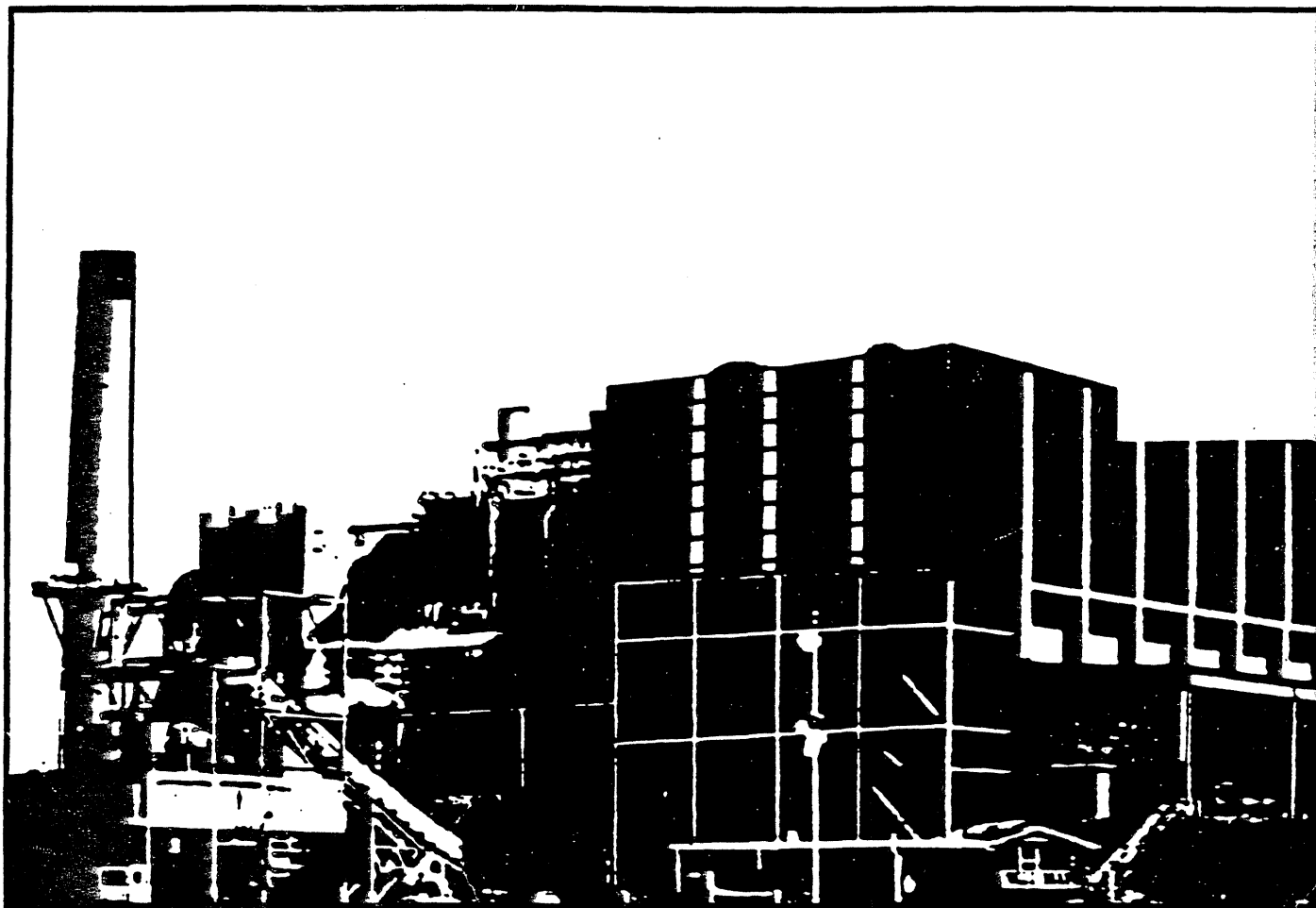




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Final Environmental Impact Statement for Proposed Anoka County Refuse Derived Fuel Resource Recovery Facility



Prepared for:

**Minnesota Pollution
Control Agency
Roseville, Minnesota**

July 1986

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1. INTRODUCTION

The proposed project consists of a processing facility designed to generate a refuse derived fuel from solid waste. The processing facility is to be located in Elk River with the RDF to be burned principally in UPA boilers located also in Elk River. The project proponents are: Anoka County, Northern States Power Company (NSP), and the United Power Association (UPA).

This document constitutes the Final Environmental Impact Statement (FEIS) for the proposed Anoka County Refuse Derived Fuel (RDF) Facility. It incorporates by reference the assessments presented in a Draft EIS prepared by the Minnesota Pollution Control Agency in April 1986. The FEIS consists of six chapters. These include:

Chapter 1 - Introduction

Chapter 2 - Executive Summary

Chapter 3 - Revised Project Description

Chapter 4 - Public Comments and Responses to the written public comments

Chapter 5 - Copy of the Public Hearing Held on the Draft EIS and subsequent issues raised.

Chapter 6 - Revised health risk assessment.

A Draft EIS on the proposed project was prepared by the Minnesota Pollution Control Agency (MPCA) in April of 1986. Copies of that Draft were provided to interested parties for review and comment. A public hearing was held by the MPCA, on Tuesday, May 27, 1986 in the Elk River High School, to receive comments on the Draft EIS for the proposed project.

In addition to comments received at the public hearing, written comments on the DEIS were received by the MPCA in May and June of 1986. Copies of the written comments are provided in Chapter 4 of this FEIS.

The purpose of this FEIS document is: to provide additional information not previously presented in the DEIS; provide

clarification on matters discussed in the DEIS, and respond to public comments on the DEIS. The FEIS represents a supplement to the DEIS document submitted by the MPCA in April, 1986. The FEIS expands upon the information provided in the DEIS and incorporates it by reference. In two instances, Project Description and Health Risk Assessment, substantial changes were made to the DEIS in order to address specific public comments. As a result, the Project Description has been reissued in this FEIS as Chapter 3 with the Health Risk Assessment being reissued as Chapter 6.

Regarding specific written comments submitted by the public on the DEIS, Chapter 4 of this FEIS document addresses those comments. Rather than reissue a revised DEIS, specific comments have been addressed individually in an FEIS question and answer format.

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2. EXECUTIVE SUMMARY

This Final Environmental Impact Statement (FEIS) for the Anoka County refuse-derived fuel (RDF) facility in Elk River, proposed jointly by Anoka County, Northern States Power Company (NSP) and the United Power Association (UPA) was prepared by the staff of the Minnesota Pollution Control Agency (MPCA) with the assistance of ERT, an engineering and environmental consulting firm, and in consultation with the Minnesota Department of Health. This FEIS is required pursuant to Minnesota Rules Part 4410.4400, Subpart 13C. Environmental review of the project began December 24, 1985 with the distribution of the Environmental Assessment Worksheet (EAW). A public scoping meeting which identified the issues to be addressed in the EIS was held January 23, 1986. This FEIS and the process used to prepare it, comply with the Minnesota Environmental Quality Board (EQB) Environmental Review Program. The FEIS addresses those issues and key concerns identified in the scoping process.

2.1 Description of the Project

Anoka County and Northern States Power Company are jointly proposing to construct a mixed municipal solid waste resource recovery facility which will recover ferrous metal, aluminum, and possibly other materials and produce refuse-derived fuel (RDF). A percentage of unprocessable waste and ash from the combustion process will be landfilled. The RDF will be utilized primarily at the UPA power generation station in Elk River, located 2 miles north-northwest of the proposed RDF facility. It may also be used at the NSP Red Wing and Willmarth power stations in Mankato, if the UPA facility is unable to utilize the fuel (i.e., scheduled maintenance shutdowns).

The facility will consist of a scale house, a receiving/storage building, a processing building, and an administration building. A separate receiving area for solid waste brought to the facility by private individuals will also be provided. The site for the facility is 34.7 acres located at the intersection of U.S. Route 10 and 165th Street Northwest.

The facility is intended to process 500 tons per day of mixed municipal solid waste from Anoka County, a volume which would be processed in a single processing line in one ten-hour shift. The 500 tons of solid waste will be generated in Anoka County, but the proposers are actively seeking additional waste contracts from other sources. If increased volume is committed prior to issuance of the notice to proceed, the facility may include one or two additional processing lines which would allow a total daily tonnage of 1000 and 1500 tons, respectively.

2.2 Environmental Impacts

Environmental issues and concerns related to the project were identified during the development of the scope of the EIS. The key project issues that were identified during the public scoping process have been addressed in this FEIS document pursuant to state regulations. They are:

- Air quality and odor
- Water quality
- Noise
- Traffic
- Handling and disposal of solid waste
- Land use and zoning
- Socioeconomics
- Public health

The environmental effects of the project with respect to these concerns, for three operating scenarios of 500, 1000, and 1500 tons per day, are discussed in detail in the FEIS and are summarized below. Issues not raised or identified during the scoping process have not been addressed pursuant to state regulations and statutes.

"Air Quality and Odor

During construction of the project, the major impacts would be fugitive dust from excavation and fugitive particulate emissions associated with employee traffic and the use of heavy, earth moving equipment. These impacts would be localized and of limited duration. Measures can be taken to ensure that there would be no significant air quality impacts. Impacts due to dust generated during facility operation are expected to be insignificant. For all of the operating scenarios analyzed, emissions of all regulated (criteria) pollutants (SO_x, TSP, CO, NO_x, VOC and lead) are less than the applicable Federal and state air quality standards.

Impacts from odors associated with the processing facility are not expected to be significant based on literature review and a site visit to a similar facility. During solid waste transportation to the facility, odors will be contained within the vehicles transporting the wastes. Dispersion of odors from the processing facility into the community will be minimized due to the enclosed facility and potential use of a reodorant spray in the waste receiving area.

Surface Water

Neither construction nor operation of any of the facility alternatives is expected to result in significant impacts to local hydrology. Storm water runoff volumes would increase with construction of the facility but any impacts of these increased flows would be eliminated by collecting the runoff in the site drainage system.. There would be no significant impacts expected upon the water quality of the Mississippi River. Wastewaters generated by washdown of refuse-handling equipment and the tipping floor will be treated at the Elk River wastewater treatment plant. The constituents of the wastewater would not cause any impact on the operation of the treatment plant, the quality of the sludge or the quality of the treated effluent.

Ground Water

The estimated water usage rate is a small fraction of the aquifer yield, therefore drawdown would be minimal and nearby wells would not be significantly affected. The surficial aquifer is recharged throughout a much larger area than the site, therefore the addition of impervious surface associated with the facility would not have a significant impact on the availability of groundwater in the region. All solid waste handling, residue stockpiling, and process wastewater generation on the site would occur above ground, in enclosed areas. Therefore, the potential for degradation of ground-water quality during daily facility operation would be minimal.

Solid Waste

Development of the proposed project would reduce landfill space requirements and change the characteristics of the wastes to be disposed. On an annual basis, approximately 26.5 to 31 percent of the waste stream would be landfilled versus at least 80 percent in the absence of a resource recovery system. Individual landfills receiving ash and residuals from larger alternative facilities would experience reduced rates of utilization and consequently increased operating life.

Transportation

The project will result in increased truck traffic on surrounding roads during construction and operation. For all intersections potentially affected by the project, operating conditions would equal or exceed the Level of Service C acceptable operating standard for all alternative facility sizes.

Land Use and Zoning

The proposed site is zoned I-1, Light Industrial. Refuse processing facilities are allowed as a conditional use. Because surrounding uses are a mixture of agriculture, business and industry,

development of the site as proposed is not expected to have significant adverse consequences. The City of Elk River must however grant a conditional use permit for the proposed facility.

Noise

Increases in noise from the project operation under all alternatives analyzed would be perceptible during the daytime but would not cause violations of state noise standards. Nighttime noise would be barely perceptible. Noise levels at a receptor on U.S. Route 169/10 near the project site currently exceed state noise standards due to traffic on U.S. Route 10. Development of the RDF facility will not, however, increase noise levels by a perceptible amount at this receptor. Therefore, the facility will not contribute to the violation of state noise standards.

Social and Economic Conditions

The proposed facility would create limited employment opportunities during both construction and operation. At most the applicants expect a permanent increase in employment of 45 people at the proposed RDF facility and 13 people at the UPA power plant. Due to proximity to the Minneapolis-St. Paul metropolitan area, it is not expected that this will result in an influx of persons to the area requiring new housing or new or expanded public services. As a result, there would not be any significant impacts on population and housing in Elk River and nearby Anoka County.

Health Risk Assessment

Combustion of the RDF produced at the proposed facility will result in emissions of dioxins, furans, other organic compounds and trace metals. Three methods were utilized in estimating the potential health risk associated with the proposed facility: the U.S. EPA, Swiss

EPA and California Department of Health Services procedures for toxic equivalency factors. The U.S. EPA utilizes the relative potencies of 2,3,7,8-TCDD and 2,3,7,8-HxCDD obtained from carcinogenic studies as well as a variety of other toxicity endpoints for other dibenzo-dioxin and dibenzo-furan isomers; the Swiss EPA procedure is based on studies associated with AHH enzyme induction; and the California Department of Health Services procedure is based on 2,3,7,8-TCDD and 2,3,7,8-HxCDD carcinogenic bioassays. These toxic equivalency factors (TEFs) were developed in order to make it possible to estimate the carcinogenic potential of those dioxins and furans for which no conclusive carcinogenic data exists.

The EIS addresses the potential impacts for three operating scenarios; 500, 1000, and 1500 ton per day facilities. A 500 tpd or 1000 tpd facility appears to be the most likely alternative. However, if all interested parties decide to participate in the Anoka project, a 1500 tpd facility could be supported. Additionally, the scenarios included treatment of the average case whose emissions are based on the average emissions of 21 operating facilities and the worst case which is based on emissions from the SWARU facility in Canada.

The exposure routes addressed in the document are inhalation, ingestion of soil and dermal exposure from contaminated soil. Additionally, food chain impacts of dioxin were evaluated.

Acceptable Daily Intakes (ADIs) of compounds which are not defined as carcinogenic were evaluated. The maximum impact for any substance for which an ADI was calculated was from lead, 13 % of the ADI. All other substances present a daily dose of less than 1/10 of one percent of the ADI.

Under the average facility operating conditions, utilizing the U.S. EPA method for the proposed 500 tons per day facility, an individual cancer risk to a maximally exposed individual of .22/100,000 is determined. Similarly, based on the use of a Swiss EPA method, the risk to the maximally exposed individual is 1.8/100,000. Utilizing, the Callifornia method, the risk to the maximally exposed individual is 0.86/100,000.

For the worst case 500 ton per day facility incorporating emissions from the SWARU facility in Canada, and the U.S. EPA TEF method, a risk of 1.7/100,000 is determined. Based on the Swiss EPA method, risk to the maximally exposed individual is 12/100,000. The California method yields a maximum risk of 5.6/100,000.

For the average case from a 1000 ton per day facility, utilizing the U.S. EPA TEF method, the resulting cancer risk is .30/100,000, for the Swiss procedure, 2.4/100,000 and for the California TEF procedure, 1.2/100,000.

The worst case from the 1000 ton per day facility, utilizing the U.S. EPA TEF method, the resulting cancer risk is 2.2/100,000. The Swiss procedure results in a cancer risk of .16/100,000 and the California TEF procedure results in a cancer risk of 1.2/100,000.

The average case from a 1500 ton per day facility, utilizing the U.S. EPA TEF, results in a cancer risk of 0.31/100,000. The resulting risk of the Swiss EPA TEF procedure is 2.5/100,000. Utilizing the procedure for California TEF, the cancer risk was determined to be 1.2/100,000.

The worst case of the 1500 ton per day facility, utilizing the U.S. EPA procedure, results in a risk of 2.3/100,000. The Swiss EPA TEF results in a determined risk of 17.1/100,000, and the California TEF results in a risk of 7.9/100,000.

The maximally exposed individual represents a hypothetical person exposed to maximum emission continuously for 70 years. The Minnesota Department of Health guideline for a health risk assessment is one per 100,000.

Depending upon the risk assessment methodology utilized, the increased risk from the proposed facility could range from .22 to .12 per hundred thousand for the projected 500 tpd facility, or a difference of approximately 55 times. The increased risk from the 1000 tpd facility could range from .30 to 16 per hundred thousand, or a difference of 53 times. The increased risk from the 1500 tpd facility could range from .31 to 17 per hundred thousand, or a difference of approximately 55 times.

3. PROJECT DESCRIPTION

3.1 Background for Proposed Action

Anoka County and Northern States Power Company (NSP) have proposed construction of a waste processing facility at a site in Elk River, Minnesota. The facility will produce a refuse-derived fuel (RDF) product and recover ferrous metals, aluminum and possibly other materials that can be economically marketed. The RDF will be burned to generate electricity in regulated boilers operated by the United Power Association. In the event the fuel cannot be fired at the UPA facility, two alternative boilers specifically permitted to burn RDF have also been identified. Figure 3-1 shows the resource recovery site location.

3.1.1 Waste Designation and Facility Sizing Considerations

The Minnesota Legislature recognized the need for waste assurances to guarantee the economic viability of resource recovery projects, and thus established a statutory waste assurance process termed waste designation. This is defined in Minnesota Statutes, chapter 115A.81 Subd2 as follows:

"Designation means a requirement by a waste management district or county that all or any portion of mixed municipal solid waste that is generated within its boundaries or any service area thereof is deposited to a resource recovery facility identified by the district or county." (Minnesota State Section 115A.81)

Anoka County's contract with NSP rests upon their designation plan. The designation process allows the County to enter into a long-term contract for operation of the proposed facility "at a reasonable risk level". Without designation, bonding for the project would be more difficult and less favorable interest rates would be obtained.

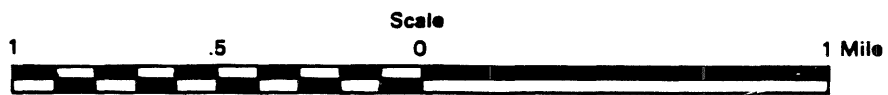
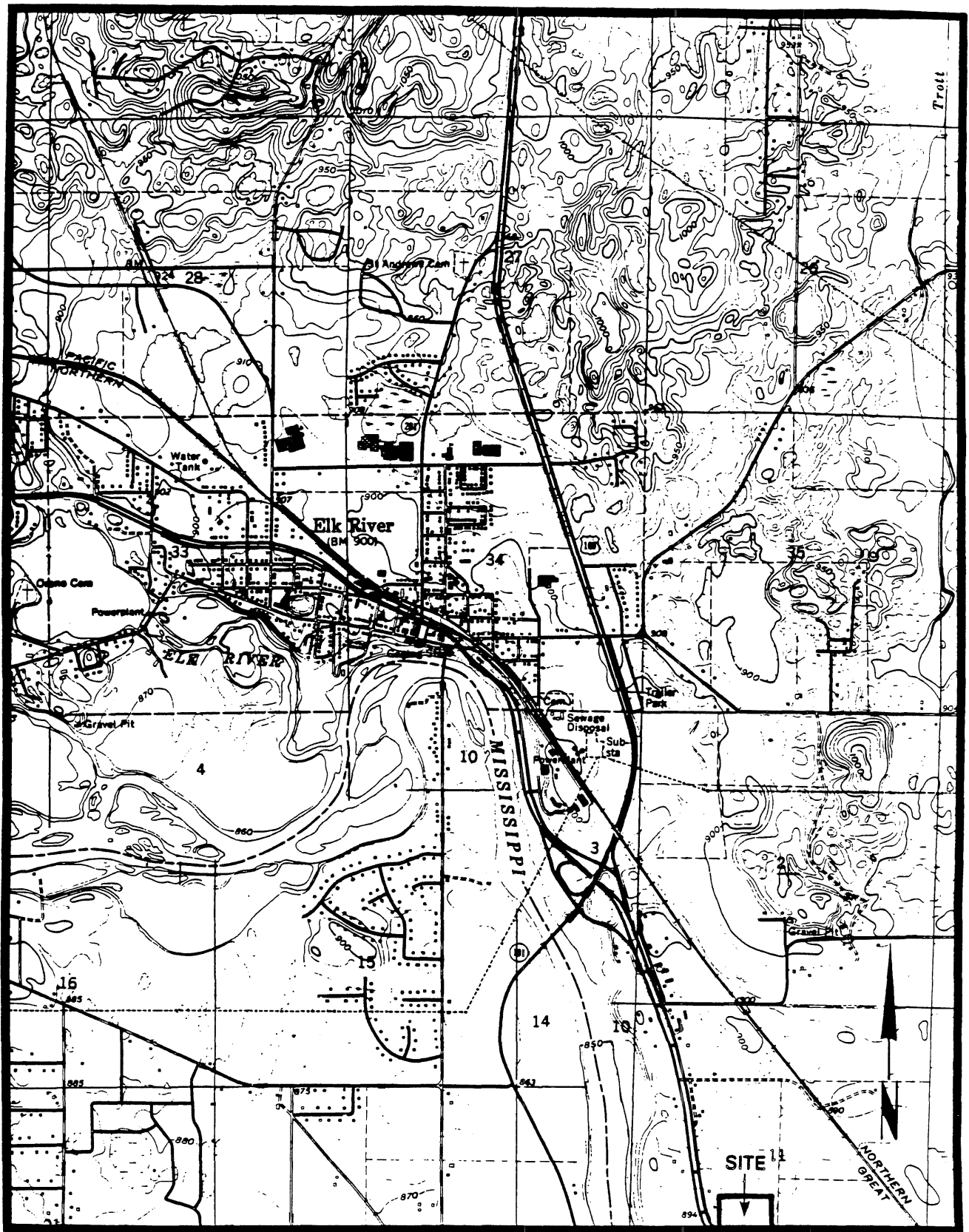


Figure 3-1 Site Vicinity

The Anoka County Designation Plan provides for designation of all non-exempt solid waste generated within Anoka County to the proposed RDF facility or a transfer station or stations serving that facility. All source-separated materials are exempt from designation. The Anoka County Waste Designation Plan was approved by the Metropolitan Council with the exclusion of 50 tons per day for a proposed mass burn project in Ramsey County. The proposed mass burn project in Ramsey County has since been abandoned and the exclusion is no longer in effect.

Based on the weighing study done by Pope-Reid, the County estimated in its designation plan that an average of 504 to 555 tons per day, six days per week, would be available for a resource recovery facility, year round, if no exclusions were granted. The designation plan states, however, that only 350 tons per day could prudently be guaranteed. This amount is based on the minimum waste generation period (winter), a margin of error and an assumption that the Metropolitan Council's waste management objectives for recycling and source separation may be met, thereby reducing the quantity of the solid waste stream available for processing at a centralized facility. The 350 tpd figure is conservative, but was selected given that the County's contract with NSP necessitates payment for a guaranteed tonnage, whether delivered or not (put or pay provision).

A comparison of costs between a 500 tpd and a 1000 tpd facility illustrates that there are significant potential cost savings from economies of scale associated with a large facility. For a 500 tpd facility, the fee per ton was projected to be \$62.07. For a 1000 tpd facility, the fee per ton was calculated to be \$43.96 (assuming 1000 tpd were contracted for). These costs are based on many assumptions and are subject to on-going revision. These estimates include total processing costs, including pass-through costs and development costs. Additional economic and financial analysis by NSP and the County revealed that if at least 685 tons per day could be contracted for, a two-line facility (capable of processing 1000 tpd) would be economically competitive with the smaller sized alternative (Norman Schiferl, 1985). Any waste processed in addition to the 685 tpd would result in decreasing costs per ton. Further, a two-line facility would enable greater operational flexibility.

Based on these analyses, NSP and Anoka County are attempting to contract for additional waste to improve the economics of the project. Contractual arrangements are being sought with other counties, among these, Hennepin County. In 1985, exclusions within Hennepin from designation authority previously granted to Richards Asphalt and Waste Energy Systems were revoked. These exclusions totalled 222 tpd. As a result of these revocations and other factors, Hennepin County has excess waste not currently arranged to be handled by a designated facility or waste reduction/recycling programs. Excess waste is estimated to be 240 tpd during the low season generation period, and an annual average of 840 tpd (HDR, 1985). Thus, in February 1986, the Metropolitan Council directed that Hennepin County must arrange for additional centralized processing capability, and that the County must:

"Negotiate with Anoka and Dakota Counties during 1986 to deliver waste not needed for the Greyhound facility, and in particular, any waste available due to revocation or cancellation of exclusion projects." (Metropolitan Council, 1986)

If these negotiations are unsuccessful, Hennepin County is to arrange alternative provisions for waste processing.

NSP and Anoka County are also discussing provisions for waste processing with Wright County, the Tri-County Solid Waste Commission (this includes Stearns and Benton County and the portions of Sherburne, County), and an additional five county group (Chisago, Isanti, Kanabec, Mille Lacs, and Pine) north and northeast of Anoka. The plans proposed or in preparation by these five counties include recommendations supporting a concept to explore the Elk River project. These five counties have undertaken a joint solid waste planning effort as the East-Central Solid Waste Commission.

None of the nine counties have undertaken weighing studies, nor are waste flows between counties restricted. Thus, waste generation estimates by county are subject to a substantial margin of error. The County has prepared a very rough estimate regarding the maximum capacity which each county might contract for, based on the solid waste estimates presented and the following assumptions:

- a) 50 tons per day of Stearns County waste will be burned at an incinerator currently operating at St. Johns University.
- b) 100 tpd from Stearns County would be processed at a currently operating composting digester in St. Cloud.
- c) Approximately 135 tons per day of the waste in Pine and Mille Lacs, Chisago, Isanti and Kanabec counties will be sent to the resource recovery facility.
- d) Of the waste potentially available (after consideration of assumptions a, b, and c), 75 percent of the average waste generated and currently being landfilled would be committed as plant capacity. This figure reflects seasonal fluctuations, recycling, composting, uncertainty about the accuracy of waste quantity estimates, and the inclusion in those estimates of waste which would not be processed at the RDF facility.

The resulting estimate of the incoming solid waste commitment from the nine counties totals approximately 500 tons per day, as indicated in Table 3.1-1. These counties are not within the Metropolitan Council's jurisdiction.

A 500 tpd or 1000 tpd facility appears to be the most likely alternative. However, if all interested parties decide to participate in the Anoka Project, a 1500 tpd facility could be supported. Elk River boiler units I and II have a total combustion capacity of approximately 700 tons per day of refuse derived fuel, which is equivalent to approximately 1000 tons per day of municipal waste received at the RDF facility. If the third boiler were converted, the capacity would be equivalent to an annual average of 1526 tpd of waste received at the RDF facility. NSP and UPA have not completed the technical and economic studies to enable a final decision regarding the use of the third unit.

3.1.2 Site Location

The proposed RDF facility will be located on a 34.7-acre site on 165th Street just east of U.S. Route 10 in Elk River. The facility

TABLE 3.1.1
WASTE FLOW TO FACILITY

Estimate of Maximum Contracted Plant Capacity Non-Metropolitan Counties				
<u>County</u>	Solid Waste ¹ Generated for		Tons/Day	Potentially to Facility
	Disposal - Tons/Day 6 Days/Week <u>1984-1985</u>	Average <u>1990</u>	6 Days/Week Average <u>1984-1985</u>	
Chisago ²	49.5	67.3	49.5	37.1
Isanti ²	35.1	48.5	35.1	26.3
Kanabec ²	27.5	31.6	27.5	20.6
Mille Lacs ²	30.3	34.7	30.3	22.7
Pine ²	31.7	34.2	31.7	23.8
Benton ³	69.7	74.8	69.7	52.3
Sherburne ³	95.4	119.4	95.4	71.6
Stearns ³	289.3	303.3	289.3	215.0
Wright	110.8	152.0	110.8	<u>40.0</u>
TOTAL:				509.4

*Source: Anoka County Staff, and MPCA staff 1986: This is strictly an estimate for planning purposes and does not reflect any written or verbal agreements by any county.

- 1 Figures should be regarded as preliminary, and apparently reflect all waste generated for disposal, not just municipal solid waste.
- 2 Solid waste generation rate based on Hickok and Associates plans. Yardage and tonnage based on landfill receipts and interviews with haulers.
- 3 Solid waste figures based on HDR draft plans and surveys by county staff.

will be adjacent to the LeFebvre & Sons, Inc. garage and a Mobil station situated on the corner of 165th Street and U.S. Route 10. The site is slightly more than 1/2 mile from the Mississippi River. The majority of the site is zoned I-1, Light Industry. A small corner of the site on the southwest is zoned commercial. A permanent entry driveway for all vehicles will be located off 165th Street. Parking will be provided for approximately 35 employees.

The site of the facility has been cultivated for many years, as has the surrounding land. To the east of the proposed RDF plant is located the Nutrena Research Farm, a facility of Cargill, Inc. Residences are approximately one quarter mile to the east and northwest of the site.

The processed RDF will be used as fuel primarily for existing electric utility boilers operated by the United Power Association (UPA). The UPA power generation station in Elk River is approximately two miles north-northwest of the proposed RDF facility. The UPA facility is located on U.S. Route 10 approximately one-third mile north of the interchange of State Route 101 and U.S. Route 10. Processed RDF will be transported via transfer trailers from the proposed RDF facility to the UPA electric generating plant. A third boiler if converted, may be capable of utilizing at least an additional 300 tons per day of processed RDF.

3.1.3 Concept

The proposed facility will be capable of processing 50 tons of municipal solid waste (MSW) per hour per line. The waste will be processed in a single processing line over one shift of 10 hours. An approximate maximum of 500 tons per day of MSW processed at the facility will be generated in Anoka County. (Anoka County has contracted to provide a minimum of 350 TPD.)

Waste may also be received under contract arrangements from other counties in central Minnesota. Depending upon the volume of MSW received from areas outside Anoka County, additional processing capacity may be provided, (up to three processing lines) or additional operating shifts will be scheduled. Alternative scales of the project are discussed in Section 4.2.

MSW received at the facility will be inspected on the tipping floor and unprocessable waste will be removed. This reject fraction will consist of bulky objects such as bed springs, carpet rolls, large automotive parts, appliances and other obviously unprocessable materials. In addition, potentially hazardous materials such as propane bottles, gasoline cans, and non-household quantities of hazardous waste will be rejected. The remaining MSW will be subjected to a series of size reduction and separation processes which classify the waste into a light combustible fraction (RDF), a heavy fraction (RDF residuals) and recovered recyclables such as aluminum and ferrous metals. If feasible, additional processes (glass recovery and heavy fraction co-composting) will be implemented to further reduce the volume of residue requiring deposition in landfills. A specific time frame for the development of such processing has yet to be determined.

Ash from combustion of the RDF in the power station will also constitute a residual which will require disposal or treatment at an appropriately permitted facility.

3.1.4 The RDF Facility

The facility will provide for municipal solid waste (MSW) receiving, storage and processing. The receiving and storage portion will have capacity for 3,000 tons of MSW, 300 tons of RDF storage in trailers, and a three-day accumulation of ferrous and aluminum metals, and other residue. Solid waste, other than metals, will generally not be stored overnight at the facility. Waste that exceeds processing capacity can be compacted for transport to landfills or other processing facilities. In addition to the receiving and processing buildings, the facility complex will include a scale/guard house, and an administration building. A refuse disposal area where solid waste delivered by citizens will be deposited in open-top trailers will be provided. Figure 3-2 shows site plan information for a generalized 500 tpd facility.

The RDF process will feature the type of equipment now operating at Baltimore County, Maryland. The Baltimore facility was designed and is operated by National Ecology. The Elk River RDF facility to be

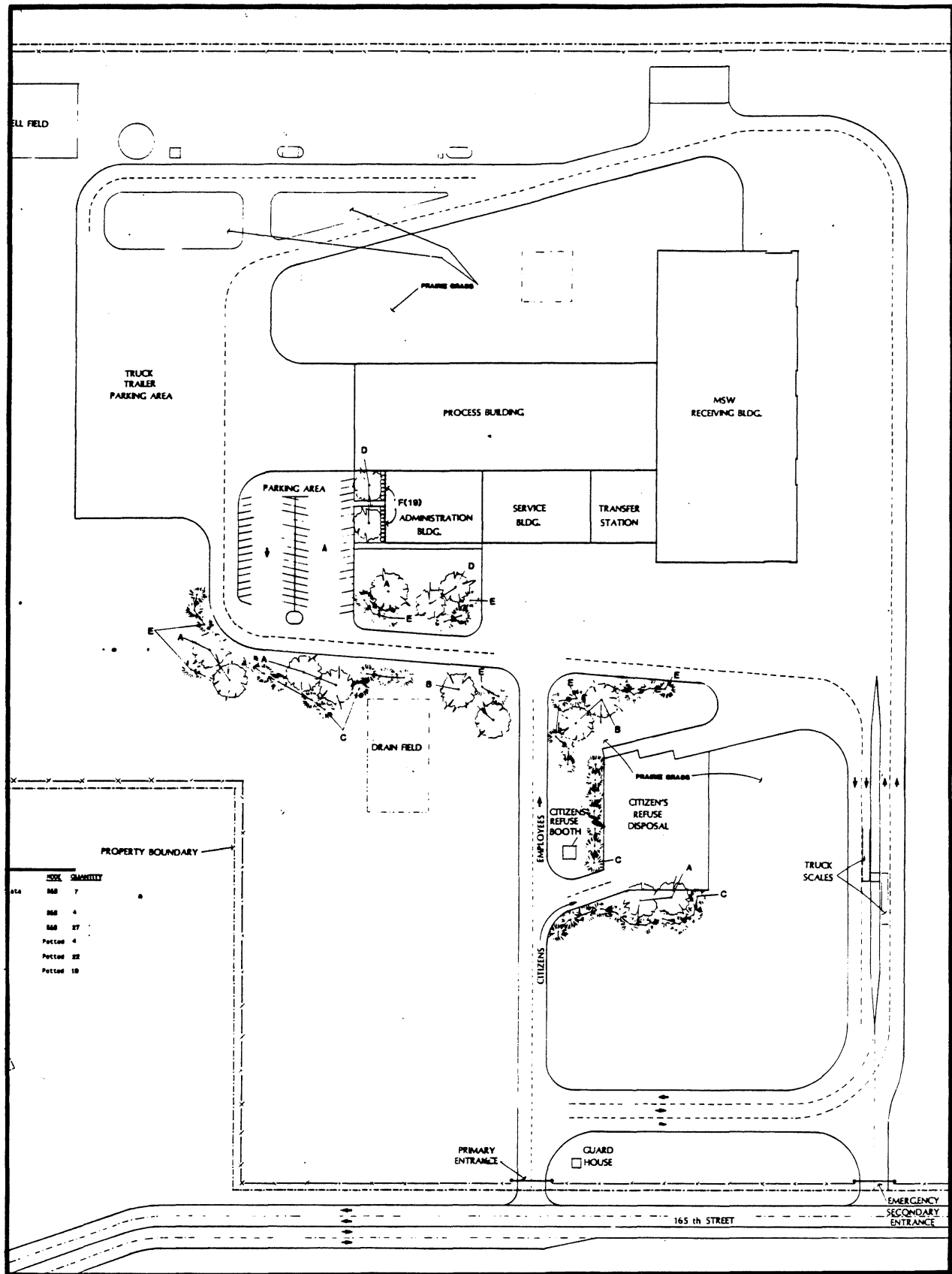


Figure 3-2 Site Plan

developed by the operators of the Baltimore facility will have one, two or three processing lines each rated to handle 50 tons per hour. A 10-hour processing schedule will achieve the 500 tons per day per line minimum processing under normal conditions.

3.1.5 Facility Operations

Figure 3-3 is a schematic diagram of the proposed processing facility. Solid waste received at the facility will be deposited on a tipping floor in the receiving building. Initial sorting for unprocessable material will occur at this point. Waste will be placed by a front-end loader onto pit-installed conveyors. Additional unprocessable material will be removed by a grapple crane.

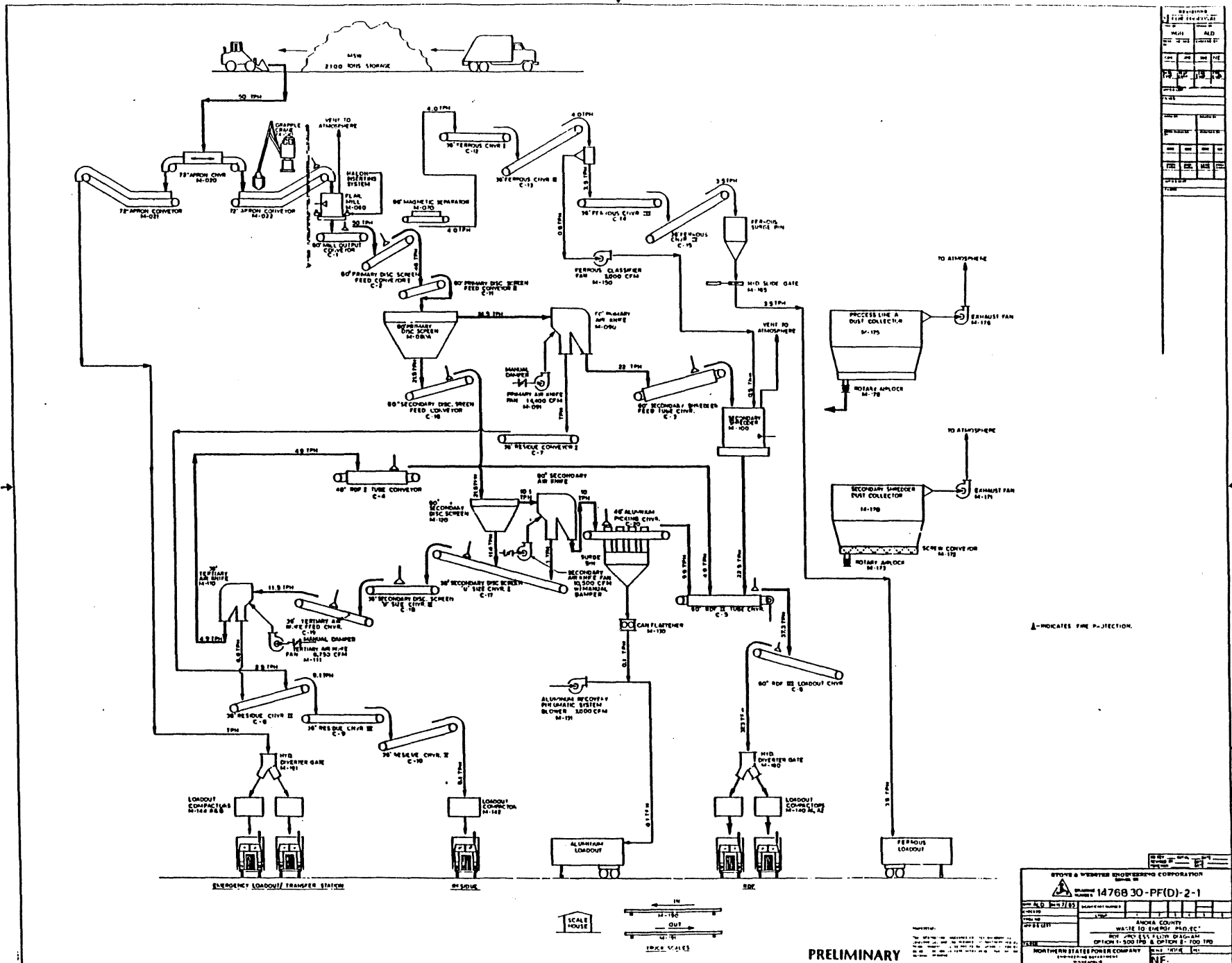
This design utilizes the concept of primary size reduction by flail mills, general sizing by disc screens, removal of specific recyclable items such as ferrous and aluminum by magnetic and manual sorting procedures, and density separation in air knives. Most highly combustible material of a variety of sizes will be converted to RDF.

The MSW will be shredded in a flail mill and liberated from plastic bags or other containment devices. The refuse will be magnetically processed for recovery of ferrous metals. MSW tends to fall into size ranges with the following characteristics:

- Glass, stones, ceramics, dirt, and other ash forming components -2"
- Ferrous and aluminum can stock 2"-4"
- "Heavy" ferrous and non-ferrous metals +4"
- Combustibles (paper, cardboard and plastics) +4"

The natural separation sizes are, therefore, 4" and 2". The separation process is described in more detail below.

Ferrous metals will then be removed by magnetic separators, cleaned of loose contaminants by an air classifier and conveyed for loadout to a small holding bin. The non-ferrous section will be routed to a primary disc screen. Self-cleaning, agitating disc screens will separate materials with dimensions less than four inches



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STONE & WEBSTER ENGINEERING CORPORATION
 14768 30-PF(D)-2-1
 ANOKA COUNTY
 WASTE TO ENERGY, P.D., ETC.
 OPTION 1 - 500 TPD & OPTION 2 - 700 TPD
 NORTHERN STATES POWER COMPANY
 PROJECT NO. 14768 30-PF(D)-2-1

PRELIMINARY

Figure 3-3 Process Flow Diagram

and further separate the smaller materials with a two-inch screen. The oversize material from the primary disc screen (+4") will be directed to an air density separator which will remove the heavy fraction by a primary air knife. The heavy portion will be directed to a stationary compactor while the light fraction from the separator will be directed to the secondary shredder for final size reduction and RDF product loadout.

The undersized material from the primary disc screen will be directed to the secondary disc screen. The oversized material that does not pass through this screen will be processed through an air knife and becomes RDF (except for aluminum cans that are concentrated and manually removed). The undersized material from the secondary disc screen will be further processed by another air knife. The light fraction will be recombined with the main waste stream while the heavy fraction will be compacted as residue for landfilling (the heavy fraction may be used in the future as a feedstock for co-composting).

System control will follow a run/no-run philosophy in which all upstream unit operations are governed by the availability of downstream unit operations. Thus, operation can be discontinued at any time. Normally operations will be directed from the central control room, but local operator control is an option.

Dust control will be accomplished by close containment of all transfer points and aspiration wherever dust generation impact is anticipated. Various semi-airborne light fractions will be settled out onto belts and within tube conveyors and dust generated will be aspirated to a baghouse.

The tipping floor will be on grade and contained by push-walls. It will have capacity to store 3000 tons of MSW. Additional space for residue storage will be in the receiving building on the tipping floor. Some limited sorting will take place on the tipping floor where the equipment operator will remove and set aside obvious salvage and items that cannot be processed.

The final RDF stream will consist of a composite of material from the secondary shredders, oversized material from the secondary disc screens (picked free of aluminum) and light combustible material separated by the secondary air knives. The RDF stream will be

outloaded through one of two compactors to semi-trailers for transportation to the power plant. It may be necessary to transfer part of the MSW without processing it into RDF at the facility. This waste would either be landfilled or processed elsewhere. Transfer without processing will only be necessary if the MSW delivered to the plant exceeds processing and storage capacity.

3.1.6 Utilities

Approximately eight acres of land surface will become impervious through construction of the project. Drainage from these surfaces will be routed through oil and debris traps prior to discharge to the existing surface water drainage system. This system includes wetlands which both attenuate the peak runoff rates as well as serve as a recharge area. Sanitary wastewater generated by employees and visitors is expected to be less than 1000 gallons/day. These wastes will be treated in an on-site system consisting of a septic tank and soil absorption system. Process wastewater consisting of tipping floor washdown will be collected, placed in holding tanks, and periodically hauled by truck to the City of Elk River Wastewater Treatment Plant. Depending on the strength of the washdown water, on-site treatment may be proposed at a later date. Such a treatment facility would be subject to review and approval by MPCA staff.

