-only analysis for the facility's maximum potential emissions before the Solids Project is implemented. The pre-modification inhalation risk assessment was conducted in an identical manner to that performed for the post-modification assessment. The same receptors were selected, the same air dispersion modeling inputs were used and the same emission substances (COCs) and emission rates were used for those operational units that are not proposed to change at the facility. New emission databases were developed for the existing units/sources, e.g., the MHIs that are planned for decommissioning in the proposal. These were not reviewed, however. Proposed emission sources were not included in this analysis.

The calculated excess lifetime cancer risks for the two receptor populations (workers, residents) were somewhat higher than those risks calculated for the post-modification scenario, but still less than MDH's *de minimus* risk level of 1×10^{-5}.

The maximum chronic hazard indices for both of these populations were also less than the state's *de minimus* value of 1.0, albeit again the pre-modification scenario values were somewhat greater in magnitude than the post-modification scenario.

The maximum acute hazard index for the worker population was greater than the state's *de minimus* value of 1.0 and greater than the post-modification hazard index, which was also greater than the *de minimus* value. This potential exceedance occurs in the same area as with the post-modification scenario. The maximum acute HI for the residential receptor population was 1.0, at the *de minimus* value.

The difference between the pre- and post-modification hazard indices seems to be due to the six existing MHIs, which will be decommissioned. In all three risk/hazard assessment cases above, the existing MHIs seemed to have contributed the differential between the pre- and post-modification scenarios. And while overall risk/hazard reduction with this proposal is likely to occur (the new FBIs) are more efficient at combustion than the old MHIs), the magnitude of this effect cannot be equated directly to the results of this study comparison. The reason for this is that the databases used to determine emission estimates for MHIs and FBIs were considerably different, both in how the data were collected and how the data were reported. For example, there were 62 emission substances reported in the MHI database, while only 38 chemicals in the FBI database. The databases did not provide enough detail to determine if the additional MHI compounds were evaluated and found not to be detected with FBIs, or if they simply were not evaluated (tested for) in the FBI stack gases.

Multi-pathway Risk Assessment Results

Many of the emission substances that were evaluated in the ATR are environmentally persistent metals such as arsenic, cadmium, chromium, lead, and nickel. Therefore, MCES supplemented the required inhalation analyses with a multi-pathway health risk assessment. In the multi-pathway assessment, particle deposition onto surface soil, surface water, home gardens, etc. were modeled. Subsequent chemical intakes calculated for human populations from various inhalation and non-inhalation exposure pathways were then quantified and summed. These doses were evaluated using USEPA health criteria.

For the study, MCES utilized average potential-to-emit emission rates for the COCs, rather than maximum potential-to-emit rates as were utilized in both inhalation risk assessments (pre- and post-modification assessments). Average potential-to-emit emission rates result in more realistic, albeit less conservative risk estimates than do maximum potential-to-emit rates. The calculated excess lifetime cancer risk was below the State's *de minimus* value of 1×10^{-5} for residents, fishers, and off-property workers at every receptor location. The predicted cumulative HIs for chronic non-cancer health effects were also below State's *de minimus* value of 1.0 for every residential and fisher receptor. Multi-pathway assessments do not evaluate acute exposure. Using MCES' procedures, MPCA's technical review team reassessed the facility's multipathway risks using maximum potential-to-emit emission rates and found no significant risks.

The multi-pathway analysis also showed no lead hazard for the public, and the calculated maximum infant dose of polychlorinated dioxins/furans through breast milk is less than what is currently considered background exposure to these chemicals.

The multipathway study evaluated, by a comparative analysis, pre- and post-mercury emissions from the facility. Post-modification mercury emissions are expected to be 70 percent lower than pre-modification emissions, based on MCES's stated reduction goals. If emissions are reduced by 70 percent, it would be expected that any associated mercury deposition into nearby lakes and the Mississippi River to be reduced. The actual percentage decrease would depend upon the form of mercury emitted both pre- and post-modification and the extent of atmospheric oxidation of elemental mercury that occurs in the region.