The electrical needs of the proposed facility will be served by Anoka Electric Cooperative. A new 69 kilovolt transmission line, approximately 3/4 mile in length, will tap the existing area subtransmission system and deliver power to a new substation that will be built on site.

3.1.7 Hazardous Materials

Minnesota hazardous waste rules prohibit commercial and industrial disposal of hazardous waste within solid waste destined for transport to a municipal landfill or RDF facility. Hazardous waste may nevertheless be delivered to the processing plant. Several

provisions have been made to screen and separate non-household hazardous waste from the solid waste stream. Incoming material will be dumped on the tipping floor and inspected. Any hazardous or unacceptable materials will be observed by plant staff and segregated for the subsequent disposal in an appropriate facility. Haulers that service areas of higher hazardous waste generation will be screened closely. Periodic inspection of refuse vehicles will be undertaken as necessary. Any incoming load containing hazardous waste or significant amounts of unacceptable waste may be rejected.

The front end loader operator will inspect the waste and remove any hazardous materials observed. A third inspection will occur at the grapple crane located on the conveyors leading to the flail mill. At this point hazardous materials identified will be removed from the process line, stored, and transported to a regulated hazardous waste disposal facility.

Residential waste will sometimes contain small quantities of hazardous waste, despite public awareness programs concerning hazardous waste disposal. The impact of small quantities of hazardous waste such as paint solvents and pesticides from households historically has not been a major concern in RDF processing. The material becomes incorporated into the RDF and is destroyed by combustion.

3.1.8 Disposal of Residuals and Ash

Residuals (the heavy fraction) from the RDF process will amount to 19 to 24 percent of the solid waste infeed. These residuals will be disposed of in an approved mixed municipal solid waste disposal facility. Ash resulting from combustion of the RDF will be approximately 10 percent by weight of the actual RDF burned and will also be landfilled in an approved facility, unless alternative uses for ash can be developed. Ash will likely be deposited in a specially constructed portion of the sanitary landfill, provided with a liner and leachate collection system. The significance of residuals to local and regional landfills are discussed in Section 5.3 of this EIS. For the proposed facility, the operators of the combustion

facility are responsible for ash disposal. The County (or counties participating) will be responsible for disposal of the heavy fraction residuals, and unacceptable wastes.

3.1.9 Schedule and Costs

Construction is scheduled to begin in the fall of 1986. The facility is expected to be completed by the fall of 1988 and begin its first full year of operation in 1989. Construction cost is estimated at \$14 million and the annual operating budget is projected at \$8.7 million for the 500 tpd facility.

3.1.10 UPA Power Plant

The existing UPA power plant is located on U.S. Route 10 approximately one-quarter mile north of the intersection of State Route 101 and U.S. Route 10. The power plant consists of three boiler units. Upon conversion Units I and II will each be capable of firing about 350 tons of refuse derived fuel. Unit III may be capable of burning at least 350 tons per day of RDF. UPA anticipates that it will be able to utilize in Units I and II a minimum of 350 tons/day of RDF at any given time. On most days, Units I and II will fire at a rate of 600 tons/day. It is expected that the Elk River Station will operate 24 hours a day, seven days a week while the resource recovery facility will operate six days a week. (Therefore, for a 1000 ton/day resource recovery facility, the average RDF available to burn at Elk River would be 600 tons per day derived as follows: $1000 \text{ tpd msw} \times 0.7 = 700 \text{ tpd RDF} \times 6 \text{ days/week} = 4200 \text{ tons RDF/week} \div 7 = 600 \text{ tpd average.}$)

Annual downtime for each of the units could be as high as 30%. This anticipated downtime reflects an annual planned shutdown of 4-6 weeks for maintenance, and overnight shutdowns scheduled every two weeks and lasting for one or two shifts for inspection. Planned downtime will be scheduled so that at least one unit is operating at any given time. Unscheduled downtime cannot be anticipated. In terms of annual utilization rates, Units I and II will be able to utilize 180,000 tons of RDF annually.

The three boilers were originally designed to generate about 45 megawatts of electricity (net). Certain adjustments will be required to convert the units to fire solid waste. These changes are outlined as follows (for Units I and II):

- Installation of a new chain grate stoker.
- Installation of a larger overfire air fan for more complete combustion.
- Removing existing refractory, lowering the grate level in the furnace, and adding waterwalls to increase furnace volume and heat transfer surface in order to reduce the furnace exit gas temperature to 1600°F.
- Modifying the multiclone dust collector downstream of the economizer to protect the baghouse from burning cinders and the ID fans from excessive wear.
- Providing a 1000 ton RDF receiving and storage facility complete with transfer conveyors, surge bins, and environmental controls including dust collection, ventilation, and fire protection.
- Providing a new bottom ash handling system consisting of a dry drag chain and modifications to the existing vacuum pneumatic boiler backpass and baghouse flyash collection systems.
- Modifying the existing baghouse for a new bag suspension system and new acid-resistant bags and door gasketing.
- Providing a new distributed control system for the boiler plant and material handling systems.
- Providing electrical distribution required for new equipment and utilizing existing auxiliary capacity to handle the conversion.
- providing new ID Fans.

The gases currently emitted from the plant's three boilers are jointly exhausted through a recently installed Research-Cottrell, Inc. baghouse. The baghouse was tested in July of 1978 and reported at a 99.4 percent efficiency (MMT Report No.8135, August 18, 1978). The existing facility generates electricity on an intermittent basis.

The UPA Elk River power station has generated electricity in the past by combusting coal, oil, shredded tires, and natural gas. In addition, a nuclear reactor was utilized on this site. The facility takes water from the Mississippi River, permitted at a withdrawal rate of 50,000 gallons per minute (gpm), and one on-site well, permitted at a withdrawal rate of 200 gpm. According to the 1984 Water Appropriation Permit report filed with the Minnesota Department of Natural Resources, the facility used an average of 126,600 gallons per day (gpd) and 17,300 gpd from the two water sources, respectively. However, it should be recognized that the facility was operated very little in 1984. Water withdrawal during normal operation of the plant is considerably higher: the average water withdrawal for the period 1970 to 1980 was 16,000,000 million gallons per day. The primary water use is for once-through cooling in turbine exhaust condensers. Additional water is used for boiler make-up, plant washdowns, and air conditioning. Wastewaters generated from boiler blowdown, in-plant washings, and the demineralizers are treated in a settling clarifier. According to the facility National Pollution Discharge Elimination System (NPDES) permit the process discharge from the clarifier is monitored prior to combining with non-contact cooling and air conditioning water for flow, pH, turbidity, suspended solids, oil and grease, copper and iron. The final combined discharge to the Mississippi River is monitored for flow, chlorine residual, and temperature.

3.2 Alternative Project Sizes

As indicated in Section 4.1, the volume of incoming MSW to be processed at the proposed Elk River RDF facility has not been conclusively determined. NSP has submitted a permit application for review by the MPCA Staff, for a resource recovery facility which will receive an annual average input tonnage of as much as 1526 tons/day capacity, based on a six-day week. The application also contains the proviso for downscaling the permitted tonnage, depending upon results of negotiations with interested counties. Ultimately, the size and

configuration of the facility will be determined by the contracted volume of waste input and operational considerations such as equipment reliability and maintenance requirements.

Three alternative plant configurations are being considered. They consist of a one-line, two-line, and three-line processing facility. Each line would process MSW at a rate of 50 tons/hour. The daily input capacity of the facilities, when operated for one shift of ten hour's duration, would be 500, 1000, and 1500 tons per day, respectively. Assuming an RDF recovery rate of 70%, RDF outputs would be 350, 700, and 1050 tons per day, respectively. If an alternative shift schedule of two shifts of eight-hours' duration is implemented, inputs could increase to 800, 1600, and 2400 tons per day, and outputs to 560, 1120, and 1680 tons per day, respectively. Fluctuation in volume resulting in inputs above these capacities would be accommodated by temporary storage of the excess within the facility, by temporarily extending operation hours, or by accelerating the rate of operations.

Contractual arrangements will be necessary with other sources of solid waste for all alternative production rates other than 500 tons/day. Under certain circumstances (scheduled and unscheduled downtime) it is likely that at least some of the RDF produced will be transported to other facilities for combustion. Utilization at other sites is a possibility given alternative configurations and production rates. For the larger alternative production volumes, this utilization at other facilities is certain. The permitted annual volume of the 1500 ton per day RDF facility is equivalent to roughly 327,000 of RDF annually (1526 tons/day x 306 operating days per year x .70 CRDF recovery rate). This compares to an estimated 180,000 tons/year of annual capacity in Elk River Units I and II.

It is noted that both Anoka County and NSP have indicated that production at an average annual tonnage rate of 2400 input tons per day is unlikely, since that amount of municipal solid waste is simply not available in the service area.

4. AGENCY COMMENTS AND RESPONSE TO COMMENTS

Written comments on the Draft Environmental Impact Statement (DEIS) have been received from the following:

- Dennis L. Carlson
- Earth Protector, Leslie Davis, President
- Larkin, Hoffman, Daly and Lindgren, LTD, submitted on behalf of the City of Elk River
- Marylin A. Schroeder
- Jerry L. Schroeder

These communications are reproduced in full and are presented in the following pages in the order discussed above. Each letter received was assigned a roman numeral and each comment within the letters was assigned a number sequentially. In the margin of each comment requiring an answer, there is a number corresponding to the comment. Following each communication are the appropriate responses, organized by the number assigned in the margin.

A public hearing was held on 5/27/86: a transcript of that meeting is included in chapter five of this report. The issues raised largely parallel those raised in the written comments received. Therefore, in the majority of instances, the answers to public hearing comments are incorporated into the written comment responses contained within this chapter.

Comments on the DEIS were also received from the Minnesota Department of Transportation (MNDOT) and the Minnesota Department of Natural Resources (DNR). Neither MNDOT nor MNDNR requested further information and indicated that their concerns were adequately addressed in the DEIS. Their letters are included in Appendix A. The Metropolitan Council requested further information on site location considerations and air quality impacts. These topics are addressed in this chapter.

In addition, UPA had comments which were subsequently incorporated into the revised project description, chapter 3 of this document, as well as Health and Safety, Chapter 6. Similarly, NSP

provided comments primarily related to the project description. These were also incorporated in Chapter 3. The remainder of NSP comments focused primarily on issues in the impact analysis raised by others, and thus corrections and clarifications in response to NSP comments are also found in responses to the public's written comments in this chapter.

Finally, Anoka County provided additional data and requested clarification on several of the DEIS sections. Anoka County information on the landfill siting process is included in Addendum 1 to this chapter, requested clarification on solid waste composition is found in Addendum 2; miscellaneous points of clarification are contained in Addendum 3; and Addendum 4 is a bibliography. Comments by NSP, UPA and Anoka County are also reproduced in full and contained in Appendix A to this report.

Cliff

RECEIVED
JUN - 9 1986

June 5, 1986

MINN. POLLUTION
CONTROL AGENCY

Dear Mr. Kilberg,

I am enclosing the following comments for your consideration regarding the draft EIS on the Anoka County RDF facility in Elk River. I have referred to them by section.

Section 4

I.1 The discussion of alternatives is not complete. At present, the only county participating in the proposed project is Anoka. It seems specious to suggest that the RDF processing facility should not be in Anoka County. This location would provide both public education for the project need and certainly increase the public awareness of recycling and composting alternatives. A discussion of siting alternatives needs to be included and a discussion of other boilers in Anoka County which could also be modified to combust or co-combust RDF should be identified. The production of steam rather than electricity should be the ultimate objective since it is more efficient and can help to reduce the need to combust fossil fuels or natural gas.

Section 1.1

I.2 The ultimate project will need to provide for emergency by-pass, demolition wastes and ash disposal. The statement that a "small percentage of unprocessable waste will be landfilled" is inaccurate at best. The percentage is typically between 25 to 35 per cent. That is certainly not small.

I.3 The entire recycling issue is tied to market conditions. No statement is made as to where the recovered materials will be stored or sold.

I.4 RDF pellets represent a different and variable fuel. The Minnesota Pollution Control Agency has previously indicated a desire to limit RDF combustion to regulated boilers which meet specific combustion characteristics. The reference to "other regulated boilers" is misleading.

I.5 If the final project does include 1000 or 1500 tons per day, will the EIS be amended or supplemented to address the additional transportation, landfill, air quality, health, etc. issues.

Section 1.2

I.6 At present, piping is not in place to handle any wastewater from the proposed RDF processing facility. Who will pay for this extension?

I.7 The Impacts section does not address the socio-economic impacts to adjoining property owners, nor does it address aesthetic impacts to the entire community and adjoining property owners. Both of those items have been addressed at previous public meetings and in written correspondence with your agency.

I.8 The proposed RDF facility will directly affect the capabilities of the Elk River Fire Department. Who will pay for the additional training, equipment (to reach a 77 foot building), and personnel? Where is the discussion of the explosion history of existing RDF processing facilities?
I.9 What will be emitted into the environment if an explosion occurs? A significant pollutant emitted at all waste to energy facilities is hydrogen chloride. It should be
I.10 discussed in detail rather than listed as an "other organic compound".

Section 2

If the purpose of this EIS is not intended to justify, then the alternative section needs to be greatly increased.

Section 3.2

It should be noted on page 3-5 that no public meeting or hearing was ever held in the City of Elk River or in Sherburne County until January 23, 1986. This fact makes the entire Anoka County project suspect since Anoka County has been working on the project since 1984. It appears to be a blatant attempt to keep the public, especially the recipients, in the dark. This attempt to deceive makes a mockery of openness in government and the public participation process.

The January 23 meeting was held because the EIS scoping process requires the meeting to be held in the location of the proposed project. It is apparent that Anoka County, NSP, and UPA have no community-minded individuals willing to address the real issues of this project to the affected

municipality. On page 3-6, the first "bullet" is almost humorous. The December 13, 1984 MINNEAPOLIS STAR AND TRIBUNE carried this quote from the Chair of the Anoka County Board, " the Elk River site is appealing because that would mean Anoka County Board members could avoid the 'political problem' of selecting a site in their own county." This project is totally political and regardless of Pope-Reid's efforts to provide technical input, the Elk River site was known to Anoka County, UPA, and NSP at least two years prior to the MPCA scoping meeting in Elk River. Once again, resolutions passed by the Elk River City Council and Sherburne County Commissioners without public meetings or hearings are not valid and should not be taken as support by the community.

I.11 Section 3.2 is without any discussion of the potential impact to be felt by the Elk River landfill. Will all Anoka County demolition waste, unprocessable wastes, and ash material be returned to the Anoka County landfill? I doubt it. Thus, it seems obvious that Elk River will not only get the RDF processing and RDF combustion but also the landfilling for Anoka County. This development seems totally absurd. Where is the pressure for Anoka County citizens to recycle? It seems suspicious that the project description does not even include a transfer station in Anoka County. Is Anoka County beyond touch in this project? This fact seems unbelievable!

Section 4.1

I.14 Figure 4-1 is a feeble effort at best. Was this a low budget effort or doesn't anyone care about the citizens of Elk River? Some specific information on recycling needs to be added. What market has been identified for ferrous metals, aluminum, and "other materials"? Furthermore, what other materials could be recovered? How will the separation be done? Will all plastics and paper products be recovered? If not, why not? Combustion of municipal solid wastes should be the last level of control.

I.13 Figure 4-1 should be at least a topographical map and a site layout depicting all surrounding land uses, the Mississippi River and proximity to the Historic Kelley Farm.

Section 4.1.3

I.14 What happens to the rejected hazardous waste? Is it to be stored for any period of time in Elk River? Whose responsibility is it? Has liability been determined? The continuous reference to a generic landfill is very misleading. It is hard to imagine that a site specific landfill has not been identified.

- I.14 Figure 4-2 is poor in quality, detail, and nearly impossible to read. Figure 4-3 is also.

Section 4.1.5

- I.16 What municipal solid waste will be landfilled during scheduled and unscheduled downtime at both the combustion facility and RDF processing facility? Where will "further treatment by composting" take place? Elk River, too?

Section 4.1.7

- I.17 Any person operating a front end loader will not inspect waste. This is a ridiculous comment. Who are these specially trained individuals who will perform the quality control of waste? No combustion process is 100% efficient. If small quantities of hazardous wastes are processed and combusted, air emission will occur.

Section 4.1.8

- I.18 The discussion of the combusted RDF ash material is totally silent on the issue of ash concerns. Ash is typically high in trace metals and the issue of dioxins bound to the ash is not touched upon. The Elk River landfill is on the Superfund list and additional expansion in a sand environment is questionable. The ash disposal issue is a national issue which is receiving a great deal of attention. To dismiss it in this EIS causes the reader to question the purpose of this document.

Section 4.1.10

- I.19 What is the by-pass plan for either scheduled or unscheduled downtime?

- I.20 Figure 4-4 is without value since it cannot be read.

- I.21 It is rather pathetic that new acid-resistant bags will be installed in the bag-house due to acid gas emissions, but no mention is made of installing scrubbers to serve the community. That is a real insult to the residents of Elk River.

The states of Texas and California, for example, require scrubbers on all waste to energy projects, including RDF. The state of New York also requires acid gas control equipment.

Section 4.2

- I.22 The inclusion of Unit III burning coal is without merit. The DEIS does not indicate any need for the potential electricity. This entire project seems to be based on political decisions not economics.

Page 4-26

- I.23 The curbside program in Minneapolis is NOT limited to handling only newspapers. Once again, the obvious is not presented. How much reduction, recycling, and composting is Anoka County going to do before combustion or processing? And where will it be done in Anoka County?

Page 4-28

- I.24 The new MPCA solid waste regulation states a goal of 25% for recycling and 12% for yard composting. This document fails to take these goals into account.

Page 4-30

- I.25 The list of mass burn concerns appears accurate, but where is a similar list for RDF which includes dust, ash, noise, explosion, odors, etc. The technologies need to be evaluated in a similar fashion.

Page 5-10

- I.26 A thorough discussion of control technology guidelines presently in use in Texas, Washington, Oregon, California, New York, Wisconsin, and many others should be included. Why not control emissions when technology is available? Landfills might still be nearing capacity, but they would probably not be leaking if liners had been installed initially. As a resident of Elk River I find it unconscionable that this project has evolved to this point without inclusion of a scrubber.

Page 5-25

- I.27 It is hard to believe the entire air quality discussion is without a table detailing emission rates, control efficiency for each pollutant and what emission factors are used in the modeling. The baghouse does have good collection efficiency for trace metals, but the hydrogen chloride concentration

will lower the boiling point of the metals and volatilize the metals.

Thus, the baghouse will not collect either the acid gases, or the volatilized metals.

- I.28 Where is a discussion of the need for background data on non-criteria pollutants? Will non-criteria pollution monitoring occur before and after operation of the facility.

Figure 5.2-1

- I.29 The Figure does not show any wetlands, but they are discussed on page 5-27.

Section 5.4.1

- I.30 The land use section does not include the Kelley Farm which is a Minnesota Historical Site. It appears that this document was written without knowledge of the local area.

Section 6.8

- I.31 The risk assessment done for this proposed project is different than done by the same consultant, ERT, for the Hennepin County project and the Ramsey-Washington project.

The length of exposure is strangely reduced to 30 years rather than 70 years. Even though these boilers are already 30+ years old, it is likely some type of combustion facility would be proposed on the same site if these boilers became uneconomical to operate. The use of a short half-life factor for dioxin is not in keeping with a conservative approach to risk assessment. On page 6-101 reference is made to scrubber/baghouse dioxin control. This is not germane to this project as described. The reader is led to believe this equipment is in existence.

The risk assessment approach appears to suggest that all waste to energy projects should be located in sparsely populated areas. This is an incomprehensible statement. If a facility is unsafe in New York City, it is unsafe in Elk River! This is an absurd perspective. Our lives as residents here are as valuable as anywhere else on earth.

I hope you give these comments due consideration. Your agency appears to be the only real hope we as Elk River residents have for a public forum and possible protection on these important environmental issues.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dennis L. Carlson".

Dennis L. Carlson

I.1 At present, the only county participating in the proposed project is Anoka. It seems specious to suggest that the RDF processing facility should not be in Anoka County. This location would provide both public education for the project need and certainly increase the public awareness of recycling and composting alternatives. A discussion of siting alternatives needs to be included and a discussion of other boilers in Anoka County which could also be modified to combust or co-combust RDF should be identified. The production of steam rather than electricity should be the ultimate objective since it is more efficient and can help to reduce the need to combust fossil fuels or natural gas.

In April, 1985, the County and Pope-Reid Associates, Inc., completed the Evaluation of Potential Working Areas Report. The purpose of the study was to identify potential sites for a resource recovery facility and/or transfer station to be located in or near Anoka County. This analysis was performed concurrent with the County's process for procuring a large-scale resource recovery facility. Because it was not known at the time what type of technology would be selected or what specific locational factors would be most appropriate for a particular vendor potential working areas were analyzed for possible refuse derived fuel (RDF), mass burn, and co-composting technologies and for a possible transfer station to serve a resource recovery facility.

Based on review of existing land use and zoning information from various sources and Anoka County's 1984 report titled Anoka County Economic Development Study and Directory of Available Real Estate, and on discussions with staff of appropriate cities, 67 preliminary working areas were identified within Anoka County. In addition, one site was identified in Sherburne County, the industrial site on 165th Avenue near Highway 10 in the City of Elk River. This site had been identified by NSP/UPA, which was one of the vendors being considered by Anoka

County. After utilizing two initial screening criteria, the availability of industrial land and the availability of at least about ten contiguous acres of land, 28 active working areas remained within Anoka County, plus one site in Sherburne County.

The active working areas were then examined according to each of the following evaluation criteria: zoning restrictions, proximity to major sources of waste generation, surrounding land uses and potential for screening, access to a nine-ton road, distance to utilities, encroachment on protected wetlands and/or one hundred year flood plain areas, existing structures on the working area, and potential for airport related height restrictions. Using these criteria, five working areas in Anoka County plus one site in Sherburne County were considered to be the most suitable active working areas in which to locate a resource recovery facility for Anoka County.

The evaluation of active working areas was based solely on readily available information. Site specific information on soils and groundwater conditions was not readily available. Therefore, after the Evaluation report had been prepared, the County had geotechnical analyses performed on seven sites, the initial six sites plus an additional site in Lino Lakes. The result of these studies indicated that potential sites located in Anoka, Blaine, Lino Lakes, Ramsey, and Elk River (Sherburne County) had adequate soil and groundwater conditions for an energy recovery facility or transfer station, while potential sites in Coon Rapids and Fridley had unsuitable soil and groundwater conditions.

In the meantime, Anoka County issued a Request for Preferences for a Facility Site in July, 1985, to the three vendors of RDF technology to whom the County had issued a Request for Proposal during June, 1985. In its response NSP/UPA stated their preference for the site already identified in Elk River. NSP/UPA had begun their search for a proposed site for the RDF

processing facility in late 1984/early 1985. The utilities had concentrated on five criteria in selecting a site. The site should be easily accessible to waste haulers. The site should be accessible and within a reasonable distance of the Elk River Power Plant where the RDF will be used. The site should be in an industrially zoned setting, adequately buffered from residential properties now and in the future. Preferably, the site should be for sale. The site should be centrally located to all potential participants. Political boundaries were not a criteria for the utilities.

In October, 1985, the Anoka County Board adopted a policy which set forth a method and schedule for selection of a primary site and back-up sites for the RDF processing facility. On November 8, 1985, the Anoka County Board selected NSP/UPA as the vendor to own, design, construct and operate a resource recovery facility. On November 19, 1985, a public hearing was held by the Anoka County Board to elicit public comment concerning site location. At the hearing, Northern States Power Company presented information in support of its recommendation that the Elk River site in Sherburne County be selected. Based upon information presented at the public hearing, analysis of the siting criteria and the recommendations of the Anoka County Project Team, the Anoka County Board at its November 26, 1985, meeting selected the Elk River site in Sherburne County as the preferred site for location of the RDF processing facility and sites in Blaine and Anoka County as alternate back-up sites.

In November, 1985, the County's environmental engineering firm, Pope-Reid Associates, Inc., conducted a study of solid waste transportation costs in Anoka County to evaluate whether development of a transfer station(s) would reduce total transportation costs to Elk River. The study showed that a properly located transfer station would be economically justified.

On November 26, 1985, the Anoka County Board approved a staff recommendation that a transfer station be built in Anoka County, and designated three general working areas within which the County could seek to locate a transfer station in the City of Blaine. During later discussions between City of Blaine and County staff regarding these working areas, City staff requested that four additional industrial areas be evaluated. In June, 1986, Anoka County and Pope-Reid Associates completed a report entitled Evaluation of Potential Sites for a Solid Waste Transfer Station. This report, which was issued to the City of Blaine in July, 1986, indicates that two sites are preferred to the other sites. It is anticipated that a final site for the transfer station will be selected during the summer of 1986.

In 1985, Anoka county and its consulting firm of Pope-Reid Associates, Inc. analyzed potential energy markets in and near Anoka County for steam, RDF, and electricity. Significant energy users were identified based on records of natural gas, coal use, and other energy sources. Officials from potential energy users were then contacted. The results of this analysis were: 1) no user of process steam was identified which would use the equivalent of an average of over 100 tpd of MSW, 2) there were very limited numbers of potential users of loose RDF, and these had significant technical and compatibility problems. As a result, no interested markets other than NSP and UPA were identified for which use of RDF would be feasible.

- I.2 The ultimate project will need to provide for emergency by-pass, demolition wastes, and ash disposal. The statement that a "small percentage of unprocessable waste will be landfilled" is inaccurate at best. The percentage is typically between 25 to 35 percent. That is certainly not small.

The proposers expect somewhere between 19 and 24 percent (by weight) of the waste delivered to the processing facility to be residue. Residue is the heavy organic fraction of the waste

stream left after RDF and recyclables have been separated. Residues include rejects and unprocessables such as wet paper and food wastes.

In addition, ash residues from the facility will require landfilling. The quantity of ash residues is equivalent to 10 percent of the RDF processed (about 7 percent, not 10 percent, of the solid waste received).

The plant is designed to recover as much as 75 percent of the combustibles received as RDF. The actual recovery rate depends on many factors affecting the quality of the waste stream. A 70 percent recovery rate is guaranteed.

Illustrative Examples

Assuming 1,000 tons are received, and 75% of the combustibles received are recovered as RDF, the quantity of waste requiring landfilling would be 265 tons, or about 26 percent by weight of the total solid waste received:

Quantity of waste recovered	1000 tons
Ferrous Metal and Aluminum recovered for recycling	60 tons (6%)
Waste recovered as RDF	750 tons (75%)
Heavy fraction and rejects (to be landfilled)	190 tons (19%)

Of the 750 tons of RDF, 10% or 75 tons will be landfilled in addition to the 190 tons of the heavy fraction.

Assuming 1,000 tons of waste are received and 70%, rather than 75%, of the combustibles received are recovered as RDF, the quantity of waste requiring landfilling would be 310 tons or 31 percent:

Quantity of waste received	1000 tons
Ferrous Metal and Aluminum recovered for recycling	60 tons (6%)
Waste recovered as RDF	700 tons (70%) of this 700 tons, (70 tons of ash for landfill)
Heavy fraction and rejects (to be landfilled)	240 tons (24%)

Of the 700 tons of RDF, 10% or 70 tons of ash would be landfilled in addition to the 240 tons of heavy fraction and rejects.

It should be noted that ash residues from RDF incineration do not equate to ten percent of the total waste stream before processing but instead 10 percent of the RDF recovered.

In sum, the quantity of waste requiring landfilling will be between 26.5 and 31 percent by weight of the total solid waste received. It is acknowledged that this is not a small quantity, but it does represent a reduction of about 70 percent of the incoming processable waste in the landfilled waste stream.

I.3 The entire recycling issue is tied to market conditions. No statement is made as to where the recovered materials will be stored or sold.

Note: the following recycling discussion is expanded to address additional recycling questions raised in subsequent comments.

As stated in Section 4.3.2 of the Draft Environmental Impact Statement, a major factor which may affect recycling programs is the location and size of markets for recycled materials. Recycling markets are addressed in the "Solid Waste

Identification and Expansion Report," prepared by the Metropolitan Council in February 1986. Some of the findings presented in the report are as follows:

- Two aluminum scrap end markets exist in the Metropolitan area. These industries use aluminum alloys in their smelting processes. End markets are also located in Indiana, Tennessee, Michigan, Ohio, and Missouri and are tied to multinational corporations and national market trends. Further, the Metropolitan area has a network of aluminum scrap collectors and brokers. Prices for recovered aluminum are low: while there are impediments to increased aluminum recycling, the long term forecast is positive.
- There is an independent network of ferrous scrap dealers which collect and market scrap ferrous metals. Principal markets are Chicago, Indiana, Nebraska, mills along the Mississippi and foreign markets. Scrap prices are sensitive to transportation costs and fluctuations in the business cycle.
- Glass, aluminum, and newspaper are traditional source-separated materials with relatively stable markets.
- There is significant growth potential for recycled glass in the Metropolitan Area. The largest end user for recycled glass in the area, Anchor Glass, accepts only glass sorted by color. Prices for glass have remained stable. The recovery of all potential recycled glass in the Metropolitan Area will not saturate the market.
- The primary use for recycled newspapers in the region is the paperboard and cellulose industries. However, newspaper publishers in Minnesota do not generate an adequate demand for newsprint to support a profitable paper mill. Demand does fluctuate. The five-state region could potentially recover enough old news to support a news-to-news mill.

- There are 45 grades of wastepaper. Independent collectors and brokers facilitate the flow of wastepaper from collection to the consuming industry.
- Corrugated cardboard containers and high grade office paper have stable markets with potential for growth. A market for corrugated materials has been established by the region's major paper mill, Waldorf, which produces paperboard and corrugated medium from 100 percent wastepaper. High grade paper is the most lucrative post-consumer wastepaper grade with a strong stable market currently supplied from large volume generators such as printing operators and large office buildings.
- Tin cans and plastics have virtually no local markets. Local scrap dealers and processors believe recycling scrap from MSW is not economical. Similarly, although there is a small local market for used plastics, the cost of raw material is low enough so that processing post-consumer plastics is not economical.
- There are ten yard waste composting programs in the Metropolitan area, which have been successful in distributing supplies. Potential markets exist, such as nurseries, landscapers, golf courses, parks and highway construction, but these have not been extensively developed.

As indicated in the following table, materials which can potentially be recycled account for more than 50 percent of the area's waste stream.

<u>Material</u>	<u>Percent Waste Stream</u>	<u>Market</u>
Corrugated Containers	14.6	Yes
Mixed Waste Paper	11.1	No
High Grade Office Paper	10.7	Yes
Newspapers	8.4	Moderate
Glass	3.5	Yes

Aluminum	1.2	Yes
Tin Cans	1.2	No
Plastics	Varies	No
Yard Wastes	7.98	Yes

Source: Solid waste market identification and expansion report, Metropolitan Council p. 15

On a national range, municipal solid waste includes approximately 50 percent recyclable secondary materials.

The Anoka County Waste Designation Plan, which has as an objective the identification of the ultimate disposal point for all of Anoka County's waste, estimates that an integrated recycling program (consisting of drop-off centers, buy-back centers, and curbside collection) can realistically recover from three to sixteen percent of solid waste.

More specifically, assuming a high citizen participation rate of 50 percent for areas serviced by a curbside collection system (approximately 75% of the County's population) and a 4 percent participation rate for the area serviced by a drop-off program, the plan estimated that source separation could divert 5 to 6 percent from landfills, and composting of yard waste an additional 4 to 5 percent. The Metropolitan Council has estimated that as much as 15 percent of the total solid waste generated annually could be separated and recovered from a full scale recycling and composting effort. A major policy of the Metropolitan Council Solid Waste Management Development Guide/Policy plan requires Metropolitan area generators to separate recyclables and compostable yard waste by 1988. The MPCA has established higher recycling goals for non-Metropolitan areas: 25 percent recycling and 12 percent yard composting. These are goals, but not necessarily fully attainable objectives.

A number of Anoka County municipalities have already initiated recycling programs, including a multi-material curbside collection program in Fridley; multi-material drop off programs in Circle Pine, Columbia Heights, East Bethel, Fridley and Ramsey; two private scrap/salvage/recycling businesses; and other programs which collect only one material. Additional programs are planned. Throughout the metropolitan area, drop-off centers are the most common type of recycling operation. Curbside collection is practiced less frequently. More than 250 sites in the Metropolitan region accept some sort of recycled materials.

The proposed RDF facility includes provisions for recovery of aluminum and ferrous metals for recycling. After removing non processables and goods which can be recycled directly, the size reduction and separation processes will result in recovery of ferrous metals and aluminum. Recovery processes are described in 4.1.5 of the EIS, the RDF facility. Glass recovery equipment may be installed in the future.

NSP is responsible for recycling aluminum. NSP expects less than one percent of the waste stream to be recoverable aluminum, and that there will be a market for this material. If, for some reason, aluminum cannot be recycled in the future, it would have to be landfilled.

Anoka County is responsible for recycling ferrous metals, which are expected to be 6 percent of the waste stream, by weight. No specific arrangements have been made by the County to date. (NSP's planning undertaken for the Newport RDF facility currently under construction indicates that a market does exist for the material. Two vendors have expressed interest in purchasing the ferrous from that facility. If, for some unforeseen reason, ferrous metals cannot be recycled, they would have to be landfilled.)

End users for recyclable materials, brokers, processors, and collectors of recycled materials are in many instances found locally. Waldorf Corporation, which has a major influence on the local wastepaper market, has its own broker, and satisfies 65 percent of its corrugated and 100 percent of its old newspaper demand from the local area. Anchor Glass Container's (in Shakopee) market consists of a 400 mile radius around the Twin Cities.

A survey was conducted as part of the Pope-Reid Hennepin County recycling study. Processors of recycled materials were asked to estimate the distance they transported materials to get to market. Generally, responses indicated that markets existed within 5 miles. Some of the markets, however, may be brokers who resell the material to more distant users. Survey results were as follows:

- Glass and magazines received no responses indicating shipment greater than 50 miles.
- 50 percent of responding processors were shipping nonferrous metal and office or computer paper over 50 miles.
- Newspaper and corrugated were being shipped less than 10 miles by over half of the responding processors.

The recycling marketing report includes several recommendations for facilitating further recycling, including: monitoring of local markets, facilitating interaction between recycling programs and markets, integrating interagency efforts for regional market expansion, and examination of intermediate processing facilities as a technique for enhancing the quality and quantities of materials being supplied to end markets.

- I.4 RDF pellets represent a different and variable fuel. The Minnesota Pollution Control Agency has previously indicated a desire to limit RDF/combustion to regulated boilers which meet specific combustion characteristics. The reference to other regulated boilers is misleading.

The RDF produced by the project would be burned at the UPA power plant in Elk River. In the event the fuel must be fired elsewhere (i.e. a shutdown of the UPA facility), the RDF will be fired at either of two boilers specifically permitted to burn RDF. The NSP Willmarth facility would be the primary back-up facility to the UPA, Elk River power plant. The NSP Red Wing boiler would be a secondary location for the burning of the RDF. Both facilities are regulated boilers permitted to burn RDF.

- I.5 If the final project does include 1,000 or 1,500 tons per day, will the EIS be amended or supplemented to address the additional transportation, landfill, air quality, health, etc issues".

Section 6.0, of the DEIS, Impacts and Mitigation, addresses the potential project impacts of the 500, 1000 and 1500 tpd facilities. For example, Section 6.1.3.9 (Air Quality Impact Results) of the DEIS has three subheadings within it. The first subheading on page 6-30 of the DEIS addresses the impacts of a 500 TPD facility. Page 6-34 addresses the impacts of the 1000 and 1500 TPD facilities. Similar discussions of the alternative project sizes are provided in the DEIS for air quality, water quality, solid waste, transportation and noise.

The public health assessment presented in the DEIS was undertaken assuming a 1500 TPD facility. This size facility poses the maximum risk to the public. The impacts of a 500 or 1000 TPD facility would be less and are identified in the Revised Public Health assessment accompanying this FEIS as Chapter 6.

I.6 At present piping is not in place to handle any wastewater from the proposed RDF processing facility. Who will pay for this extension?

The applicant proposes to construct wells to withdraw water for use in the facility. In addition, it is proposed that all sanitary waste would be treated on site. As a result, neither sewer nor water service will be required to be extended to the site. Thus, there would not be any cost to anyone to extend piping to the site.

The applicant will sweep the facility daily to minimize dust and odor problems. On occasion washdown of certain interior areas will be required. The applicant has indicated a desire to minimize the use of water for floor washdown. The proposed process is by design a dry-process not requiring the use of water. Any floor washdown water will be stored on site until such time as sufficient volume is generated to truck the washdown wastewater to the Elk River Sewage Treatment Plant. The Draft EIS provides an estimate of the amount of washdown water to be generated.

I.7 The impacts section does not address the socio-economic impacts to adjoining property owners, nor does it address aesthetic impacts to the entire community and adjoining property owners. Both of those items had been addressed at previous public meetings and in within correspondence with your agency.

Although much debate has developed regarding the impact of resource recovery facilities on property values, no conclusive study has been conducted to adequately quantify such perceived impacts (be they negative or positive). Limited studies have been conducted in an attempt to shed some light on the property value question. One such report by Konheim and Ketcham of New York concludes that resource recovery facilities are difficult to site due to negative connotations of garbage and fears of

odors, truck traffic and pollution. "These perceptions lead to fears about adverse effects on nearby property values. However, an examination of the experience of mass burning plants built since 1970 in the United States reveals that in no cases have property values of surrounding areas been lower than residential or commercial areas more distant from the plants, and that, in most cases, the areas surrounding resource recovery facilities have experienced very rapid appreciation. Nearby economic development appears to be an indirect effect of resource recovery plants which provide a major anchor of public and private investment, solve an infrastructure need, prove to be good neighbors, and in some cases, stabilize energy rates and property taxes. Successful economic development efforts seem to be a characteristic of communities which choose resource recovery." ("Effect of Resource Recovery Plants on Nearby Property Values", by Carolyn S. Konheim of Konheim and Ketcham, Brooklyn, NY, 11201; presented at the Fifth Annual New England Resource Recovery Conference & Exposition, Boxborough, MA, June 10-12 1986).

- I.8 The proposed RDF facility will directly affect the capabilities of the Elk River Fire Department. who will pay for the additional training, equipment (to reach a 77 foot building) and personnel.

NSP has indicated to Elk River that the company will execute a hold harmless agreement stating that NSP recognizes that part of the facility structure will be in excess of heights capable of being reached by the fire department's existing equipment. The company only expects Elk River to use equipment normally on hand in a prudent manner.

Many measures will be taken to minimize chances of fire. Employees at the processing facility will be trained in fire prevention and control. As discussed in response I.9, the facility is designed to safely contain fires or explosions, should they occur. An extensive fire protection system has also been incorporated into the design.

I.9 Where is the discussion of the explosion history of existing RDF processing facilities. What will be emitted into the environment if an explosion occurs?

Based on National Ecology's eight year operating experience at a similar plant in Baltimore, Maryland there have not been any instances of explosions which resulted in emissions of projectiles or other materials to the surrounding environment. There were instances of small explosions at this facility each year which were contained within the processing equipment (plant) itself (Personal Communication, Raymond Letito, Associate Program Director, National Ecology, Maryland, 1985). National Ecology is NSP's consultant on the proposed facility.

NSP's Elk River plant will use proven technology to minimize chances of fire or explosion. The prevention policy will begin even before the municipal solid waste arrives at the facility. Refuse collectors will be made aware of the kinds of waste the plant will and will not accept. The facility will also incorporate explosion and fire protection measures. An element of the facility design is inspection of the refuse stream before shredding. Close inspection by the grapple operator will be achieved as the MSW is spread, and a hydraulically operated articulated picking grapple will be included in the design to permit removal of potentially hazardous materials. Also, closed circuit TV monitoring of hazardous areas will be employed. Any obvious large containers of potentially hazardous materials, such as 50 gallon drums of solvent or gasoline, will be identified and removed. Smaller household products such as hair spray, cans, etc. will likely not be identified and may be passed along through the processing. Household quantities of potentially hazardous material are not considered as statutory hazardous material (MPCA, 1986).

The flail mill will be enclosed in a concrete enclosure that would contain an explosion or fire hazard. A blast vent through the roof will be provided and blast mats for projectiles will be located over the vent. In addition, the flail mills will be fitted with a water deluge system to extinguish any fire than may occur from an explosion. To further prevent damage caused by explosions, combustible vapor detectors will be placed in the flail mill. These detectors would sound an alarm in the plant control room at 50 percent of the lower explosion limit. The detectors would activate a mechanical ventilating system -with manual override- to remove the combustible vapor. A halon type explosion suppression will be installed on each individual flail mill and shredder.

A sprinkler system will protect other conveyors in the RDF process. Plant operators will use closed-circuit television to monitor potentially hazardous areas of the facility. Operators will work in safe areas. These explosion protection measures represent the current state-of-the-art.

I.10 A significant pollutant emitted at all waste to energy facilities is hydrogen chloride. It should be discussed in detail rather than listed as an "other organic compound".

Table 6.1-15 of the DEIS provides information on expected pollutant emissions from the facility for hydrogen chloride. Maximum ambient concentrations of hydrogen chloride from the facility are provided in that table. Section 1.2 of the DEIS is an Executive Summary and does not discuss all project impacts in detail. Section 6.1 on the other hand, provides a detailed discussion of pollutant emissions including hydrogen chloride (refer to Table 6.1-15).

I.11 It should be noted on page 3-5 that no public meeting or hearing was ever held in the City of Elk River or in Sherburne County until January 23, 1986. This fact makes the entire Anoka County project suspect since Anoka County has been working on the project since 1984. This project is totally political and regardless of Pope-Reid's efforts to provide technical input, the Elk River site was known to Anoka County, UPA and NSP at least two years prior to the MPCA scoping meeting in Elk River.

NSP and UPA began their search for a proposed site for the RDF processing facility early in 1985. On August, 1985, the utilities formally submitted the proposed site to Anoka County. The EIS scoping notice appeared in the EQB Monitor December 30, 1985. The scoping public meeting was held on January 23, 1986.

The utilities concentrated on five criteria in selecting a site. These criteria were: (1) the site should be easily accessible to waste haulers; (2) the site should be accessible and within a reasonable distance of the Elk River Power Plant where the RDF will be used; (3) the site should be in an industrially zoned setting, adequately buffered from residential properties now and in the future; (4) the site should preferably be for sale; and (5) the site should be centrally located to all potential participants. Political boundaries were not a criteria in the utilities site selection.

Additional background siting information is provided in I.1.

I.12 Section 3.2 is without any discussion of the potential impact to be felt by the Elk River landfill. Will all Anoka County demolition waste, unprocessable wastes, and ash material be returned to the Anoka County landfill. I doubt it. Thus, it seems obvious that Elk River will not only get the RDF processing and RDF combustion but also the landfilling for Anoka County. This development seems totally absurd. Where is the pressure for Anoka County cities to recycle. It seems

suspicious that the project description does not even include a transfer station in Anoka County. Is Anoka County beyond touch in this project? This fact seems unbelievable.

Contractual arrangements with Anoka County and proposed contracts with others provide that the County of origin is responsible for disposal of residues (the heavy organic fraction of the waste stream left after RDF and recyclables have been separated). No decisions have been made yet about where residue will actually go. Anoka County has indicated they do not intend to use the Elk River Landfill for residue disposal. No decisions have been made yet about where the ash will be landfilled. UPA is examining the use of an existing landfill, and the alternative of a new independent landfill. In either case ash will be placed in a separate cell with liners, leachate collection, and extensive groundwater monitoring. The ash cell would be separate from other parts of the landfill if an existing landfill location is used.

It should be pointed out that in all probability, less waste will likely go to Elk River Landfill as the result of the proposed RDF facility, even if ash is landfilled there. Anoka County currently deposits trash at the Elk River Landfill. Only ash from that waste might be placed there in the future. If other counties who use the Elk River Landfill, including Sherburne County, participate in the project, that trash will then be diverted to the processing facility. The result will be less waste going to Elk River Landfill.

Anoka County is committed to source reduction and recycling as required by the Metropolitan Council Solid Waste Management Development Guide/Policy Plan and Anoka County landfill abatement policies. In calculating the quantity of waste to commit to processing at the proposed RDF facility, it was conservatively assumed that Anoka County would guarantee only 350 tons per day although the most recent weighing study by

Pope-Reid estimated that approximately 562 tons per day of solid waste is generated within Anoka County. In committing only 350 tpd, it was assumed that the Metropolitan Council's waste management objectives for recycling and source separation would be met.

- I.13 Some specific information on recycling needs to be added. What market has been identified for ferrous metals, aluminum, and other materials. Furthermore, what other materials could be recovered. How will the separation be done will all plastics and paper products be recovered. If not, why not.

Please see previous response in I.3 of this FEIS.

- I.14 Figure 4-1 is a feeble effort at best. Was this a low budget effort or doesn't anyone care about the citizens of Elk River. Figure 4-2 is poor in quality, detail, and nearby impossible to read. Figure 4.3 is also.

Figures 4.1 and 4.2 and 4-3, are supplemented by new figures which follow.

- I.15 What happens to the rejected hazardous waste. Is it to be stored for any period of time in Elk River. Whose responsibility is it? Has liability been determined? The continuous references to a generic landfill is very misleading. It is hard to imagine that a site specific landfill has not been identified.

Responsibility for initial control of hazardous waste lies with refuse collectors and generators. They will know what kinds of waste the plant will not accept. The facility will not knowingly accept hazardous waste.

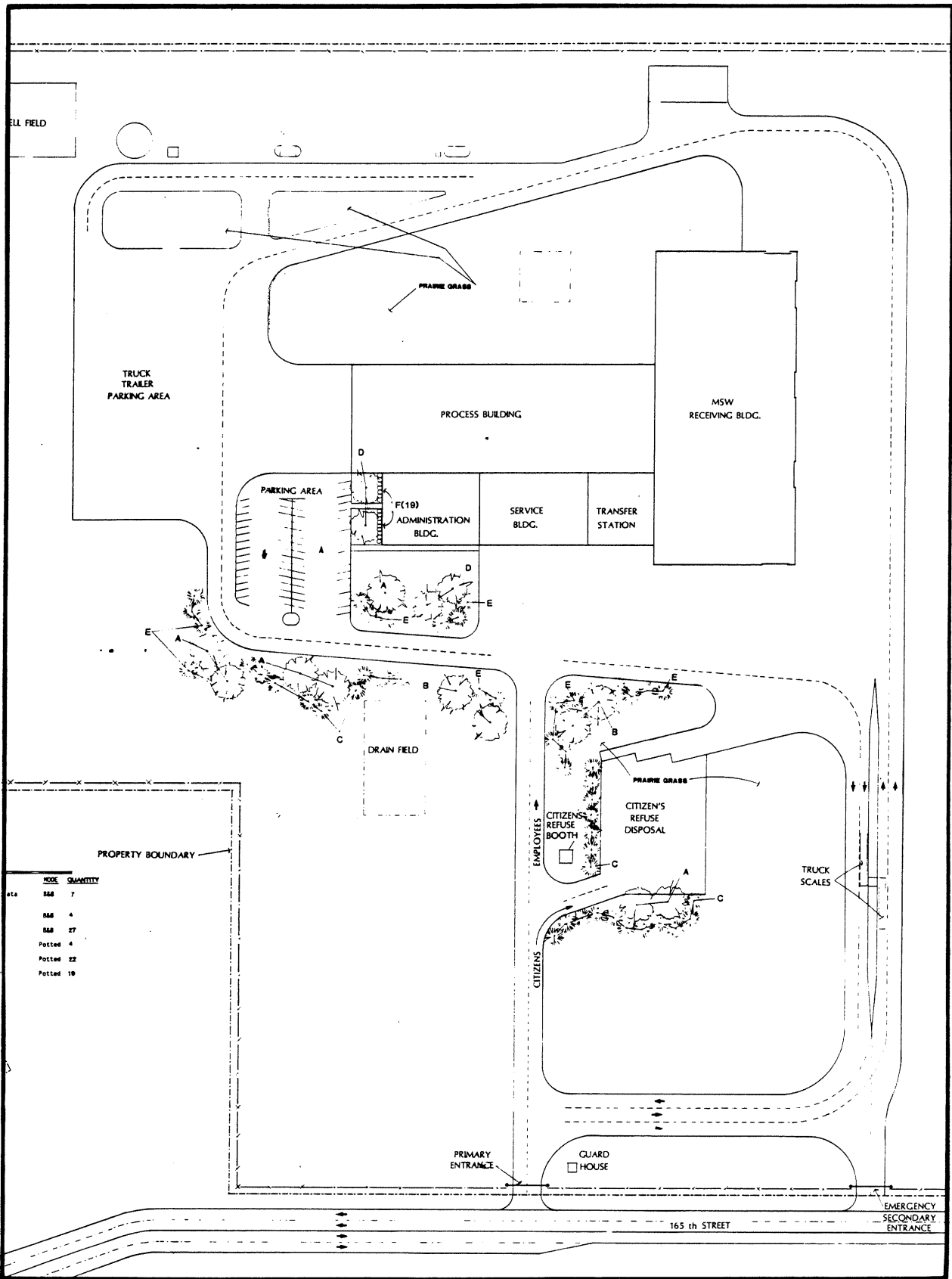


Figure 4-1 Site Plan

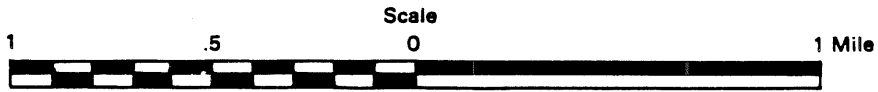
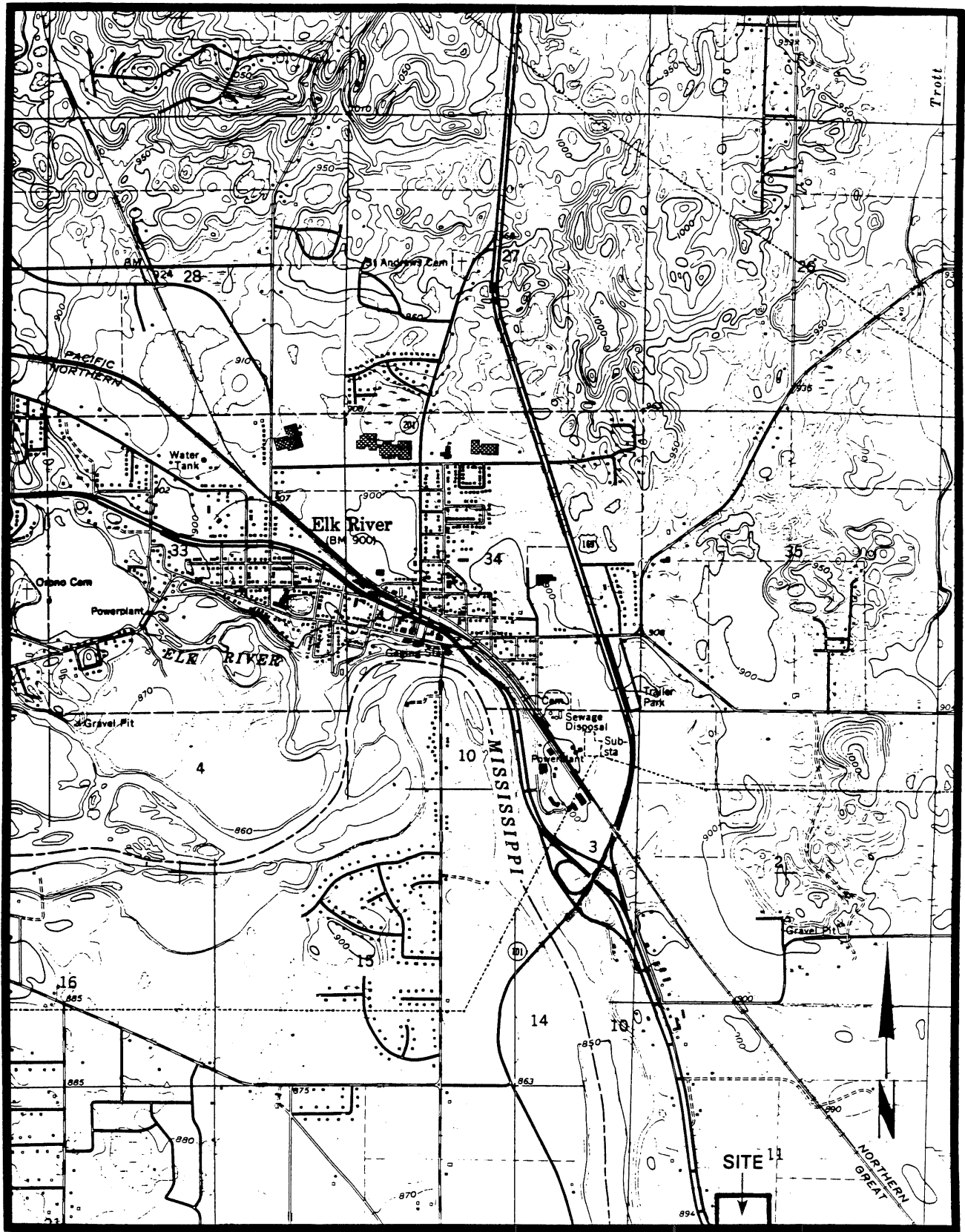
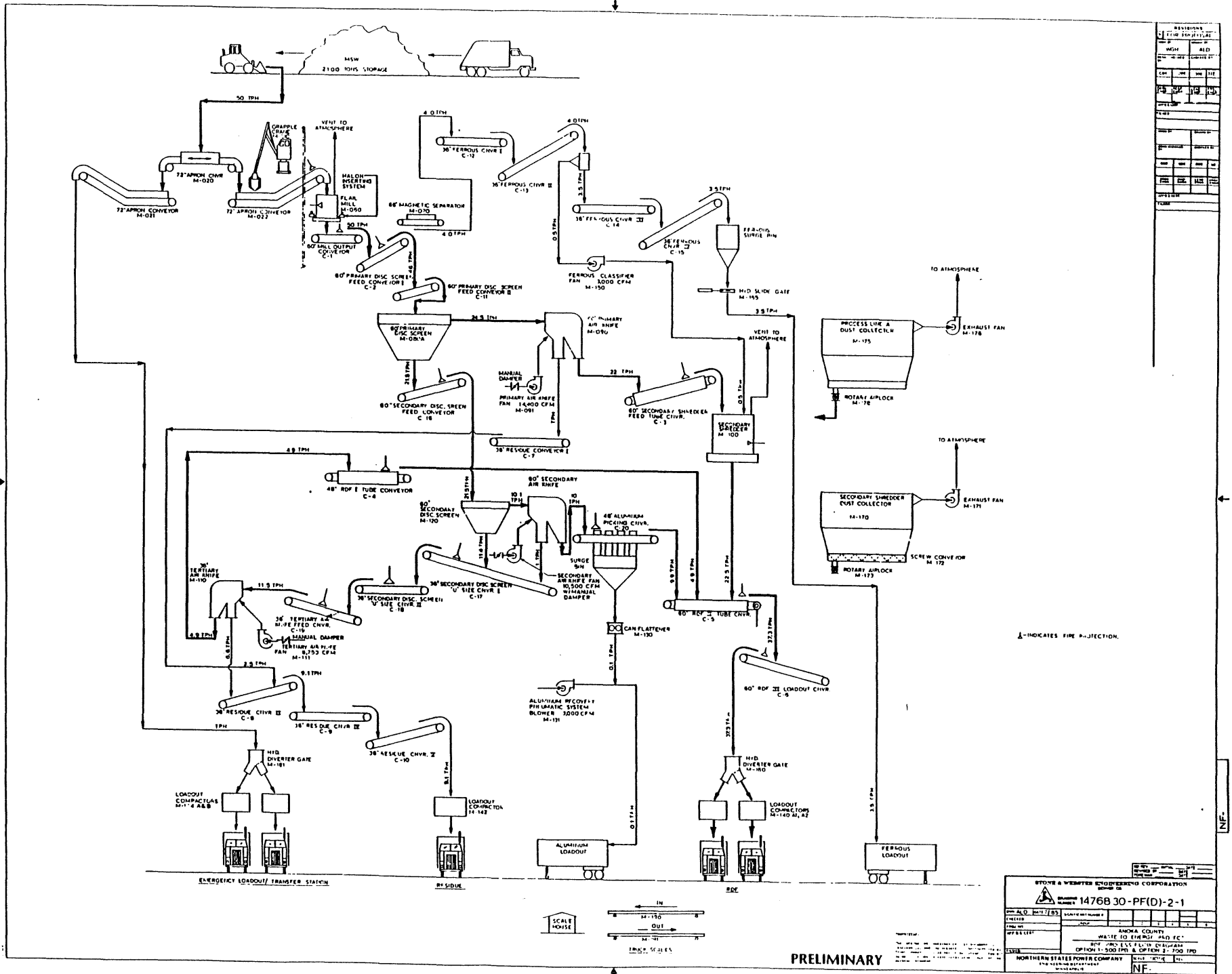


Figure 4-2 Site Vicinity

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When haulers arrive at the Elk River facility, they will deposit trash on a large concrete tipping floor. Here, front-end loader operators will inspect the MSW as they spread it around the floor. They will spot obviously unacceptable items such as 55 gallon drums containing potentially hazardous materials and place them in a special container for hazardous waste rejects. The container will go to a properly licensed landfill, probably in Ohio. There is no hazardous waste landfill in Minnesota. Small quantities of household items such as spray cans will likely not be observed and will be processed.

A second inspection will occur as conveyors take the MSW to the flail mill for processing into RDF. The operator will use a bucket-crane device to remove obviously unacceptable items from the conveyor, if they are observed.

The County will reimburse NSP for the cost of handling and disposing of hazardous waste rejected before processing. NSP will handle and dispose of the material in accordance with local, state, and federal regulations. NSP will dispose of hazardous waste it identified after processing, at its own expense in approved hazardous waste landfills, outside of the state of Minnesota. Most likely the hazardous wastes will be transported to a landfill in Ohio.

I.16 What municipal solid waste will be landfilled during scheduled and unscheduled downtime at both the combustion facility and the RDF processing facility? When will further treatment by composting take place. Elk River, too?

The processing facility will have at least three days of waste storage capability on the enclosed tipping floor. Since a maintenance shift is part of the daily operation of the facility, we expect the facility will be able to process waste as guaranteed. There is opportunity for extended hours of

operation and some increase in the processing rate, should it become necessary. For 2 or 3 line facilities, there will be redundant systems. If, for some unforeseen reason, waste cannot be processed, it would be transferred to landfill. The RDF will be sent primarily to the Elk River Power Plant. In the event one or more of the Elk River boilers are not available, RDF will be sent to the Wilmarth plant. Landfilling RDF is very unlikely with such a redundant system. Due to penalties in the NSP/Anoka contract for not meeting a 68 percent minimum weight reduction performance guarantee, there is further incentive for NSP to minimize bypassing of waste.

It is anticipated that any by-pass waste derived from waste from Anoka and other counties, with the exception of Sherburne would not be landfilled at Elk River. Anoka, Hennepin and Washington counties are required by state law and Metropolitan Council policy to prepare EISs on their inventory of landfill sites, and to select a site for a new landfill. It is anticipated that these new landfills will be developed for disposal of bypass waste, as well as residuals.

Co-composting sites have not been determined.

- I.17 Any person operating a front-end loader will not inspect waste. This is a ridiculous comment. Who are these specially trained individuals who will perform the quality control of waste. No combustion process is 100% efficient. If small quantities of hazardous wastes are processed and combusted, air emissions will occur.

The usual operating procedure at resource recovery facilities is the inspection of refuse by operators of front-end loaders. Operators of front-end loaders will be able to spot many obviously unacceptable items such as large drums of materials, (i.e. gasoline and propane tanks). In addition, inspection will also occur as MSW is conveyed to the flail mill for processing

into RDF. It is true that smaller quantities of household wastes will not be observed. If small quantities of hazardous wastes are indeed processed as part of the MSW fuel they will be properly controlled by the incineration combustion conditions. These combustion conditions include combusting waste at very high temperatures (approximately 1800-2000 degrees fahrenheit), long residence time and adequate turbulence. These conditions result in high destruction efficiencies of the wastes. The introduction of additional excess air above the primary combustion zone further ensures the combustion of trace quantities of any combustible including a hazardous waste. While it is true that no combustion process is 100% efficient, the trace quantities of uncombusted waste in the exhaust gases are expected to be negligible.

I.18 The discussion of the combusted RDF ash material is totally silent on the issue of ash concerns. Ash is typically high in trace metals and the issue of dioxins bound to the ash is not touched upon. The Elk River landfill is on the Superfund list and additional expansion in a sand environment is questionable. The ash disposal issue is a national issue which is receiving a great deal of attention. To dismiss it in this EIS causes the reader to question the purpose of this document.

The resource recovery facility will produce fly ash and bottom ash wastes or a combination waste of fly and bottom ash. If the facility produces the former, each type of ash will be tested under the direction of the MPCA to determine whether it is hazardous as defined by regulations. MPCA rules provide that a waste is hazardous if it exhibits ignitability, corrosivity, reactivity, toxicity, extraction procedure toxicity or is an oxidizer, or if it meets the additional criteria at Minn. Rules Ch. 7045.0129 (1984) which primarily pertains to acute toxicity.

Current test results from existing MSW incinerators indicate that dioxin has been detected in the fly ash but not in the bottom ash. As required by the hazardous waste rules, an acute toxicity analysis must be conducted on the ash. Preliminary estimates indicate that even the worst case of dioxin found in fly ash falls below the hazardous waste acute toxicity levels. However, a final determination cannot be made until the proposed facility is operational and its specific ash is analyzed.

If either ash is determined to be hazardous, it would have to be treated or disposed of according to MPCA's hazardous waste rules. No facilities are currently available in the State of Minnesota to dispose of hazardous wastes. Accordingly, the material would have to be shipped out of state for disposal. If either ash is determined to be non-hazardous, it would have to be disposed of according to MPCA's solid waste rules. The two options available would be disposal in a landfill designed and operated exclusively for the disposal of ash or co-disposal with mixed municipal waste in a mixed municipal waste sanitary landfill. The former would be governed by MPCA's solid waste rules, Minn. Rules Ch. 7035 (1984). The latter would be governed by MPCA's guidelines for co-disposal, implemented pursuant to Minn. Rules Ch. 7035.1700(V)(4). Under this option, ash would have to be disposed of in separate cells or as a final layer atop existing fill material.

If the facility produces a combination of fly and bottom ash, its disposal would be governed either by MPCA hazardous waste rules or solid waste rules, depending upon the results of testing for hazardous wastes.

Whether the facility proposer will be entitled to evaluate and dispose of facility ash as a combined waste stream or whether it will be obligated to test and dispose of each type of ash separately will depend upon whether, in the judgment of MPCA,

the ash streams were combined as a result of facility design and waste management plans rather than as a subterfuge for avoiding the obligation to test individual waste pursuant to Minn. Rules Ch. 7045.0215 (1984). If MPCA determines that the combined ash streams result from the former, the proposer will be entitled to evaluate only the combined ash to determine whether it is hazardous or not. If each type of ash is tested separately, and one or the other is hazardous within the meaning of MPCA rules, the facility might be eligible to be treated as a totally enclosed treatment facility, defined at Minn. Rules Ch. 7045.0020, sub. 92 (1984). In such a case, combining the bottom and fly ash to produce a non-hazardous waste would be permissible. Eligibility for status as a totally enclosed treatment facility may not be available for all types of hazardous materials.

If any ash is determined to be hazardous, it likely will be shipped out of state for disposal, until such time as a permitted hazardous waste disposal facility exists within Minnesota. Under this scenario, no existing or planned landfill capacity within the region or state would be used by this facility. Out-of-state shipment of ash would reduce demand for existing or planned regional landfill capacity. If the ash is not hazardous, its disposal will utilize either existing or planned landfill capacity within the region or state.

I.19 What is the bypass plan for either scheduled or unscheduled downtime?

Please see I.16 response.

I.20 Figure 4-4 is without value since it cannot be read.

A new Figure 4-4 follows.

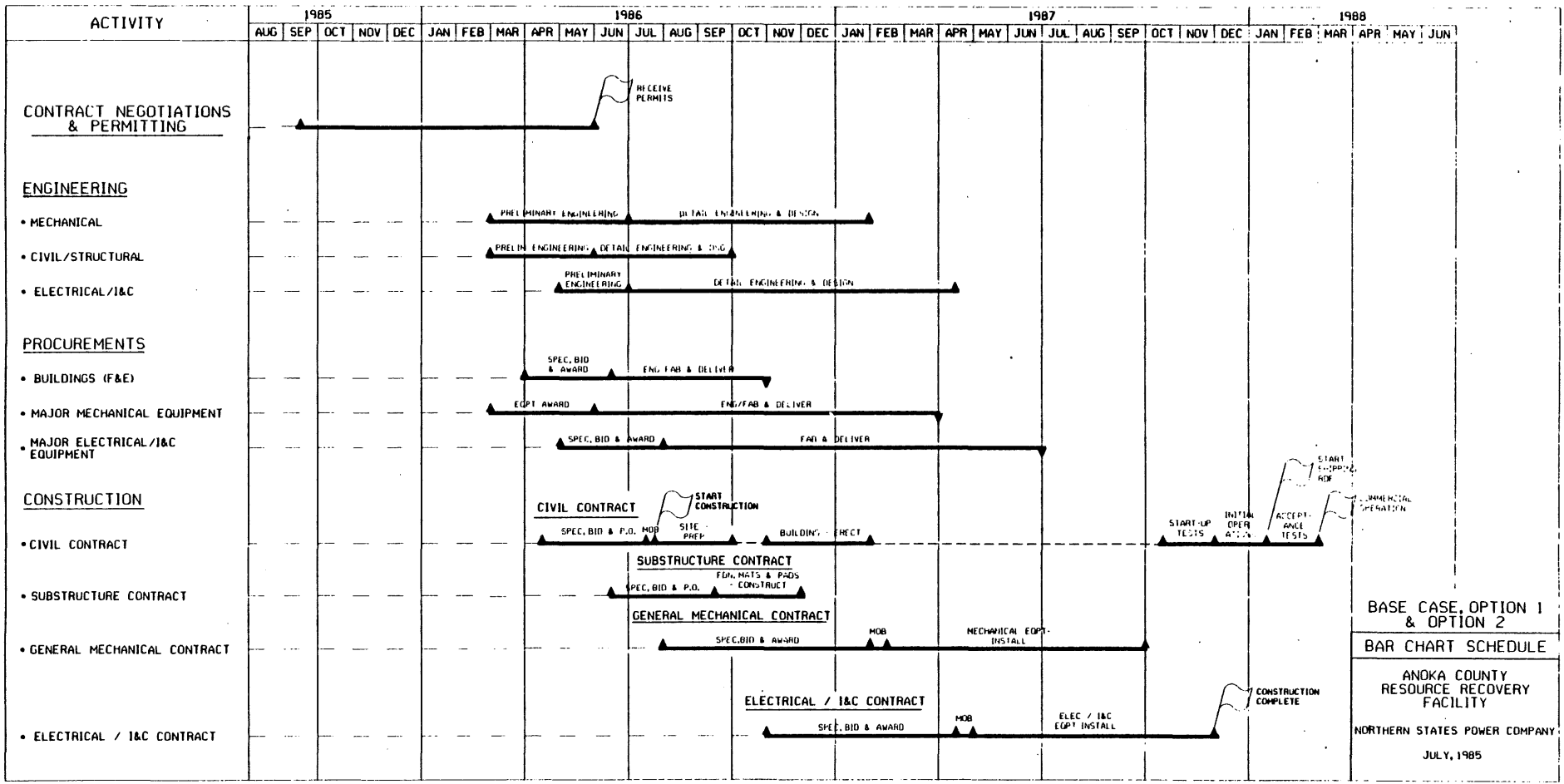


Figure 4-4 Construction Schedule

I.21 It is rather pathetic that new acid-resistant bags will be installed in the baghouse due to acid gas emissions, but no mention is made of installing scrubbers to serve the community. This is a real insult to the residents of Elk River.

Note: The issue of pollution control equipment and Best Available Control Technology (BACT) is addressed in the following paragraphs. These paragraphs not only respond to the question above, but subsequent comments on the same theme which address air pollution control and dioxins.

The application of BACT for control of acid gases was not discussed because this facility is exempt from the BACT requirement. A major reason the EPA exempted a retrofitted facility of this type (coal/oil-fired boiler to an RDF-fired boiler) from the BACT evaluation is that a reduction in most criteria pollutants usually occurs as a result of the retrofit. Therefore an overall improvement in air quality results with respect to criteria pollutant impacts. Reductions in the following criteria pollutants (from the current permitted burning of coal) are expected given similar boiler operating rates and load conditions before and after the retrofit; SO₂, NO_x, particulates and CO. If a BACT evaluation for acid gas control was performed, an acid gas add-on control system would most likely be found to be feasible. Acid gas control systems are currently being permitted for most new resource recovery facilities. A BACT evaluation is defined as follows:

"An emission limitation based on the maximum degree of reduction for any regulated contaminant emitted from or which results from any regulated facility which the Agency on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of control of production processes and available methods, systems and techniques for each such contaminant."

Although a formal BACT evaluation was unnecessary to perform from a regulatory standpoint, the existing baghouse, with the proposed modifications, represent BACT for control of particulate matter. A baghouse is used primarily to remove particulates from air emissions. Baghouses consist of various fabric filters which trap particulates and gases to pass through the device and enter the stack. Electrostatic precipitators (ESP) are an alternative technology and remove emissions through electrostatic forces.

Installation of a multiclone particulate collector downstream of the economizer, to protect the baghouse from burning cinders, and installation of new acid-resistant bags and door gasketing clearly represents BACT. There is no other alternative control technology that is capable of a higher degree of particulate control efficiency than this modified system. Therefore it is deemed BACT. In fact, this type of control system is permitted frequently as the control system to meet the LAER requirement in non-attainment areas for TSP. This systems can only remove particulate matter and the percentage removal efficiency is anticipated to exceed 99.4%.

Polychlorinated dibenzo-p-dioxins (PCDDs or 'Dioxins') and polychlorinated dibenzofurans (PCDFs or "Furans') are chlorinated organic compounds typically emitted in very trace amounts from municipal refuse incinerators. The mechanism for formation is suggested to be the combustion of aromatic precursors in the presence of chlorinated compounds under the combustion conditions of inadequate oxygen in the high temperatures of the flame. Therefore, it is argued by some engineers that the primary control technology for PCDDs and PCDFs is maintaining proper combustion conditions in a well designed combustion chamber. Combustion control technology at the UPA Power Plant will include evenly distributed primary and secondary combustion air distribution, high excess combustion air, temperature, residence time, and turbulence, and proper combustion conditions monitoring.

Baghouses are generally ineffective at removing gaseous emissions from a facility. Gaseous contaminants would only be removed if they were adsorbed on to particulates and consequently removed by the fabric filters. In the case of dioxins and furans it is suspected that a certain portion are adsorbed by particulate matter. Most of the residual PCDDs and PCDFs emissions are however believed to pass through the fabric filter medium.

In order to remove acid gasses such as HCL, a scrubber/baghouse or scrubber/ESP would be required. Resource recovery facilities are being proposed throughout the county with scrubber/baghouses for acid gas control. Certain states are recommending the inclusion of scrubber/baghouse or scrubber ESP systems for acid gas control. A scrubber/baghouse system could be required by the MPCA as part of the permitting requirements for the proposed facility.

- I.22 The inclusion of Unit III burning coal is without merit. The DEIS does not indicate any need for the potential electricity. This entire project seems to be based on political decisions not economics.

The applicants have indicated that one potential operating scenario is the burning of RDF at two units with the burning of coal at Unit III. Although the applicant has not committed to this operating scenario, the potential to burn coal in Unit III does exist. The purpose of the EIS is to address and identify the maximum likely environmental impacts of the proposed project. Since the applicant has proposed burning coal in Unit III, the DEIS by statute must assess the possible environmental impacts of the proposed action.

The purpose of the DEIS is not to determine whether a proposed action is politically or economically feasible. Rather, the objective of a DEIS is to assess the environmental impacts of a proposed action. The proposed burning of coal in Unit III would result in generally greater emissions of criteria pollutants (thereby representing worst case air quality impacts) than if RDF were fired in that unit as shown in Tables 6.1-1 and 6.1-4. of the DEIS.

The Elk River generating station is now operated as a peaking unit burning coal. Because the generating station will still maintain the capability of firing unit no. III as a peaking unit on coal even if units nos. I and II are converted to RDF firing, the impact of coal combustion needed to be addressed in the air quality impact analysis when assessing compliance with ambient air quality standards.

- I.23 The curbside program in Minneapolis is not limited to handling only newspapers. Once again, the obvious is not presented. How much reduction, recycling, and composting is Anoka County going to do before combustion or processing. And where will it be done in Anoka County.

Please see recycling response in I.3 of this FEIS.

- I.24 The new MPCA solid waste regulation states a goal of 25% for recycling and 12% for yard composting. This document fails to take the goals into account.

Please see recycling response in I.3 of this FEIS.

- I.25 The list of mass burn concerns appears accurate (4-30), but where is a similar list for RDF which includes dust, ash, noise, explosions, odors, etc. The technologies need to be evaluated in a similar fashion.

Page 4-31 of the DEIS discusses RDF concerns:

"RDF systems have a greater ability to recover resources and thus can result in less residues than mass burn systems especially if the heavy fraction (i.e. banana peels, wet paper, food waste) is co-composted. RDF systems do, however, require more complex equipment than mass burn, and operating experience has revealed reduced reliability associated with this additional equipment. There have been instances of explosions associated with the use of shredders. However, these problems are possible to overcome. RDF facilities tend to produce dust."

Additional environmental concerns related to RDF are: ash, odors, noise, residue, microorganisms, organic compounds, occupational safety and air pollution. Many of these environmental concerns are of similar magnitude for mass burn and RDF facilities.

Additional transportation and transportation costs are associated with RDF facilities where processed RDF must be transported to off-site boilers. RDF facilities generally have additional processing equipment when compared to mass burn facilities, thereby resulting in additional sources of noise as well as increased maintenance involved in operation of additional processing equipment. There are concerns regarding the reliability and safety of RDF processing. Only about 20 percent of the resource recovery facilities in the U.S. use the RDF processing technique. RDF is a less proven technology than mass burn, which has a lengthier operating history established in more than 30 years of European application.

There are however, advantages associated with RDF. By classifying materials before incineration, RDF technology provides for a greater potential to recycle materials such as

ferrous metals, aluminum and glass than does mass burn. It better meets the MPCA goals of recycling of materials than does mass burn or landfilling. The RDF generally has a lower ash content, a higher heating value, and a slightly lower moisture content than mass burn refuse.

The RDF can be incinerated on-site or transported to an existing fossil-fuel facility and can be burned by itself, or as a fuel supplement to coal or oil. This potential for flexibility in the use of the RDF fuel is a major advantage of the RDF process. Where an existing boiler is available to burn the RDF fuel, RDF will have lower capital costs than mass burn since there are no costs to construct a boiler.

I.26 A thorough discussion of control technology guidelines presently in use in TEXas, Washington, Oregon, California, New York, Wisconsin and many others should be included. Why not control emissions when technology is available....As a resident of Elk River I find it unconscionable that this project has evolved to this point without inclusion of a scrubber.

See Response to 1.21 of this FEIS.

I.27 It is hard to believe the entire air quality discussion is without a table detailing emission rates. Control efficiency for each pollutant and what emission factors are used in the modeling. The baghouse has good collection efficiency for trace metals, but the hydrogen chloride concentration will lower the boiling points of the metals and volatilize the metals.

This information is given in Tables 6.1-1 through 6.1-4 on pages 6-11 through 6-17 of the DEIS.

The chemical reactivity between trace metals and hydrogen chloride is minimal, and if and when chemical reactivity occurs the boiling point of trace metals would increase causing less volatilization of trace metals.

I.28 Where is a discussion of the need for background data on non-criteria pollutants? Will non-criteria pollution monitoring occur before and after operation of the facility.

Although not subject to PSD review, the impacts of those non-criteria pollutants that would be emitted as a result of RDF combustion at the Elk River generating station were compared to the corresponding air quality concentrations for exempting sources from the monitoring requirements of the PSD regulations. The maximum predicted impacts of the Elk River station for RDF firing were shown to be below the appropriate de minimis air quality impact levels for those non-criteria pollutants. Therefore, no ambient monitoring of non-criteria pollutants either before (for background levels) or after RDF operations commence at the facility are planned.

I.29 The figures does not show any wetlands, but they are discussed on page 5-27.

Figure 5.2.1 presents the 100-year flood zone as designated by FEMA maps for the city of Elk River. Any local wetlands are not part of the 100-year flood plain for the Mississippi River. The map is not intended to display local wetland resources. Reference to wetlands in the text is based on site observations and drainage profiles as observed on a USGS topographic map. No effort has been made to delineate area wetlands based on either soil types or vegetation.

I.30 The land use section does not include the Kelley Farm which is a Minnesota Historical Site.

The historic Kelley Farm is located approximately one mile south of the proposed RDF facility. The Kelley Farm is separated from the RDF facility by U.S. Highway 10. U.S. 10 and land uses along the highway provide a buffer between the Kelley Farm and the RDF facility.

The historic Kelley Farm is located approximately three miles south of the UPA power plant. Due to the distance separating the Historic Kelley Farm from the proposed project, it is not anticipated that there would be any impacts on this Historic land use.

- I.31 The Risk Assessment done for this project is different than done by the same consultant, ERT, for the Hennepin County Project and the Ramsey-Washington project.

A revised Chapter 6.0 to this FEIS addresses the health risk assessment.

earth protector[®]

Mr. Cliff Anderson
Minnesota Pollution Control Agency
Office of Planning and Review
1935 W. County Road B2
Roseville, MN 55113-2785

RECEIVED
JUN 10 1986

MINN. POLLUTION
CONTROL AGENCY
June 9, 1986

Dear Mr. Anderson:

RE: Comments for the Elk River garbage burning Draft Environmental Impact Statement

Earth Protectors' interest in the above referenced project is to protect the air, land, and water resources of our state and nation from contamination and misuse.

- The stated primary purpose of the Elk River project is to reduce landfilling.
- II.1 The category, Landfill Site Utilization, 6.3.4.1, page 4-46, should clearly explain the net reduction by burning. We are referring to the compaction and degradation factor. Two recent studies show that incineration reduces the volume of garbage only 17-21% more than landfilling. The Metropolitan Council predicts only a 25% relative volume reduction. Refer to Hennepin County Resource Recovery Project, DEIS 12/85 by Metropolitan Council and, To Burn or Not to Burn by the Environmental Defense Fund, 1985.
- II.2 Alternative Technologies, 4.3, page 4-21. The Institute for Energy and Environmental Research in Heidelberg, Germany, has a 306 page report or 6 page summary done by Bert Frank or Frankel and should be reviewed for incorporation in the Final EIS. They have taken 9 waste options and combinations against 13 parameters and produced a matrix that would be important to review by your agency for possible inclusion in the alternative technologies section of the Final EIS. This document will be provided by Earth Protector if you are not able to get it quickly.
- II.3 Exposure Assessment, 6.8.10, page 6-119. Elk River is a rural area that has a land use base that is primarily agricultural and agriculturally related. Many people in the area consume various combinations of vegetables, dairy products, and meat that are grown locally. In December, 1984, the Danish National Environmental Protection Agency, released a study (summary enclosed) done at an incinerator in the area around Kaerup. This study shows that for groups of persons who live and consume milk, meat, and vegetables produced within the area impacted by the incinerator, the effective dose of PCDD's and PCDF's could be 480 times greater than by inhalation alone.

The DEIS assessed three main exposure routes, inhalation, ingestion, and dermal contact. Since Elk River and the surrounding area are rural and agriculturally based, it is essential that the Final EIS include the consequences of consuming products grown and eaten in the area around the incinerator. This should be called FOOD CHAIN in the Exposure Assessment category.

While the total FOOD CHAIN category is important, particular attention should be paid to cows milk and mothers milk, (two reports enclosed). One is from Professor Rappe, University of Sweden, regarding PCDD's and PCDF's in cow milk in Switzerland and the second paper is a May 28, 1986 paper delivered by Dr. Barry Commoner in Philadelphia on the Health Effects of Chlorinated Dioxins and Furans.

It is not clear in the DEIS whether the USEPA/CAG, upon which the potency slopes are based, incorporates the H. Poiger and C. Schlatter information delivered at the 5th International Symposium on Chlorinated Dioxins and Related Compounds in the Federal Republic of Germany, September 1985 (summary enclosed). Poiger and Schlatter found a half life for dioxin in humans to be 4.95 years. If the CAG did not include this information, and the DEIS dose response is based on rat studies, the DEIS could be underestimating the dose response by 80 times.

Community Risk, 6.8.13, page 6-132. Assuming the Poiger, Schlatter half life data has been included in the USEPA/CAG dose response work, when one incorporates the Danish data for FOOD CHAIN exposure, the DEIS may be underestimating the community cancer risk by 480 times. Using the Swiss EPA TEF, the average for a population of 10,000 exposed within 6 miles of the incinerator, the average scenario would be 10 new cancers and the worst case would be 48 new cancers among the 10,000. The Final EIS needs to adjust the Community Risk estimates to reflect the above.

The Final EIS should examine the benefits of measuring the dioxin in cows milk now for background information. This should be done with at least 10 split samples.

The Final EIS should examine the potential for the formation of "bis chloro methyl ether" from garbage burning. There is a strong suspicion that this potent carcinogen can form spontaneously when combusting formaldehyde, moisture, and chlorides. All three components are available in garbage. Sources of the above in the surrounding area should be examined.

Thank you for the opportunity to comment on the Elk River project.

Yours For A Cleaner Earth

Sincerely,



Leslie Davis
President

LD/wo

Enclosures: Poiger, Schlatter
Danish EPA, 1984
Commoner, May 28, 1986
Rappe, cows milk

II.1 The stated purpose of the Elk River project is to reduce landfilling. The category, Landfill Site Utilization, 6.3.4.1, page 4-46 should clearly explain the net reduction by burning. We are referring to the compaction and degradation factor. Two recent studies show that incineration reduces the volume of garbage only 17-21% more than landfilling. The Metropolitan Council predicts only a 25% relative volume reduction. Refer to Hennepin County Resource Recovery Project, DEIS 12/85 by Metropolitan Council, and to Burn or Not to Burn by the Environmental Defense Fund.

The vendor has guaranteed a 68 percent waste reduction by weight of MSW based on the following formula:

<p>Minimum Weight = 100 x Reduction</p>	<p>Tons of process rejects landfilled + Tons of ash landfilled + tons of RDF landfilled + tons of Contractor waste not Processed + tons of aluminum 1- <u>Recovered but not landfilled</u> Tons of contacted waste + tons of processed surplus waste</p>
---	--

The proposed facility is designed to recover as much as 75 percent of the combustibles as RDF; 70 percent is anticipated. If 70 percent is recovered as RDF and 6 percent is recovered ferrous and aluminum, 19 percent by weight is rejects. In addition, 7.5 percent by weight of the original tonnage delivered would be ash (10 percent of RDF processed results in ash). Thus, under this scenario, there would be a 26.5 percent of the waste would be landfilled, or a reduction of about 74.5 percent from the initial combustible waste input. Under the

scenario where 75 percent of the combustibles are recovered, and 6 percent is recovered as ferrous and aluminum, 24 percent by weight is rejects. In addition, there would be 7 percent ash by weight (.10 x 70 percent of RDF). In total, waste to be landfilled would be by weight about 31 percent, or a reduction of about 69 percent from the initial combustible waste input to the RDF facility.

In effect, incineration reduces the volume of garbage appreciably more than landfilling and more than the 17 to 21 percent rate cited in the question above. The significant volume reduction is recognized by both the MPCA and the Environmental Defense Fund.

The Metropolitan Council projected for the period 1990-2000 that the County would reduce its need for landfill capacity by about 28 percent as a result of the 1000 tons per day Hennepin County facility. However, this percentage is not equivalent to the volume reduction to be achieved by the 1,000 TPD facility for the waste it will process. Instead, it reflects the fact that the total waste generated by Hennepin County will be 2,400 TPD, that not all waste generated in the County would be directed to the facility (only 1000/2400 or 42 percent), and that the waste stream of the county will increase as the population increases. The residuals produced by the facility itself would require about 93 acre-feet of capacity per year. In the absence of the Hennepin facility, 452 acre-feet of landfill capacity would be required for the 365,000 tons of solid waste (1,000 TPD x 365) otherwise processed at the facility. The $(359/452 = 80\%)$ volume reduction achieved by the facility is about 80 percent of the incoming waste stream.

The article "To Burn or Not to Burn" also indicates a volume reduction achieved by incineration comparable to that percentage proposed by the facility's vendor. In that article, the following is stated:

"Second incinerators produce a significant ash residue - 30 percent by weight - which must be landfilled. Although incineration significantly reduces the volume of the material to be landfilled - to less than 10 percent of the original volume - ordinary garbage also undergoes substantial volume compression due to compaction after it is landfilled. The relative volume reduction factor - amount of incinerated garbage to be landfilled versus ordinary landfill garbage is 21%."