Conclusions

The Metro Plant's maximum potential emissions after the Solids Project is implemented will not likely cause or contribute to an unacceptable chronic health risk. The following results of the inhalation pathway analysis support this conclusion:

- The calculated excess lifetime cancer risk is below the State's *de minimus* value for both residents and off-property workers at every receptor location.

- The predicted cumulative HI for non-cancer chronic health effects are below the State's *de minimus* value for every residential receptor and for every off-property worker receptor.

Acute hazard indices were exceeded in two off-property locations near the facility. In both cases, the major contributing chemical was hydrogen sulfide, with the gravity thickening tanks and the east primary clarifiers being the main sources for each area, respectively. Both areas were also affected by the facility's paint booth. This latter source emits xylenes and methanol as major contributors to air quality impacts in the area. Exceedences of these acute health criteria do not in themselves indicate a chemical hazard.

Rather, these exceedences denote what emissions and emission sources at a facility require further discussions. As a result of these discussions, MCES has agreed to monitor for H_2S when the Solids Processing Project is completed in 2005. MCES has also agreed to prepare and submit Pollution Prevention Plans for the paints used in the paint booth (the source of xylene, methanol, and trimethylbenzene emissions).

23.2.3 Greenhouse Gas Emissions

Fluidized bed incineration is superior to the currently used multiple hearth furnace incineration technology in terms of minimizing the emission of greenhouse gases. This is due primarily to much lower fossil fuel consumption rates associated with operation of FBIs compared to MHIs.

Greenhouse gases include primarily water vapor, CO_2, methane, nitrous oxide (N_2O), and ozone (O_3). Other nongreenhouse, radiatively important gases, such as CO, NO_X, and nonmethane volatile organic compounds - contribute indirectly to the greenhouse effect. These are commonly referred to as "tropospheric O_3 precursors" because they influence the rate at which O_3 and other gases are created and destroyed in the atmosphere.

Carbon dioxide is the greenhouse gas emitted in the largest quantity by the proposed FBIs, auxiliary boilers, and standby diesel generator. Although CO_2 is a byproduct of burning sewage sludge, these CO_2 emissions are not thought to increase total atmospheric CO_2 because the carbon in the sludge is biogenically "recycled" on a renewable basis. Guidance issued by the USEPA[1] instructs states to inventory CO_2 emissions resulting from bioenergy separately from those emitted from fossil fuel combustion. Reduction strategies will be aimed primarily at reducing fossil fuel consumption. Unlike conventional air pollutants, there are no "end-of-pipe" or process control technologies that can be employed to reduce most species of greenhouse gas emissions.

Fluidized bed incineration offers lower fossil fuel consumption rates than the MHI technology currently employed at the Metro Plant. Therefore, changing to FBIs from the MHIs is a move towards the goal of maintaining CO_2 emissions at or below 1990 levels as suggested by the recently developed Kyoto Protocol.

Although sludge burning is not considered to be a net source of CO_2, this practice is a net source of emissions for many of the other direct and indirect greenhouse gases. However, these other pollutants are emitted in lesser quantities and are thought to have less direct impact on climate change than CO_2 emissions.

Nitrous oxide emissions will result from land application of alkaline stabilized biosolids, just as they would from the application of any other organic or synthetic fertilizers. Nitrous oxide is produced naturally in soils through the microbial processes. Adding nitrogen to the soil with fertilizer products, both synthetic and organic, increases the amount of nitrogen available for nitrification and dentrification, and ultimately the amount of N_2O produced. Fertilizer use is the most significant source of nitrous oxide in the United States. While N_2O emissions are much lower than CO_2 emissions, N_2O is approximately 310 times more powerful than CO_2 at trapping heat in the atmosphere over a 100-year time horizon. The net impact of producing and land applying a biosolids product will be limited as it is expected that only 10 percent of the sludge produced annually at the Metro Plant will be processed for land application.

[1] State Workbook: Methodologies for Estimating Greenhouse Gas Emissions, Second Edition, U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, State and Local Outreach Program, Washington, DC 20460, January 1995.