The appendix of the "To Burn or Not to Burn", provides information on how this percentage is derived. In the appendix, it is evident that the 21 percent refers to the ratio of landfill volume required by garbage which is burned and then landfilled to the landfill volume required by garbage which is not burned. This is supported by the following excerpt from the article's appendix:

"The volume reduction factor for landfilled incinerator ash, as compared to ordinary landfilled garbage, is derived as follows. The Department of Sanitation expects the landfilled density of ash to be 2,000 lbs/cu.yd while the density of compacted garbage is 1,400 lbs/cu.yd. In its calculations of landfill depletion the DOS used an ash residue fraction by weight of 30%. Thus, the landfill volume required by ordinary garbage is 38.6 cu.ft/ton (equivalent to 1,400 lbs/cu.yd). The landfill volume required by ash is 27 cu.ft/ton (equivalent to 2,000 lbs/cu.yd.). Since 70 percent of the weight of garbage is lost during incineration the landfill volume required by garbage which is burned and then landfilled is 8.1 cu. ft./ton of original garbage (30 percent of 27 cu/ft/ton). The ratio of 8.1 cu/ft/ton to 38.6 cu/ft/ton is 21 percent to the landfilled, or a weight reduction of about 79 percent."

The MPCA has encouraged the use of co-composting of the heavy fraction, particularly the organic portions such as food waste. If NSP were to co-combust the heavy fraction as much as a 90 percent weight reduction from the waste input might be realized.

II.2 Alternative Technologies, 4.3, p.4-21. The Institute for Energy and Environmental Research in Heidelberg, Germany has a 306-page report or 6-page summary done by Bert Frank or Frankel and should be reviewed for incorporation in the Final EIS. They have taken 9 waste options and combinations against 13 parameters and produced a matrix that would be important to review by your agency for possible inclusion in the alternative technologies section in the Final EIS. This document will be provided by Earth Protector if you are not able to get it quickly.

The six-page summary of "Trash-Recycling, Composting or Incineration" by Bernd Franke was reviewed as suggested. The nine options evaluated in the summary were:

- 1) Landfills
- 2) Incineration
- 3) Composting
- 4) RDF
- 5) Pyrolysis
- 6) Central Recycling Plants
- 7) Source Separation of Raw Materials
- 8) Refuse Derived Fuel (RDF) plus composting
- 9) Source Separation and collection of raw materials and composting.

These nine methods were compared in the cited study on the basis of costs; land space consumption; air, noise, surface water, soil, and groundwater pollution; degree of recycling; energy saving; public acceptance; long-term security and flexibility.

The study's conclusion was that based on pilot programs, source separation and collection of raw materials and composting shared an achievable waste reduction of 60 percent, and that this combination was the optimal method of trash handling, from an ecological and economic view. Additional findings of the Franke article included:

- 1) The main problem with RDF are high emission of chlorides and heavy metals;
- 2) Questions on the environmental effects, economics, and long-term reliability of pyrolysis can only be assessed after practical experience;
- 3) Previous studies have shown that central recycling plants did not fulfill their expectations; and
- 4) In contrast to centrally located, large scale recycling plants, the source separation of raw materials is better suited to provide recycling materials from trash.

The options considered in the Franke article parallel those considered by the Metropolitan Council in their Solid Waste Management Development Guide/Policy Plan, the draft EIS for the Anoka RDF plant, and Anoka County landfill abatement studies. However, the Development Guide/Policy Plan, the Hennepin County Recycling Study as well as the State Landfill abatement goals, do not project the same high levels of recycling as the Franke article.

The Hennepin County Recycling study evaluated in detail six scenarios for recycling, and concluded the total additional abatement levels (over and above the current 23.4 percent) ranged from 1.3 percent to 40.6 percent. The higher recycling percentages were associated with a scenario which necessitated curbside collection for all residents, pick-up of all yard waste, a requirement that commercial enterprises source separate office paper and prepare cardboard boxes for recycling, a tire

recycling plant, a significant public promotion campaign, and extensive institutional support mechanisms. The Hennepin Country Recycling Advisory Committee did not consider this to be an implementable scenario, and recommended a scenario consistent with the Metropolitan Council's 16 percent recycling goal (in addition to the present 23.4 percent present composting and materials recycling level).

It should be noted that numerous studies have addressed volume reduction achievable by various landfill abatement methods, and that conclusions vary. This is due to the differences found in solid waste composition and quantities in various study areas, and to the fact that the success of recycling programs is indeed dependent upon a host of variables. These variables were cited in the EIS and include:

- characteristics of the collection system,
- location and size of markets for recycled materials,
- public awareness,
- cost of the recovery process,
- cost of other disposal methods,
- government policies,
- end uses of recycled materials.

In short, results achievable in pilot studies in Germany are not necessarily transferable to the Metropolitan Area. It remains to be seen what level of recycling can be achieved in the metro area.

The evaluation of options in the Franke article indicated that some of the serious drawbacks to RDF included land space consumption, noise pollution, air pollution, surface water pollution, groundwater pollution, and soil pollution. These problems contributed to the comparatively low favorability of RDF in the options evaluation. The conclusions of the Franke

article are not consistent with the analyses found in the Anoka Draft EIS. It is not clear if the Franke article's assessment of RDF included facilities with:

- 1) Provisions for proper disposal of ash in secure landfill cells to reduce the likelihood of soil and water pollution.
- 2) The enclosure of tipping and storage areas to reduce and most likely preclude, the likelihood of contaminated run-off and contact with soil, surface waters, and groundwater.
- 3) Treatment of process wastewaters before discharge to surface waters.
- 4) Maintenance of high combustion temperatures coupled with particulate control to reduce air emissions.

II.3 Exposure Assessment, 6.8.10, page 6-119. Elk River is a rural area that has a land use base that is primarily agricultural and agriculturally related. Many people in the area consume various combinations of vegetables, dairy products, and meat that are grown locally... Since Elk River and the surrounding area are rural and agriculturally based, it is essential that the Final EIS include the consequences of consuming products grown and eaten in the area around the incinerator... It is not clear in the DEIS whether the USEPA/CAG, upon which the potency slopes are based, incorporates the H. Polger and C. Schlatter information delivered at the 5th International Symposium and Chlorinated Dioxins and Related Compounds in the Federal Republic of Germany...

A revised health risk assessment has been incorporated in this FEIS as Section 6.0. It addresses many public comments received by various responders to the DEIS, and includes an assessment of the consequences of consuming products grown and eaten in the area around the incinerator. The health risk assessment used potency slopes and toxic equivalency factors recommended by the USEPA Carcinogen Assessment Group (CAG) as directed by MPCA in consultation with the Minnesota Department of Health.

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REPLY TO MINNEAPOLIS OFFICE

DAVID C. SELLERGREN

June 10, 1986

Mr. Eric Kilberg
Senior Planner
Office of Planning and Review
Minnesota Pollution Control Agency
1935 West County Road B2
Roseville, Minnesota 55113

DELIVERED VIA
MESSENGER

MINN. POLLUTION
CONTROL AGENCY

RECEIVED
JUN 10 1986

Re: Comments of the City of Elk River on the Draft Environmental
Impact Statement for the Proposed Elk River Resource Recovery
Facility

Dear Mr. Kilberg:

This letter is submitted on behalf of the City of Elk River (the City) and contains the comments of the City on the Draft Environmental Impact Statement (DEIS) for the proposed Elk River Resource Recovery Facility (the RDF Facility).

A number of the comments contained herein were originally raised in the City's January 29, 1986 comment letter on the Scoping EAW for the RDF Facility. We have found the analysis and discussion contained in the DEIS to be inadequate and unresponsive to our comments in these areas. We request that the PCA fully analyze all impacts of the RDF Facility and respond to the comments and concerns of the City of Elk River.

1. Impacts of the RDF Facility on the Elk River Sanitary Landfill

III.1

Our letter of January 29, 1986, identified a number of concerns about impacts of the RDF Facility on the Elk River Sanitary Landfill. The City is extremely concerned about the current operation of the landfill and about potential impacts which location of the RDF Facility in the City may have on the landfill. The DEIS discusses solid waste impacts and landfill site utilization in only general terms; groups the Elk River Landfill together with several other existing landfills and analyzes the impacts of the RDF Facility on the landfills as a group; and mentions briefly that Anoka County is attempting to locate sites for new landfills. This analysis is totally inadequate and does not enable the City of Elk River to analyze the impact of the RDF Facility on Elk River and the Elk River Landfill. The DEIS fails to specifically identify and discuss the

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Mr. Eric Kilberg
June 10, 1986
Page 2

impacts of the RDF Facility on utilization of the Elk River Landfill or the related groundwater and other impacts which would follow from such utilization.

The City once again requests that the PCA specifically address the impacts of the RDF Facility on the Elk River Landfill. If the proposed RDF Facility is constructed the City of Elk River will be receiving up to 1,500 tons per day of solid waste for processing at the RDF Facility and burning in the UPA facility. The City is entitled to know how much of the rejects and ash from the processing and burning facilities will also be landfilled in Elk River. The following concerns were raised in our January 29, 1986 letter and we once again request that they be responded to:

- a. Are process rejects from the RDF Facility and/or ash from the UPA Facility proposed to be landfilled in Elk River;
- b. If so, what impacts would that landfilling have on the City and the Landfill, including:
 - i. Would daily volumes at the Landfill increase?
 - ii. Would the Landfill be enlarged?
 - iii. Would the lifespan of the Landfill increase?
 - iv. How long would the Landfill be used for these purposes?
 - v. Would process rejects from the RDF Facility and/or ash from the UPA Facility aggravate or intensify the existing contamination problems at the Landfill?
 - vi. Will landfill space in addition to the existing Landfill be sought in Elk River?
- c. If process rejects and ash are not proposed to be landfilled in Elk River, the EIS should identify and discuss the capacities and contractual commitments which Anoka County and NSP/UPA have from their proposed landfills. The City is concerned that adequate capacity be under contract so that process rejects and ash do not go to Elk River solely for lack of another option.

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June 10, 1986
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- d. The EIS should discuss in detail the economics of process reject and ash disposal (i.e., the cost per mile to landfill disposal site) so that the economic pressures and incentives to landfill in Elk River are clear and understood prior to undertaking the project.

In addition, we note that Table 5.3-4 of the DEIS does not identify a "remaining capacity" of the Elk River Landfill. We also note that the DEIS states, on page 6-46, that Table 6.3-3, "provides an indicator of the RDF facility impact on the site life of each landfill." Table 6.3-3, which appears on page 6-47, does not appear to do so. At a minimum, such a table should be provided and the remaining capacity and site life of the Elk River Landfill, with and without the RDF Facility, should be identified. The City also requests that the PCA respond to the concerns identified on page 3 of its January 29, 1986 letter relating to co-compacting.

The City notes that on page 6-50 of the DEIS the PCA suggests that incinerator ash be disposed of in the separately permitted ash only solid waste facilities. The DEIS does not, however, indicate whether incinerator ash will be disposed of at the Elk River Landfill or, if so, the Elk River Landfill will become a separately permitted ash only facility. The City is very concerned that incinerator ash not be mixed with municipal solid waste and, absent more information, may consider opposing any use of the Elk River Landfill for incinerator ash or RDF bypass unless the entire landfill is converted to a facility for the exclusive disposal of RDF bypass and incinerator ash with no other municipal solid waste or co-disposal materials accepted.

2. Impacts Related to the Use of UPA's Elk River Station Units 1 and 2 to Burn RDF

III.2 AIR QUALITY

Despite the many pages of discussion describing the regulatory framework, analytical methods, and conclusions, the Draft Environmental Impact Statement (DEIS) is inadequate in its analysis of air quality impacts.

As the DEIS points out, the UPA/RDF combustion facility is closely located south/southeast of the most populous area of the City. The prevailing spring and summer winds are from the south and southeast,

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potentially carrying any pollutant directly into that area of the City. Because the UPA power plant is an antiquated facility, the stack servicing the boiler units is less tall than good engineering practice (GEP). (See Pages 6-7 and 6-8 of the DEIS.) The top of the stack is at 1,027 feet above sea level, while terrain which lies north-northwest at a distance of four to five kilometers is 1110 feet above sea level. This means that the area most populated in Elk River is at higher elevation than the top of the stack. The height of the stacks at various coal burning facilities in the state of Minnesota seems to indicate that tall stacks are critical components in dispersion of air pollutants. More discussion with respect to the beneficial effects and economic feasibility of increasing stack height should be provided in the Final EIS.

III.3 The discussion on pages 4-16 through 4-19 gives no hint that best available control technology (BACT) has been considered. To the contrary, the DEIS appears to rely exclusively on a baghouse which was most recently tested eight years ago as the method for emission controls; thereby, only particulates are captured. The City is tempted to conclude that reliance on eight-year-old test data of baghouse efficiency evidences an unwillingness to take a serious look at particulate emission reduction. The Final EIS should discuss the degree of reliability of eight-year-old tests relative to efficiency of the baghouse. In addition, the Final EIS should make clear what specific pollutants will be removed by the baghouse and the percentage of removal of those pollutants. These results should be compared to results which are achievable from the application of BACT to the particular pollutant.

We attach photocopies of materials from the state of Texas, New Hampshire, and California, all of which strongly indicate that BACT for acid gas control is technically practicable and economically reasonable given the benefits to be derived for protection of the public health and welfare. The City of Elk River strongly urges the consideration of use of BACT and considers the DEIS inadequate because it fails to discuss the efficiencies, the pollutant reductions, and the costs associated with the application of BACT. Rather, the DEIS appears to accept as a given the regulatory gap which it identifies in a number of pages, starting on page 5-4. It is ironic that a retrofitting of non-state-of-the-art burn facility brings about avoidance of otherwise-applicable and feasible engineering practices to reduce air pollutants. The materials from the state of Texas succinctly describe the deficiencies in exclusive baghouse control in dealing

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with acid gases at page 6 of the materials. The City of Elk River respectfully suggests that the State of Minnesota should consider the application of the same degree of regulatory care that is being used by the Texas Air Control Board and discuss in the Final EIS and require in the permitting of the combined RDF/UPA combustion facility, the application of BACT, particularly scrubbers. The DEIS is inadequate because it fails to discuss what could be accomplished by the application of BACT.

III.4 On Page 6-125 of the DEIS, the document identifies an expected cancer risk in excess of Minnesota Department of Health Risk Guidelines. This analysis is based on a worst case operational characteristic analogous to the SWARU facility. Nonetheless, no foundation is provided to serve as a basis for the conclusion that the proposed facility is not expected to operate in a manner similar to the SWARU facility. Because of that, the DEIS appears to be inadequate in its treatment of cancer risk assessment. At a minimum, operational monitoring and a clear commitment to shut down the facility should monitoring indicate that the expectations are not met, should be mandatory.

In sum, by proposing to convert an old, under-used plant (with an under-built stack for emissions, located closely proximate to the most populated area of the City) which fits into a regulatory gap, the proposers seem to have avoided the necessity of applying BACT to the burn facility. Even if the Minnesota Pollution Control Agency may not have specific regulatory authority, the City suggests that there should be a thorough discussion of the beneficial impacts of the application of BACT. Absent a discussion in the Final EIS, enough doubt is interjected into the analysis that could leave the City of Elk River to be quite concerned about the impact on its citizens should it choose to issue a conditional use permit. Indeed, without knowing the results of BACT application, it is difficult, if not impossible, to determine whether the health safety and welfare of its citizens are adequately protected. If the City cannot make that determination, it is difficult, if not contrary to Elk River ordinances, to issue a conditional use permit.

TRANSPORTATION

III.5 The DEIS fails to discuss the impact of trucks hauling solid waste on the existing roadways and adjacent lands. The Final EIS should include a discussion of: (1) increased incidence of break-up of

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existing paved surfaces, particularly 165th Street, associated with truck traffic; (2) the commitment of NSP/UPA to incur the costs of maintenance on adversely affected roadways, particularly 165th Street; (3) incidence of increased litter on road rights-of-way and adjacent lands; and (4) the commitment of NSP/UPA to regular litter pick-up of affected lands and a method for response to extraordinary incidents such as truck turn-overs and spillage. This information is important to the City's determination of whether to issue a conditional use permit and the conditions to be part of it should one be issued.

III.6 A somewhat related issue, also not discussed in the DEIS, is the specific method of transporting bottom ash and fly ash. Table 6.3-5 on page 6-52 notes that the fly ash is predicted to exceed EPA toxicity limits with respects to cadmium and lead. At least as to those two pollutants, it is extremely important that trucks hauling the ash from the City of Elk River be appropriately designed so as to eliminate any potential for deposition of the ash in transit. The Final EIS should include a detailed discussion with respect to the design and function of the ash hauling trucks.

3. Groundwater Quality Impacts

III.7 Groundwater at the site of the proposed RDF Facility is quite shallow. The City is concerned that all measures be taken to ensure that hazardous waste or other contamination not leave the RDF Facility and enter the water table. The DEIS indicates that except for washdown water in the tipping area, which will be collected and treated (see below), general site drainage will be flowing into adjacent wetlands and eventually into the Mississippi River. The City is very concerned about the quality of the water draining from the site. The City is particularly concerned that during heavy rainstorms a back-up of trash hauling and/or compacting trucks waiting to unload at the RDF Facility will be draining onto the asphalt parking areas of the RDF Facility and into the adjacent wetlands and eventually into the local water table. The City is also concerned about similar drainage from fire hoses in the event that an emergency occurs. The City requests that all runoff from the site be contained and treated to protect the quality of local groundwater. At a minimum, all drainage from the site should be detained in an onsite pond which should be sampled on a regular basis to determine whether general run-off from the site is hazardous.

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4. Washdown Water

III.8 The DEIS indicates that washdown water at the RDF Facility will be collected and treated either onsite or at the City's sewage treatment plant. The City requests that the Final EIS specify whether treatment of washdown water will be onsite or in the City sewer system. If onsite, a detailed discussion of the septic system proposed to treat waste water generated by the RDF Facility should be provided. If the proposal is to dispose of waste water at City facilities, the FEIS should contain a detailed discussion of the impact this will have on the City sewage system including the potential for damage to the sewage treatment plant, the potential for toxic waste not now present in the City sewage treatment system, the need to test such washdown and other waste water prior to treatment, the need to dilute washdown water from the RDF Facility before treatment in the City sewer system and the need, if any, for extra personnel to monitor any unique or additional procedures required to treat waste water from the RDF Facility.

5. Hazardous Waste Issues

III.9 The EAW indicated that Anoka County will enforce its hazardous waste ordinance with respect to the operation of the RDF Facility. The City would like additional information and discussion as to the scope and requirements of this ordinance. If additional counties participate in the RDF Facility, the Final EIS should identify and analyze the hazardous waste ordinances and programs of those counties as well. The specific actions which will be taken to monitor the handling and disposal of hazardous waste both at its source and at the RDF Facility must be spelled out and analyzed in detail. The City is particularly concerned with how the operators of the RDF Facility will monitor the ultimate disposal of hazardous waste which is not allowed to be left at the facility. The City does not want waste haulers who are not allowed to dispose of their load at the RDF Facility to continue up the road and dump such loads at the Landfill.

6. Safety Issues

III.10 The EAW and the "Waste to Energy Project" booklet spell out a number of actions which will be taken to reduce the possibility of an explosion or fire at the RDF Facility. The City is concerned as to the potential impacts of an explosion or fire if it were to occur. Impacts which concern the City include:

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- a. impacts on adjoining property owners;
- b. air and water quality impacts; and
- c. the responsibility, if any, that the City will bear for providing firefighting and other emergency services in the event of an accident at the RDF Facility.

7. Contingency Plan and Recycling

III.11 The EAW indicates that space will be available at the RDF Facility to accept waste if the RDF Facility shuts down for a short period. The City is concerned as to where waste will be deposited if the RDF Facility shuts down for longer periods of time. Once again, the City's concern is that the Elk River Landfill not be the backup site for disposal of waste if the RDF Facility shuts down or is otherwise unable to accept waste designated for it.

8. Economic Impacts on the City

III.12 In our January 29, 1986, letter the City requested that the DEIS include a thorough discussion of the economic impacts of the RDF Facility on the City. Minnesota Environmental Quality Board Rules require consideration of economic impacts. Minnesota Rules, Section 4410.2300H. The DEIS is totally unresponsive to this concern and we once again request a thorough discussion of the positive economic impacts of the RDF Facility on the City -- such as increased tax revenues and other fees which the facility would generate for the City -- along with a thorough discussion of all options which the City may have for generating revenue from the RDF Facility. The City also requests that the negative economic impacts of the RDF Facility on the City be thoroughly discussed -- including the increased public services required to service the RDF Facility (i.e., litter control, inspections, fire and emergency personnel, etc.) and public improvements necessary to serve the RDF Facility (i.e., water, sewer, and roadway improvements).

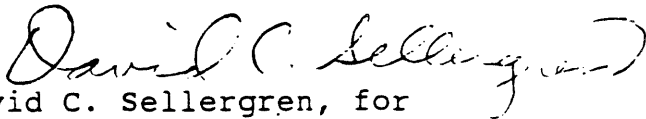
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The City appreciates this opportunity to make its comments on the DEIS for the RDF Facility and requests that it be kept thoroughly informed throughout the environmental review process for the RDF Facility.

Very truly yours,



David C. Sellergren, for
LARKIN, HOFFMAN, DALY & LINDGREN, Ltd.
City Attorneys for the City of Elk River

cc: Mayor Richard Hinkle, City of Elk River
Patrick Klaers, City Administrator
Frank Madsen, Sherburne County Board of Commissioners
John MacGibbon, Sherburne County Attorney
Brian Bensen, County Sanitarian

III.1 The City is extremely concerned about the current operation of the landfill and about potential impacts which location of the RDF facility in the City may have on the landfill. The City once again requests that the PCA specifically address the impacts of the RDF facility on the Elk River landfill. The following concerns were raised in our January 29, 1986 letter and we once again request that they be responded to:

- a. Are process rejects from the RDF facility and/or ash from the UPA facility proposed to be landfilled in the Elk River?
- b. If so, what impacts would the landfilling have on the City and the landfill?
- c. If process rejects and ash are not proposed to be landfilled in Elk River, the EIS should identify and discuss the capacities and contractual commitments which Anoka County and NSP/UPA have from their proposed landfills.
- d. The EIS should discuss in detail the economics of process reject and ash disposal.

Landfill Utilization

Annually the facility could receive the following amounts of raw municipal solid waste:

1 line 500 tpd = 153,000
2 line 1000 tpd = 306,000
3 line 1500 tpd = 459,000

Six percent of the waste would be ferrous and aluminum which would likely be recycled, not landfilled. Approximately 70-75 percent of the incoming waste will become RDF. Approximately 10 percent of the RDF remains as ash after combustion (equivalent

to 7 to 7.5 percent of the original waste stream). The following annual tonnages of ash would result from RDF combustion:

- 1 line = 10,710-11,475 ton per year (tpy)
- 2 line = 21,420-22,950 tpy
- 3 line = 32,130-34,425 tpy

Elk River is expected to burn approximately 70 percent of the RDF produced, considering maintenance outages and some provision for forced outages. The remaining 30 percent would go to Wilmarth. Therefore, ash produced at Elk River could be the following:

- 1 line, 500 T/D = 7,500-8,030 T/Y
- 2 line, 1,000 T/D = 15,000-16,060 T/Y
- 3 line, 1,500 T/D = 22,500-24,090 T/Y

Ash has a density of 70-75 lbs/cubic foot or 1 T/cubic yard. Weekly cover requirements at a landfill are anticipated to be roughly 5 percent by volume. Therefore, ash will require the following annual landfill capacity:

- 1 line, 500 T/D = 7,875-8,430
- 2 line, 1,000 T/D = 15,750-16,860
- 3 line, 1,500 T/D = 23,625-25,290

Approximately 19-24 percent of the original waste will remain as a heavy organic fraction (often called rejects). Initially, rejects will be landfilled. Rejects are estimated to have in-place density similar to MSW.

The following landfill requirements will be necessary for rejects, assuming an average in-place density and cost requirements equal to MSW:

- 1 line = 29,070 to 36,720 tpy or 6,560 to 76,500 yd³/y
- 2 line = 58,140 to 73,440 tpy or 121,125 to 153,000 yd³/y
- 3 line = 87,210 to 110,160 tpy or 181,690 to 229,550 yd³/y

Pages 4-33 to 4-35 of the DEIS discuss co-composting the rejects as an alternative to landfilling. If implemented, a large portion of the rejects would be diverted from landfills.

Bypass waste will be minimized as discussed in response I.16.

The amount of landfill demand required for the project per year for each alternative size project under normal operation are the rejects plus the RDF ash from the Elk River Power Plant.

- 1 line, 500 T/D = 68,990-84,375 yd³/y
- 2 line, 1,000 T/D = 137,985-168,750 yd³/y
- 3 line, 1,500 T/D = 206,980-253,125 yd³/y

Anticipated Utilization of Elk River Landfill and Other Landfills.

It is anticipated that any by-pass waste, process rejects derived from waste from Anoka and other counties outside of Sherburne County will not be landfilled at the Elk River landfill. Anoka, Hennepin, and Washington Counties are currently pursuing landfill siting and implementation within their counties.

Also, NSP/UPA/Anoka County are currently involved in contract negotiations with several other counties which are interested in participating in this project. These contracts provide that project reject wastes derived from processing waste from these counties will not be disposed of in any other participating county unless alternative disposal locations are mutually agreed upon.

No decisions have yet been made about where ash will be disposed. The alternatives appear to be a separate cell in an existing landfill, some new county landfill, or a new dedicated ash landfill. UPA has embarked on a search for potential sites and evaluation of the alternatives. Ash will be landfilled in accordance with MPCA regulations as discussed in response I.18. As this detailed response indicated, landfilling requirements would vary depending on the hazardous or non-hazardous nature of the waste.

Elk River landfill is currently receiving waste at the rate of roughly 559,700 yd³/y and has remaining permitted capacity of 3.3 million yd³. Therefore, under current operation, the permitted landfill would have a life of six to seven years. This assumes no expansion of the permitted facility.

If Anoka County rejects and bypass goes someplace other than Elk River as expected, only ash resulting from the power plant might be landfilled at the Elk River landfill if a one-line 500 T/D facility is built. Roughly 43,000 yd³/y of Anoka County waste currently goes to Elk River. Therefore, a one-line facility could result in reduction in the solid waste going to Elk River.

If other participants in a two-line 1,000 T/D facility make arrangements similar to Anoka County, as expected, only ash and rejects from Sherburne County might go to Elk River landfill. Assuming waste from Anoka, the tri-county group, the five-county group and Wright County goes to the processing facility, approximately 363,800 yd³/y of landfill demand, would be diverted from the Elk River landfill. Ash plus rejects from Sherburne County would require perhaps 37,600 cubic yards annually. Therefore, landfilling at Elk River would be reduced.

A three-line facility would probably occur only if Hennepin County participates with all, or nearly all, others previously mentioned. In this case, virtually all waste currently going to Elk River landfill would be diverted to the project. Assuming that all ash and only Sherburne rejects go to Elk River, there would be a significant reduction in the use of the Elk River landfill, thus extending its life.

III.2 Despite the many pages of discussion describing the regulatory framework, analytical methods, and conclusions, the draft EIS is inadequate in its analysis of air quality impacts. Because the UPA power plant is an antiquated facility, the stack servicing the boiler units is less tall than good engineering practice (GEP). The top of the stack is at 1027 feet above sea level, while terrain which lies north-northwest at a distance of four to five kilometers is 1110 feet above sea level. This means that the area most populated in EIR River is at higher elevation than the top of the stack. The height of the stacks of various coal burning facilities in the State of Minnesota seems to indicate that tall stacks are critical components in dispersion of air pollutants. More discussion with respect to the beneficial effects and economic feasibility of increasing stack height should be provided in the final EIS.

As pointed out, the stack servicing the boiler units at the Elk River generating station is 10 feet less than the formula height as determined from EPA's "Guideline for Determination of Good Engineering Practice Stack Height." The GEP formula height identifies the stack height EPA judges necessary to ensure that excessive ground-level concentrations do not result from atmospheric downwash, eddys, and wakes that may be created by the source itself, nearby structures, or nearby terrain. Such "excessive concentrations" are viewed by EPA as significant increases (of at least 40%) in the maximum ground-level concentrations over those experienced in the absence of such

downwash, wakes, or eddy effects, and which contribute to a total concentration that is greater than an ambient air quality standard. Therefore, EPA, in its GEP stack height regulations, limits the use of stack height as a dispersion technique in controlling ground-level concentrations to the avoidance of such downwash, wakes, and eddy effects. Any further reduction in ground-level concentrations cannot be accomplished through increasing stack height above GEP height, but must be accomplished through a reduction in stack emissions by controlling combustion conditions. The goal is therefore not to increase stack height to reduce ambient concentrations but rather to minimize combustion emissions to reduce ambient concentration through improved operating conditions.

EPA does not limit the use of less than GEP formula height stacks, if it can be demonstrated that pollutant emissions from such stacks result in compliance with ambient air quality standards. Because the stack at the Elk River generating station is only about seven percent shorter than GEP formula height, it was anticipated that downwash effects on stack emissions would not be significant. This view was tested by using EPA's ISC dispersion model along with its building downwash algorithm and a five year meteorological data record to calculate ground-level concentrations due to pollutant emissions from the generating station.

Terrain within 10 kilometers of the Elk River generating station is at or below stack top except in an area some four to five kilometers north to northwest of the station where terrain reaches heights some 80 feet above stack top. Because the plume emitted from the stack at the Elk River station is a hot, buoyant plume, pollutant emissions will rise until the plume reaches an equilibrium with the atmosphere and becomes horizontal as it is transported downwind. This effective stack height, i.e., physical stack height plus plume rise, should keep the Elk River station plume sufficiently above the ground, even

in areas to the north and northwest where the terrain is above stack top. This conclusion is verified by the model calculations performed as part of the air quality impact analysis. The EPA's ISC model was used to calculate ground level pollutant concentrations at 360 receptor locations within 10 kilometers of the Elk River station. Terrain height up to stack top (as the ISC model will not accept receptor elevations above stack top) were input to the model for each receptor point used in the model calculations. The results of these model calculations showed total concentrations to be in compliance with all ambient air quality standards when Elk River boiler unit nos. 1, 2 and 3 are burning RDF and boiler unit no. 3 is burning coal. Subsequently, model calculations were performed using EPA's Valley model to calculate pollutant concentrations at receptor locations to the north and northwest where the terrain is above stack top (as the Valley model will accept receptor elevations above stack top). The results of these worst-case Valley model calculations showed peak impacts to be less than the peak impacts predicted by using the ISC model, thus confirming compliance with ambient air quality standards as determined through the ISC model calculations.

Although the height of the stacks at various coal burning facilities in the state may be significantly higher than the stack at the Elk River generating station, it is not EPA's policy to employ the use of tall stacks as a dispersion technique for compliance with ambient air quality standards. In fact, EPA's good engineering practice (GEP) stack height regulations limit the height of a stack to where excessive ground-level pollutant concentrations resulting from atmospheric downwash, eddies and wakes are avoided. Any need for a reduction in ground-level concentrations in order to show compliance with ambient standards can not be credited through increasing stack height above GEP height, but must be accomplished through reduction in stack pollutant emissions (i.e. improved operating conditions or pollution control equipment). Thus, the stacks at

these various coal burning facilities may require heights up to which the GEP stack height regulations allow in order to avoid excessive ground-level concentrations from atmospheric downwash, eddys and wakes that may be created by the source itself or nearby structures. Because pollutant emissions are sufficiently low when Elk River boiler unit nos. 1, 2 and 3 are burning RDF and boiler unit no 3 is burning coal, compliance with all ambient air quality was shown in the air quality impact analysis when pollutant emissions are vented through the existing stack at the generating station.

III.3 The discussion on pages 4-16 through 4-19 gives no hint that best available control technology (BACT) has been considered. To the contrary, the DEIS appears to rely exclusively on a baghouse which was most recently tested eight years ago as the method for emission controls, thereby, only particulates are captured. The City is tempted to conclude that reliance on eight-year-old test data of baghouse efficiency evidences an unwillingness to take a serious look at particulate emission reduction. The final EIS should discuss the degree of reliability of eight-year-old tests relative to efficiency of the baghouse. In addition, the final EIS should make clear what specific pollutants will be removed by the baghouse and the percentage of removal of those pollutants. These results should be compared to results which are achievable from the application of BACT to the particular pollutant.

See response in Question I.21.

III.4 On page 6-125 of the DEIS, the document identifies the expected cancer risk in excess of the Minnesota Department of Health Risk Guidelines. This analysis is based on the worst case operational characteristic analogous to the SWARU facility. Nonetheless, no foundation is provided to serve as a basis for the conclusion that the proposed facility is not expected to operate in a manner similar to the SWARU facility. Because of that, the DEIS appears to be inadequate in its treatment of cancer risk assessment.

Please see Section 6.0, a revised public health risk assessment which addresses the SWARU facility, and provides background information in support of assumptions employed in the risk assessment.

III.5 The DEIS fails to discuss the impact of trucks hauling solid waste on the existing roadways and adjacent lands. The final EIS should include a discussion of: (1) increased incidence of break-up of existing paved surfaces, particularly 165th St., associated with truck traffic; (2) the commitment of NSP/UPA to incur the costs maintenance on adversely affected roadways, particularly 165th St; (3) incidence of increased litter on road rights-of-way and adjacent lands; and (4) the commitment of NSP/UPA to regular litter pickup of affected lands and a method for response to extraordinary incidents such as truck turn-overs and spillage. This information is important to the City's determination of whether to issue a conditional use permit and the conditions to be part of it should one be issued.

NSP has made arrangements with Anoka County to provide access to the site from Highway 10. Anoka County will pay for the upgrading of 165th Avenue to provide adequate access to the facility. In the future, the City of Elk River will be responsible for maintaining 165th Avenue.

NSP expects no litter as the result of the RDF project. Experience at the RDF facility in Baltimore County has shown litter is not a problem. Waste arrives in enclosed vehicles and RDF leaves in enclosed vehicles. Storage and processing are within buildings at the site. NSP personnel will periodically police the entrance to the site to collect litter.

In the event an accident results in the loss of waste from a truck, the operator of that truck would be responsible for cleaning up the area. This circumstance is no different than waste transported to landfills now. Minnesota has stringent

litter laws making haulers responsible for waste they carry. NSP may exclude haulers from utilizing the facility if they do not comply with federal, state, and local laws and regulations.

III.6 A somewhat related issue, also not discussed in the DEIS, is the specific method of transporting bottom ash and fly ash. Table 6.3-5 on page 6-52 notes that the fly ash is predicted to exceed EPA toxicity limits with respect to cadmium and lead. At least as to those two pollutants, it is extremely important that trucks hauling the ash from the City of Elk River be appropriately designed so as to eliminate any potential for deposition of the ash in transit. The Final EIS should include a detailed discussion with respect to the design and function of the ash hauling trucks.

The Elk River Power Plant has an enclosed ash collection system on-site. After being water conditioned, ash will be loaded on 20-ton dump trucks that will then be covered with tarpaulins before leaving the power plant. The trucks will be equipped with gaskets to prevent leakage of ash. Ash residue characteristics are addressed in response to I.18.

III.7 Groundwater at the site of the proposed RDF Facility is quite shallow. The City is concerned that all measures be taken to ensure that hazardous waste or other contamination not leave the RDF Facility and enter the water table. The DEIS indicates that except for washdown water in the tipping area, which will be collected and treated (see below), general site drainage will be flowing into adjacent wetlands and eventually into the Mississippi River. The City is very concerned about the quality of the water draining from the site. The City is particularly concerned that during heavy rainstorms a back-up of trash hauling and/or compacting trucks waiting to unload at the RDF Facility will be draining onto the asphalt parking areas of the RDF facility and into the adjacent wetlands and eventually into the local water table. The City is also concerned about similar

drainage from fire hoses in the event that an emergency occurs. The City requests that all runoff from the site be contained and treated to protect the quality of local groundwater. At a minimum, all drainage from the site should be detained in an onsite pond which should be samples on a regular basis to determine whether general run-off from the site is hazardous.

No stormwater detention/retention pond is proposed for the site. The primary reason is that from a hydrologic perspective, the wetlands will naturally attenuate the peaks from large precipitation events. Because distance is so short to the Mississippi River, the amount of increase in runoff is small, and the potential impacts downstream between the site and the River are negligible, no provisions are made for site stormwater. Concerning water quality, catch basins will collect runoff prior to overland flow via ditches to the wetland area. Each basin will be equipped with a grate to catch large debris, a sump to collect sediment and debris, and a separator hood to remove oil and grease that may wash off of truck parking areas. The rainfall event described above is an extreme occurrence, and if in fact it is necessary to consider this or the fire water runoff scenario, it may be appropriate to design a detention pond/sump equipped with a gross particle/oil separator.

III.8 The DEIS indicates that washdown water at the RDF Facility will be collected and treated either onsite or at the City's sewage treatment plant. The City requests that the Final EIS specify whether treatment of washdown water will be onsite or in the City sewer system. If onsite, a detailed discussion of the septic system proposed to treat waste water generated by the RDF Facility should be provided. If the proposed is to dispose of waste water at City facilities, the FEIS should contain a detailed discussion of the impact this will have on the City sewage treatment system including the potential for damage to the sewage treatment plant, the potential for toxic waste not now present in the City sewage treatment system, the need to

test such washdown and other waste water prior to treatment, the need to dilute washdown water from the RDF Facility before treatment in the City sewer system and the need, if any, for extra personnel to monitor any unique or additional procedures required to treat waste water from the RDF Facility.

Since the proposed RDF process is a dry process, it precludes recycling of the wash-water. Because of this, the wash-water will have to be treated in some manner. Current intentions are to treat the washwater at the Elk River wastewater treatment plant. On site treatment is not actively being considered at this time and would only be considered as a future alternative once a better understanding of the plant operations is obtained. No data exists on the quality of wastewater from similar facilities. Wash-water volumes are anticipated to be low, as are contaminant levels due to the short contact time with municipal refuse. Consequently, the feasibility of disposing of the wash-water at the treatment plant is considered highly likely. However, actual testing of the wash-water is necessary to determine an acceptable disposal method. Prior to disposal, approval must be obtained from the MPCA.

III.9 The EAW indicates that Anoka County will enforce its hazardous waste ordinance with respect to operation of the RDF facility. The City would like additional information and discussion as to the scope and requirements of this ordinance. If additional counties participate in the RDF facility, the Final EIS should identify and analyze the hazardous waste ordinances and programs of those counties as well. The specific actions which will be taken to monitor the handling and disposal of hazardous waste both at its source and at the RDF facility must be spelled out and analyzed in detail. The City is particularly concerned with how the operators of the RDF facility will monitor the ultimate disposal of hazardous waste which is not allowed to be left at the facility. The City does not want waste haulers who are not allowed to dispose of their load at the RDF facility to continue to the road and dump such loads at the landfill.

Anoka County and the MPCA are engaged in a program of hazardous waste generation identification and in providing for proper management of hazardous waste at the place of generation. This program will significantly reduce the possibility of hazardous waste, as defined by Minnesota Rules, from reaching the RDF facility, transfer stations, and landfills. In addition, all hazardous waste generators with Minnesota must inventory their waste, and if it is determined to be hazardous, they must obtain an EPA identification number; obtain a generator license or file an initial disclosure (depending upon what county they are located in); properly store and label hazardous waste; use a hazardous waste manifest whenever hazardous waste is hauled; and keep copies of manifests.

Discussion of monitoring and disposal of hazardous waste is found in I.15.

If a load is rejected at the RDF facility or the transfer stations to be developed in Anoka County because it is suspected of containing hazardous waste, a written order will be given to the drivers of the vehicle telling the driver why the load was rejected, requiring that the driver properly manage the hazardous waste, and requiring that the driver provide evidence of said proper management to Anoka County Hazardous Waste Office/MPCA and the Hazardous Waste Office for the county of origin, within a specified time period.

III.10 The EAW and the "Waste to Energy" Project booklet spell out a number of actions which will be taken to reduce the possibility of an explosion or fire at the RDF facility. The City is concerned about the potential impacts of an explosion or fire, if it were to occur.

Please see responses I.8 and I.9.

III.11 The EAW indicates that space will be available at the RDF facility to accept waste if the RDF facility shuts down for a short period. The City is concerned as to when waste will be deposited if the RDF facility shuts down for longer periods of time. Once again, the City's concern is that the Elk River landfill not be the backup site for disposal of waste if the RDF facility shuts down or is otherwise unable to accept waste designated for it.

The disposition of bypassed waste is addressed in questions I.16 and II.1.

III.12 In our January 29, 1986 letter the City requested that the DEIS include a thorough discussion of the economic impacts of the RDF facility on the City. Minnesota Environmental Quality Board Rules require consideration of economic impacts. Minnesota Rules Section 4410.2300H. The DEIS is totally unresponsive to this concern and we once again request a thorough discussion of the positive economic impact of the RDF Facility on the City... The city also requests that the negative economic impacts of the RDF Facility on the City be thoroughly discussed--including the increased public services required to service the RDF Facility (i.e., litter control, inspections, fire and energy, personnel, etc.) and public improvements necessary to serve the facility (i.e., water, sewer, and roadway improvements).

NSP has budgeted approximately \$250,000 per year in taxes to be paid to the City of Elk River. As described in the DEIS and FEIS it is not anticipated that the proposed facility will result in increased demands on police, emergency, or fire protection services. There is the potential for increased maintenance associated with truck traffic on 165th Avenue. It is not anticipated that the increased demand in City services will exceed the additional taxes paid of \$250,000 per year.

Clifford T. Anderson, Director
Office of Planning and Review
MPCA
1935 West Co. Rd. B2
Roseville, Minnesota

RECEIVED
JUN 10 1986

MINN. POLLUTION
CONTROL AGENCY

Mr. Anderson,

I am a resident of Sherburne Co. and the city of Elk River, Minnesota. I write today expressing my concerns about the health risks that will be imposed upon the residents of this community, by the proposed Refuse Derived Fuel (RDF) panned by Northern States Power and the Uniter Power Association.

Reviewing the Environmental Impact Study written by the MPCA, I have two major questions to ask:

IV.1

What laws and regulations are available to protect the air quality in Elk River and Sherburne Co.?

IV.2

If guidelines and laws do not provide specific restrictions concerning air quality and environmental protection, will our exposure to air pollutants, soil contamination, ingested food from these soils increase our exposure carcinogens (slope) described in this study (6.8-8 through 6.8-11)?

Concerning the first question listed above, the Air Quality Section in the study (pg. 5-1 through 5-4) speaks about Prevention of Significant Deterioration (PSD). Shurburne Co. and Elk River are listed under # 127 designated as unclassified, based on present air quality. It is my understanding, the amount of pollutants in this area (#127) is lower, so regulations governing emission into the environment are not as stringent. Areas in the seven county metropolitan area including Minneapolis-St. Paul and Anoka are regulated under stricter regulations of Interstate Air Quality Control Restriction #131. HOW CAN THE RESIDENTS OF THIS COMMUNITY PROTECT OUR PRESENT AIR QUALITY? (or lack of pollutants) Are UFA and NSF required to provide the same pollution devices on the proposed RDF Facility in Elk River as they would if it were in Anoka? Will they insure the citizens of our community the same protection required in AQCR PSD #131? One of these areas lies 7 miles from Elk River, in Anoka County. Will the same AQCR standard be provided by NSF & UFA, when laws do not insure this protection?

The second question comes because of the first question. In reviewing page 6-99 through 6-133 much emphasis is placed on proper pollution reducing devices, such as dry scrubbers reducing chemicals detrimental to humans. Clear examples of facilities having the worst expected emissions, see page 6-105, are given in this section.

IV.3

If our area doesn't meet specific and stringent regulations will we be exposed to greater amounts of these chemicals, because of lack of pollution devices on these stacks and AQCR #127?