23.3 EXISTING AIR QUALITY CONDITIONS

The stringency of emission limits for existing facilities and permitting requirements that are applied to new or modified sources of air emissions are dependent upon the existing air quality conditions. An area where ambient air contaminant concentrations are measured in excess of National Ambient Air Quality Standards (NAAQS) for a particular pollutant is designated as a "nonattainment" area for that pollutant. Facilities that emit pollutants for which the area is designated as nonattainment are subject to greater scrutiny than similar facilities located in areas that are designated as "attainment" or "unclassified".

The Metro Plant is located within an area that is designated as being in nonattainment with NAAQS for PM_{10}. The area is designated as in attainment with NAAQS for CO, O_3, NO_x, SO_2, and Pb. PM_{10} concentrations have declined sufficiently over the past several years to allow the MPCA to request redesignation of the attainment status for this pollutant. Formal redesignation by the USEPA can take several years.

23.4 APPLICABLE AIR EMISSION REQUIREMENTS

This section discusses the applicability of state and federal air emission regulations to the solids processing facility. The regulations are summarized as follows:

- The project will not be subject to review under the State and Federal PSD/NSR regulations**.**
- PM_{10} emissions from the proposed project will be governed by the State implementation Plan (SIP) for operation within a PM_{10} non-attainment area.
- The FBIs are subject to New Source Performance Standards (NSPS) for sewage sludge incinerators specified in 40 CFR, Part 60, Subpart O, Standards of Performance for Sewage Treatment Plants. The waste heat boilers also make the FBIs subject to Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units; however, there are no emission limits that apply to steam generating units fired with sewage sludge.
- The project is subject to Part 61 NESHAPs, Subpart E governing mercury emissions.
- The FBIs will be subject to metals emission limits established in accordance with 40 CFR Part 503, Subpart E.
- The project is not subject to Part 63 NESHAP Maximum Achievable Control Technology (MACT) standards or case-by-case MACT determination under Section 112(g) of the Clean Air Act.
- The project is subject to Minn. R. chs. 7011.1300-1350 set limits for PM emissions, opacity, minimum combustion temperature/retention time for sewage sludge incinerators, and Minn. R. chs. 7011.0700-0735 (Industrial Process Rule) sets limits on PM emissions from the ash handling and alkaline stabilization systems.

23.4.1 Permitting and Regulatory Status

The Metro Plant currently operates under MPCA Air Emission Permit No. 879-90-OT-3 (Facility ID 12300053). In addition to the permit, an Administrative Order governs PM_{10} emissions because the MPCA has determined, through computerized air emission dispersion modeling, that the limits on PM_{10} from emissions MHIs at the Metro Plant are needed to ensure the attainment of the PM_{10} ambient standard.

The MPCA is currently preparing a new air emission-operating permit for the Metro Plant as required by 40 CFR 70 (Part 70) and Title V of the federal Clean Air Act Amendments of 1990. The MPCA administers the Title V program in Minnesota through rules set out in Chapter 7007. The permit application for the Metro Plant was submitted in a timely manner in December 1995.

The Metro Plant is an existing major source under the PSD/NSR rules. The plant is located within the Ramsey County PM_{10} nonattainment area. The existing plant's potential to emit (PTE) for PM_{10} is greater than 100 tpy. The PTE for NO_X, SO_2, CO, and total particulate matter (PM) exceed the PSD major source threshold of 250 tpy. Any changes at the facility must be evaluated to determine the applicability of nonattainment NSR provisions for PM_{10} as well as PSD rules for other regulated pollutants. The *de minimis* thresholds that would trigger PSD/NSR requirements are listed in Table 9.

PSD/NSR Applicability

The decommissioning of the existing MHIs and the associated ash handling systems will offer sufficient creditable reductions to enable the project to "net out" of PSD/NSR. Emissions netting is a term that refers to the process of considering previous and prospective changes at an existing facility to determine if a net emission increase of a pollutant will result from a proposed change at the facility. A proposed project is subject to PSD/NSR review only if the net emission increase, expressed as the difference between future potential emissions and past actual emissions, for one or more pollutants were to exceed the respective *de minimis* threshold for that pollutant.

Netting out of PSD/NSR offers benefits to the MPCA, MCES, the public, and the environment. The objectives of the PSD/NSR program - emission reductions, ambient air quality assessment, and mitigation of associated project impacts - will all be achieved sooner than if the permit application were to be processed under the PSD/NSR rules. These objectives are described as follows:

- A level of emission control comparable to that which has been prescribed by the PSD/NSR rules for other sewage sludge incinerators will be achieved.
- The reduction in actual PM_{10} emissions will help achieve and maintain compliance with the NAAQS for PM_{10}.

Future potential emission rates for PM, PM_{10}, SO_2, H_2S, and Pb are based on proposed emission limits and operational restrictions that will enable the project to net out of PSD/NSR.

The application specifies emission limits for several of the regulated PSD/NSR pollutants that will qualify the project as a "synthetic" minor modification to an existing major source. The term "synthetic" is used to indicate that voluntary emission limits requested by MCES, which are more stringent than the applicable State and Federal regulations, will be imposed in the permit to ensure that the net change in emissions is less than specified thresholds that would trigger PSD/NSR requirements.

The maximum potential emissions for the affected sources that will ensure that the net emission changes associated with the modifications are less than the PSD/NSR *de minimis* thresholds are listed in Table 10. Table 10 also shows the creditable reductions in actual emissions that will result from the Solids Project.

The net change between the potential emission increases and the past actual emissions is below the PSD *de minimis* threshold for each pollutant. A comparison of future and past emissions that is more physically meaningful is presented in Table 6. Table 6 shows that the Solids Project will result in decreases in actual emissions of every regulated pollutant except SO_2.

TABLE 8

PSD/NSR DE MINIMIS EMISSION THRESHOLDS
Solids Processing Improvements Project

Pollutant	PSD/NSR De Minimis Emission Increase Threshold (ton per year)
PM	25
PM_{10}	15
SO_2	40
Nox	40
VOC	40
CO	100
Lead	0.6
H_2SO_4	7
H_2S	10

Note: PSD/NSR review may not be required because the net change in emissions may not exceed the de minimis increase threshold for any regulated pollutant.

TABLE 9

POTENTIAL EMISSIONS FROM AFFECTED SOURCES
THAT ENSURE THE NET EMISSION CHANGES ARE DE MINIMIS
Solids Processing Improvements Project

Pollutant	Total Potential Emissions (tpy)*	Past Actual Emissions (tpy)	Net Emission Change (tpy)*	PSD/NSR Trigger (tpy)
PM	62.5	38.0	24.5	25
PM_{10}	44.1	29.6	14.5	15
SO_2	53.7	14.2	39.5	40
NO_x	426.2	386.7	39.5	40
VOC	39.5	NA	39.5	40
CO	777.7	678.2	99.5	100
H_2S	9.90	0.40	9.50	10
TRS	9.90	0.40	9.50	10.0
Lead	0.735	0.185	0.55	0.6
H_2SO_4	21.7	15.28	6.5	7

***** These numbers may be revised during the permitting process.

23.4.3 New Source Performance Standards

The federal NSPS in 40 CFR, Part 60, Subpart O, govern particulate emissions and visible emissions from sewage sludge incinerators. These rules apply to sewage sludge incinerators that charge more than 2,200 pounds of dry sludge daily and that are constructed, reconstructed, or modified after June 11, 1973. PM is limited to 1.3 pounds per dry ton of sludge charged. Visible emissions are limited to 20 percent opacity. The existing MHIs are subject to NSPS Subpart O. The new FBIs are also subject to NSPS Subpart O.

The waste heat boilers also make the FBIs subject to NSPS, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. However, there are no emission limits that apply to steam generating units fired with sewage sludge. They are also subject to the General Provisions of 40 CFR 60, Subpart A. They are also subject to the General Provisions of 40 CFR 60, Subpart A.

23.4.4 National Emission Standards for Hazardous Air Pollutants (NESHAPS)

The new FBIs are subject to the NESHAPs for mercury specified in 40 CFR 61, Subpart E. This section discusses the applicability of the NESHAPs to the Solids Project. They are also subject to the General Provisions of 40 CFR 61, Subpart A. They are also subject to the General Provisions of 40 CFR 61, Subpart A.