Does this problem multiply the Dose and Exposure Assessment as people are exposed to carcinogens? (6.8.9)* "The magnitude of risk can be calculated from the potency slopes. Cancer risk is the product of potency slope times the calculated lifetime daily dose."

Are the doses of carcinogens and elements reviewed in charts 6.8 through 6.8-11 multiplied by air dose, soil dose, (ingestion of food from contaminated soil) inhalation and dermal exposure?

Does the extended exposure to an individual on this slope chart exceed the one per 100,000 Minnesota Department of Health Risk Guidelines?

In young children and infants are these figures then multiplied again, because their sensitivity is greater than the adult sized body?

Thank you for your time and consideration.

Marilyn A. Schroeder R.N.



IV.1 What laws and regulations are available to protect the air quality in Elk River and Sherburne County?

Under the Clean Air Act, congress mandated that the Environmental Protection Agency (EPA) identify pollutants which may reasonably be anticipated to endanger public health or welfare and to issue air quality criteria for them. EPA has promulgated regulations which set National Ambient Air Quality Standards (NAAQS) for such pollutants as sulfur dioxide, total suspended particulates, nitrogen dioxide, carbon monoxide, ozone and lead at levels to protect public health and welfare with an adequate margin of safety. In addition to the NAAQS, the State of Minnesota imposes more restrictive standards for sulfur dioxide and carbon monoxide than the NAAQS, and ambient standards for hydrogen sulfide and hydrocarbons. The DEIS addressed the impact of the project relative to these ambient standards in the Air Quality assessment. Pollutants such as dioxins and trace metals are addressed in the Health and Safety Assessment Section 6.0

IV.2 If guidelines and laws do not provide specific restrictions concerning air quality and environmental protection, will our exposure to air pollutants, soil contamination, ingested food from these soils increase our exposure carcinogens (slope) described in this study.

Section 6 is a health and safety assessment which addresses exposure to carcinogens. Section 5 also discusses health impact issues.

IV.3 ...the Air Quality Section in the study (pg. 5-1 through 5-4) speaks about Prevention of Significant Deterioration (PSD). Sherburne County and Elk River are listed under #127 designated as unclassified based on present air quality. It is my understanding, the amount of pollutants in this area (#127) is lower so regulations governing emissions into the environment are not as stringent. Areas in the seven country metropolitan area including Minneapolis-St. Paul and Anoka are regulated under stricter regulations of Interstate Air Quality Control Restriction #131. How can the residents of this community protect our present air quality? (Or lack of pollutants). Are UPA and NSP required to provide the same pollution control devices on the proposed RDF facility in Elk River as they would if it were in Anoka? Will they insure the citizens of our community the same protection required in AQCR PSD #131? One of these areas lies seven miles from Elk River, in Anoka County. Will the same AQCR standard be provided by NSP and UPA, when laws do not insure this protection?

The same national ambient air quality (NAAQS) are applied to protect the public health and welfare in Sherburne County and Elk River, as they are in Minneapolis-St. Paul and Anoka, as they are nationwide. The State of Minnesota also imposes more restrictive standards for sulfur dioxide and carbon monoxide than the NAAQS, and ambient standards for hydrogen sulfide and hydrocarbons. In fact, a more restrictive 3-hour sulfur dioxide standard is imposed by the State of Minnesota in AQCR #127 (which includes Sherburne County) than in AQCR #131 (which includes Anoka County)/ The conversion of the Elk River generating station to RDF combustion would come under the same regulations whether the generating station was located in Sherburne County or Anoka County. Although pollutant emission limitations set by the State of Minnesota are more stringent in AQCR #131 than in AQCR #127 for existing sources, the emissions limitations (and necessary pollution control equipment) set by the State for new sources, (which are more stringent than for

existing sources) are the same in either AQCR for the size facility of the Elk River generating station. The Elk River station's emission rates of sulfur dioxide, particulate matter and nitrogen dioxide for RDF combustion will be below the limits set by the State of Minnesota for new sources. In fact, RDF combustion at the Elk River station would show lower emissions for most of the criteria pollutants (sulfur dioxide, total suspended particulates, nitrogen dioxide, carbon monoxide) than if coal were combusted.

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Clifford T. Anderson, Director
Office of Planning and Review
MPCA
1935 West Co. Rd. 82
Roseville, Minnesota

MINN. POLLUTION
CONTROL AGENCY

Mr. Anderson,

The proposed DFR facility and burning at the UFA plant in Elk River appears to be a very negative proposal in regards to health and environmental impact. Several issues certainly arise from the proposed facility.

V. 1 One, the impact on three areas in the Elk River Community will be very great. Potential ground water pollution because of our porous sandy soil which allows rapid percolation deep into water tables. High emission levels of many toxins into the air and overuse of a landfill area that is already a disgrace to the community.

V. 2 Two, within the proposal there is no adequate protection for the people of Elk River or Anoka from toxic emissions. It maybe possible that the technology to burn safely is available, but I don't see it in this proposal. The studies clearly show that a great deal of money and equipment must be involved to make it even half safe. This proposal does not meet those requirements.

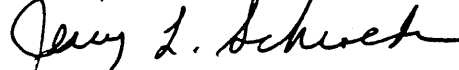
V. 3 Three, as the "Right To Know Law" instructor for Elk River Dist. #728 I believe the public is not being informed of all the true potential dangers from this project. Even our work places are being protected better from chemical and other health hazzards than our living space. I believe this is a little ironic when we pride ourselves on our environmental protection in Minnesota. This facility is being sold as a tax base and economic need and the health issues are being glossed over. When I get our and talk to people in the community I find great concern when they hear the issues.

V. 4 Four, the problem of the ash and non-burnable materials has not been settled. It is known that the Elk River Landfill already has some severe problems with PCB and other ground water contamination. Test wells have proven this fact. Yet all this ash and material from up to 11 counties maybe dumped here. I realize that this is not stated per say but other alternatives have not been cemented down only generalized. In this case generalizations are not good

enough there must be something very specific and concrete now not after the fact. This landfill cannot take the amount of refuse produced and not be a complete health hazard.

Therefore I do not believe that this facility and proposal is in the best interest of the people and community of Elk River. There are simply too many loopholes and unanswered questions. Thank you for your time and consideration.

Jerry L. Schroeder



Science Instructor

Chem., Bio., Ecology

Right to Know Law

Elk River High School

V.1 One, the impact on three areas in the Elk River Community will be very great. Potential ground water pollution because of our porous sandy soil which allows rapid percolation deep into water tables. High emission levels of many toxins into the air and overuse of a landfill area that is already a disgrace to the community.

Sanitary wastewater will be discharged to the ground via a septic system utilizing a leaching field. The amount of water involved is typical of a facility that has on-site showers, washrooms, and sanitary facilities. The City of Elk River will ultimately decide if the "porous" soils are sufficient for the construction of such a system. The type of wastes and small volumes involved do not require state approval. Without actually performing percolation tests on site soils, it is not possible to precisely determine the fitness of the soils. Generally, 2 to 4 feet of unsaturated soil (i.e. a depth to ground water greater than 4 feet) is sufficient to remove bacteria and viruses to acceptable levels and nearly all phosphorus (U.S. EPA, 1980).

U.S. EPA Design Manual: Onsite Wastewater Treatment and Disposal Systems. EPA 625/1-80-012, October, 1980.

V.2 Two, within the proposal there is no adequate protection for the people of Elk River or Anoka from toxic emissions. It may be possible that the technology to burn safely is available, but I don't see it in this proposal. The studies clearly show that a great deal of money and equipment must be involved to make it even half safe. This proposal does not meet those requirements.

Please see I.17 response, as well as chapter 6, Addenda 5, Dioxin control, and Section 5.

V.3 Three, as the "Right to Know Law" instructor for Elk River District #728, I believe the public is not being informed of all the potential dangers from this project. Even our work places are being protected better from chemical and other health hazards than our living space. I believe this is a little ironic when we pride ourselves on air environmental protection in Minnesota. This facility is being sold as a tax base and economic need and health issues are being glossed over.

Health impacts associated with the facility are addressed in detail in Chapter 6 of this report. Need for the facility is addressed in the draft EIS, in Chapters 3 and 4 which address solid waste management planning and alternatives.

V.4 Four, the problem of the ash and nonburning materials has not been settled. It is known that the Elk River landfill already has some severe problems with PBC and other groundwater contamination. Test wells have proven this fact yet all this ash and material from up to eleven counties may be dumped here. I realize that this is not stated per se but other alternatives have not been commented down only generalized.

Please see response I.18 which discusses concerns associated with ash disposal, as well as response III.1 which notes that no decisions have yet been made about where ash will be disposed, but that alternatives are being evaluated.

Addendum 1 - LANDFILL SITING

Anoka County has begun a landfill siting process. Anoka, Hennepin and Washington counties are each required by State law and Metropolitan Council policy to prepare an EIS on their inventories of candidate landfill sites, and to select a site for a new landfill. We anticipate that these new landfills will be developed for disposal of residuals from waste processing and recovery activities. It is anticipated that process reject wastes derived from waste from Anoka County that is processed at the proposed processing facility will be disposed of at the new landfill for Anoka County. Anoka County has three potential sites that were approved for further study by the County, the MPCA and the Metropolitan Council. These potential sites are located in the Township of Oak Grove, the City of Ramsey, and on the Andover-Coon Rapids border. Anoka County has completed the EAW for the siting process. It is anticipated that the EIS and site selection will be completed during 1987, and that the landfill could be in operation in 1989 or 1990.

Addendum 2 - SOLID WASTE COMPOSITION

Various waste composition studies have been conducted nationally, as well as in specific localities. A comparison of waste composition data from different parts of the country will show that significant variation can be expected in any given region (Pope-Reid Associates, 1984). It is important to recognize that development of an accurate waste composition analysis is difficult for several reasons, including, but not limited to, the following:

- 1) errors in surveys and sampling;
- 2) waste composition and quantities can vary considerably from source to source due to income and geographic location, etc.;
- 3) various conversion factors may be used in waste estimates. These conversion factors have significant margin for error, i.e., compaction ratios of refuse for converting cubic yards to tonnage; and
- 4) use of different definitions.

No waste composition studies have been conducted specifically in Anoka County. The best available information on the composition of residential, commercial, and industrial waste is the Comprehensive Recycling study prepared by Pope-Reid Associates in 1985. In this study, mixed solid waste was sorted on site at area landfills throughout 1984. The information presented in the Pope-Reid study more accurately represents the Anoka waste stream than earlier waste compositional estimates published in Anoka County landfill abatement reports.

Waste composition data for landfilled municipal solid waste analyzed in the Hennepin County study is presented below. It supercedes the composition data previously presented in the draft EIS.

	Residential Waste (Annual Average)	Commercial and Industrial Waste (Annual Average)	Combined Waste (Annual Average)
Newspaper	9	4.3	6.6
Corrugated	4.23	16.7	10.8
Mixed Waste Paper	10.8	18.4	14.8
Ferrous	5.3	5.0	5.2
Aluminum	.9	.8	.9
Other Non Ferrous	.1	.2	.2
Glass Containers	4.7	2.9	3.8
Yard Waste	16.1	1.9	8.7
Wood Waste ¹	6.3	9.2	7.8
Other Organics ²	35.4	33.1	34.2
Other Inorganics	<u>7.0</u>	<u>7.3</u>	<u>7.2</u>
Total	99.8	99.8	100.2

¹ Some material which could be considered yard waste in other studies was included in the wood category. The percentage of wood in the waste stream is apparently higher in Hennepin County than the country as a whole. Part of this difference is undoubtedly in the definition. For the purpose of the Hennepin County study, yard waste was defined as material which could be composted without being shredded. Tree limbs or other wood from landscaping activities were included with wood if they did not meet this criterion (Pope-Reid Associates, 1985 p. 23 and 24)

² Other organics include paper which was judged to be non-recyclable.

Source: Hennepin County Comprehensive Recycling Study, Volume 2
Appendix 2-G, Pope-Reid Associates, 1985.

In addition, since a portion of the solid waste that is generated is not landfilled, but is instead recycled, the Pope-Reid study also contained an estimate of total MSW generated, including materials estimated to be both landfilled and recycled. This data is presented below as well.

<u>Material</u>	<u>Total MSW Generated</u>
Newspaper	8.39
Corrugated	14.58
Office/Computer	10.74
Magazines other	11.09
Food Containers	1.17
Bi-Metal Cans	1.05
Other Containers	.57
Other Ferrous	1.57
Beverage	1.24
Other	.16
Other Non Ferrous	.27
Glass	3.52
Yard	7.98
Wood	5.99
Other Organics	26.18
Other Inorganics	<u>5.50</u>
	100

It should be noted that the materials in the Hennepin study were categorized to facilitate the quantification of recyclables in the County's waste stream, and that materials included as a certain waste type in this study could be categorized differently in other studies. For example, the category "newspaper" consisted of printed groundwood fiber newsprint, but did not include contaminated newspapers and books printed on newsprint, but bound with other material. Contaminated newsprint was recorded as other organics. Noncorrugated

containers such as chipboard and single ply boxes or nonrecyclable cartons heavily coated or waxed were not included in the corrugated carton category. Similarly, mixed waste paper does not include non-repulvable mixed waste paper. Therefore, items contaminated by other materials such as metals (orange juice cans), plastics (a window envelop), wax (milk carton), or other non-paper materials were sorted into the "other organics category."

Addendum 3 - MISCELLANEOUS

Page 2.3, Table 201: a) The reference to Drainage Permit should be deleted because there is no watershed district in the project area. b) Under Conditional Use Permit, the Elk River City Council is the agency which will consider issuance of a conditional use permit. The Elk River Planning Commission will make a recommendation to the City Council.

The applicant acknowledges these comments, and will pursue permitting accordingly.

Page 4-17 Figure 4-4: The proposed schedule for project implementation shown is from the July, 1985 proposal from NSP. The current schedule calls for the project to be in operation by summer or fall of 1988. The source for the schedule shown is NSP, not Springsted, Inc.

The schedule has changed since NSP submitted its proposal. Now, it is anticipated that permitting will be completed in August or September as opposed to June 1, 1986, as previously indicated. Construction will begin shortly thereafter. Thus commercial operation will begin later than March 1988 as 4.17 of the DEIS indicates.

Pages 6-71 and 6-77: The transportation assumptions for vehicle routing from Wright County do not appear to be consistent. Presumably it was assumed that vehicles would enter the City of Elk River via the Highway 101 bridge and then travel south on U.S. Route 10 to the processing facility.

Vehicles from Wright County would arrive from the south via State Highway 101 and then travel south on U.S. Highway 0 to the processing facility. A typographical error appeared in the Draft EIS resulting in an incomplete description of the routing of the vehicles from Wright County to the processing facility. The transportation analysis was based on the routing of vehicles from Wright County via State Highway 101 to U.S. Highway 10.

Addendum 4 - BIBLIOGRAPHY

A bibliography of references used in preparing the documents should be included.

A bibliography of sources consulted in the draft and final EIS is presented below. This list of references consulted is exclusive of sources used in Chapter Six. There, a separate bibliography is presented.

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5. PUBLIC HEARING COMMENTS

The transcripts of the 5/27/86 public hearing on the proposed project follow. A summary list of concerns voiced in the public hearing, as well as an indication as to where these concerns are addressed in Chapters 4 and 5 are as follows:

- Traffic (Addendum 3, Response III.5, and Section 5 below)
- Residuals - quantities and proposed disposal sites (Responses I.2, I.12, I.15, I.18, II.1, I.19, III.1)
- Air emissions and control technology (Responses I.10, I.21, I.28, III.2, IV.1, IV.3)
- Health and Safety (Chapter Six)
- Potential surface and groundwater pollution (Responses III.7, III.8, V.1)
- The siting process (Response I.1)
- Odor Control (Section 5 below)

Almost all public hearing concerns were addressed in Chapter 4. Those concerns not responded to in Chapter 4 include Traffic Routing, Traffic Count data collection, Odor Control and Noise. Responses to these questions precede the public hearing transcripts.

PUBLIC HEARING COMMENTS

Traffic Routing

For the 1,500 TPD facility, it would be expected that a total of 150 round trip truck deliveries would be made to the RDF processing facility on a daily basis (p. 6-77 of the DEIS). During a 10 hour work-day, this translates to approximately 15 round trips per hour or one round trip every 4 minutes.

Trucks will be routed to the facility via U.S. Route 169/10 to 165th Avenue and directly into the facility. It is not expected that trucks would use Jarvis Street as a through route to the facility.

Trucks would not be expected to park along the farmlands waiting to unload. All vehicular traffic would be directed onto the site property to be weighed and ultimately to unload. Space for approximately 20 refuse vehicles would be provided on site for parking before the scales. This would accommodate one hours worth of truck deliveries on site grounds. As a result, it is not anticipated that parking would occur on public roadways.

Traffic Counts

As stated in the DEIS on page 5-49, the traffic count data was collected during a two day period on February 18 and 19, 1986. The data collected during that period was compared to Minnesota Department of Transportation (MNDOT) data on average annual daily traffic collected at various times during the year.

The traffic data conducted was not collected over the course of a full year. It would be impractical, extremely costly, and of little value to collect a full year of traffic data. The department of Transportation collects data on the periodic basis and adjusts that traffic to average annual conditions. The data collected by ERT was compared to historic data collected by MNDOT and no significant differences were found to exist. Therefore, the data used in the DEIR is typical of an average day's traffic and is useful in preparing a traffic impact assessment.

Traffic volume variations do occur depending on the day of the week and month of the year (1985 Highway Capacity Manual, Special Report 209, TRB, Wash. D.C.). In recreational areas, the peak is generally Sunday during July or August. The traffic counts were taken on Tuesday and Wednesday which is an average day during the week. Garbage truck deliveries will not occur on Sundays since the facility only operates six days per week.

Odor Control

Two reodorant chemicals are being evaluated for use on the Anoka facility.

1. Freshkill. This is described by the manufacturer as "highly effective counteracting agent specifically formulated to control odors from landfill operations, garbage disposal areas, and incinerator plants."

Dilution of 500:1 water are required. It is non-toxic and nonirritating when used as directed and it contains only essential oils, condensifiers, dye, and water. It contains no formaldehyde or any known airborne carcinogens, such as polynuclear aromatic hydrocarbons, or any nasal irritants. The chemicals and emulsifiers are biodegradable. The manufacturer offers to furnish an OSHA Form 20 covering safety of this product.

2. Malabate. This is water soluble organic compound which has been used at Cockeysville, Maryland for over three years and at the Baltimore County Southwest Transfer Station for one year. During this time its effectiveness has been implied by the total lack of citizen and operator complaints and the tacit approval of the county and state sanitary and health authorities.

Noise

Existing noise levels currently exceed state standards at receptor two (along Highway 10). Noise levels are exceeded due to existing traffic noise. Noise levels at the three other receptors discussed in Sections 5.6 and 6.6 of the DEIS are well within state standards.

As described in Section 6.6 of the DEIS, facility operation and associated truck traffic will not result in the further exceedance of state noise standards. While increases in noise levels would result at receptors one three, and four, state standards would not be exceeded. At receptor two, state standards are currently exceeded; however, the project would not contribute additional noise.

As table 6.6-6 in the DEIS shows, the noise levels from the project only are significantly less than baseline (existing) background noise levels. Existing noise levels will generally mesh or overshadow the noise to be contributed by the project. This is particularly true in the case of receptor two (along highway 10). At this receptor, baseline noise currently exceeds state standards and would be much higher than project noise. As a result, there would not be any noticeable increase in noise levels at receptor two from the proposed project.

It is correct to say as stated in the DEIS that where there will be increases in noise levels due to the proposed project (receptors 1, 2 and 3), future noise levels will be within state standards. Only at receptor two will state standards be exceeded, and at this receptor there will not be any increase in noise levels due to the project.

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BEFORE THE MINNESOTA POLLUTION CONTROL AGENCY

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In the Matter of:

DRAFT ENVIRONMENTAL IMPACT
STATEMENT FOR PROPOSED ANOKA
COUNTY REFUSE DERIVED FUEL
RESOURCE RECOVERY FACILITY

EVENING PUBLIC
MEETING

The above-entitled matter came on for
hearing pursuant to Notice on Tuesday, the 27th day of May,
1986, in the theater auditorium of the Elk River High School
in Elk River, Minnesota, commencing at approximately 7:00
o'clock, p.m.

* * *

BARBARA J. NELSON
Court Reporter
1241 Alameda Street
St. Paul, MN 55117
488-4189

PENGAD/INDY. MUNCIE. IN 47302
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APPEARANCES:

MINNESOTA POLLUTION CONTROL AGENCY

CLIFFORD ANDERSON - Chairperson

DON KYSER

MARLENE VOITA

VELMA CHARLES-SHANNON

DANIEL BERG

MIKE HANSEL

ANOKA COUNTY

COLLEEN KERMAN (phonetic)

NORM SCHIFLER (phonetic)

NSP

PETER JONES

DON CHMIEL

JIM ALDERS

UPA

REY RAHKO

DALE THIELEN

DAN McCONNON

DON KETNER (phonetic)

E.R.T.

PAT FLEISCHAUER

* * *

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Susan Sundahl

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* * *

1 MR. ANDERSON: We are scheduled to start at
2 7:00 o'clock. And it is a few minutes after.

3 So, continue to sign up on the sheet as
4 you are coming in the door, and come on down.

5 My name is Cliff Anderson. And I am with
6 the Minnesota Pollution Control Agency.
7 And I am going to Chair this meeting.

8 With me tonight, we have staff from the
9 Pollution Control Agency, from Anoka County, from
10 NSP, and UPA. And we have a representative from
11 the consulting that helps us do the EIS, from
12 E.R.T.

13 I would like to go through some informal
14 introductions for this group and take it one at
15 a time.

16 If the people from the Pollution Control
17 Agency could stand up and give their names so you
18 can recognize who they are? And you can address
19 comments at a later time.

20 MR. KYSER: I am Don Kyser, an engineer with
21 the Solid Waste Division.

22 MS. VOITA: I am Marlene Voita, with the
23 Office of Planning and Review.

24 MS. CHARLES-SHANNON: I am Velma Charles-
25 Shannon from the Office of Planning and Review.

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I am a staff toxicologist.

MR. BERG: I am Dan Berg. I work with the Office of Planning and Review. I am an environmental review specialist.

MR. ANDERSON: I would ask the Anoka County staff to introduce themselves so we can see who is here.

MS. KERMAN: I am Colleen Kerman. I am with the County Attorney's office in Anoka.

MR. SCHIFLER: I am Norm Schifler with the Anoka County Administration office.

MR. ANDERSON: Could NSP staff please stand up?

MR. JONES: I am Pete Jones from the Northern States Power Company.

MR. CHMIEL: I am Don Chmiel, C-h-m-i-e-l, from Northern States Power.

MR. ALDERS: I am Jim Alders from our Environmental and Permit Department at NSP.

MR. ANDERSON: UPA?

MR. RAHKO: I am Rey Rahko with UPA.

MR. THIELEN: Dale Thielen with the Communication Division at United Power.

MR. McCONNON: Dan McConnon with the Environmental and Land Division of UPA.

1 MR. KETNER: Don Ketner.

2 MR. ANDERSON: Over here in the corner is
3 Pat Fleischauer from E.R.T.

4 MS. FLEISCHAUER: Pat Fleischauer from E.R.T.

5 MR. ANDERSON: The purpose of this meeting
6 is to conduct a public meeting after the draft
7 EIS has been prepared, published and allowed or
8 distributed for public comment.

9 This is sort of the mid point in the EIS
10 process where we have completed a scoping of the
11 EIS, a draft Environmental Impact Statement.
12 And we are now in a stage where we solicit public
13 input into the process.

14 This is not the only place the public input
15 can be taken in the process. The scoping decision,
16 the scoping process, was another point. And
17 certainly, as we go through the final EIS, public
18 input can be accepted at that point as well.

19 However, this is a significant point in the
20 process where we hope you have had access to the
21 draft EIS. And you have some comments on it.
22 You have some criticism, suggestions, or whatever
23 it is.

24 It is our intent at this point to get those
25 comments, and use them, and respond to them in

1 the process of preparing the final EIS.

2 The comment period will be open until June
3 10. So, for anyone who has additional comments
4 to be made who wants to put their comments in
5 writing and submit them to us, that is fine.
6 Please get them in by June 10.

7 Following the June 10 date, we will formally
8 go through the final EIS preparation; and then
9 distribute that for public review; and hopefully
10 bring it to the Minnesota Pollution Control Agency
11 Board for adequacy determination towards the end
12 of July.

13 That is the tentative schedule we have had.
14 We have been able to meet the schedule up to this
15 point. And we hope we can continue with that.

16 At this point, I would like to introduce
17 Pete Jones from NSP. And he is going to give us
18 a brief overview of the project.

19 For anyone who hasn't heard this presentation
20 before, you may like to indicate to Pete and he
21 may go into a little additional detail.

22 For those who have heard it, it might be a
23 little redundant. But we do want to at least
24 explain in brief what the project is.
25

PRESENTATION

1
2
3 MR. JONES: This project is a joint project
4 between Northern States Power Company and United
5 Power Association. And we have a contract with
6 Anoka County to process 500 tons a day of
7 municipal solid waste. We are looking for waste
8 from additional counties. And it might be a
9 1500-ton-a-day facility.

10 So, it might be 500 with Anoka. And if we
11 get additional counties, it might be a 1500-tons-
12 a-day facility.

13 Now, there are two basic components to the
14 project.

15 The first component is a resource recovery
16 facility. And that is to be located down on 165th
17 Street. And that is down on the southern end of
18 Elk River, just off of Highway 10. That is right
19 near the Cargill Research Farm.

20 There is another component which is a
21 combustion facility. And this is UPA's Elk River
22 Station, Units 1 and 2, primarily. We might use
23 Unit 3. And that is on the southern end or outside
24 of the major city of Elk River. But it is still
25 inside the city limits.

1 At the resource recovery facility located
2 here, waste will be delivered and will be coming
3 in two types of trucks. You have seen them on the
4 street already.

5 There is the 5-day ton packer truck, which
6 you see on the streets. And there is 20-ton
7 semi trailers which look like a regular over-the-
8 road semi trailer. And they will be delivering
9 waste to the facility.

10 What the facility will be doing is separating
11 out the combustible portion of waste from the
12 noncombustible portion. And the combustible
13 portion makes up approximately 70 percent of the
14 waste. And that is paper and plastic.

15 And I think there is a list that the EIS
16 goes into more detail.

17 But the facility does one thing. It separates
18 out the combustibles from noncombustibles.
19 We also are looking at recovering ferrous
20 metal and aluminum. And maybe in the future, doing
21 or recovering additional materials from the waste.

22 The combustible portion of RDF will go from
23 the Elk River Station Resource Recovery Facility
24 along Highway 10 to UPA's Elk River Station where
25 it will be burned. And that will be 20-ton semi

1 trailers like the semi trailers you see over the
2 road.

3 The ash from the station will go to the land-
4 fill. And the residue from the RDF will go to a
5 landfill.

6 The ferrous metal, Anoka County has a
7 responsibility for finding a market. Ferrous metal
8 makes up about five percent of the waste coming
9 in.

10 NSP has responsibility for marketing the
11 aluminum from the resource recovery facility.

12 I think the EIS or draft EIS goes into more
13 detail on what the process is and how it works.
14 But the resource recovery facility, there is
15 fairly simple sizing and screening devices to
16 separate out the materials.

17 The Elk River Station, we have to make some
18 boiler modifications so the RDF burns a little
19 better; and get a fuel feed system to put the RDF
20 in. And a storage system to store the RDF so we
21 can burn RDF over the weekend.

22 That is a basic description of what the project
23 is. I think that if the PCA wants, I can answer
24 questions or wait until afterwards.

25 MR. ANDERSON: I would prefer we wait until

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afterwards. Or it could be very soon.

The EIS basically looked at about eight issues

These issues were water quality, air quality, noise, traffic, transportation issues, land use, social and economic, and health and safety.

After this analysis in the EIS, it was determined that these issues had some impacts, had no impacts, or they had a degree of impact in the community.

The EIS is detailed though, I think, fairly accurately. And I don't think we need to go over them at this time.

What I would like to do is spend most of our time here to hear what you have to say about the project and about the draft EIS.

And so at this time, I would like to open it up for public comment. I would suggest that if anyone wants to speak to the EIS, please come down here to the podium. State your name. And then, contribute what you have to say.

It is important that you speak clearly when you come down because we are taking this by a court reporter. And she is trying to hear what you say. And she can't record it unless you speak clearly and speak into the microphone.

1 MR. JONES: All of these trucks will be
2 turning off of Highway 10, going in on 165th
3 Street and onto the facility site. There will be
4 no parking on 165th Street. We have enough space
5 on the site that we will have parking on the site.

6 As far as your question about the trash, I
7 think you see packer trucks going down the street
8 every day. And I don't think you see a lot of
9 debris from them. They are fairly consciencious
10 There are rules and regulations controlling the
11 amount of, you know, how they are handling their
12 normal traffic flow, and this containment of
13 waste.

14 MR. SUNDAHL: I am thinking like -- you are
15 not sure exactly how many tons of waste will be
16 going through here?

17 MR. JONES: If it is a 500-ton facility,
18 it will be processing a 500 tons a day.

19 If it is a three-line facility, it will be
20 about 1500. As far as processing, it might be
21 receiving a bit more. But that is as far as
22 the processing goes.

23 MR. SUNDAHL: If indeed that time comes, we
24 can call up? And when we start having trucks go
25 by, we can have a recourse and say, "We don't want

1 them on our road"?

2 MR. JONES: I think the situation is all of
3 the trucks will come right up Highway 10, right
4 onto the facility site.

5 There won't be any parking.

6 MR. SUNDAHL: There shouldn't be any backup
7 on the highway?

8 MR. JONES: No.

9 MR. SUNDAHL: I had something else. Maybe
10 it will come back to me.

11

12 STATEMENT

13

14 MS. EGGERT: I am Jeanne Eggert. And we live
15 in Richwood (phonetic) East.

16

17 My main concern right now -- and there are
18 several of them -- but one of them is that 25
19 percent of the 500 tons that is brought to that
20 site will be brought to our landfill. And with all
21 the extra communities added to what is already
22 using our landfill, we will end up with a fuller
23 landfill much faster than we will if we don't have
the burning site at all.

24

And so, that is one thing I am really concerned
25 with.

1 Number two, we moved here eight years ago
2 from St. Louis Park. I am a produce of the
3 creasote plant there. And we moved to Elk River
4 to get away from anything like this. We moved
5 to get away from burning, to get away from dumping.

6 I do not want my children saying, "I am
7 from Elk River, the garbage capital of Minnesota."

8 So, I am very concerned because I am worried
9 about that. Not only will we have all of the
10 garbage sitting there, but I have also wondered
11 what it is going to do as it seeps into our ground,
12 and it enters into our water tables. And as it
13 causes other problems.

14 Time Beach was told when their products were
15 being dumped that there would be no problem there.
16 And there is no longer people living at Time Beach.

17 So, I have very many concerns.

18 Another one is the actual burning.
19 The scrubbers will not be installed that have been
20 talked about that do take the dioxins out.
21 There is nothing down right now that I can see
22 of actually the most expensive scrubbers being
23 put in.

24 And even when they are in use, there is a
25 certain percentage of pollutants that do still

1 enter the air. And on a day that is windy, you
2 can be polluted anywhere in Elk River, depending
3 on which way the wind blows.

4 So, I just don't see anything positive about
5 this other than jobs, and a lot more traffic, in
6 Elk River.

7 The only thing is if Elk River is expanding,
8 maybe it is expanding for the reason we thought.
9 And that is because it is a clean city to live in.
10 It is away from the airplanes. It is away from the
11 pollution.

12 We take care of our own problems here. And
13 I guess I just am against a lot of this.

14 So, those are some of the questions or fears
15 that I have that are rising from this.

17 STATEMENT

18
19 MR. EBNER: I am Ron Ebner (phonetic).
20 And I operate Ebner's Live Bait.

21 My business is within a half mile of this
22 site.

23 I need good clean water to run my business.
24 Our water table out there is ten feet below the
25 top of the ground. We have good excellent water

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now.

If they put this outfit in there, what is going to stop the seepage from getting into our ground water? What is going to stop the smell?

You know, when these garbage trucks haul them in, in the summertime, there is no way to stop the smell. We are all going to get smelled out. Plus, the fact that we are going to have the highway so crowded with trucks hauling this stuff, that our tourist business is going to go somewhere else.

And I think that this place is in the wrong place to put it. And I think they should look into this much closer, especially the water table. Because, they get the water table ruined, all of the people out in that area have their own wells, and they need that water.

Also, I am familiar with that type of plant a little bit in St. Petersburg, Florida. I spend my winters down there. And they have had their plant there for two or three years. And there is a smell there all of the time.

And that plant right now, in a matter of two or three years, has a mountain of landfill deposited already from refuse there that don't

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burn.

We are going to be filling our landfill up and be looking for new ones in a matter of a short time.

So, I think we better look much closer and deeper into this deal.

Thank you.

STATEMENT

MR. MYHRE: My name is Ron Myhre. I am from Elk River. I am not a public speaker, so bear with me. I am nervous.

First of all, on your EIS, on your page 1-2, maybe it is the way I am reading it, but I see here on the paragraph at the top of the page, continued from the previous page, it says, "If additional volume is committed prior to the finalization of financing arrangements, the facility may include one or two additional processing lines which will allow a total" -- in a one-day shift, I believe that means there -- "daily tonnage of 1,000 and 15,000 tons, respectively.

Now, the way I read that, when you put in that

1 word "respectively", that each of those lines,
2 the second line that you would add, would add a
3 thousand tons a day. And the third line would
4 add 15 tons a day.

5 Am I reading that wrong? Or are you talking
6 way over?

7 Is that 15 tons daily -- is that the total?

8 MR. ANDERSON: No. The way you read it --
9 the original proposal was for 500 tons. If they
10 had a second line, it will be a thousand tons.
11 A third line, it will be a total of 1500 tons.

12 MR. MYHRE: A total. But this "respectively",
13 it sounded like your second line adds to your
14 first 500-ton line -- it sounded like it adds
15 a thousand.

16 And then, if you add a third one, you are
17 adding 1500 more. So, you are talking 3,000 tons.

18 MR. ANDERSON: No. That is incorrect.

19 The numbers here you see is the total amount.

20 MR. MYHRE: Now, on this -- the gentleman
21 just said her on the odor, you are talking here
22 of using a redeodorant spray. This is on the
23 next page on 1-3.

24 Is this spray hazardous? What is the spray
25 made up of? Has anybody looked into that?

1 MR. JONES: It smells like perfume.

2 MR. MYHRE: Is it air polluting, or ground
3 polluting?

4 MR. JONES: On that redeodorant, if we use
5 it -- it is sort of an option.

6 But I think some people like the smell of,
7 let's say, raspberries versus if you go into one
8 of these resource recovery facilities, they don't
9 smell as you suggested here like the RDF facility.
10 If you have ever been near the silos with silage,
11 it smells a little like that. It is a little
12 sweet, strange as it is.

13 There is only a sweet odor inside the
14 facility. And outside the facility it is
15 essentially none at all.

16 So, there is a misconception that it will be
17 a vast smell over the community. That is not the
18 case.

19 There are enough of these facilities, in
20 Ames, Iowa and Madison, Wisconsin. And they don't
21 have these problems. And ours won't either.

22 MR. MYHRE: Again, my question is: Is the
23 spray that is in here, is this a hazardous spray?
24 Has anybody looked into that? Do you know what
25 the chemicals are?

1 MR. JONES: I don't know what the chemical
2 nature is. But I am sure it is not hazardous.

3 You can make redeodorants and not be a
4 hazard.

5 MR. MYHRE: I don't want to take up too much
6 time. But I have only read as much as I could
7 and retained or understood this.

8 I haven't even made it halfway through this
9 book here. But I do have a lot of questions on
10 what I have already read.

11 Under the ground water section which is on
12 page 1-3, it says in here that you will be
13 stockpiling, and let's see. The water would be
14 stored above ground.

15 And then -- excuse me. I am sorry. Let's
16 see.

17 What I believe I am reading here is that you
18 are going to use a percolation or a septic system.
19 That is what I read in here. But it will be used
20 like homes have, where you go through a series of
21 tanks into a ground drainfield.

22 At that last meeting, it was stated that --
23 from the tipping floor. The water from the
24 tipping floor.

25 At the last meeting, they were talking about

1 an underground tank. That this tipping floor
2 water sludge and hazardous chemicals spilled on
3 the floor will go into that tank.

4 Maybe I am confused on this. But I would
5 like to hear something on that.

6 MR. ANDERSON: Jim?

7 MR. ALDERS: I am Jim Alders from NSP.

8 Essentially, we are planning on two water
9 systems. One water system for the collection of
10 any washdown water from the tipping floor that you
11 spoke about. That stuff would be directed to a
12 tank and either transported to the Elk River
13 Sewage Treatment Plant or after we get some
14 experience and find out what the quality of the
15 water really is, we might propose an onsite
16 treatment system. That is separate from the
17 domestic water use of showers, bathrooms, et
18 cetera. And normal water use by the employees.
19 That would go to a septic system.

20 MR. MYHRE: One question on this tank.
21 Now, I remember here a year or two or three ago,
22 Minnesota suddenly they found that all of these
23 tanks put into the ground for your corner gas
24 stations, they are leaking. They found this out.
25 And they have been probably leaking almost since

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they were put in there.

Now, why on earth at this garbage plant -- I assume you know something of this. I would imagine there would be no underground, of course, no way to visually check for leaks. If you had it above ground, you could visually check. And I would imagine also as far as checking the level to see if it would be leaking.

It would be hard because it would be either filling or being sucked out of there.

So, you would never have any kind of a consistent level to judge if it is leaking, by that means.

So, there is a potential in my mind simply putting that above ground would take care of some of this problem in that area.

I don't understand why you would be putting it underground.

MR. ALDERS: At this point in time, I am not sure if it is going to be under ground or above ground.

MR. MYHRE: Last meeting it was stated underground.

MR. ALDERS: There are some extensive rules and regulations being developed by the United

1 States Environmental Protection Agency. And I
2 imagine the States also with regard to underground
3 storage tanks. And I think there is a lot of
4 regulations in that area being developed that I am
5 not completely familiar with. But we would have
6 the intention of closely monitoring these tanks
7 to make sure we are not going to get leaks. And
8 if we get a leak, take the appropriate action to
9 fix it immediately.

10 MR. MYHRE: I would limit myself here to
11 two more questions. Although, I have many, many
12 more.

13 On the noise -- and that is on page 1-4.
14 Just the synopsis, I guess, of it.

15 I understand that the noise level taken there,
16 it says it already currently exceeds the State
17 noise standards. That is already.

18 And now, I know NSP and UPA are fond of saying
19 that these garbage trucks are already on the road,
20 which I am sure they are. But my point is that
21 common sense says that they are not concentrated
22 on Highway 10 between Elk River -- downtown almost
23 of river -- and this plant.

24 They are now going to be -- well, actually
25 from Anoka up 10. There is going to be a concen-

1 tration there. And also, up 169 to the landfill.

2 Now obviously, they are coming from different
3 routes up 94, up 10, and 101, and up other routes.
4 So, they are not all concentrated right at this
5 point.

6 So, I think that if the noise levels are
7 already exceeded there, that they are going to
8 be greatly exceeded by diesel, huge diesel trucks,
9 making much noise and diesel smoke, and whatnot.

10 I guess this is for the Pollution Control
11 Agency. How is this going to be dealt with?
12 How can you reduce that?

13 MR. ANDERSON: I would like to refer that
14 question to Pat Fleischauer from E.R.T., if I
15 could.

16 MS. FLEISCHAUER: We took measurements of
17 noise levels in four areas that we identified as
18 sensitive receptors based on current land uses.

19 Those receptive locations were right across
20 from where the facility is proposed, at a location
21 up Highway 10, and at two locations in the
22 vicinity of the UPA power plant.

23 And the place that you are referring is what
24 we have called Receptor No. 2, up Highway 10.

25 The baseline noise conditions do exceed

1 what are MPCA standards for that area, which
2 means if you would put a facility in that area,
3 you would have to meet certain MPCA standards.

4 Due to truck traffic in that area, it is
5 noisy relative to the current land use. By
6 virtue of the noise level and the traffic there, the
7 analysis we did that incorporated the noise
8 propagation from trucks that would be using the
9 highway to that receptor and other receptors
10 indicated there would be increased noise levels,
11 but it would be barely perceptible.

12 MR. MYHRE: I guess that is where I would
13 say the criticism on the report -- that would be
14 one strong criticism.

15 I believe just common sense that you con-
16 centrate these tractor trailer trucks going in
17 and coming out of that plant, you are going to
18 have a heck of a lot of noise right there. And
19 I don't think you need equipment to measure that
20 or anything. That just takes common sense.

21 My one last question I have was -- let's
22 see. I guess I will limit it at that. I guess
23 I combined my last two questions.

24 Thank you.

25 MR. ANDERSON: If you have additional comments

1 or questions, please feel free to state them
2 tonight or to put them in writing and send them
3 to us.
4

5 STATEMENT

6
7 MS. HENTGES: My name is Marlene Hentges,
8 H-e-n-t-g-e-s. I live outside of town, back at
9 the -- actually at the front door of the landfill.
10 I am real concerned about that.

11 We already have contamination in our water.
12 And it upsets me greatly.

13 With the burning at the power plant, we are
14 going to have more in the air. And that upsets
15 me greatly.

16 I am concerned also when this study was done,
17 what time of the year was the traffic study done?
18 Was it for a full year's time? Or a certain number
19 of months?

20 MR. ANDERSON: Once again, I would refer that
21 question to Pat.

22 MS. FLEISCHAUER: The traffic counts
23 specifically ones that appear in the report, they
24 are noted that they were taken this past -- I want
25 to say February or March.

1 When you do traffic counts on a 24-hour
2 basis for an average day -- and an average day
3 is typically a Tuesday, Wednesday, or Thursday
4 as opposed to a Monday, Friday or a weekend
5 And you use those traffic counts to determine
6 peak hour daily patterns which is why we
7 analyze peak hour traffic and not noon hour.
8 It is the peak hour between 7:30 and 8:30 in the
9 morning and four and five in the afternoon.

10 So, 24 hours are done to identify those
11 two periods.

12 And then, as far as volume on the highway
13 over the course of the year, we defer to the
14 State for their traffic counts along Highway 10
15 and other roadways.

16 In addition, we take turning movement counts
17 to identify the specific movements that cars are
18 making left or right turns, or going straight.
19 And also, to assess existing roadway conditions,
20 highway geometrics, and site distance for
21 sensitivity. And also, collect data from the
22 State on accidents that occurred at key inter-
23 sections to identify any further particular
24 problems.

25 MS. HENTGES: I might suggest in your next

1 evaluation that you might consider that we have
2 a lot of traffic going through our town, coming
3 from all different ways, going up north. And
4 we let our kids go home early from school to get
5 them off of the highways so we don't have any
6 accidents. And then, the children are safer.

7 And it is really mind boggling on the
8 highways. And you get those big trucks, we are
9 really going to have problems.