There are two sets of NESHAPS:

- 40 CFR 61 (Part 61) NESHAPs are risk-based standards, which were mandated by the 1970 Clean Air Act Amendments. They apply only to a handful of pollutants emitted by specific categories of emission sources.

- 40 CFR 63 (Part 63) NESHAPs are technology-based standards; their development was mandated by the 1990 Clean Air Act Amendments. Part 63 standards are being promulgated in a phased approach between 1994 and 2000. Part 63 governs emissions of 188 listed hazardous air pollutants from several dozen emission source categories.

23.4.4.1 Part 61 Subpart C, Beryllium

The Part 61, Subpart C NESHAP for beryllium will not apply to the new solids processing facility. It applies only to foundries, extraction plants, ceramic plants, propellant plants, and to incinerators that process wastes from these specific types of facilities. This determination is summarized in a USEPA memorandum dated July 16, 1979, from Edward E. Reich, Director, Division of Stationary Source Enforcement, to Stephen A. Dvorkin, Chief, General Enforcement Branch, USEPA Region II, (Control No. ZC12). None of these types of facilities are currently sewered to the Metro Plant. This subpart formerly applied to the existing MHIs at the Metro Plant. A Bloomington foundry was engaged in casting beryllium-containing aerospace parts during the 1980s and wastewater was treated at the Metro Plant.

23.4.4.2 Part 61 Subpart E, Mercury

The Part 61, Subpart E NESHAP for mercury applies to the existing MHIs and will also to apply to the new FBIs. This subpart limits facility-wide mercury emissions to 3,200 grams per day, which is equivalent to 1.29 tons per year.

23.4.4.3 Part 63 NESHAP

Part 63 NESHAPs will not apply to the new solids processing facility because the Metro Plant is not a major HAP source. The MCES requested, through the facility's Part 70 Operating Permit Application, that enforceable permit conditions be imposed to demonstrate the facility's status as a non-major source of HAPs. The application specifies limits on volatile organic HAPs, HAP metals, and hydrochloric acid (HCl).

The development of MACT standards was originally scheduled for two primary emission source categories present at the Metro Plant: POTWs and sewage sludge incineration. Only six existing POTWs across the country have been identified as major HAP sources subject to the recently promulgated POTW MACT regulations. The new requirements will be imposed upon modifications or reconstruction of any of these six facilities. The USEPA has announced plans to regulate sewage sludge incineration under Section 129 of the Clean Air Act, which governs waste combustion, instead of the more general Section 112 provisions. If the USEPA continues this course, then the new FBIs may be subject to the new Section 129 rules despite the facility's nonmajor source status.

The application for the new Solids Project will specify new emission limits that will retain the Metro Plant's status as a non-major HAP source. Limits will be imposed on emissions from the FBIs and alkaline stabilization system. The limits will reapportion the potential HAP emissions that are presently allocated to the MHIs and the ash handling systems.

23.4.5 40 CFR Part 503, Subpart E

Part 503 rules authorized by the Clean Water Act also address air emissions of toxic air contaminants. The daily metals emission limits for the FBIs will be determined using the following information:

- Emission control efficiency.
- Dispersion coefficient of source emissions to maximum ambient air impact receptors.
- Maximum allowable ambient air concentrations of the seven metals regulated under 40 CFR 503.43.
- Daily sewage sludge feed rates.

Results from air emission dispersion modeling conducted by MCES will be used to establish the source-specific dispersion coefficients for each of the new sources. These coefficients, along with the information described above, will be input into the equations listed in 40 CFR 503.43 to calculate the emission limits for each source.

23.4.6 State Rules

Several state emission standards will apply to the proposed solids processing facility. The rules that apply for each of the alternative processing technologies are identified in this section. The voluntary limits requested for the modification to net out of PSD/NSR are more stringent than the limits specified by state rules.

The following rules apply to the FBIs and the associated equipment:

- Minn. R. chs. 7011.1300-1350 set limits for PM emissions, opacity, minimum combustion temperature/retention time for sewage sludge incinerators.

- Minn. R. chs. 7011.0700-0735 (Industrial Process Rule) sets limits on PM emissions from the ash handling and alkaline stabilization systems.