10 I have another concern about the wash
11 water at the resource recovery plant where they
12 wash it down. You know?

13 We have been told through the years when you
14 have medicine that you no longer want, and you
15 throw it down the sink, or throw it in your
16 garbage. We are getting all kinds. We are
17 getting dog worming pills, and people fixing
18 pills, into our garbage which will end up in our
19 landfill and go down to our water.

20 Now already, we have got contamination.
21 We don't need any more. I would like to see
22 something happen there.

23 Thank you.

24
25 STATEMENT

1
2 MR. DAVIS: My name is Leslie Davis. And
3 I represent an organization called the Earth
4 Protectors. We are basically community advocates
5 that try to help out when people come into a
6 community and befuddle lay people with these
7 documents that document impending environmental
8 and health disaster, and tell you why it is going
9 to be good for your community, and try to con-
10 vince you of that.

11 So, I would like to talk about a couple of
12 things. And one of them will be briefly on the
13 summary of the DEIS. And I don't want to
14 legitimize that charade of a document any further
15 than saying that in the document itself, it says
16 the operation of the proposed facility will result
17 in emissions of dioxins, furons, and
18 other organic compounds and trace metals of which
19 are carcinogenic. And a lot are not known, and
20 all of that stuff.

21 What these folks would like to do is enter
22 into the dualing consultant syndrome and debate
23 numbers. How much? How long, is how bad, to
24 how many people. And how many trucks?

25 And with all due respect to Ron's comments,

1 by talking about whether the tank will be
2 underground or above ground, you already inject
3 into your mentality an acceptance of the project,
4 which we find completely unacceptable and
5 intolerable.

6 So, what can a community do when they are
7 approached with it? When the community leaders
8 don't come forward? And they allow the public to
9 sit and dwell on these huge documents that are
10 loaded with numbers, and arbitrary figures, and
11 fraudulent statements by scientists like the
12 Hasselrise Report (phonetic) which Dr. Commodore
13 (phonetic) had proven as a fraudulent study that
14 has become part of this DEIS, to legitimize it.

15 This scientist is a liar. And he is a
16 fraud. And his name has been used in this
17 particular document to legitimize it.

18 So, what can a community do? How are you
19 going to stop it at this point?

20 There is a steamroller going along. There
21 are deadlines set for it. There is only one way
22 to do it because the public officials are not
23 going to take action.

24 You have to form a community task force.
25 And we are going to have to pool our resources and

1 give them a fight. That is all they are going
2 to understand. You have to challenge them every
3 step of the way in the variance, in the permitting
4 process, in the roads, and the Department of
5 Transportation. Because they have got all the
6 answers, and they have got all the numbers com-
7 piled.

8 They will take the air emissions and they
9 will say, "We will take 21 facilities. We will
10 average them all together. We will take the best,
11 and the worst, and take the middle. And we will
12 arbitrarily cut it up and say that this is the
13 worst case. This is the middle case. This is the
14 best case."

15 And they will sell this project.

16 Why do they want to do that? What is in it
17 for NSP? Are they going into the garbage business
18 with UPA? Are they simply trying to capture the
19 garbage to protect their market because they sensed
20 several years ago that other folks would be coming
21 in and capturing the garbage, burning it, and
22 producing electricity with it, and selling it back
23 to them?

24 If they are doing that, if they were assured
25 or made comfortable that no one was going to burn

1 the garbage and sell them electricity, maybe
2 they would abandon this absurd scheme.

3 Or have they decided and taken a serious
4 look at the forecast for electrical use towards
5 the end of the decade, and towards the end of
6 the century? They have exaggerated the demand
7 for electricity. And that efficiency has become
8 less expensive to purchase today than electricity.
9 And people are moving to efficiency with more
10 efficiency light bulbs and industrial drive
11 motors.

12 NSP is even promoting efficiency.

13 So, they know that the day is dawning.
14 Their doom is upon them because the demand for
15 electricity is not there.

16 So, what do we have to do in this community?
17 When this meeting ends tonight, as the PCA as
18 they always do with go back with their figures.
19 And they will professionally and methodically
20 analyze all of the comments. And they will come
21 out with a rebuttal to that.

22 They have got staff of attorney general
23 lawyers that are represented by Mr. Humphrey's
24 office. I think there are 14 to 18 of them who
25 are on staff full-time at the PCA.

1 How can a community under seige combat that
2 type of thing?

3 The Office of Planning and Review has a lot
4 of professional, well-intentioned people with
5 terrific credentials. But they operate
6 within a particular box, within particular
7 recommendations or guidelines, from the management.

8 The manager of the Pollution Control Agency
9 is appointed by the governor. So, if the Pollution
10 Control Agency is sanctioning this thing, then
11 obviously the director or the boss of the PCA is
12 approving that by the direction of the governor.
13 Because he obviously knows that this is going on
14 in this community. And he must be approving of
15 burning the garbage.

16 Well, there is an election coming up in
17 November. This thing is scheduled to be driven
18 through by July sometime or August.

19 And they say, "Be sure to have your comments
20 in by June 9th or 10th. And we will respond to
21 them on a timely basis."

22 There are some questions raised in a variety
23 of reports. And I would like to ask if the
24 Danish EPA report of 1984 that indicates that a
25 rurally-sited incinerator is worse than if you would

1 site one in the Cities. Because they say that
2 just breathing air alone is not as harmful as
3 someone eating the vegetables they have grown
4 that the pollutants are landing on.

5 Have you seen or know about the Danish
6 report of 1984 by their Environmental Protection
7 Agency?

8 MR. ANDERSON: Mr. Davis, if you give us the
9 citation, we will certainly check and make sure
10 we read the report.

11 MR. DAVIS: So, the answer is that it hasn't
12 been. If you allow them to go forward with this
13 project, it is not a landfill abatement plan.
14 It will not abate landfill. It is going to increase
15 it.

16 And all your fears are valid. It will
17 increase truck traffic. And it will increase
18 the danger to the community.

19 Once this thing is put on line, you won't
20 stop it not only for decades, you won't ever stop
21 it. Because there will be no alternate plan in
22 line to be able to prevent it.

23 Twenty years will pass. It doesn't matter
24 what you find in the atmosphere, or what you find
25 in the health effects of your family. Because

1 you won't be able to turn in any direction.

2 So what is needed is for garbage management.
3 Not only in the Elk River and Anoka County area,
4 but the State of Minnesota. You need a well-
5 designed, reprocessing, composting, wind driving
6 type because you are going to have to farm the
7 garbage -- not big buck burner complicated
8 technologies.

9 Engineers would have you believe that they
10 can burn at very high temperatures. And by keeping
11 it at the high temperature for a certain period of
12 time, and putting certain control equipment on the
13 top of the stack will reduce the emissions.
14 Well, it will for certain ones. But it will make
15 it worse for others.

16 You are not dealing with dioxins which has
17 become a focal point.

18 I am going to move off the dioxin issue now
19 to the metals, to the chromiums and the
20 cadmiums. And the cadmiums, which I understand,
21 are also carcinogenic. They can cause cancer.

22 At what level? How long? To whom? Nobody
23 really knows.

24 That is for sure to come out of this facility
25 because municipal garbage burners -- they are not

1 incinerators. They are garbage burners. They are
2 not landfills. They are garbage dumps. They are
3 not all sanitary landfill. That is an absurd
4 name for a garbage dump. That is known and
5 guaranteed to contaminate ground water wherever
6 there is a garbage dump. The ground water under
7 is contaminated.

8 They said 20 years ago that wouldn't happen.
9 We are going to not burn in open pits. We are
10 going to build sanitary landfills.

11 Well, that didn't work. Now, we are going to
12 build double lined and leachate collection systems
13 and a whole intricate mechanism which is going to
14 propel the price of processing garbage through
15 the roof.

16 Interestingly enough, the prices probably
17 will be controlled by the Public Utilities
18 Commission. Isn't that going to be interesting?

19 NSP is going to own the garbage. And the
20 price of it and the cost of it is going to be
21 determined by the Public Utilities Commission.

22 So, we need to do in this community, and
23 my organization, and all the resources available
24 to us whether legal, financial, organizational,
25 or other organizations that we network with are

1 available to this community to fight them every
2 step of the way.

3 Never mind whether the tank will be above or
4 below the ground; whether this will go to the
5 landfill or not. This technology is unacceptable.
6 And you should fight them all of the way and not
7 allow it here or anywhere else.

8 Just by saying it is okay to burn it in the
9 Twin Cities but not out here -- I am from the
10 Twin Cities. I've lived there for 23 years.
11 we care about what goes on in Elk River.

12 If the people in Elk River will care about
13 what goes on in the Twin Cities, we can then work
14 together and get a sensible garbage processing
15 policy for the State of Minnesota.

16 And I hope we can all work together to do
17 that.

18 Thank you.

19
20 STATEMENT

21
22 MR. PETERSON: My name is Gary Peterson.
23 I agree that we cannot continue to dump garbage
24 in the landfills.

25 I have some real problems with the burning of

1 the refuse in the UPA plant because I understand
2 there will not be scrubbers or secondary burn
3 units. It seems like we are creating another
4 long-term problem to solve a short-term problem.

5 I think there must be some other alternatives
6 available.

7 I have not pursued it. I have been kind of
8 a lazy citizen. I have sat back and not gotten
9 involved earlier enough.

10 But I am afraid we are looking at using a
11 plant that is no longer in use; the economic
12 values of the Elk River area.

13 I think we are looking at creating some
14 problems which probably will be minimal. I think
15 we are talking in terms of creating a better tax
16 base which I understand is somewhat limited
17 because it is under the environmental laws.

18 So, it does seem to me that we are moving
19 very rapidly to create a situation which once it
20 is in place, it will not change. And we will be
21 forced to deal with it later.

22 I am very concerned about the ground water
23 and the pollution of that. I do not see how
24 burning the garbage and bringing more garbage in
25 is going to significantly reduce the ground water

1 pollution.

2 So, based upon what I have seen, I am very
3 concerned that this appears to be a very greased
4 action. And I am sorry for the people that put the
5 time in to think about it.

6 And maybe I am just lazy and should have been
7 involved before. But it seems we are moving too
8 quickly without enough understandable information
9 from a variety of resources.

10
11 STATEMENT

12
13 MR. DWYER: My name is Patrick Dwyer. And
14 I am resident of Elk River.

15 I have done a little research. I don't claim
16 to be an expert. But in reading some information
17 put out by the California Air Resource Board in
18 a May 24, 1984 study in which they are talking about
19 RDF plants, 50 megawatts or less, which is what
20 this project is, there is no question from what I
21 read in the report that to control flue gasses,
22 scrubbers should be required. And to control
23 particulates, bag houses that filter down to
24 two microns or less should be required.

25 The plant out there has a bag house that may

1 be capable of filtering out the particulates
2 down to two microns. Although, I have been told
3 by the people out there that sometimes particulates
4 up to ten microns would be filtered through.
5 But there are, as far as I know, there has been no
6 requirements for scrubbers on this plant at all.

7 And unless this would be a requirement of
8 the plant, I would not be in favor of it being
9 located in Elk River.

10 The report also goes into things like heavy
11 metals that will be not only emitted through the
12 flue gasses, but also as residuals in the ash which
13 will be dumped into our landfill. And I don't see
14 any benefit to Elk River to taking on the risk of
15 the emissions to the air and the possible
16 ground water contamination.

17 And for that reason, I am opposed to the
18 project at this time.

19
20 STATEMENT

21
22 MR. TROWLEY: My name is Jim Trowley (phonetic).
23 I am from Elk River. I am the chairman of the
24 City Planning Commission.

25 I, too, have concerns like Mr. Dwyer and a

1 number of others that have expressed concerns
2 about the particulate matter and the gasses and
3 the heavy metals that are going to be emitted
4 or potentially emitted from this plant.

5 I would like to see if the PCA grants permits
6 that a reviewal system be installed or initiated
7 that they can at a future time go in and say,
8 "Yes, you are putting out too much of this product"

9 So then, we can at least control that.

10 The second issue I would like to address
11 myself to, and this is a misconception that a
12 number of people have stated already, that all
13 of the residual effects will go into the Elk
14 River landfill. That has not been determined yet.
15 That is something the City can control under the
16 existing permit laws that we have for granting
17 such a facility.

18 And as I understand it, and Anoka County --
19 and Norm, you can correct me if I am wrong.
20 Anoka County is responsible for their own waste
21 material. You will have to dispose of it in your
22 own site.

23 I believe that the city government through
24 the conditional use permits can require all this
25 material coming in from outside of the county to go

1 back to the county of its origin.

2 Now, I think that can solve some of our
3 problems. I do believe that continually dumping
4 material into landfills is no solution. I also
5 don't think this is a solution of the century.
6 But it is using existing technology now. And I
7 think it is the best answer we have today.

8 Thank you.

9
10 STATEMENT

11
12 MR. CARLSON: My name is Dennis Carlson. I
13 am also a resident of Elk River.

14 I have about three concerns that I would like
15 to address.

16 The first one is on page 5-4 of the report.
17 And I found it elsewhere. And I would like to
18 ask the Pollution Control Agency a number of
19 times in the report it says that the fuel switch
20 from coal to RDF is not considered a change. And
21 I guess I would like to know either why or why they
22 are not standards that are updated to deal with this
23 kind of technology.

24 MR. ANDERSON: I would like to defer this to
25 Mike Hansel. He came in after we made our intro-

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ductions.

But Mike Hansel can answer that question.

MR. HANSEL: It certainly is a change in fuel from coal to RDF. But the way that the federal rules are written, the particular federal rule that we are talking about here is P.S.D. or Prevention of Significant Deterioration.

Under that rule, RDF and coal are essentially similar fuels. So just switching between the two of them does not trigger a review under that particular law. It does trigger other reviews that our agency does, however.

MR. CARLSON: When was that rule written?

MR. HANSEL: It was written in 1973.

MR. CARLSON: And there has been no change in technology between '73 and '86?

MR. HANSEL: There has been a lot of change in technology between '73 and '86.

MR. CARLSON: But we are asked to believe the standards are the same?

MR. HANSEL: No. The standard that is concerned with are the things that are listed over on the opposite page there. At least the first five or six of them, the so-called criteria pollutants.

And what the federal regulations

1 say is that changing from coal to refuse derived
2 fuel will not significantly change the emissions
3 of things like carbon monoxide, sulfur dioxide,
4 and things like this.

5 So, that is the significant change that they
6 are talking about. They are not talking about the
7 things that most people are concerned about the
8 metals and dioxins and those things.

9 Those fall under a different review that we
10 do.

11 MR. CARLSON: Let me also refer to 6-102,
12 the very top of the page. And I think it really
13 causes me to question the whole EIS. I think it
14 is best summed up in this one paragraph.

15 It talks about a report on the previous page
16 and goes on to say that this article suggested
17 that dioxins and furons emissions are a function
18 of operating characteristics including temperature,
19 residence, time, pollution control equipment, and
20 maintenance.

21 The proposed facility will be equipped with
22 pollution control equipment.

23 I would like some explanation of that.

24 MR. HANSEL: Okay.

25 MAN FROM THE AUDIENCE: Could the person who is

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responding to his questions please use the microphone?

MR. ANDERSON: Would you come up here?

MR. HANSEL: The permit which our agency is developing for this facility, particularly for the UPA facility, will address all of these things -- not just pollution control equipment. It will certainly require the use of bag houses out there as pollution control equipment. But it will also require continuous monitoring of the flue gasses from the facility and include continuous monitoring of temperature and combustion conditions inside the incinerator.

MR. CARLSON: Who does that monitoring?

MR. HANSEL: The monitoring is done by the permittee and is audited on a regular basis by the Pollution Control Agency.

MR. CARLSON: You mean UPA will do the monitoring?

MR. HANSEL: They will be audited by us. They will be inspected by us as is typical for emission facilities throughout the State.

MR. CARLSON: I think the thing I find unfortunate about that statement is that the assumption is made that you have the best Pollution

1 control equipment available. And I think there
2 are many, many studies that scrubbers on that
3 kind of a plant would make a lot of sense for a
4 better quality of air. And that statement, as I
5 understand your office is supporting, would
6 lead me to believe that you have the state of the
7 art equipment. And I don't think that is even
8 coming close to the truth.

9 MR. HANSEL: I don't think the Pollution
10 Control Agency is claiming that this is state of
11 the art equipment.

12 MR. CARLSON: You are claiming it is
13 acceptable.

14 MR. HANSEL: Correct.

15 MR. CARLSON: The last statement I would like
16 to make, I guess, was the reason I got involved in
17 this in the first place.

18 I ended up writing a letter to the governor
19 with a couple of other signatures.

20 I think what we find very frustrating about
21 the process is that you can have a business like
22 NSP make a contractual agreement with the county --
23 Anoka -- to burn garbage in Sherburne County or
24 Elk River. And that nowhere prior to that contract
25 being made was there any ability or any necessity

1 at all for public comment. And it seems like at
2 this point, that everything is going through. The
3 EIS certainly would indicate that it is going
4 through because there is no statement here to the
5 contrary.

6 It appears very frustrating for those of us
7 who live here and see no way of turning that
8 around.

9 And we expressed our concerns to the governor.
10 The governor sent it, I believe, around to your
11 division. I am not sure, but somebody from solid
12 waste responded to us. But they weren't really
13 sure what to do with the complaint.

14 And I think the process, from my point of
15 view, really needs to be looked at. Because it is
16 a very frustrating one for residents who live in
17 a county that have no real say in whether or not
18 garbage is burned here.

19 Those would be my comments.

20
21 STATEMENT

22
23 MS. SUNDAHL: I am Susan Sundahl, S-u-n-d-a-h-l.
24 First of all, with no due respect to Mr.
25 Dwyer or Mr. Commissioner, the planners have

1 already accepted this program.

2 The City planners have already accepted this
3 program by their comment.

4 I request a reviewal to be used as a
5 vehicle.

6 Your planners have already accepted this.
7 But I don't.

8 Mr. Dwyer, you are requiring scrubbers.
9 You have accepted this project. I don't.

10 NSP, the rest of you, I don't accept you.
11 I don't want you.

12 And I would like to know where our mayors are.
13 I would like to know where our commissioners are,
14 and our county people are, to hear what their
15 constituency has to say about this.

16 Now, moving right along, I would just like
17 to make a comparison for just a moment -- a little
18 sidetrack.

19 About Ramsey. The economy of Ramsey has been
20 virtually annihilated by way of "sanitary
21 landfills". It is not a landfill. It is a dump.
22 It is a joke as a ski hill. It is a dump. It
23 stinks. Stuff flies around.

24 And I don't care how you bury it. It is
25 there. Ramsey has been ruined. Andover has been

1 ruined by the tainted wells. Just try building
2 economy there. You are not going to do it.

3 The only thing Ramsey has been able to do,
4 and I know from whence I speak, is put car lots
5 and truck lots on Highway 10 to build a tax base.

6 There is no moving in or out of Ramsey.

7 I have not accepted this project, nor do I
8 intend to accept it. I will fight to the end,
9 even to sell our farm for which we moved here.
10 And it is up for sale because of this.

11 I would like to know how many jobs this place is
12 going to create. How many? Can you tell me?
13 Because is it going to outweigh the number of
14 people that will refuse to live here and move out
15 and pull their children out of the tax base
16 school?

17 I have three. But they are gone. You can
18 count them out.

19 Now, what else? How are we going to keep
20 Elk River -- here you have Ramsey here and Elk
21 River here. And then, going towards Zimmerman,
22 you will have three garbage heaps right along
23 Highway 10. It is so neat, and real easy access
24 there. How are you going to keep Elk River from
25 being known as the garbage capital?

1 When will the people have a vote in this?

2 I respect the question that was just posed
3 right before. Why has this been ramroded?

4 This has been done all under the table. It has
5 been real quiet. And all of a sudden, July 13
6 is crawling upon us. It is coming at a fast pace.

7 All of a sudden, we are expected to submit
8 comments.

9 Everyone here obviously -- other than those
10 that are here for their own reasons -- oppose this
11 project. I haven't heard one person say, "I
12 accept it", except those that are accepted
13 scrubbers and reviews.

14 Anybody that opposes the project -- where does
15 it go from here?

16 You can put in scrubbers. That would be
17 great. That is going to be in the next report.
18 I expect to read that. You are going to put in
19 scrubbers. And only the highest caliber, by George.

20 Who am I? I don't know anything about
21 scrubbers. That is true.

22 Put in anything you want. I don't want it.
23 I don't want scrubbers. I don't want a project
24 here. The place is a dump.

25 You are finally building Elk River. You finally

1 have quality homes and quality life.

2 And you have just put it down the toilet.
3 That is it. You dumped it.

4 MR. ANDERSON: Is there anyone else who
5 wants to make a comment on the project?

6 STATEMENT

7
8 MR. WOODS: My name is Tom Woods. I am a
9 resident of Elk River.

10 Let me start by saying something positive.
11 I think that the DEIS did an interesting job of
12 looking at a compost project in St. Cloud.
13 That sounds like a terrific project. It utilizes
14 74 percent of the garbage that is hauled there,
15 as opposed to the RDF plant that would only use
16 66 percent.

17 I think that co-composting makes an awful
18 lot of sense. I think that burning it makes very
19 little sense.

20 I think that the DEIS also did residents
21 a favor in looking at the capacities of individual
22 landfills in the area and clearly indicating that
23 the Elk River landfill is the only one of four
24 in the immediate vicinity that would have a capacity
25 to handle the garbage expected to be generated

1 by this project. I think that that was a favor.
2 I think that that was helpful.

3 I think the statement at the beginning of the
4 DEIS which said that some landfills will experience
5 a shorter lifespan because of the RDF plant is
6 interesting. And I think that is a very helpful
7 statement. And I thank you for that.

8 However, I see the DEIS filled with negatives.
9 It is an inconsistent, misleading, and very poorly
10 documented piece of work.

11 For instance, for noise on page 1-4, again
12 you state that additional noise from plants --
13 from the plant would be within the State standards.
14 But then, you say some locations already in the
15 area exceed the State standards. That is a direct
16 contradiction within the DEIS. I don't care how
17 you explain it. That is a contradiction. And how
18 can you have an acceptable noise standard when it
19 is already unacceptable?

20 And one thing you need to consider when you
21 are thinking about noise is not only the trucks
22 driving by, but it is the semi trailer trucks
23 slowing down and speeding up. That is when you
24 hear them literally for miles.

25 It is incredible to me that the percentage of

1 garbage landfilled with RDF is referred to about
2 seven different times in the DEIS. Almost everytime
3 it is referred to by a different percentage.

4 How do you come up with the differences, for
5 instance, on 1-4? You say 25 to 35 percent of the
6 waste is landfilled with RDF.

7 On 4-15, you say 24 percent of the infeed is
8 rejected as residuals. And ten percent of the
9 ash is landfilled. That is a total of 34 percent
10 landfill.

11 Then, you say on 4-36 that 20 to 25 percent
12 are residuals and landfilled with RDF.

13 And then this project, on 6-42, you say it
14 will produce a maximum of 25 percent landfillable
15 garbage.

16 How do you come up with the differences in
17 percentages? I don't understand that at all.
18 And this goes on and on and on throughout the whole
19 document.

20 But yes, one thing you do not take into
21 account is that the Metropolitan Council of the
22 Twin Cities has estimated there is only a 25
23 percent relative volume reduction with incineration,
24 because landfill garbage also compacts. You don't
25 have to burn it to compact it. And I think this

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should be taken into account.

Again, I would like to echo other speakers about the traffic section.

In the document, you are calling this the worst case, peak hour situation. Yet, you gather the data under winter conditions.

The roads around here are tourist roads. And we do let our students out of school early to avoid the tourist traffic.

Now, how can the increase in traffic produced by the RDF plant be inconsequential when already, I literally have to wait ten minutes to get onto Highway 10 in some cases.

And why in the world do you want to only measure it on Tuesday and Thursday?

I don't care what the tradition is. If you are looking at peak hours, worst case, look at it on Friday about anytime between 2:00 o'clock and 5:00 o'clock, especially on a holiday or the opening of fishing season, for instance. Then, you will get a worst case scenario.

One thing that really irritates me also is implications that you make about the bag house device.

On 4-18 you say, "The gasses currently emitted

1 from the plant's three boilers are jointly exhausted
2 through the bag house. The bag house was recently
3 tested in July of 1978 and reported at a 99.4
4 percent efficiency".

5 "Efficiency", for what? It has never said
6 in the document what it is efficient in removing.
7 And we are asked as citizens, and our council,
8 and planning commission -- we are asked to use
9 this document to make decisions with?

10 That kind of sloppy research is totally
11 inadequate.

12 Then on 6-101 through 6-102 you say, "Journal
13 articles have indicated that both E.S.P.'s and
14 scrubber bag house pollution control devices can
15 be effective in removing dioxins and furon
16 emissions."

17 And then, you say later on, "The proposed
18 facility will be equipped with pollution control
19 equipment."

20 That is an incredibly misleading statement.

21 Following a talk about E.S.P.'s and scrubber
22 bag houses, immediately you say categorically that
23 it will include pollution control equipment.

24 What pollution control equipment? How about
25 being specific? And how about studies on a plant

1 in Shushima (phonetic), Japan that show, in fact,
2 E.S.P.'s scrubber bag houses, top of the line,
3 state of the art equipment does absolutely nothing
4 in eliminating dioxins and furon emissions. In
5 fact, from the study performed in Shushima,
6 Japan, the devices actually increased dioxin
7 emissions because dioxins were formed in the pollution
8 control equipment as it exited from the stack and
9 cooled down.

10 Where is that study? I think the research
11 methods wer horrendously flawed for this document.
12 I see no research at all. I see no documentation
13 at all.

14 I see no analysis of independent studies
15 indicated. I see no bibliography. The list of
16 references at the end includes only documents
17 from the EPA and a few from the MPCA.

18 What about some independent studies conducted
19 by scientists around the world? These are available.
20 Do citizens have to give you, the Pollution Control
21 Agency, the citations so you can find out what is
22 going on in the field?

23 The Pollution Control Agency is supposed to be
24 the regulatory commission that we look to for
25 protection. And yet, you are asking us for

1 citations? That is absurd. Why don't you do your
2 own work?

3 You talk about criteria pollutants. Table
4 6-1 information on potential emission rates
5 apparently has been supplied by UPA estimate,
6 And upon this estimate, you base the entire
7 projection of pollution on the criteria pollutants
8 from this plant.

9 Again, no independent analysis. No research
10 of other plants. Why are you even bothering to do
11 an EIS if you are merely going to ask the applicant
12 if they are going to pollute. Because, that is what
13 you are doing. You are asking UPA, "Will you
14 pollute?"

15 And they will say, "No. This is what we will
16 emit."

17 And you are taking them at their word and
18 making decisions based on that.

19 Is that good government?

20 I see no risk assessment of criteria pollutants
21 from the document, even though John Rafferty from
22 the Minnesota Department of Health has said those
23 were necessary -- when he was speaking about the
24 Hennepin County proposed plant.

25 Regarding the nine criteria pollutant health

1 impact assessment, you say that one of the
2 criteria in selecting plants was that they had to
3 have some form of pollution control.

4 That is fine. I think you should be inclusive
5 in your study. But I also think that you need to
6 do something with comparative analysis of plants
7 using the same kind of equipment.

8 In no case do I see a comparison of a plant
9 burning garbage with only a bag house and a similar
10 setup that UPA has.

11 Where are the studies? Where is that variable?
12 How can we decide whether or not this is going to
13 be a health impact -- have a terrible health
14 impact, if in fact we haven't anything to compare
15 it with.

16 In fact, that is what you are telling us.
17 There is nothing to compare it with. You are
18 merely adding up all of these places, whether they
19 have electrostatic precipitators, whether they
20 have scrubbers, whether they have spray dryers.
21 You are taking everything into account. You are
22 saying that this is what it is going to emit.

23 What about our particular instance? What
24 about this specific plant? Why aren't you address-
25 ing that issue?

1 I don't see any place in the document where
2 there is an attempt to distinguish between
3 effectiveness of different kinds of pollution
4 control devices. That is something I specifically
5 asked for in the scoping process. And all of these
6 questions I have were specifically addressed in
7 the scoping process.

8 Why did I go to that hearing? Why am I
9 wasting my time on this process? I have
10 important things to do.

11 Is this a valuable document at all in
12 decision making if you don't deal with the
13 variables about pollution control equipment?

14 Page 6-100, you quote a paper by Thomas
15 Oberg (phonetic) which says, "Some relationship
16 may exist between increased temperature and
17 reduced dioxins and furon emissions."

18 "Some relationship may exist". Is that
19 documentation on which to base a decision?
20 Inconclusive, scientific work like that?

21 Where is the health impact assessment of
22 ash disposal? On 6-49 through 6-50 you note
23 studies "by others", that show ash when it is
24 mixed with fly ash, when it is mixed with bottom
25 ash, it is not a problem.

1 What studies "by others"? Where in the
2 world is the documentation? Do we have to give
3 you the citation for your own document?

4 Where is the bibliography? What about ash
5 from the Auburn, Maine plant that is currently
6 being deposited in a hazardous landfill?

7 What about California studies that regard
8 fly ash as hazardous waste? What about studies
9 that have shown dioxins actually adhere to
10 submicron sized particles?

11 So, a bag house is totally ineffective in
12 eliminating any kind of particulate emission that
13 may contain dioxin contamination.

14 Studies have shown or suggested at least that
15 85 percent of all dioxins -- if a plant is 95
16 percent effective in eliminating fly ash, up
17 to 85 percent -- even though only five percent
18 of the ash is being emitted from the stack, up
19 to 85 percent of the dioxin is still emitted
20 because the dioxin has a tendency to adhere to the
21 smallest submicron sized particles which are not
22 affected in the least by bag houses.

23 Why aren't you using studies like this?
24 How have you selected your information?

25 It is very easy to sell a situation by selecting

1 only favorable information. It is very easy to
2 sell a project when you don't document anything
3 that you are using for substantiation of your
4 case.

5 In fact, I see no expertise in this document.
6 I don't feel at all safe that the MPCA is guarding
7 my health, because they haven't shown me that they
8 have a real grasp of what the problems are. And
9 they haven't shown me that they have any notion
10 whatsoever about a proper way to research a
11 project and document possible effects on that
12 project.

13 I, too, think that the MPCA, the City of
14 Elk River, and all the counties involved should
15 take a very, very close look at this project.
16 Indeed, a very close look.

17 Thank you.

18 STATEMENT

19 MR. RENNER: My name is Tom Renner (phonetic).

20 I would like to say hello to Mike. I have
21 known him a long time.

22 I am not anywhere near the orator as the
23 man before me. I thought he did a nice job.
24
25

1 We have just spent \$360,000 building a plant
2 on Jarvis Street to get away from the landfill
3 in Ramsey. Now, we are going to bring it out
4 here.

5 I also have done an awful lot of drilling
6 in landfills and done a lot of work for the PCA
7 and private people involved with landfills. And
8 I can tell you now that this county is highly
9 permeable and highly susceptible to contamination.
10 There are very few clays, no aquitards. We are
11 out of aquicludes, entirely. And aquitards are
12 very poor. And we have a problem here with
13 contamination.

14 The Waste Management Board, which I was on
15 for five years or five and a half years, picked
16 a site for processing waste, hazardous and toxic
17 waste, in Ramsey, provided that it had water and
18 sewer.

19 I think that this particular plant should
20 have a sewer connection to the metro sewer plant
21 rather than to try and handle it on site. I think
22 that it is tough to handle out here. It is easy
23 to handle in the metro area.

24 This basically, you are talking, is about
25 a metro problem with this particular plant. The

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garbage is all coming out of Anoka County, which is a metro county. And I, for one, would like to see them keep their problems within the metro area as long as it is their problem.

And I really think it is in the wrong place. Although, I am sick and tired of seeing ground water being contaminated by open pit garbage. And I think this is a step forward to -- anything is a step forward than to bury garbage or to bury materials.

The Waste Management Board determined many, many years ago that up to 30 percent or around 30 percent of the garbage, solid waste, contained -- 30 percent of it was hazardous and toxic. And therefore, it is difficult to handle in landfills.

The Ramsey landfill is a problem as was stated earlier. So is the Andover. And this one is even worse.

There are no aquitards or aquicludes around this landfill at all. There is coarse gravel right down to bedrock.

And I think it is wrong even to put the ashes from this particular plant, the residue in this plant, in a landfill in the Elk River area. You are going to get into trouble with it. It has

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1 already got contamination in it. And you are going
2 to compound it.

3 Thank you.
4

5 STATEMENT

6
7 MR. SCHROEDER: My name is Jerry Schroeder.

8 One of the things in listening and reading and
9 hearing what is going on, I think it is fairly
10 obvious that NSP and Anoka County picked the site
11 that they picked in this area for some of the
12 reasons that are mentioned in the report. That
13 some of it is unclassified. It is area where
14 there are no rules or regulations. And therefore,
15 you can slip things through without a lot of
16 challenge. And it makes it easier to get their
17 way to slip it past.

18 I have to chuckle that one of the statements
19 was that UPA was going to be involved in monitoring
20 something.

21 We had a nuclear power plant here for many
22 years. And it took them 17 years to admit they
23 had a leak in it. They never did while it was
24 here admit that it was leaking.

25 I think that is a real joke in itself to talk

1 about monitoring themselves.

2 The whole thing in a nutshell is that our
3 technology is such if we put this here, we will
4 probably be contaminating the ground water in
5 both areas greatly. There is no doubt we are
6 going to make our air sources highly polluted with
7 certain things.

8 No matter what is said and done, that is
9 going to happen. If we accept that, that is where
10 we are at.

11 And they can give all the warnings they want.
12 But look at the technology we have. It doesn't
13 stop those things.

14
15 STATEMENT

16
17 MR. PETERSON: Gary Peterson again. I am
18 from Elk River.

19 Everything I have heard tonight makes me
20 more convinced we should not have this. And I
21 would like to know what we as citizens now can do
22 to prevent this from being built in our area.

23 Do we have any input into that?

24 MR. ANDERSON: The EIS process as we are going
25 through it now is a process to identify the

1 environmental impact on a project; identify alterna-
2 tives to the project, or as part of the project;
3 and to as best we can, quantify those impacts.

4 It is not a decision making document. It is
5 a document that is prepared to assist the decision
6 makers in deciding whether they are going to go
7 ahead with the project, or go to modify it, or not
8 go ahead with it as the case may be.

9 Once the EIS process is complete, it will then
10 go to a permitting process. Permits will be
11 required from the Minnesota Pollution Control
12 Agency, from various local units of governments,
13 Sherburne County, and Anoka County. You can look
14 in the document and see the list of permits.

15 At that point in time, the decision will be
16 made whether to implement the project, modify the
17 project, decide not to go with the project.

18 That is basically the program we are in.

19 MR. PETERSON: Who has the final decision if
20 the project is to go or not to go?

21 MR. ANDERSON: The decision to permit the
22 project again will be made by the various units
23 of government.

24 We have certain permits. And it will be the
25 Minnesota Pollution Control Agency making those

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decisions whether to permit the project.

It is also the decision up to the units of government that are issuing the other permits that are listed in the document. And they will also make those decisions.

Obviously, if those bodies, whether they be in the Pollution Control Agency, Anoka County, Sherburne County, Elk River, if they decide not to issue the permits, then of course the project won't go.

MR. PETERSON: Would the local places to start be the zoning commission?

MR. ANDERSON: From looking at the list of permits, you are going to have to have a conditional use permit from the Elk River Planning Commission. You are going to have to have building construction permits from Elk River. And you will have to have a drainage permit from the Anoka Watershed District.

MR. PETERSON: Is that the document that is available in the library?

MR. ANDERSON: Yes, it is.

STATEMENT

1 MR. CARLSON: Dennis Carlson, again.

2 It is my understanding that the only thing we
3 as citizens really have any decision in is in fact
4 the RDF processing plant.

5 Is that accurate?

6 MR. ANDERSON: The EIS is basically directing
7 its attention towards the project as a whole.
8 And the project as a whole encompasses the RDF
9 processing plant and the modification of the
10 existing power plant in Elk River to utilize the
11 RDF.

12 MR. CARLSON: But it is my understanding that
13 we don't have any say in whether or not the plant
14 has scrubbers or any of that.

15 It is my understanding that the only thing
16 that we can respond to as citizens and have some
17 control over is in fact the RDF processing plant.

18 MR. ANDERSON: That is really a permit issue.

19 I would like to direct that to Mike, here.

20 And he can address that.

21 MR. HANSEL: That is not correct. You do have
22 a say in the permit for the power plant at Elk
23 River.

24 In order for that plant to operate using RDF,
25 we have to issue a new air emission facility permit.

1 That permit will go out on public notice.
2 Everyone will be allowed a chance to comment on
3 that. If you want different conditions,
4 different equipment, or whatever, you can make
5 those requests to the Pollution Control Agency.

6 There is also a provision in our permitting
7 rules which allows for a contested case hearing.
8 A case hearing about whether a permit should be
9 issued, or what conditions should go on it.

10 So, yes. You do have a say in that. You
11 do have input into that.

12 And that permit, when it is drafted, will
13 be noticed. And you will be notified of that.

14 MR. CARLSON: That is a public hearing that
15 will occur in Elk River?

16 MR. HANSEL: There are a couple of things.

17 One, the agency can hold informational
18 meetings to explain the permit. We could
19 certainly do that.

20 If citizens request a contested case hearing,
21 that is a hearing in front of a body which is not
22 the Pollution Control Agency, but a separate
23 administrative law judge, that has to be approved
24 by a board in another public hearing down in
25 Roseville.

1 MR. CARLSON: But there are no local permits
2 dealing with the burning of garbage?
3 The only local permits that we have a say in are
4 with the RDF plant?

5 MR. HANSEL: That is as I understand it.
6 But I don't know exactly what the situation is
7 here.

8
9 STATEMENT

10
11 MR. DAVIS: Leslie Davis, again.

12 The decision on this process is divided up
13 amongst several different agencies.

14 The PCA is only one of them that has to issue
15 a permit. And they have already established a
16 precedent by permitting other facilities in
17 Red Wing and in Mankato, Minnesota, that would
18 preclude them from preventing these people from
19 burning the garbage here because they already
20 have a precedent set. And they have allowed
21 facilities to be permitted with less control
22 equipment than this particular plant is proposed
23 to have.

24 So, I don't think you really have a shot in
25 dealing with the permit. Even though, you could

1 request a contested case hearing before an
2 administrative law judge. You are talking about a
3 very extensive legal proceeding. You have got
4 expensive attorney fees. This is an ongoing
5 hearing type of process.

6 The hearing examiner would be delighted to
7 sit there. They sit there all day long. And they
8 get paid by the State for listening to your hired
9 lawyers, who are being paid \$150 an hour, telling
10 him why you shouldn't have this. But I don't
11 think you have got a case in a contested case
12 to fight the permit.

13 What you have got to do is take away the
14 bullets to the gun. And the way you take away
15 the bullets is to tell your local representatives
16 that they are not to issue a special use permit
17 to put in this bullet or garbage processing
18 facility which will feed the burner. If they
19 don't have that, the situation of the air emission
20 permit is moot. It is unnecessary. You don't
21 have to deal with the emissions or any of that
22 other stuff.

23 It is right here. You have got a local
24 decision. It is going to be made by your local
25 representatives that you pay.

1 And you tell them, "No plant in Elk River".
2 Begin to tell your neighbors in your
3 community. Tell them, "We don't want the pro-
4 cessing plant here".

5 And it won't be here. If their jobs are
6 on the line, and their careers, and their futures,
7 and their businesses are on the line, then they
8 will respond. That is the only thing they are
9 going to respond to.

10 So, that is what you have to go after:
11 The local community to deny the special use
12 permit.

13 They need to put up a 70-foot building in
14 order to accomodate the facility. They will need
15 a variance of local regulations in order to go
16 above the 40-foot code.

17 Well, you can stop them right there by
18 telling your permitting people, "No variance.
19 No exclusion for this facility." And they will
20 just pack up their bags and go away.

21 Then, they will take their garbage someplace
22 else. And we will stop them there. And we'll
23 stop them wherever they go with their garbage.
24 And we will surround their landfills in Eden
25 Prairie.

1 that I turned in in college was more factual and
2 more up-to-date than your report. Anybody with
3 common sense would know when to monitor traffic.

4 The whole thing has really been bad. And I
5 guess I have no faith in you. I don't want the
6 plant here. And if I don't have faith in you, I
7 have to worry about what you are going to do
8 behind my back. And I think that is a real
9 concern here tonight. And we have to get
10 together. We need to fight this thing, people.
11 We cannot let these people run the show.

12 We have already been shown the report.
13 And the report stinks just like the garbage
14 plant will stink.

15 Are we going to get off our duffs and do
16 something? Are we going to get our neighbors to
17 work on this? Or in ten years, are we going to
18 be suffering from cancers and moving our families
19 out of here?

20 My kids love Elk River. They have been
21 brought into this town. They are going through
22 the whole process of growing up here. They are
23 proud of it.

24 I think it stinks when I have to think about
25

1 putting a home that I love on the market to get
2 the heck out of danger.

3 So, what are we going to do about it? I
4 already know I can't trust any one of these
5 people here. And I already know I am really sick
6 at heart against the city council and against our
7 mayor. I feel like they have betrayed us. And
8 I'm sorry. But we need to do something. And
9 sitting isn't going to do it.

10 MR. ANDERSON: Is there anyone else who wants
11 to offer comments?

12
13 STATEMENT

14
15 MR. MYHRE: Ron Myrhe.

16 I hope the people know here by what I was
17 saying before -- maybe, they don't. But I am
18 totally against this.

19 Besides all the dangers, the serious dangers,
20 that this whole setup is going to present to us
21 here in Elk River, I think there are people out
22 there that aren't here tonight that they read
23 about the Love Canals and the Russian nuclear
24 accidents and on and on and on. And how if we
25 are not polluting our ground water, we are burning

1 it and we are polluting the air. You know?

2 I do believe we have to organize. I guess I
3 have been led down the path, you know -- the
4 garden path.

5 I have been criticized as being too radical
6 at the last meeting. So, I tried to tone it down
7 for this meeting. And then, I see people much
8 more radical than I am. So, I am back to radical.

9 I guess what I am saying is I don't know how
10 to fight this thing. I have never been involved
11 in something like this before.

12 I thought maybe attacking this EIS would be
13 the way to go, trying to fight it on its own
14 merits. Maybe that is not the way to go.

15 But back to the people that aren't here
16 tonight, I believe that there are a lot of people
17 in Elk River that are concerned about this, but
18 they read it and again, they have heard of the
19 Love Canals and on and on. And they shrug their
20 shoulders and say, "What can we do about it?
21 What can I as an individual do about it?"

22 I think they should be made aware and maybe
23 fight it.

24 They might not be aware of the mundane
25 things. I don't know. It seems to me that the

1 really serious cancer -- and you talk about these
2 pollutants and that -- again, they don't under-
3 stand the facts and figures as some of us do here,
4 and the intricacies of it.

5 If you tell them about it that you won't be
6 able to enter on Highway 10, and you will have to
7 put up paying for stop lights, and the road will
8 deteriorate, and the noise and that type of thing,
9 the mundane things, the small things that we live
10 with every day, then I think you are going to get
11 them involved.