24. ODORS, NOISE AND DUST. Will the project generate dust, odors, or noise during construction and/or operation?

___X___ Yes ________ No

If yes, describe sources, characteristics, duration, and quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify the locations of nearby sensitive receptors and estimate the impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

The project will occur within the existing wastewater treatment plant in an area zoned for industrial use. The area in the vicinity of the Metro Plant is not expected to be adversely affected by noise, dust, or odors during construction or operation. Odor is expected to be reduced as a result of the operation of the facilities constructed under this project.

24.1 CONSTRUCTION

Varying degrees of noise can be expected during the construction period. Anticipated noise sources are primarily construction equipment and normal construction activities. Mitigative measures would include standard mufflers on engine driven equipment and possible ear protection as necessary for workers engaged in periodic demolition or other short term noise intensive activities.

Generation of dust can be anticipated during the limited amounts of demolition work that will occur. Nuisance levels of dust generated during demolition activities can be controlled though periodic wetting and/or other measures.

It may be necessary to phase in a portion of the odor control system upon initial start-up of the new dewatering equipment in the Solids Management Building**.** The centrifuge discharge hoppers and the sludge bins are vented through ducting to the FBIs through fluidizing air blowers. All emissions of odorous compounds from dewatering and sludge cake handling will be contained and treated in the FBIs by thermal oxidation. There will normally be at least one FBI in operation at all times, therefore during start-up of an FBI, the potential odorous emissions will be treated by the operating FBI. However, during initial dewatering start-up, it may be necessary to divert the sludge to alkaline stabilization until the first FBI is brought on line. This start-up period, during which time a portion of the potentially odorous air stream is not treated, is temporary and is not expected to last more than two months. This project is not expected to generate odor as a result of construction activities.

24.2 OPERATION

Off-site dust and noise are not expected to increase as a result of operation of the facilities constructed under this project. Odor is expected to be reduced as a result of operation of the facilities constructed under this project.

The project will occur within the existing wastewater treatment facility in an area zoned for industrial use. The area in close proximity to the project is not expected to be adversely affected by noise, dust, or odors during construction or operation. Odor and odor sources will be reduced by the Solids Project. Decommissioning the Zimpro™ thermal conditioned and RBS processes will eliminate two of the most dominant odor sources at the plant. All new facilities will be contained, and process air will be incinerated or treated to eliminate odors from solids processing. The alkaline stabilization process and storage areas will be contained within buildings with odor control facilities.

25. NEARBY RESOURCES. Are any of the following resources on or in proximity to the site:

a. Archaeological, historical, or architectural resources?
__X__ Yes ____ No

Previous cultural resources investigations within the Metro Plant indicate that the plant site was once the location of two historically important settlements during the first half of the 19th century: the Dakota village Kaposia and the Pigs Eye settlement (The 106 Group Ltd. 1995). Subsurface testing indicated that portions of the plant site, including the project site, have the potential to contain deeply buried Pre-Contact or Contact Period Archaeological site (Anderson and Ketz 1997). The SHPO concurred that an archaeological survey should be completed for the project site (Item 1, Minnesota Historical Society letter, Appendix A).

In April 1998, a Phase I/II archaeological survey was conducted at the Metro Plant site to ensure MCES compliance with Section 106 of the National Historic Preservation Act of 1966, as amended; the Minnesota Historic Sites Act (Minnesota Statutes 138.31-138.6691); and the Minnesota Field Archaeology Act (Minnesota Statutes 138.31-138.42). The purpose of the Phase I/II investigation was to identify archaeological sites within the area of potential effect of proposed improvements, and to evaluate the National Register of Historic Places eligibility of identified sites. The field investigation employed a combination of machine grading and excavation as well as hand excavation. Excavation reached a maximum depth of 15 feet below the existing ground surface and included an area of approximately 3,865 square feet. While a buried native A horizon of Holocene age was identified within the project area, no archaeological resources were identified during the investigation. The geomorphological data indicates that much of the project area was poorly drained, and that the buried native surface soil has been disturbed and reworked to varying degrees. The findings indicate that there is little potential for unidentified subsurface archaeological sites to be present within the area of potential effect. It is recommended that no further archaeological investigation is warranted with in the area to be affected by the Solids Project. Pending SHPO concurrence, no further investigation will be conducted.

b. Prime or unique farmlands or land within an agricultural preserve?
____ Yes __X__ No

c. Designated parks, recreation areas, or trails?
__X__ Yes ____ No

Lands south and east of the Metro Plant are designated as Pigs Eye Park (Figure 3), and a trail corridor (unspecified location) has been shown for the area as part of the MNRRA plan.

d. Scenic views and vistas?
__X__ Yes ____ No

The Metro Plant is located in the “industrial riverscape” area of the Mississippi River where the balance of open space and industrial use has been a consistent goal as referenced in many planning documents. This a “working section” of the river with barge traffic, barge terminals and a variety of industries such as rail, sand and gravel, shipping operations and the St. Paul Downtown Airport. Existing and planned recreational usage (hiking, bicycling, nature study, boating, fishing, etc.) and the preservation of natural areas are important area uses. Much of the undeveloped land consists of Pigs Eye Park, including the Pigs Eye SNA, that encompasses Pigs Eye Lake. This portion of the river and adjacent designated lands are included in MNRRA, as a unit of the National Park System.

Views of the plant are reduced by the levee/floodwall surrounding the facility. Frequently, views from adjacent roadways and river are of brick buildings and stacks visible above the levee/floodwall. The view of open tankage is blocked, unless viewing from adjacent bluffs or highlands. View from residential areas and parks on the bluffs above the plant are of the river and associated industrial and open space areas.

There is a scenic vista from Highway 61 looking across Pigs Eye Lake, the railyards, and the Metro Plant. There is also the view of the Metro Plant from the Mississippi River. The proposed Solids Project location is within the existing levee and floodwall. The three incinerator stacks, within one housing at a height of 105 feet, will be visible over the levee and floodwall. The stacks will be approximately 1300 feet from the Mississippi River. The existing stacks for the MHIs are approximately 900 feet from the river and 129 feet high. The new stacks are not anticipated to be more noticeable than the existing ones and are consistent with the industrial nature of the area.

e. Other unique resources?

________ Yes   ___X___ No

If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

26. VISUAL IMPACTS. Will the project create adverse visual impacts? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks?

________ Yes   ___X___ No

If yes, explain.

However, although adverse visual effects are not expected, a plume may be visible. Any resulting plume will be no more noticeable than the plume from the existing MHIs. The plume will be suppressed by high stack temperatures. Residual heat in the exhaust stream will be captured upstream of the wet scrubbers and added back into the air stream downstream of the wet scrubbers. This elevates the air stream by about 100º F. This addition of heat to the heat produced in the induced draft fan effectively increases exhaust stream temperature to 250º F as it enters the discharge stack. This higher stack temperature aids plume dispersion and reduces the appearance of the steam plume from the stack.

27. COMPATIBILITY WITH PLANS AND LAND USE REGULATIONS. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency?

___X___ Yes   ________ No

If yes, identify the applicable plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

The project site is located within the Metro Plant's existing floodwall and levee which are designed to protect the facility from the 100-year flood. The Metro Plant is located within the designated Critical Area for the Mississippi River; it is also within MNRRA corridor. Under the Critical Area program, state and regional agencies follow the standards and guidelines provided in Executive Order 79-19 for permit regulation and in developing plans within their jurisdiction, and for reviewing plans, regulations, and development permit applications. In addition, capital improvement program or public facilities program of state and regional agencies should be consistent with the standards and guidelines. The final Critical Area Standards and Guidelines recognize that certain reaches of the river can be utilized as a receiving stream for properly treated sewage. The MCES will coordinate with the city of St. Paul to comply with Critical Area Plan requirements. The project is compatible with the requirement of Executive Order 79-19 as described under Section 14.4 of this EAW. Runoff will be minimized during construction and operation and runoff water quality will be addressed. Only those areas that need to be disturbed by construction activities will be altered by grading or the cutting of existing vegetation. The MCES will coordinate with the city of St. Paul regarding the review of site plans and related guidelines. This particular project occurs within a portion of the Metro Plant facility that currently consists of buildings, tanks, impervious surface, gravel, and lawn areas, limiting opportunities for native vegetation establishment. However, the MCES recognizes that portions of the Metro Plant facility provide opportunities for the restoration of natural vegetation, particularly along the Mississippi River shoreline and outside of the levee. The MCES will consider using native species as part of the planning process for projects where appropriate, primarily in the less developed portions of the plant and along the Mississippi River shoreline. In some cases, such as along the portion of the shoreline with floodwall, vegetation options may be limited to avoid impacts on structural integrity. However, there are portions of the facility where native vegetation is very appropriate and can be considered as part of future planning.