12 And again, I want to go down on the record as
13 this is a very bad thing. You are taking Anoka's
14 and the metropolitan region, which doesn't include
15 Sherburne, and conveniently moving it up to this
16 site up here.

17 And one woman said here tonight that because
18 of this, she is moving. I believe 99 percent of
19 what she said to be correct. But I believe that
20 that is running away.

21 And I also believe that that would be an
22 answer: Just to get out of here. But it is going
23 to follow you all over. We have to stand here and
24 fight.

25 I like Elk River. I moved up here from the

1 Cities, myself, to get away from the city concerns:
2 Garbage, noise, and all of that type of pollution.
3 And here it comes up here again. And I think in
4 this atmosphere of conservatism that Mr. Reagan,
5 our President, seems to be putting out that we
6 should all pull ourselves up by our own bootstraps
7 and on and on. And that goll darn it, Anoka
8 County should take care of its own garbage.

9 Don't send it up here to us.

10 Thank you.

11
12 STATEMENT

13
14 MR. SCHROEDER: Jerry Schroeder, again.

15 My wife and I would like to invite those
16 that would like to meet on this, to come over to
17 our house. And unfortunately, we can't have it
18 available until like a week from tonight on a
19 Tuesday at 7:00 o'clock. Maybe we will put an ad
20 in the paper. Or tonight, we could meet after
21 this, if you would like to come over and see if
22 we can get something organized to stop this from
23 happening.

24 Put down this address. We live at 13575
25 Island View Drive. And the name is Jerry Schroeder.

1 It is in the phone book.

2 MAN FROM THE AUDIENCE: What was your
3 address again?

4 MR. SCHROEDER: 13575 Island View Drive.
5 It used to be called Teacher's Road, along the
6 northside of Orono Lake.

7 So, if people would like to come over there
8 after this meeting tonight, maybe that would be
9 a good time to meet.

10 Thank you.

11
12 STATEMENT

13
14 MS. SCHROEDER: My name is Marilyn Schroeder.
15 Regardless of how some people feel about what
16 the Minnesota Pollution Control Agency has written
17 in this document, and I have had trouble getting
18 through it myself, I feel they have given us
19 time. February 11, they had a meeting in Roseville.
20 At that time, it was tabled or decided that they
21 needed to look more closely at what was going to
22 happen in Elk River. Were we going to have
23 hundreds of these facilities throughout the State?

24 And I, myself, for two months have really
25 done little or nothing about it.

1 challenge. And I can appreciate the fact that
2 some people have researched some of the things
3 I have heard about.

4 I appreciate the young lady back there.
5 I had a few comments to make about traffic. I am
6 not so sure that traffic is a concern once you
7 have garbage convoys that there will be any other
8 types of traffic in your neighborhood or anybody
9 else's.

10 I have a concern about if the city fathers
11 really look at the fact that we are close to a
12 population center. What about that proximity?

13 I am a little further away from that proximity,
14 myself. But doggone it. I am closer to this,
15 which makes garbage burning a concern of mine.

16 I live close to the banks of the Mississippi
17 River. That is a constant source of problems for
18 pollution all of the way from its source down to
19 where we live. And then, the people in Minneapolis
20 and St. Paul drink it.

21 I am not sure that the ground content is
22 suitable to contend with an issue such as garbage
23 burning because of all the things that have been
24 spoken about here -- not being assured totally
25 of what is going to happen to the pollutants.

1 I have a real concern about that.

2 They did at Chernobyl. And they ended up
3 with emergency factors which said to encase the
4 mess with concrete.

5 When we start here, we can encase the whole
6 mess with concrete.

7 We do have city officials here. And I think
8 they are listening to the things that you people
9 are saying. Doggone it, laugh or not, you can't
10 bury your head in the garbage.

11 It is here. Maybe there are alternatives.
12 Maybe these are things that our community leaders
13 need to sound out for themselves. There are
14 alternatives.

15 Can we wait on this? The garbage is still
16 collecting.

17 It is a concern. You are saying and we are
18 saying to our elected officials that we have a
19 concern for this because of its location, its
20 proximity, a lot of the things are unsure about
21 the kinds of life that we want to promote, and
22 you are saying you want to live with and that I
23 want to live with.

24 And I think these are things you are building
25 for the future. And I don't think you want to be --

1 Nashville has the Grand Ol' Opry. And you don't
2 want to be the Grand Ol' Garbage Dump of Minnesota.
3 We don't want that.

4 Are there alternatives for people to explore?
5 And to let the city officials know -- which is
6 to say Ix-nay on the Ap-cray when it comes to
7 permits. Let's support them with this.

8 At least tell them that is what we think they
9 ought to do. They are elected by us. And I think
10 they listen to us.

11 I think this is a reasonable, sensible,
12 and intelligent direction to go in. And I would
13 go for that, myself.

14 Thank you.

15 MR. ANDERSON: Mr. Woods, after your comment,
16 we are going to have a short break. And then,
17 for anyone else who still has comments to make,
18 we will be happy to stay here as long as is
19 necessary.

20
21 STATEMENT

22
23 MR. WOODS: This is not a lengthy comment.
24 It is basically a point of information.
25

1 I believe the paper said that the public
2 hearing before the Planning Commission on issuing
3 the permit for the 44-foot high stack was tomorrow
4 night at the Elk River Public Library at 7:00
5 o'clock.

6 If you are interested in the project, that
7 might be a good place to start.

8 MR. ANDERSON: I would like to take a short
9 break at this time.

10 My watch says 8:55. Let's be back by 9:05.
11 That would be fine.

12 (Whereupon, a ten-minute recess was taken.)

13 MR. ANDERSON: I would like to call the meeting
14 back to order -- if we could take our seats now.

15 I would like to continue where we left off
16 before the break.

17 And where we were, we were still listening
18 to comments and questions.

19 If anyone else has a comment to make, we will
20 entertain that now.

21
22 STATEMENT

23
24 MS. SUNDAHL: Susan Sundahl.

25 It has been brought to my attention -- where is

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he? That the mayor was here.

I am sorry. If Mr. Mayer is here, I don't see him.

MAN FROM THE AUDIENCE: I think he left.

MS. SUNDAHL: I think you're right. I think his interest is real wide.

I wanted to ask the mayor and the councilman thank you, Mr. Mayor. I am addressing this question to you.

The question is: Exactly how much money are the taxes that are coming into the City of Elk River worth to sell us out?

Thank you, and good night.

MR. ANDERSON: Is there anyone else who wishes to make a comment?

STATEMENT

MS. HENTGES: Marlene Hentges.

I have just a couple of words. We all have an obligation. I have children, six of them. I have an obligation to protect them.

I have seven grandchildren, two more on the way. I have an obligation to protect them, as do you.

1 But isn't it wonderful that we live in a
2 land that we can come and say what we want about
3 the project and not get shot for it?

4 Let's all do our thing.

5 MR. ANDERSON: Is there anyone who wishes to
6 make a comment?

7 (No response.)

8 MR. ANDERSON: If no one else has comments
9 to make, then this will conclude the public meeting
10 on the draft Environmental Impact Statement.

11 I would request that if you haven't signed
12 the signup sheet at the back of the room, please
13 do so before you leave.

14 If anyone would like a copy of the draft EIS,
15 we have a few extra copies in our office. And if
16 you would either tell me this evening, I will
17 try to mail you one. Or you can call me.

18 My number is 296-7799.

19 WOMAN FROM THE AUDIENCE: Could you give us
20 the number one more time?

21 MR. ANDERSON: 296-7799.

22 My name is Cliff Anderson.

23 I have a limited number of copies. I can't,
24 you know, keep passing them out until the end of
25 time. But if I have a copy that I can send to you,

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I will).

Then, without any more comments, this concludes
the meeting.

Thank you very much for coming.

(Whereupon, the hearing was closed at 9:15
o'clock, p.m.)

REPORTER'S CERTIFICATE


1
2
3 I, Barbara J. Nelson, do hereby certify that I recorded
4 in Stenotype the hearing on the foregoing matter on the 27th day
5 of May, 1986 at Elk River, Minnesota;

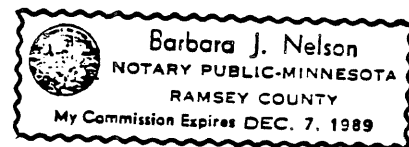
6
7 That I was then and there a Notary Public in and for the
8 County of Ramsey, State of Minnesota;

9
10 I further certify that thereafter I transcribed into type-
11 writing under my direction, the foregoing transcript of said
12 recorded hearing, which transcript consists of the typewritten
13 pages 1 through 89;

14
15 I further certify that said hearing transcript is true and
16 correct to the best of my ability.

17
18 WITNESS MY HAND AND SEAL THIS 30th day of May, 1986.

19
20 
21 Barbara J. Nelson
22 Court Reporter



6.8 Health Risk Assessment

The following description represents a revision to the health and safety risk assessment provided in the previously issued DEIS for the proposed Anoka County RDF facility. For ease of comparison with that document, the section numbering has been consistently applied. The methods and assumptions used for the risk assessment for the proposed facility were made per the directions of MPCA and their consultation with the Minnesota Department of Health. Although other approaches are possible the MPCA believes that the methods used for producing this section most closely reflect present consensus on the controversial issues involved in the risk assessment process.

6.8.1 Introduction and Summary of Results of Analysis

The combustion of municipal solid waste has been found to result in the emission of trace quantities of various heavy metals and organic materials. Because of the potential toxicity of many of these compounds, it is important that the emissions from facilities burning municipal refuse be kept to levels that will not present any risks to public health. This section addresses the emission of such compounds, from the burning of the fuel processed at the Anoka County RDF facility. It also addresses the potential for associated human health effects. The RDF fuel would be burned at the UPA's Elk River facility or at NSP's Willmarth or Red Wing facility if Elk River is not available. The metals and organics likely to be emitted are often called non-criteria pollutants since specific standards have not been established by regulatory agencies such as the U.S. EPA. The assessment of potential human health effects is based on an analysis that compares the amounts of these pollutants to which the population would be exposed to with the known toxic effects of the pollutants of concern. Absent actual operating data, estimates of non-criteria pollutant emissions were

developed based on experience with similar operating facilities. For this study, a data base was developed that was comprehensive and included operating data for both RDF and mass burn facilities.

The emissions inventory includes data on 21 facilities operating in North America and Europe that burn municipal waste, are equipped with some form of pollution control device, and for which test data were verifiable and scientifically defensible. It was also required that some minimum information on plant operations be available including: approximate age of the facility, type of fuel burned, technology, and approximate boiler temperature.

Possible dioxin exposure pathways (inhalation, ingestion, dermal exposure, and food chain) were evaluated and calculated for each isomer to provide a daily dose rate. The daily dose rate was evaluated to assess the hypothetical incidence of disease from exposure to pollutants. A community based risk assessment is provided to show the estimated potential increase in morbidity due to the proposed project.

Three potential operating scenarios for the RDF processing facility have been proposed by the applicant. These include waste inputs of 500; 1,000; and 1,500 TPD. The risk assessment was modeled for the 500; 1,000 and 1,500 TPD facilities. Emphasis has been placed on presenting the results in tabular format for the 1,500 TPD facility. This facility size represents the maximum, project size impacts. Health risks would be less for the 1,000 and the proposed 500 TPD facilities.

For the proposed 500 tons per day facility, if it is assumed that the facility will operate similar to an average resource recovery facility (average emissions rate), the total cancer risk from pollutant emissions would be 0.22 per hundred thousand assuming U.S. EPA TEF, 1.8 per hundred thousand assuming Swiss TEF, and 0.86 per hundred thousand assuming the California TEF. The Minnesota Department of Health Standard is one per one hundred thousand. This standard is exceeded if the Swiss EPA TEF approach is utilized. It should be noted that the results provided assume a continuous exposure for 70 years at the point of maximum ambient concentration.

The expected health risk for a 500 tpd facility assuming pollutant emissions comparable to those for the SWARU RDF facility in Canada were also calculated. The results of the analysis show that if the proposed facility operated similar to the SWARU plant the health risk would be: 1.7 per hundred thousand for the U.S. EPA TEF, 12 per hundred thousand for the Swiss EPA TEF, and 5.6 per hundred thousand for the California TEF. In all cases, the Minnesota standard of one per hundred thousand would be exceeded.

Depending on the methodology used the estimated health risk can vary significantly. For the proposed 500 tpd facility the risk ranges from 0.22 per hundred thousand to 12 per hundred thousand. The variation occurs as a result of differences in assumptions regarding the toxicity to humans and persistence of dioxin.

Summary tables are provided toward the end of the risk assessment which show the potential risks from operation of the 500, 1,000 and 1,500 TPD processing facility (and associated burning of the RDF fuel at the UPA facility). It should be noted, however, that the discussion provided in this chapter emphasizes the maximum project impacts, the 1500 TPD facility, unless otherwise specifically stated. The following section identifies the pollutants to be emitted which are to be evaluated, the toxicity of those compounds, the likely emissions of those pollutants, the method for assessing impacts of exposure of those pollutants to humans, and the likely effects or risks on nearby residents.

6.8.2 Pollutants Evaluated

A review of the available literature on the subject of toxic emissions from municipal refuse incinerators was conducted in an effort to develop a data base of those chemicals and chemical categories most frequently found in flue gas emissions from municipal waste incinerators. These potential emissions represent the possible chemical compounds which could pose a health risk as a result of the proposed project. This included data contained in the open literature

such as professional journals and published reports. Table 6.8-1 is a listing of those constituents which have appeared most frequently in the open literature as components of flue gas emissions from municipal refuse incineration systems.

The target compound classes, those underlined in Table 6.8-1 provide the universe of possible compounds that were evaluated in the health risk calculations. From this listing certain compounds were chosen for further analysis. The following are brief profiles on the toxicity of compounds which might be emitted from the facility. They are intended to identify which emissions should be subjected to detailed risk analysis if they are to be emitted from the facility in amounts sufficient to potentially pose a health risk. The reasons for selecting only certain compounds for analysis are provided in the following paragraphs.

Chlorinated phenols: Toxicologic data is sufficient for detailed risk analysis of 2,4,6-trichlorophenol and pentachlorophenol only. Trichlorophenol will be subjected to a detailed risk analysis. The trichlorophenol is an animal carcinogen.

Chlorinated benzenes: The chlorination of benzene can yield 12 different compounds. It has been found that toxicity differs at least in potency, and perhaps qualitatively, among individual members of this chemical class. Most chlorinated benzenes appear to have effects on the reticuloendothelial and hematopoietic systems, liver, and kidneys. Only hexachlorobenzene has been associated with carcinogenesis. EPA documents are inconsistent in their opinion on whether sufficient data exists to analyze risk from long term exposure to chlorinated benzenes, except for hexachlorobenzene. In the cases where analysis has been performed (EPA, 1980), acceptable daily intakes (ADI) were calculated at hundreds of $\mu\text{g}/\text{kg}/\text{day}$. Only hexachlorobenzene was subjected to further analysis.

Polychlorinated biphenyls: Polychlorinated biphenyls possess essentially the same toxic properties as the polychlorinated dibenzodioxins and dibenzofurans. Polychlorinated biphenyls will be subjected to a detailed risk analysis.

TABLE 6.8-1

"TARGET" COMPOUND INVENTORY - NON-CRITERIA POLLUTANT EMISSIONS
 IDENTIFIED IN THE OPEN LITERATURE AS BEING CONTAINED IN FLUE GAS
 EMISSIONS FROM THE INCINERATION OF MUNICIPAL REFUSE

<u>Chlorinated Phenols</u>	<u>Polynuclear Aromatic Hydrocarbons (PAHs)</u>
Dichlorophenols	Chrysene
Trichlorophenols	Benzo(a)pyrene
Tetrachlorophenols	Benzo(2)pyrene
Pentachlorophenol (PCP)	Benzo(a)anthracene
	Coronene
<u>Chlorinated Benzenes</u>	Fluoranthene
Pentachlorobenzene	Fluorene
Hexachlorobenzene	Anthracene
Dichlorobenzenes	Pyrene
Trichlorobenzenes	Methylnaphthalene(s)
Tetrachlorobenzenes	Biphenyl
	Naphthalene
<u>Polychlorinated Biphenyls (PCBs)</u>	Acenaphthylene
Monochlorobiphenyls	Acenaphthene
Dichlorobiphenyls	Phenanthrene
Trichlorobiphenyls	Benzo(k)fluoranthene
Tetrachlorobiphenyls	Dibenz(a,h)anthracene
Pentachlorobiphenyls	Benzo(g,h,i)perylene
Hexachlorobiphenyls	
Heptachlorobiphenyls	<u>Chlorinated Dibenzodioxins (PCDDs)</u>
Octachlorobiphenyls	Monochlorodibenzodioxins
Nonachlorobiphenyls	Dichlorodibenzodioxins
Decachlorobiphenyl	Trichlorodibenzodioxins
<u>Chlorinated Dibenzodioxins (Cont.)</u>	<u>Metals</u>
Tetrachlorodibenzodioxins (TCDDs)	Beryllium (Be)
Pentachlorodibenzodioxins	Lead (Pb)
Hexachlorodibenzodioxins	Mercury (Hg)
Heptachlorodibenzodioxins	Vanadium (V)
Octachlorodibenzodioxin	Manganese (Mn)
<u>Chlorinated Dibenzofurans (PCDF)</u>	
Monochlorodibenzofurans	Tin (Sn)
Dichlorodibenzofurans	Cadmium (Cd)
Trichlorodibenzofurans	Chromium (Cr)
Tetrachlorodibenzofurans (TCDF)	Copper (Cu)
Pentachlorodibenzofurans	Nickel (Ni)
Hexachlorodibenzofurans	Zinc (Zn)
Heptachlorodibenzofurans	Arsenic (As)
Octachlorodibenzofuran	Selenium (Se)

Source: FEIS, Hennepin County Resource Recovery Facility,
 Metropolitan Council, 1986.

Polychlorinated dibenzodioxins and dibenzofurans: Chlorinated dibenzodioxins and dibenzofurans are considered together because they have identical toxic properties. The potency of toxic effect is highly variant among the members of the group, however. Acute human response to accidental dibenzodioxin exposure results in mucous membrane and dermal irritation if the exposure is via inhalation. Regardless of exposure route, the acute toxic signs are followed (within days to weeks) by chloroacne skin eruptions, hyperpigmentation of the skin, psychopathological changes and other disorders. Equivalent signs are seen with lower-level subacute to chronic exposure. Most experimental toxicologic study has centered on 2,3,7,8-tetrachloro-p-dibenzodioxin (2,3,7,8 TCDD), which has been demonstrated to be among the most potent animal toxins known. Animal data on 2,3,7,8 TCDD and other specific isomers of polychlorinated dibenzodioxins and dibenzofurans yield results comparable to human observations, with the exception of chloroacne. Other animal studies indicated that the compounds are potent teratogens, embryotoxins, and carcinogens, but these effects have not been unequivocally observed in man (EPA, 1985).

Polynuclear Aromatic Hydrocarbons (PAH): This is a large group of compounds grouped on the basis of chemical character (multiple aromatic rings). The toxic actions of the members of the class are not equivalent in either a qualitative or quantitative sense. PAH tend to have very low acute toxicity (IARC, 1983). The health effect of major concern for PAH is cancer following long-term exposure via any route, but this is a toxic property of only a portion of the chemical class. Cancer risk analysis is further complicated by variance in carcinogenesis. PAH will be subjected to risk analysis.

Beryllium: Beryllium produces toxic effects through all routes of exposure, however the major health hazard is through inhalation. Occupational exposure to beryllium produces lesions of the lungs, a chronic disease known as berylliosis. Inhalation of elemental beryllium and certain beryllium-containing compounds have been reported to cause cancer in animals. Carcinogenicity has not been demonstrated in man or animals exposed to beryllium by ingestion. The cancer risk of beryllium will address the inhalation route of exposure. (Metro Council, 1986).

Lead: Lead has toxic effects on the blood, gastrointestinal tract, central nervous system, and after prolonged exposure, the kidneys. Peripheral nerves are also affected by lead poisoning. Lead chromate is a suspected carcinogen, but the data are inadequate to make a positive determination. Lead may be absorbed via various routes.

Mercury: Exposure to mercury in most forms is associated with a high degree of toxicity. Acute exposures produce irritation of the respiratory and gastrointestinal tracts. Elemental metallic mercury causes behavioral effects and other nervous system damage. Inorganic mercury salts do not cross the blood/brain barrier but will produce kidney damage. Divalent mercury is substantially more toxic in this regard than the monovalent form. Organic mercury compounds reach the central nervous system easily, producing behavioral and motor changes. Organic mercury can cross the placental barrier and cause devastating and irreversible neurologic damage to the fetus. Therefore, mercury will be subjected to a detailed risk analysis.

Vanadium: The toxicity of vanadium is limited to pulmonary disfunction upon inhalation of vanadium pentoxide in concentrations well in excess of those which might be emitted at the facility (Stokinger, 1978). The metal will not be subjected to detailed risk assessment.

Manganese: Inhalation of manganese fume is associated with pulmonary and neurological effects, but the concentrations required are beyond those that would realistically be associated with the facility. Chronic inhalation exposure to low levels of manganese increase the prevalence of pneumonia and bronchitis without the effect on the nervous system (EPA, 1983). Ingestion exposure, except at high levels, is not associated with untoward effects, probably because the element is poorly absorbed by the gastrointestinal tract. Detailed risk analysis will be undertaken.

Tin: Tin is of relatively low toxicity. Although long term inhalation exposure to the metal is associated with pulmonary effects, the toxic concentrations are well beyond those that would realistically be associated with the facility (Stokinger, 1978). Thus, further risk analysis will not be performed.

Cadmium: Cadmium is associated with both acute and chronic toxicity. Acute doses by ingestion produce severe gastrointestinal signs including nausea, vomiting, salivation and diarrhea. Acute exposure due to inhalation is associated with pulmonary edema while longer-term exposures are associated with flu-like symptoms, and emphysema with fibrotic changes of lung tissue. By any route, cadmium affects the kidneys, blood, and possibly the cardiovascular, reproductive, and skeletal systems. Cadmium workers have been reported to be at risk of prostate and lung cancer. Because of these reports, the risk assessment for cadmium will be based on carcinogenic potency. No carcinogenic response to this compound has been observed with ingested doses (EPA, 1984), so inhalation exposure alone will be analyzed.

Chromium: Chromium dusts and chromic acid are extremely irritating and have produced conjunctivitis, bronchitis, and dermatitis in humans occupationally exposed. Kidney damage has been observed in experimental animals exposed to chromium salts. Chromium exists in three oxidation states (Cr+2, Cr+3, and Cr+6), as elemental chromium metal, or alloyed with other metals. Trivalent and hexavalent chromium are predominant. It is believed that hexavalent chromium compounds are substantially more toxic than trivalent compounds. There is good epidemiologic evidence that inhalation of Cr+6 may be carcinogenic. Carcinogenicity has not been demonstrated in man or animals exposed to chromium by routes other than inhalation. Thus, cancer risk analysis of chromium will only address the inhalation route of exposure (USEPA, 1984).

Copper: Copper is of relatively low toxic potency. Inhalation of copper fumes is associated with pulmonary effects, but the concentrations required are beyond those that would realistically be associated with the facility. Thus, further risk analysis was not performed.

Nickel: Nickel toxicity is dependent on the form of nickel and its route of exposure. Contact with nickel produces dermatitis. Additionally, a small proportion of the population exhibits nickel allergy which is presumably like other allergic reactions in not being

dose dependent. The toxicity of nickel by the oral route is low, partly because intestinal absorption of nickel is low. The main effect in oral ingestion appears to be gastric irritation. Inhalation but not ingestion of certain nickel compounds is associated with cancer of the respiratory tract. Common practice is to consider only inhalation exposures in an analysis of cancer risk. The inhalation pathway will be considered in this analysis as well.

Zinc: With the exception of some irritant salts ($ZnCl_2$), the metal is without toxicity unless inhaled in high doses as a fume. Because of its limited toxicity, and the fact that zinc is an essential nutrient at low levels, this element will not be subjected to detailed risk analysis.

Arsenic: Arsenic is an irritant of the skin, mucous membranes, and GI tract. Acute toxicity for ingestion results in vomiting, diarrhea, and cardiovascular effects. Acute exposure to airborne arsenic, adsorbed on particles, causes conjunctivitis and pharyngitis. Chronic inhalation of arsenic has been associated with pulmonary cancer in producers of arsenical pesticides and smelter workers. Some studies have associated increased cancer risk with high levels of arsenic in drinking water. Arsenic exists in more than one valence state, and it appears that Trivalent arsenic is more toxic than pentavalent arsenic, while metallic arsenic is only minimally toxic. Total arsenic is generally considered in risk assessments because analytical methods for speciation are difficult and the species associated with carcinogenesis has not been determined (USEPA, 1984a).

Selenium: Selenium dust is an irritant to mucous membranes and the lungs. Long term exposure by ingestion or inhalation in humans has been associated with lassitude, dermatitis, halitosis, poor teeth and nails, hair loss, and chronic gastrointestinal disease (Beliles, 1978). There is no compelling evidence that selenium is carcinogenic. As the doses producing toxic effect are well in excess of that realistically expected from the facility, and because selenium at low levels is an essential nutrient, further risk analysis will not be performed.

In summary, ten compounds or compound groups have been selected for risk analysis based on carcinogenicity. They are: arsenic, beryllium, cadmium, chromium, hexachlorobenzene, nickel, polychlorinated biphenyls, polychlorinated dibenzodioxins and dibenzofurans, carcinogenic polynuclear aromatic hydrocarbons, and trichlorophenols. Four other compounds were determined to be of concern. They are: pentachlorophenol, lead, manganese, and mercury. Copper, tin, selenium, vanadium, and zinc have been eliminated as emissions of concern due to the expected low emissions of these contaminants, as have certain members of the compound classes chlorinated benzenes, chlorinated phenols, and polynuclear aromatic hydrocarbons.

Potency slopes have been developed by the U.S. EPA for the potentially carcinogenic emissions identified above. The Acceptable Daily Intakes (ADI's) of compounds that are not thought to be carcinogenic have been calculated. The greater the potency slope for a compound the more toxic the compound is felt to be. Table 6.8-2 lists the compounds of interest and their associated potency slopes and ADI's. More information on ADI's may be found in the U.S. EPA report "Summary of Current and Acceptable Daily Intakes for Systematic Toxicants," May 1984. The Bay Area Resource Recovery Facility Project Application for Certification, Appendix J: Supplemental Environmental Information Health Risk Assessment, 1984, provides more details on the specific hazards of toxic pollutants. Some of the discussion previously provided in this sub-section was based on information provided in both of those reports.

TABLE 6.8-2
 POTENCY SLOPES AND ADI'S*

<u>Pollutant</u>	<u>Potency Slope</u> <u>(per mg/kg/day)</u>	<u>ADI</u> <u>(per mg/day)</u>
2,3,7,8-Tetrachlorodibenzodioxin (TCDD)	156,000	
Hexachlorobenzene	1.67	
Trichlorophenol	.0199	7.0
Total Polychlorinatedphenols (PCB's)	4.34	
Arsenic	15	
Beryllium	2.6	
Cadmium	6.1	UR
Chromium	41	0.15
Nickel	1.15	1.5
Polynuclear aromatic hydrocarbons (PAH) (as benzo(a)pyrene)	11.5	
Pentachlorophenol		2.1
Lead		UR*
Manganese		.74
Mercury		0.020

Source: USEPA, 1984, 1985

UR = Under Review

6.8.3 Literature Review

After having identified the potential toxicants which might be emitted by the facility, a comprehensive review of available literature on the subject of the amount of toxic emissions from municipal refuse incinerators was conducted in order to develop an extensive but representative data base on flue gas emissions. Data available for existing solid waste resource recovery facilities was compiled and included the most recent test results, specifically those for the Signal Resco facility in Peekskill, New York (Westchester Resco facility). In total, 35 facilities were identified as potential sources of data on the amount of flue gas emissions of dioxins and other compounds from municipal incinerators.

6.8.4 Emissions Data Base Development

From the initial literature review of the 35 facilities regarding the amount of rate of emissions from municipal incinerators, a data base on emissions was refined to include data representative of potential emissions from the proposed facility. The following four criteria were used in selecting from the 35 facilities, the data on emissions which would be included in the analyses. The selection criteria are:

Municipal Waste Incineration

All facilities included in the final data base burn exclusively municipal solid waste in some form. Facilities which burn other fuels such as coal, would obviously emit pollutants different from that for a waste burning facility; and would therefore not be applicable to the proposed project. Some form of energy recovery (i.e., steam or electricity production) should be included in the design of the facility, since the proposed facility will recover energy in the form of electricity.

Information Regarding Facility Operations

Combustion efficiency is a useful indicator to describe the results of the burning process. Although it has not been conclusively demonstrated that there is a one-to-one correlation between combustion efficiency and emissions of dioxins and furans, it appears that "in most cases the combustion efficiency has been high and emissions low." (Dioxins from Scandinavian Waste Combustion Plants, Thomas Oberg, Environmental Consultant at Studsvik AB, 5-611-82, NyKoping, Sweden 98s). This paper, and others, suggests that a relationship exists between increased temperatures and reduced dioxin and furan emissions.

Some information on the facility tested is essential to determine if the reported test results are valid. If operating data such as the age of a facility is not available, the emissions data would be excluded. For example, test data for a facility built and designed using 1950's technology would not be expected to operate as efficiently as a modern plant or an older plant which has been significantly modified to incorporate the most recent combustion technology. Plant operating data were obtained for location, incinerator type, capacity, and pollution control technology utilized.

The study previously mentioned by Oberg indicates that "Evidently flue gas emissions of chlorinated aromatics can be reduced both through improvements of combustion, as well as by different flue gas cleaning systems. A first step to reduce high emission should always be to improve combustion conditions since, such measures are the most effective" (Oberg, Op Cit, p.3). Efficiency is related to three operational parameters: time, temperature, and turbulence. Residence time and high temperatures result in a more complete burning of fuels as evidenced by reduced emissions of CO. The mixing of air exposes increased surface area thus allowing increased oxygen to react with otherwise unburnt fuels (Oberg).

The emissions tests referred to by Oberg were performed at two Swedish incinerators with results indicating a reduction in CO emissions from 1520 to 190 parts per million (ppm) with a consequent reduction in TCDD from 1500 nanograms per cubic meter (ng/m^3) to

26 ng/m³. At the Avesta facility CO was reduced from 100 ppm to 20 ppm and TCDD from 130 to 0.18 ng/m³. The evidence from this testing indicates that it is important to obtain information on facility operating conditions in order to develop an emissions data base representative of the proposed facility.

Pollution Control

Facilities included in the data base must have been equipped with some form of pollution control device. Journal articles have indicated that both Electro Static Precipitators (ESPs) and scrubber/baghouse pollution control devices can be effective in removing PCDD and PCDF emissions. An article entitled "Joy/Niro Spray Dryer Absorption Flue Gas Cleaning System" (J.R. Donnelly, Joy Manufacturing Company, Acid Gas Dioxin Control Conference, Wash. D.C. p.19 November, 1985), indicated that initial preliminary measurements suggest high removal efficiencies with dry scrubbers/baghouses for dioxins and furans. The proposed resource recovery facility is however, to only be equipped with a baghouse for particulate removal.

In a report prepared by Floyd Hasselries, P.E., "Refuse Combustion and Effects on Trace Organic Emissions," presented at the U.S. Conference of Mayors, Fifth Annual Resource Recovery Conference, March 19-21, 1986, it is suggested that well designed and optimally functioning incinerators operate with low CO emissions and subsequently low emissions of dioxins and furans. This article suggests that dioxin and furan emissions are a function of operating characteristics including: temperature, residence time, pollution control equipment, and maintenance procedures. The proposed facility will be equipped with a baghouse for pollution control. The facilities included in the emissions data base are equipped with ESPs which are also effective in removing particulates.

Data Quality Must be Verifiable

Each data set was examined in light of a number of quality control/quality assurance criteria in an effort to establish reliability. If the data could not be traced to the original emissions testing, they were not utilized in the data base. The data quality criteria in general conform to those adopted by the United States Environmental Protection Agency for use with state-of-the-art flue gas monitoring concerning sample location, sample duration and collection, instrument location, and method blanks to name only a few (Harris, 1983; EPA 1985).

6.8.5 Facilities Included in Emissions Data Base

Table 6.8-3 lists the 21 facilities which were selected from an initial 35 facilities and are to be included in the data base for development of an emissions rate for the proposed project. These 21 data points were selected from the initial data set of 35 facilities based on the selection criteria stated in subsection 6.8.4. The facilities selected are located in North America and Europe and met the primary selection criteria. Of that sample of acceptable data, four RDF facilities were included. Since the emissions from the RDF burning facilities varies for this small sample, but falls within the range of values for mass burn plants, they were included with all other incineration facilities. It is possible that waste composition (i.e., unprocessed MSW versus RDF) may affect dioxin and furan emissions, but there is no evidence of such an effect in the data.

A total of fourteen facilities were excluded from the initial data base. In particular, Data from six Italian facilities (included in the initial 35 facilities) were excluded from the final data base of 21 facilities for two reasons. The six Italian facilities were found to be older municipal incinerators which do not recover resources or energy through the production of steam or electricity. Rather, they merely burn garbage without any form of resource recovery (MPCA, 1986) or pollution control equipment. They thereby do not meet the selection criteria specified in Section 6.8.4 and thus were

Table 6.8-3: EMISSIONS DATA BASE USED IN DEIS

Country	Site	Run	PCDD EMISSIONS (ng/NM ³)							PCDF EMISSIONS (ng/NM ³)							TOTAL PCDD + PCDF		
			T3CDD	T4CDD	2,3,7,8 T4CDD	P5CDD	H6CDD*	H7CDD	O8CDD	P4 - P8 CDD	T3CDF	T4CDF	P5CDF	H6CDF	H7CDF	O8CDF		P4 - P8 CDF	
Average of All Published Data by Individual Facility																			
Mass Burn Facilities																			
	WESTCHESTER, N.Y.			2.11	0.21	2.11	2.00	4.10	6.57	17.76			22.20	12.95	13.39	7.70	0.28	56.60	74.36
	CHICAGO, N.W., ILL.		12.67	6.27	4.33		16.33	7.57	2.53	32.70	300.00	89.67		62.00	7.47	0.60	159.74	192.44	
	HAMPTON, VA.		46.00	309.25		900.30	659.75	493.25	128.50	2571.13	1992.40	1506.50	4300.80	886.25	534.63	37.13	7273.30	9844.50	
	USA, (MAYPORT)			3.57	1.67					3.57			21.03				21.03	24.60	
	MONTREAL, CANADA			0.06		0.06	0.09	0.10	0.19	0.50			0.12	0.10	0.06	0.04	0.03	0.37	0.87
	QUEBEC, CANADA			4.06		14.65	15.46	12.23	1.70	40.10			45.87	35.55	30.97	8.38	0.64	129.41	177.51
Refuse Derived Fuel Facilities																			
	SHARU, CANADA		760.00		* 34.5	713.85	686.15	290.46	229.23	2687.69			2560.77	2261.54	1063.00	193.85	53.85	6133.00	8020.77
	ALBANY, N.Y.			15.73	0.41	132.61	112.65	103.12	8.65	134.74			37.13	30.37	6.53	1.06	0.00	49.79	104.53
	DCC, CHEM., N.Y.			93.84	2.86	99.20	224.00	225.50	115.00	757.62			199.00	339.00	160.00	67.65	13.53	707.90	1545.60
	USA, (WPAFB)			30.00	9.60	0.00	0.00	0.00	0.00	30.00			312.00	0.00	0.00	0.00	0.00	312.00	342.00

AVERAGE OF ALL NORTH AMERICAN FACILITIES - ALL TECHNOLOGIES - BY FACILITY AVERAGE

Average =	122.49	1.91	194.29	171.73	114.43	49.24	620.30	229.24	479.51	690.04	223.83	02.00	10.61	1492.34	2120.72
Standard Deviation =	230.92	2.93	334.79	259.72	162.21	76.27	1023.04	594.49	817.16	1375.30	300.50	161.49	18.27	2627.02	3834.93
Maximum =	760.00	9.60	900.30	686.15	493.25	229.23	2687.69	1992.40	2560.77	4300.80	1063.00	534.63	53.85	7273.30	9844.50
Minimum =	0.06	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.12	0.00	0.00	0.00	0.00	0.37	0.87

* Estimate. MPCA, 1986

Table 6.8-3: (continued)

Country	Site	Run	PCDD EMISSIONS (ng/NM ³)								PCDF EMISSIONS (ng/NM ³)						TOTAL PCDD + PCDF	
			T3CDD	T4CDD	2,3,7,8 T4CDD	P5CDD	H6CDD	H7CDD	O8CDD	TOTAL PCDD	T3CDF	T4CDF	P5CDF	H6CDF	H7CDF	O8CDF		TOTAL PCDF
Average of all European Runs by Facility Average																		
Belgium	Beveren		3.6		6.5	35.0	87.5	125.0	257.6		16.0	33.0	35.0	47.5	40.0	171.5	429.1	
	Unknown		30.0	2.4	215.0	119.0	136.5	177.5	678.0		156.0	198.5	269.0	354.5	318.5	1296.5	1974.5	
Italy	Valmadrera		126.9		199.1	366.0	286.3	125.9	1104.1		309.0	250.3	314.2	215.1	123.8	1212.3	2316.4	
	Milan I		15.3	2.0	0.0	0.0	0.0	804.3	819.7		0.0	0.0	0.0	0.0	584.3	584.3	1404.0	
	Milan II		0.2	0.0	0.0	0.0	0.0	113.0	113.2		0.0	0.0	0.0	0.0	90.9	90.9	204.1	
	Busto		0.0	0.1	0.0	0.0	0.0	33.0	33.8		0.0	0.0	0.0	0.0	44.5	44.5	78.3	
	Desio		0.6	0.2	0.0	0.0	0.0	75.0	75.6		0.0	0.0	0.0	0.0	67.0	67.0	142.6	
Netherlands	Zaandstad		57.1		231.3	439.9	347.1	451.8	1527.2		161.1	271.6	528.4	293.0	67.6	1321.8	2849.0	
Sweden	Unknown		0	0.0	0.0	40.3	234.1	366.7	641.0		0.0	0.0	0.0	0.0	0.0	0.0	641.0	
	Avesta		65.09	0	225.6	0	0	0	290.7		226	310.5	0.0	0	0	536.5	827.2	
Switzerland	Zurich		4.0	0.2	11.0	24.9	24.1	49.1	113.1		22.3	27.3	18.7	12.4	8.2	88.9	202.0	
Average of all = European Runs By Facility			27.6	0.4	80.8	93.2	101.4	211.0	514.0		80.9	99.2	105.9	83.9	122.3	492.2	1006.2	
Standard Deviation =			38.6	0.8	103.8	150.6	124.7	229.7	464.3		106.8	122.8	172.8	128.9	169.2	514.7	980.0	
Maximum =			126.8023	2.385	231.25	439.8571	347.125	804.3333	1527.160		309	310.5	528.4285	354.5	584.3333	1321.839	2849	
Minimum =			0	0	0	0	0	0	0		0	0	0	0	0	0	0	
Average for all 21 facilities =																	1535	
Standard Deviation for all 21 facilities =																		2725

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TABLE 6.8-3

BIBLIOGRAPHY - SEE DETAILED CITATIONS PROVIDED AT END OF
HUMAN HEALTH SECTION

- 1) Westchester, NY - NYSDEC, 1986
- 2) Chicago, NW, IL - Haile, 1983
- 3) Hampton, VA - Haile, 1984
- 4) USA, Mayport - Higgins, 1982
- 5) Montreal, Canada - Environment Canada, 1984
- 6) Quebec, Canada - Environment Canada, 1981
- 7) SWARU, Canada - Canadian Ministry of Environment, 1984
- 8) Albany, NY - NYSDEC, 1985
- 9) Occidental Chemical, NY - NYSDEC, 1985
- 10) USA - Higgins, 1982
- 11) Beveren, Belgium - Janssons, 1981
- 12) Belgium - Defre, 1985
- 13) Valmadrera, Italy - Gizzi, 1982
- 14) Milan I, Italy - Cavallaro, 1982
- 15) Milan II, Italy - Cavallaro, 1982
- 16) Busto, Italy - Cavallaro, 1982
- 17) Desio, Italy - Cavallaro, 1982
- 18) Zaanstad, Netherlands - Olie, 1982
- 19) Sweden - Ahling, 1982
- 20) Avesta, Sweden - Oberg, 1985
- 21) Zurich, Switzerland - Swiss/EPA, 1982

excluded because they would not be representative of the proposed facilities operating conditions. The information available on the results of the testing of the Italian facilities was reported in Chemosphere. Vol.II. No.9, pp.859-856. 1982. Unfortunately, the article does not provide detailed information on the facilities. The data that are available indicate that these facilities are not representative of a modern resource recovery facility, and therefore, should be excluded from the data base. The specific 14 facilities excluded include: five German facilities; Italy 1 through 6; Sweden Eksjo; and two U.S. facilities. The Sweden Eksjo facility was excluded because it represents the fluidized bed technology which is not comparable to mass burn or RDF technology (MPCA, 1986). The two U.S. facilities excluded were one in Philadelphia and one in Arkansas of very limited capacity (less than 100 TPD). The German facilities were excluded due to a lack of comprehensive documentation regarding the testing.

The facilities utilized in the human health analysis and shown in Table 6.8-3 are equipped with high efficiency electrostatic precipitators (ESP) for particulate removal control. Only limited test results for dioxin emissions are currently becoming available for baghouse or scrubber/baghouse equipped facilities. Thus it was not possible to develop an emissions data base for facilities equipped with baghouses only (proposed facility is equipped with a baghouse).

High efficiency ESP's generally provide particulate removal efficiencies of between 95 and 99 percent. Baghouse fabric filters typically remove slightly more of the particulates than EPS's, although the differences are generally insignificant when high efficiency well maintained equipment is installed. Baghouse fabric filters operate by trapping particulates of certain sizes on the fabric filter. Dioxins in particulate phase and some gaseous components adhering to particulates are also trapped on the filter. Baghouses are however, not believed to be effective in controlling gaseous dioxin emissions. ESP's on the other hand trap particulates through an electro-static attraction. Dioxins in particulate phase would be collected. Dioxin in its gaseous phase would likely not be trapped. As Table 6.8-4 and Figure 6.8-1 show the particulate removal efficiencies for high efficiency baghouses and ESP's are similar.

TABLE 6.8-4
PARTICULATE REMOVAL EFFICIENCY

<u>Control</u>	<u>Removal Efficiency (in Percent)</u>		
	<u>.1 Microns¹</u>	<u>1.0 Microns</u>	<u>2 Microns</u>
Baghouse Fabric Filter	95	99	99+
High Efficiency ESP	95	97	98
Medium Efficiency ESP	65	90	90
Low Efficiency ESP	30	70	80

Removal Efficiency (in Percent)

Dry Scrubber/Baghouse or ESP	Particulates	SOx	NOx	CO	Lead	VOC	HCL	Unknown
High Efficiency ESP	95+	0	0	0	95+	0	0	Unknown
High Efficiency Baghouse	95+	0	0	0	95+	0	0	Unknown
Dry Scrubber/Baghouse or ESP	95+	70	0	0	95+	0	90	Unknown
Venturi Scrubber	90	70	0	0	90	0	90	Unknown

Source: Industrial Pollution, N. Irving Sox, 1980,
van nostrand Reinold Company

Source: ERT, 1986

Note 1: Assumes generalized control equipment. Removal efficiencies will vary depending on manufacture, operating conditions, maintenance, type of construction.