The three incinerator stacks, within one housing at a height of 105 feet, will be visible over the levee and floodwall. The stacks will be approximately 1300 feet from the Mississippi River. The existing stacks for the MHIs are approximately 900 feet from the river and 129 feet high. The new stacks are not anticipated to be more noticeable than the existing ones and are consistent with the industrial nature of the area.

The MNRRA Plan recognizes the role of appropriate river-related industry along the river, but does not specifically address wastewater treatment plants. The MCES met with the NPS in January of 1994 as part of the Environmental Inventory process. During this meeting, the NPS staff indicated that wastewater treatment facilities are recognized as an appropriate use along the riverfront since water quality is an important issue and the facility is river related. The MCES will coordinate with MNRRA regarding this project.

The Metro Plant and its continuance are also provided for in St. Paul’s Critical Area Plan for this river segment. The MCES will coordinate with the city of St. Paul to comply with St. Paul's River Corridor Ordinance Provisions.

Portions of the Metro Plant site are within the runway protection zone designated by the Federal Aviation Administration for the St. Paul Downtown Airport; construction in these areas is subject to FAA review. The review has already been completed for the Solids Project and the FAA letter is included in Appendix A.

28. IMPACT ON INFRASTRUCTURE AND PUBLIC SERVICES. Will new or expanded utilities, roads, other infrastructure, or public services be required to serve the project?

_________ Yes   ___X___ No

If yes, describe the new or additional infrastructure or public services required to serve the project. (Any infrastructure that is a “connected action” with respect to the project must be assessed in this EAW; see *EAW Guidelines* for details.)

29. CUMULATIVE IMPACTS. Minnesota Rule part 4410.1700, subpart 7. Item B requires that the RGU consider the "cumulative potential effects of related or anticipate future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonable foreseeable future projects that may interact with the project described in this EAW in such a way as to cause future projects that may cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts *(or discuss each cumulative impact under appropriate item(s) elsewhere on this form).*

a. Are future stages of this development planned or likely?

_________ Yes ___X___ No

However, in response to growth, regulatory requirements, equipment replacement needs, or rehabilitation, modifications or expansion at the Metro Plant may be proposed in the future.

a. Is this project a subsequent stage of an earlier project?

_________ Yes ___X___ No

b. Is other development anticipated on adjacent lands or outlets?

_________ Yes ___X___ No

However, in response to growth, regulatory requirements, equipment replacement needs, or rehabilitation, modifications or expansion at the Metro Plant may be proposed in the future.

30. OTHER POTENTIAL ENVIRONMENTAL IMPACTS. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

No effects are anticipated except those addressed in this review. However, in response to growth, regulatory requirements, equipment replacement needs, or rehabilitation, modifications or expansion at the Metro Plant may be proposed in the future.

31. SUMMARY OF ISSUES. *Do not complete this section if the EAW is being done for EIS scoping; instead address relevant issues in the draft Scoping Decision document, which must accompany the EAW.* List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

All anticipated impacts associated with the proposed project have been identified in previous sections of this voluntary EAW. Any necessary mitigative measures will be specified in the permits required. This project will result in the reduction of odors and air emissions compared to current actual emissions.

RGU CERTIFICATION.

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minn. R. 4410.0200, subps. 9b and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Name and Title of Signer: ______________________________

Beth G. Lockwood, District Planning Supervisor
Operations and Planning Section; North, South, and Metro Districts

Date: ______________________________

The format of the Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at Minnesota Planning. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-296-8253, or at their Web site www.mnplan.state.mn.us.