2: Combustion conditions believed to be effective in controlling emissions of all pollutants.

Note: A. particulate diameter

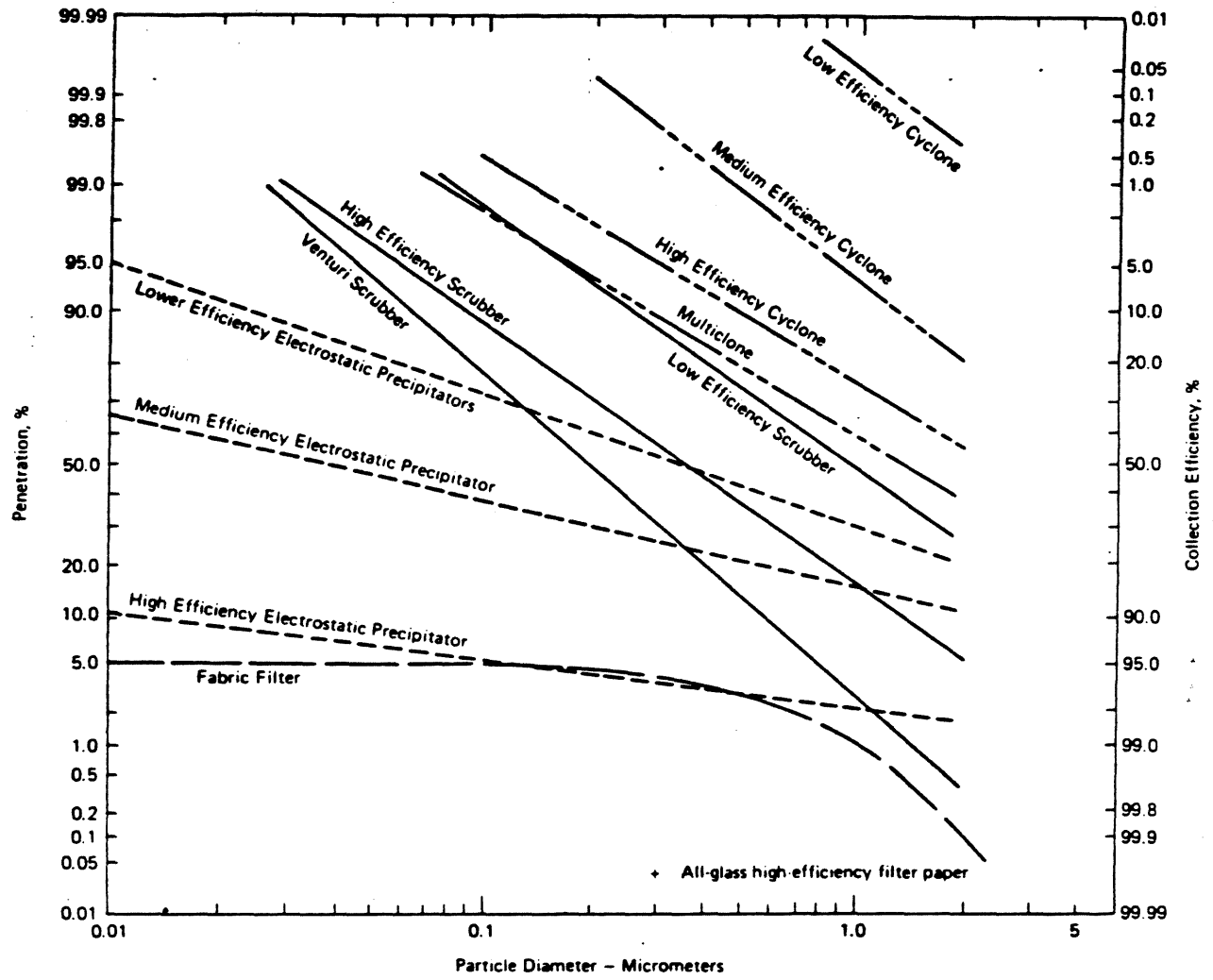


Figure 6.8-1 Particulate Removal Efficiencies

This table also shows that the dry scrubber/ESP or baghouse combination is most effective in removing pollutants. The removal of dioxin by pollution control equipment is, however, unknown. Certain researchers (Commoner, 1986) believe dioxin is formed either in or after pollution control equipment as a result of the combustion process. Thus control equipment may be ineffective in removing dioxin. As yet conclusive evidence regarding dioxin formation and removal is not available. It has been assumed in the analysis that the emissions data utilized in the DEIS for ESP controlled plants would not differ significantly from the emissions for a baghouse equipped facility such as the UPA power plant since both ESPs and baghouses are about equally effective in removing particulates.

6.8.6 Emission Rates

Emission projections for dioxins and furans and other organic compounds were calculated using the mass burn and RDF technology data base. An average emissions value was calculated based on an average for each facility analyzed. In addition, an emissions factor for the RDF facility which showed the highest emissions (SWARU) was calculated.

As Table 6.8-3 shows, six North American mass burn, four North American RDF, and eleven European facilities were included in the emissions data base. The average PCDD and PCDF emissions rate for the ten North American facilities was 2,120 ng/m³. In comparison the average PCDD & PCDF emissions rate for the eleven European Facilities was 1010 ng/m³ with a standard deviation of 980 ng/m³. The average emissions rate for the North American facilities is higher than for the European facilities. For all 21 North American and

European facilities combined, the average total PCDD & PCDF emissions rate was 1,535 ng/m³ with a standard deviation of 2,725 ng/m³. This average emissions rate of 1,535 ng/m³ for PCDD and PCDF was utilized in calculating health risk for the average expected case.

For comparative purposes and in order to evaluate the impact of excluding certain data, a detailed calculation of the unadjusted emissions of PCDD and PCDF for the initial 35 North American and European facilities (before selecting facilities which met the selection criteria specified in Section 6.8.4) was also undertaken. The 35 facilities included data for several Italian facilities (Italy 1-6) and others previously mentioned in Section 6.8-5. Fourteen of the 35 initial facilities for which emissions data were collected, were excluded from the DEIS due to a lack of sufficient data on facility operating characteristics. Inclusion of the entire 35 facilities results in a total PCDD and PCDF emissions rate of 1,580 ng/m³, with a standard deviation of about 2,900 ng/m³. In comparison, the average of 21 facilities used in this DEIS was 1,535 ng/m³.

6.8.7 Metals and Other Emissions

Municipal incinerators are also a source of emissions of metals and other organics. A review of the literature also provided data on emissions of metals from several incinerators. Table 6.8-5 shows the data base used for development of the emissions rates. The average emissions rates are shown as well as the standard deviation for all the facilities analyzed. An average emissions rate was utilized in the DEIS. A worst case emissions rate was also used in the DEIS based primarily upon the SWARU RDF facility, which has the highest emissions of the facilities included in the data base.

6.8.8 Tetrachloro dibenzo-p-dioxin (TCDD) Toxic Equivalence Factors (TEF) for Dioxin Exposures

After determining the likely emissions of dioxins and other pollutants for the proposed facility it was necessary to assess the likely potency of exposure to humans. The following subsection discusses the potential effects of dioxin exposure on humans.

Table 6.8-5: Metals and Other Emissions Data Base

Country	Site	Run	Chlorinated Benzene Emissions (ug/M*3)					Chlorinated Phenol Emissions (ug/M*3)					Chlorinated Biphenyl (PCB) Emissions (ug/M*3)							
			Di chloro benzene	Tri chloro benzene	tetra chloro benzene	penta chloro benzene	hexa chloro benzene	'total chloro benzene	di chloro phenol	tri chloro phenol	tetra chloro phenol	penta chloro phenol	total chloro phenol	mono chloro biphenyl	di chloro biphenyl	tri chloro biphenyl	tetra chloro biphenyl	penta chloro biphenyl	hexa chloro biphenyl	total chloro biphenyl
MASS BURN INCINERATORS																				
USA	Chicago Northwest	1	ND	0.438	0.79	ND	0.11	1.338	0.24	1.4	1.5	0.19	3.33	NA	0.0058	0.0076	0.0092	0.0023	NA	0.0249
		2	ND	0.457	0.63	ND	0.048	1.135	0.28	1.2	1.1	0.16	2.74	NA	0.006	0.0043	0.0015	0.001	NA	0.0128
		3	ND	1.17	ND	ND	0.26	1.43	0.63	1.9	1.7	0.43	4.66	NA	0.04	0.036	0.013	0.0045	NA	0.0935
USA	Hampton Virginia 1983	3	0.0032	0.361	1.985	4.745	1.435	8.529	NA	14.1	4.2	2.6	20.9	NA	0.002	0.83	0.431	0.017	0.004	1.284
		5	0.654	1.181	1.503	5.5	2.02	10.858	NA	73.4	31.5	9.5	114.4	NA	0.002	0.002	0.002	0.002	0.002	0.01
		7	4.41	19.06	28.66	39.41	11.33	102.87	NA	129.3	64.5	40.6	234.4	NA	0.002	0.051	0.075	0.002	0.048	0.258
USA	Hampton Virginia 1984	1												0.0005	0.071	0.0005	0.0005	0.056	0.0005	0.129
		2												0.18	0.7	0.13	0.025	0.001	0.013	1.049
		3												0.2	0.2	0.32	0.061	0.011	0.007	0.799
		4												0.23	0.52	0.081	0.018	0.019	0.026	0.894
		5												0.091	0.3	0.06	0.002	0.0005	0.0005	0.454

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Table 6.8-5: (Continued-2)

Chlorinated Biphenyl (PCB) Emissions (ug/M ³)											
Country	Site	Run	mono chloro biphenyl	di chloro biphenyl	tri chloro biphenyl	tetra chloro biphenyl	penta chloro biphenyl	hexa chloro biphenyl	total chloro biphenyl	REFERENCE	ENVIRONMENTAL CONTROL DEVICE
MASS BURN INCINERATORS											
USA	Chicago Northwest	1	NA	0.0058	0.0076	0.0092	0.0023	NA	0.0249	EPA Study [560/5-83-004] 1983	ESPs
		2	NA	0.006	0.0043	0.0015	0.001	NA	0.0128		
		3	NA	0.04	0.036	0.013	0.0045	NA	0.0935		
USA	Hampton Virginia 1983	3	NA	0.002	0.83	0.431	0.017	0.004	1.284	4	
		5	NA	0.002	0.002	0.002	0.002	0.002	0.01		
		7	NA	0.002	0.051	0.075	0.002	0.048	0.258		
USA	Hampton Virginia 1984	1	0.0005	0.071	0.0005	0.0005	0.056	0.0005	0.129	1	
		2	0.18	0.7	0.13	0.025	0.001	0.013	1.049		
		3	0.2	0.2	0.32	0.061	0.011	0.007	0.799		
		4	0.23	0.52	0.001	0.010	0.019	0.026	0.894		
		5	0.091	0.3	0.06	0.002	0.0005	0.0005	0.454		
Canada	Toronto Ontario	1							0.029	5	
		2							0.00		
		3							NA		
REFUSE DERIVED FUEL FACILITIES											
Canada	Hamilton Wentworth Ontario	1							0.182	Canada's Ministry of the Environment 1984	ESPs
		4							0.01		
		5							0.324		

Table 6.8-5: (Continued-3)

5

6	0.089
7	0.286
8	0.087
9	0.202
10	0.1
11	2.064
12	0.609
13	0.936
14	0.347
15	0.687

Average	0.063772	0.160072	0.1384	0.058018	0.017845	0.009181	0.408896
Count	11	11	11	11	11	11	27
Std Dev	0.009070	0.230085	0.235803	0.120337	0.025512	0.014432	0.485585

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Table 6.8-5: (Continued-4)

Country	Site	Run	METAL EMISSIONS (ug/g)													TOTAL	REFERENCE	ENVIRONMENTAL CONTROL DEVICE
			Ni	Cr	Cd	Be	As	Pb	Mn	Hg	Cu	Se	Sn	V	Zn			
MASS BURN INCINERATORS																		
USA	Alexandria Virginia	1	2.00E+02	4.90E+02	1.10E+03	NA	2.10E+02	9.70E+04	1.50E+03	NA	2.00E+03	2.30E+01	1.07E+04	NA	1.20E+05	2.33E+05	Greenberg 1978	SPRAY CHAMBER
USA	SMAC #1 Wash. D.C.	1	1.70E+02	8.70E+02	1.90E+03	NA	3.10E+02	7.70E+04	4.10E+02	NA	1.50E+03	3.90E+01	1.00E+04	NA	1.30E+05	2.23E+05	Greenberg 1978	CYCLONE & ESPs
USA	Nicosia Chicago	1	7.90E+01	1.05E+02	1.50E+03	NA	2.00E+02	6.90E+04	2.70E+02	NA	1.70E+03	4.90E+01	1.29E+04	NA	1.10E+05	1.96E+05	Greenberg 1978	SPRAY CHAMBER & SCRUBBING TOWER
USA	Braintree Braintree MA	1	NA	NA	2.14E+03	NA	1.42E+02	4.27E+04	NA	1.06E+02	1.15E+03	NA	NA	NA	NA	4.63E+04	Golembiewski 1979	ESP
		2	NA	NA	1.01E+03	NA	1.06E+02	3.60E+04	NA	1.60E+02	1.52E+03	NA	NA	NA	NA	3.96E+04		
		3	NA	NA	1.25E+03	NA	1.06E+02	6.36E+04	NA	9.73E+01	1.50E+03	NA	NA	NA	NA	6.66E+04		
Italy	Various	1	4.50E+02	1.10E+03	4.40E+02	NA	1.10E+02	1.00E+04	1.12E+03	3.50E+01	1.70E+03	1.20E+01	2.80E+03	7.70E+01	4.35E+04	6.13E+04	Gallorini 1981	ESP
Canada	Prince Is. Quebec	1	1.00E-01	1.80E-02	2.02E-01	NA	NA	1.65E+00	NA	0.54E-02	NA	NA	NA	NA	NA	2.06E+00	Canada 1985	EPS UNKNOWN
AVERAGE			1.12E+02	3.21E+02	1.17E+03	0.00E+00	1.50E+02	4.95E+04	4.13E+02	5.00E+01	1.30E+03	1.54E+01	4.65E+03	9.63E+00	5.04E+04	1.00E+05		
COUNT			0	0	0	0	0	0	0	0	0	0	0	0	0	0		
STD DEV			1.49E+02	4.10E+02	6.64E+02	0.00E+00	8.56E+01	3.12E+04	5.46E+02	6.00E+01	5.69E+02	1.04E+01	5.39E+03	2.55E+01	5.50E+04	8.71E+04		

REFUSE DERIVED FUEL FACILITIES

USA	OCC-EFW New York	1	3.84E-07	5.10E-07	1.30E-07	3.10E-09	1.05E-07	1.04E-06	7.56E-07	4.66E-07	NA	NA	NA	3.23E-06	9.96E-06	1.74E-05	NYSDEC 1986	TWO ESPs
USA	Sheridan Albany NY	1	1.50E-05	8.00E-05	1.47E-07	1.10E-09	7.17E-05	1.92E-06	1.54E-05	9.36E-06	NA	NA	NA	3.32E-07	1.26E-05	2.15E-04	NYSDEC 1984	TWO ESPs

Table 6.8-5: (Continued-5)

2	1.75E-05	2.99E-05	1.36E-07	5.84E-10	1.14E-04	8.76E-06	2.20E-06	6.24E-06	NA	NA	NA	1.23E-07	1.38E-05	1.92E-04
3	8.33E-06	1.07E-05	5.54E-08	NA	1.14E-04	2.16E-06	1.54E-06	1.06E-06	NA	NA	NA	4.37E-08	5.55E-06	1.43E-04
4	6.66E-06	7.38E-06	8.43E-08	NA	NA	5.76E-06	1.32E-07	NA	NA	NA	NA	4.42E-08	7.77E-06	2.70E-05
5	1.54E-05	1.97E-05	1.23E-07	NA	NA	5.76E-06	2.64E-06	NA	NA	NA	NA	8.50E-08	1.63E-05	6.00E-05
6	7.45E-05	1.06E-04	1.65E-07	NA	NA	3.10E-05	1.45E-05	NA	NA	NA	NA	3.78E-07	1.18E-05	2.38E-04

AVERAGE	1.98E-05	3.74E-05	1.21E-07	7.06E-10	4.29E-05	8.17E-06	5.31E-06	2.45E-06	0.00E+00	0.00E+00	0.00E+00	6.05E-07	1.10E-05	1.28E-04
COUNT	7	7	7	7	7	7	7	7	7	7	7	7	7	7
STD DEV	2.38E-05	3.89E-05	3.54E-08	1.09E-09	5.12E-05	9.61E-06	6.16E-06	3.51E-06	0.00E+00	0.00E+00	0.00E+00	1.08E-06	3.38E-06	8.53E-05

|||||

TOTAL AVERAGE, COUNT, AND STD DEV

AVERAGE	1.12E+02	3.21E+02	1.17E+03	7.06E-10	1.58E+02	4.95E+04	4.13E+02	5.00E+01	1.38E+03	1.54E+01	4.65E+03	9.63E+00	5.04E+04	1.08E+05
COUNT	15	15	15	15	15	15	15	15	15	15	15	15	15	15
STD DEV	ERR	ERR	7.58E+02	ERR	ERR	3.36E+04	ERR	ERR	ERR	ERR	ERR	ERR	ERR	8.34E+04

Table 6.8-5: (Continued-6)

COUNTRY	SITE	RUN	POLY AROMATIC HYDROCARBONS (ug/m ³)												TOTAL	REFERENCE
			Phenanthrene	Fluoranthene	Pyrene	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Chrysene	Benzo(k)fluoranthene	Benzo(a)Pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene		
MASS BURN INCINERATORS																
USA	Chicago Northwest 1982	1	2.00E-01	3.90E-02	9.20E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.31E-01	Haile 1983
		2	1.10E-01	2.70E-02	9.10E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.28E-01	
		3	3.40E-01	5.10E-02	7.70E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.68E-01	
USA	Hampton Virginia 1984	1	1.50E+02	1.10E+02	1.20E+02	6.40E+02	2.20E+02	3.00E-01	1.30E+01	7.70E+00	9.90E+01	7.40E+00	0.00E+00	4.30E+00	1.37E+03	Haile 1984
		2	2.20E+02	1.60E+02	2.30E+02	4.00E+02	2.50E+02	3.00E+00	1.40E+01	1.20E+01	1.60E+01	1.20E+01	0.00E+00	0.00E+00	1.40E+03	
		3	1.30E+02	7.00E+01	8.40E+01	3.00E+02	1.20E+02	1.70E+00	8.00E+00	7.00E+00	8.60E+00	5.90E+00	0.00E+00	1.30E+00	8.25E+02	
		4	2.50E+02	1.30E+02	1.60E+02	1.04E+03	3.30E+02	5.70E+00	2.40E+01	1.70E+01	2.30E+01	1.40E+01	0.00E+00	0.00E+00	1.99E+03	
		5	2.00E+02	1.30E+02	1.40E+02	5.60E+02	1.80E+02	2.40E+00	1.50E+01	2.60E+01	2.70E+01	1.90E+01	1.40E-01	2.50E+01	1.32E+03	
		AVERAGE	1.19E+02	7.60E+01	9.18E+01	3.88E+02	1.38E+02	1.64E+00	9.35E+00	8.71E+00	2.17E+01	7.29E+00	1.75E-02	3.83E+00	8.64E+02	
		COUNT	8	8	8	8	8	8	8	8	8	8	8	8	8	
STD DEV	9.83E+01	6.26E+01	8.07E+01	3.50E+02	1.20E+02	1.90E+00	8.25E+00	8.73E+00	3.09E+01	6.76E+00	4.63E-02	8.13E+00	7.31E+02			
REFUSE DERIVED FUEL FACILITIES																
USA	Sheridan Ave Albany NY (Answers) 1984	1	NA	NA	NA	NA	NA	NA	NA	2.35E+00	NA	1.11E+00	NA	NA	3.46E+00	NYSDEC 1985
		2	NA	NA	NA	NA	NA	NA	NA	3.96E-01	NA	2.50E-02	NA	NA	4.21E-01	
		3	NA	NA	NA	NA	NA	NA	NA	1.92E-01	NA	5.00E-02	NA	NA	2.42E-01	
		4	NA	NA	NA	NA	NA	NA	NA	4.57E-01	NA	1.31E-01	NA	NA	5.88E-01	

Table 6.8-5: (Continued-7)

	5	NA	NA	NA	NA	NA	NA	NA	7.83E-01	NA	1.66E+00	NA	NA	2.44E+00
	6	NA	NA	NA	NA	NA	NA	NA	2.53E-01	NA	5.86E-01	NA	NA	8.39E-01
	AVERAGE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.39E-01	0.00E+00	5.94E-01	0.00E+00	0.00E+00	1.33E+00
	COUNT	6	6	6	6	6	6	6	6	6	6	6	6	6
	STD DEV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.45E-01	0.00E+00	6.11E-01	0.00E+00	0.00E+00	1.20E+00
TOTAL	AVERAGE	6.87E+01	4.39E+01	5.33E+01	2.26E+02	7.99E+01	9.78E-01	5.44E+00	5.39E+00	1.33E+01	4.47E+00	1.20E-02	2.50E+00	5.01E+02
TOTAL	COUNT	14	14	14	14	14	14	14	14	14	14	14	14	14
TOTAL	STD DEV	8.87E+01	5.66E+01	7.12E+01	3.05E+02	1.06E+02	1.54E+00	7.26E+00	7.21E+00	2.40E+01	5.71E+00	3.40E-02	6.04E+00	6.53E+02

Table 6.8-5: (Continued-8)

Country	Site	Run	Chlorinated Benzene Emissions (ug/M ³)						total chloro benzene	REFERENCE	ENVIRONMENTAL CONTROL DEVICE
			Di chloro benzene	Tri chloro benzene	tetra chloro benzene	penta chloro benzene	hexa chloro benzene				
MASS BURN INCINERATORS											
USA	Chicago Northwest	1	NA	0.438	0.79	NA	0.11	1.338	EPA Study [560/5-83-004] 1983	ESPs	
		2	NA	0.457	0.63	NA	0.048	1.135			
		3	NA	1.17	NA	NA	0.26	1.43			
USA	Hampton Virginia 1983	3	0.0032	0.361	1.985	4.745	1.435	8.529	4		
		5	0.654	1.181	1.503	5.5	2.02	10.858			
		7	4.41	19.06	28.66	39.41	11.33	102.87			
USA	Hampton Virginia 1984	1									
		2									
		3									
		4									
		5									
Canada	Toronto Ontario	1	NA	0.649	1.88	1.1	0.33	3.959	5		
		2	NA	0.377	0.111	0.222	0.235	0.945			
		3	NA	0.651	2.19	2.19	0.574	5.605			
REFUSE DERIVED FUEL FACILITIES											
Canada	Hamilton	1						54	Canada's Ministry of the	ESPs	
	Ontario	4					24.3				

6-31

Table 6.8-5: (Continued-9)

	Environment 7.7 1984
5	
6	38.7
7	76.5
8	31
9	52.8
10	22.3
11	47.5
12	34.5
13	102.5
14	42.4
15	26.3

Average 1.689866 2.704888 4.194333 8.861166 1.815777 31.32586
 Count 9 9 9 9 9 22
 Std Dev 1.375293 5.790006 8.683488 12.00873 3.422323 30.36596

Table 6.8-5: (Continued-10)

Chlorinated Phenol Emissions (ug/M ³)									
Country	Site	Run	di chloro phenol	tri chloro phenol	tetra chloro phenol	penta chloro phenol	total chloro phenol	REFERENCE	ENVIRONMENTAL CONTROL DEVICE
MASS BURN INCINERATORS									
USA	Chicago Northwest	1	0.24	1.4	1.5	0.19	3.33	EPA Study (560/5-83-004) 1983	ESPs
		2	0.28	1.2	1.1	0.16	2.74		
		3	0.63	1.9	1.7	0.43	4.66		
USA	Hampton Virginia 1983	3	NA	14.1	4.2	2.6	20.9	4	
		5	NA	73.4	31.5	9.5	114.4		
		7	NA	129.3	64.5	40.6	234.4		
USA	Hampton Virginia 1984	1							
		2							
		3							
		4							
		5							
Canada	Toronto Ontario	1	NA	4.2	2.8	1.5	8.5	5	
		2	NA	1.9	1.8	1.5	5.2		
		3	NA	0.53	2.2	1.1	3.83		
REFUSE DERIVED FUEL FACILITIES									
Canada	Hamilton Wentworth Ontario	1					41.7	Canada's Ministry of the Environment	ESPs
		4					23		

6-33

Table 6.8-5: (Continued-11)

5	72	1984
6	36.6	
7	48	
8	39.7	
9	83.6	
10	74.9	
11	32.2	
12	96.5	
13	102.5	
14	4.8	
15	85.9	

AVERAGE 0.127777 25.32555 12.36666 6.397777 51.78909

COUNT 9 9 9 9 22

STD DEV 0.207084 42.89644 20.59126 12.39597 53.57368

TABLE 6.8-5
BIBLIOGRAPHY

- 1) Chicago Northwest, IL - EPA, 1983, Haile, 1983
- 2) Hampton, Virginia - Haile, 1984
- 3) Toronto, Canada - Environment Canada, 1981
- 4) Hamilton/Wentworth, Canada - Canadian Ministry of Environment, 1984
- 5) Alexandria, VA - Greenberg, 1978
- 6) SWRC #1, DC - Greenberg, 1978
- 7) Nicosia, Chicago - Greenberg, 1978
- 8) Braintree, MA - Golembiewski, 1979
- 9) Italy - Gallorini, 1981
- 10) Prince Edward Island, Canada - Canada, 1985
- 11) Occidental, New York - NYSDEC, 1985 & 1986
- 12) Sheridan, Albany, NY (Answers) - NYSDEC, 1984, 1985

Dioxin and furan exposure has become one of the primary interests in assessing the health risks related to resource recovery facilities. In 1977, the discovery of PCDD adsorbed on precipitated fly ash and in flue gas samples from waste combustion, was reported (Olie and Hutzinger, Recent Developments in Mass Spectrometry in Biochemistry and Medicine, Vol. 1, Plenum Publishing Company, New York, 1978). Later other individuals confirmed these findings and reported the occurrence of PCDFs.

Dioxin is a generic name given to a large number of isomers of chlorinated compounds with a similar general molecular structure. These several compounds exhibit different degrees of toxicity. Given the large number of dioxins and furans, the concept of a toxic equivalence factor (TEF) was developed in order to make it possible to estimate the carcinogenic potential of those dioxins and furans for which no conclusive carcinogenic data exists.

Different groups have proposed at least six methods for the determination of TEFs which provide an estimate of the toxicity of the different dioxin and furan isomers. Three methods have been utilized in this DEIS. These include the U.S. EPA Chlorinated Dioxins Work Group method of November 1985, the Swiss EPA approach and the California method. These three approaches represent the methods which would give the range of estimates of the toxic equivalency of the various congeners of dioxin and furan. Table 6.8-6 shows the factors for each of these methods.

- U.S. EPA 1985 - The U.S. EPA method used the relative potencies of 2,3,7,8 tetrachloro dibenzo-p-dioxin (TCDD) and 2,3,7,8 hexachloro dibenzo-p-dioxin (HXCDD) obtained from carcinogenic studies as well as a variety of other toxicity end points for other dibenzo-dioxin and dibenzo furan isomers. The method limits the resolution in interpreting the data to generally orders of magnitude.

TABLE 6.8-6
TCDD EQUIVALENCE FACTORS

	<u>U.S. EPA 11/85</u>	<u>Swiss EPA</u>	<u>California</u>
2,3,7,8 TCDD	1	1	1
Other TCDD	0.01	0.001	0.00
2,3,7,8 PeCDD	0.5	0.1	1.0
Other PeCDD	0.005	0.1	0
2,3,7,8 HxCDD	0.04	0.1	0.03
Other HxCDD	0.004	0.1	0
2,3,7,8 HpCDD	0.001	0.01	0.03
Other HpCDD	0.00001	0.01	0
2,3,7,8 TCDF	0.1	0.1	1.0
Other TCDF	0.001	0.1	0
2,3,7,8 PeCDF	0.1	0.1	1.0
Other PeCDF	0.001	0.1	0
2,3,7,8 HxCDF	0.01	0.1	0.03
Other HxCDF	0.001	0.1	0
2,3,7,8 HpCDF	0.001	0.01	0.03
Other HpCDF	<u>0.00001</u>	<u>0.01</u>	<u>0</u>
Total	1.77	2.05	4.12

Source: MPCA, 1986, USEPA, 1985, CARB, 1984, California, Dec. 1985

- o Swiss EPA - The Swiss EPA uses data from AHH enzyme induction studies to determine relative potencies. This method assumes equal potencies for all isomers of a given group.

- o California - The California Department of Health Services recently published a report outlining their criteria for determining TEFs. The method uses carcinogenic potencies of 2,3,7,8 TCDD and 2,3,7,8 HXCDD which were obtained from carcinogenic bioassays. It assumes zero potency for isomers not chlorinated in the four lateral 2,3,7,8 positions.

The toxic equivalency factors (TEF) are utilized to combine the toxicity of the various dioxin isomers into a single toxicity value for the 2, 3, 7, 8 TCDD isomer for which concinogenic dose response data are available. The TEF's therefore convert the carcinogenic toxicity of all TCDD isomers into a single value for 2, 3, 7, 8 TCDD which is then multiplied by a potency slope factor to arrive at the expected increased cancer risk from exposure to dioxin.

6.8.9 Dose Response

The use of the TEFs allows for the calculation of the potency or toxicity of the various dioxin and furan isomers. The toxic equivalency can then be utilized in a formal risk assessment. Humans respond to exposure to toxic compounds in a manner dependent upon their sensitivity to the compound. The U.S. EPA Cancer Assessment Group (CAG) has estimated the upper bound (95 percent confidence by a Chi square goodness of fit method) slope of a specialized dose response model for approximately 50 carcinogens. The dose response model approximates the likely effect (response) of (a dose) exposure in humans to these carcinogens. The magnitude of health risks can be calculated from the potency slopes. Cancer risk is the product of the potency slope times the calculated lifetime daily dose.

Implicit in the CAG model is the assumption that there is no threshold for carcinogenic response. The magnitude of risk can be calculated from the "potency slopes." There is no absolutely safe

dose which can be compared to exposure levels. The model allows for an estimate of the increased potential for disease from a given exposure to a carcinogen.

CAG potency slopes were used here to calculate risk. Cancer risk is the product of the potency slope times the calculated lifetime daily dose. Because of the small number of potency slopes available, certain assumptions were made to estimate cancer risk for all potential emissions at the proposed facility:

- (a) Total trichlorophenols were used with a potency slope generated specifically for 2,4,6-trichlorophenol.
- (b) Total PCBs were used with a potency slope generated for a specific PCB mixture, Aroclor 1254.
- (c) Of the 12 PAH compounds judged to have potential for emission from the facility, only 4 are known or suspected carcinogens. Non-carcinogenic PAH was eliminated from assessment and the total of carcinogenic PAH was used with a potency slope generated for benzo(a)pyrene.
- (d) Assumptions outlined by the Chlorinated Dioxins Work Group (US EPA 1985) were used to calculate 2,3,7,8 TCDD "equivalents" from doses of other polychlorinated dibenzodioxins and dibenzofurans. A further assumption was that all positional isomers of polychlorinated compounds have equal likelihood of forming. Thus, the proportion of the total chlorinated dibenzodioxin or dibenzofuran class which is chlorinated at positions 2,3,7 and 8 can be calculated. This is necessary because the potency of 2,3,7,8 substituted compounds is much higher than other members of each class. The Work Group equivalence factors (potency factors) and proportions of 2,3,7,8 substitution are shown in Table 6.8-7.

Other Long Term Effects

Four non-carcinogenic compounds were also identified which are of concern because of their effects on human health. Acceptable daily intakes (ADI) were calculated for pentachlorophenol, lead, manganese and mercury. The ADI is the concentration below which no adverse health effect would be expected.

TABLE 6.8-7
2,3,7,8 TCDD EQUIVALENCE FACTORS (USEPA)

<u>Compound</u>	<u>2,3,7,8 Isomer</u>		<u>Other Positional Isomers</u>	
	<u>Proportion</u>	<u>Potency Factor</u>	<u>Proportion</u>	<u>Potency Factor</u>
TCDD	0	1	1	0.01
2,3,7,8-TCDD	1	1	0	0
PCDD	0.071	0.5	0.929	0.005
HxCDD	0.30	0.04	0.70	0.004
HpCDD	0.50	0.001	0.50	0.00001
TCDF	0.026	0.1	0.974	0.001
PCDF	0.072	0.1	0.928	0.001
HxCDF	0.252	0.01	0.748	0.0001
HpCDF	0.50	0.001	0.50	0.00001

Source: USEPA, 1985
Barnes, 1985

ADIs for the four non-carcinogenic compounds are as follows:

- (a) Pentachlorophenol: The U.S. EPA (1980) has reviewed animal studies indicating that ingestion of pentachlorophenol may be fetotoxic. The EPA calculated that limitation of pentachlorophenol exposure to 0.03 mg/kg/day would protect humans from this potential toxic compound. This value will be used as an ADI in the present risk assessment:

Pentachlorophenol ADI = 0.03 mg/kg day.

- (b) Lead: The acceptable daily intake for lead must be set to prevent further effects rather than prevent toxicity. The average blood lead level of an urban dweller in the U.S. is nearly 17 $\mu\text{g}/\text{dl}$ (EPA, 1985). This blood level has been associated with subtle effects on enzymes and nervous system function. Thus, while overt clinical signs of lead poisoning are not prevalent in the population at large, little room has been left for safety. For the purpose of this risk assessment, it is proposed that a lead dose which produces no more than a 1% increase in blood lead be set as the ADI. Extensive study has been made of the relation of lead intake to increase in blood lead levels. The EPA has calculated that 1 $\mu\text{g}/\text{m}^3$ increase in air lead concentration produces a 1.7 $\mu\text{g}/\text{dl}$ increase in blood lead. Similar comparisons have been made to have a shallower slope. To be conservative, this risk analysis will use the air calculations. Presuming the relation is linear, one would expect 0.17 $\mu\text{g}/\text{dl}$ increase in blood lead from 0.1 $\mu\text{g}/\text{m}^3$. This would represent an increase of 1% over the average human blood lead level. Applying standard breathing volume and weight assumptions to this concentration yields an intake of: (Hennepin County FEIS, 1986 Metropolitan Council)

$$\begin{aligned} \text{Lead ADI} &= 0.1 \mu\text{g}/\text{m}^3 \times 20 \text{ m}^3/\text{day} \times 1/70 \text{ kg body weight} \\ &= 2.8 \text{ E-2 } \mu\text{g}/\text{kg}/\text{day} = 2.8 \text{ E-5 mg}/\text{kg}/\text{day}. \end{aligned}$$

- (c) Manganese: Several reports indicate that chronic low-level inhalation exposure to manganese is associated with chronic bronchitis, increased sensitivity to infection, and other subtle pulmonary effects (see review in U.S. EPA, 1983). These appear to be the effects which occur at the lowest dose. On the basis of animal dose response experiments where the same toxic effect was observed, the U.S. EPA (1983) calculated adjusted human equivalent exposure levels (HEELs) of 5-57 $\mu\text{g}/\text{m}^3$. These values will be used for the calculation of acceptable daily intake (Hennepin County FEIS Metropolitan Council, 1986).

$$\begin{aligned} \text{ADI} &= 37 \mu\text{g}/\text{m}^3 \times 20 \text{ m}^3/\text{day} \times 1/70 \text{ kg} \times 1/1000 \\ &= 1.05 \text{ E-2 mg}/\text{kg}/\text{day}. \end{aligned}$$

- (d) Mercury: Because mercury types are known to intraconvert as the result of chemical and biological actions in air and soil, a conservative approach in determining dose-response is to choose the most toxic species of the element. Methylmercury appears to be that species (U.S. EPA, 1984). Extensive study has been made of the toxic effects of this compound in humans. The effect occurring at the lowest dose seems to be paresthesia. This toxic effect is noticed in approximately 8% of people receiving 3 ug methylmercury/kg body weight/day. For a dose of approximately .07 $\mu\text{g}/\text{kg}/\text{day}$, the response drops to 0.3% of the population. This is for practical purposes the threshold dose. For this risk assessment, a value ten-fold lower than the practical threshold will be used as an acceptable daily intake (Hennepin County FEIS, Metropolitan Council, 1986).

$$\begin{aligned}\text{Mercury ADI} &= 0.7 \text{ } \mu\text{g/kg/day} \times 1/10 = 0.07 \text{ } \mu\text{g/kg day} \\ &= 7.0 \times 10^{-4} \text{ mg/kg day.}\end{aligned}$$

6.8.10 Exposure Assessment

The three main exposure routes by which a person can be affected by the proposed facility's emissions and which are typically addressed in risk assessments for the pollutants considered are: inhalation, dermal exposure from contaminated soil, and ingestion of soil. The purpose of the exposure portion of the assessment is to determine a dose of pollutant, usually calculated as an average lifetime daily dose, which might reasonably be attained by an individual residing near the facility. The exposure was calculated based on a lifetime exposure of 70 years. It should be noted that the risk assessment assumes that an individual would be located at the point of maximum exposure continuously for a period of 70 years. The half life of 2,3,7,8 TCDD equivalents has been assumed to be 12 years in soil.

Inhalation

Inhalation exposure from facility emissions was estimated for the maximally exposed receptor (the receptor with the highest ambient concentration of pollutants) by noting the ambient air concentrations of pollutants based on the dispersion modelling undertaken in Section 6.1 (in $\mu\text{g}/\text{m}^3$) and assuming a 70 kg human, breathing 20 m^3 (moderate exercise) of air per day (Metropolitan Council, 1986). The daily lifetime air intake of pollutant in mg/kg/day was thereby calculated. It was assumed that the entire dose is respirable. The daily air intake (mg/kg/day) was calculated from the following equation.

$$\begin{aligned}\text{Ambient air concentration } (\mu\text{g}/\text{m}^3) \times 20\text{m}^3/\text{day} \times 1/70 \text{ kg} \times \\ 1/1000 \text{ mg}/\mu\text{g} = \text{daily dose air (mg/kg/day)}.\end{aligned}$$

The assessment of cancer risk from exposure using USEPA potency slopes requires input of a lifetime average daily dose. It must be noted that this is a daily dose not a lifetime daily dose. The cancer risk assessment using the EPA CAG method requires input of a lifetime daily dose. Risk is not linearly related to either length of exposure or the period in an individual's life when the exposure takes place (Crump and Howe, 1984). Doses early in life it is argued, are more important than those experienced later. Thus, the worst case most conservative situation for portion-of-lifetime exposure in the case of the facility would be inhalation exposure in the first 20 or so years of life (this is identical to the scenario which was chosen to maximize dose). This results in a risk assessment which provides an estimate of the health effects on the most sensitive populations (i.e., children).

Using Crump and Howe's model for this situation, it can be calculated that exposure to a carcinogen at some concentration, C, for the first 20 years of life yields a cancer risk equivalent to a lifetime exposure at concentration 0.95C. (Contrast this to an expected risk equivalent to exposure of 20/70 C for a lifetime, if the relation were linear over time.) The cancer risk assessment therefore used a lifetime daily dose which was equal to 0.95 times the daily dose calculated by Equation 1, or Equation 1 x .95 = Air Dose (mg/kg/day).

The calculation of the health risk of cancer in this section is based on the greater potency of doses early in life. The health risk assessment presented is conservative based on the calculations in the section. It assumes that exposure during the first twenty years of life is equivalent to 95 percent of a lifetime exposure of 70 years.

The equivalent toxicity of the air dose per day of 2, 3, 7, 8 TCDD for all dioxin and furan isomers was calculated using three methods; the USEPA, the Swiss EPA, and the California method. A risk assessment was provided for each of the three methods.

Ingestion

Humans may be exposed to emissions from the facility by ingestion of soil into which pollutants are deposited. For the purpose of this risk assessment, the quantity of 100 mg/day of soil based on Hart 1984 was assumed to be ingested. This takes into account the increased incidence of soil ingestion in young children. It was assumed that the exposure between house dusts and outdoor soils is not significantly different, although it has been reported that indoor dust is likely to have a lower concentration of PCDD/PCDF than outdoor soils due for example to the effect of closed windows. (Bay Area Resource Recovery Project, Combustion Engineering, P.4-26).

Potential emissions from the facility would be continuous so that individuals would be exposed to progressively higher concentrations in soils and dusts as the result of deposition during the operating life of the plant. After the plant is no longer operational, an individual would be exposed to a constant concentration of dioxin in soil. Dioxins have been observed however, to degrade through biodegradation as well as photodegradation. Studies in Sweden among others indicate that the half life of 2,3,7,8-TCDD in the ground is about 10 to 12 years (Memo on Dioxin Emissions From Waste Combustion, Swedish EPA, Technical Department, Disposal and Recycling Unit, February 11, 1985). Therefore, some reduction in soil exposure over time due to dioxin degradation would be observed.

The following assumptions in calculating the health risk from soil ingestion were made in the DEIS analysis: all of a pollutant is adsorbed to particles; PCDD/PCDF has a half life of 12 years, a deposition rate of 1.0 cm/sec (McMahon and Denison, 1979), was used; soil density is 1.6 g/cm³; and an average individual weighs 70 kg. The concentration was calculated by assuming an increase in concentration followed by an appropriate adjustment for the 12 year half life of 2, 3, 7, 8-TCDD equivalents in soil.

The soil concentration assuming a 12-year half life has been calculated below. Investigators have observed significant rates of environmental degradation of dioxins and furans. The half life figure

felt reasonable by investigators for those compounds is 12 years (Kimbrough, 1984) and is included in the analysis below. The average soil concentration for the dioxins and furans would be equal to:

$$\frac{\sum_{i=1}^{20} X_i + \int_0^{50} e^{(X_{20}-0.0058t)} dt}{70}$$

$$X_i = (X_{i-1})^{.942} + C$$

C = annual soil deposition rate of pollutant

X_{20} = Soil concentration of pollutant at year 20 (first 20 years of life assumed most critical period of exposure)

t = years

The integration of this function gives the value of 0.10 times the soil concentration for the constant soil accumulation rate discussed above. In effect, due to the use of a half life of 12 years, the dioxin concentration in soil is ten percent of that deposited and accumulated in the soil. Soil concentration for dioxin and furans can be calculated as: deposition (864 m/day) x pollutant air concentration ($\mu\text{g}/\text{m}^3$) = $\mu\text{g}/\text{m}^2$ day pollutant accumulation. Pollutant accumulation may be converted to units of mg pollutant/kg soil/day assuming $1.6 \text{ g}/\text{cm}^3$.

In addition to the traditionally accepted risk analysis for inhalation and ingestion of pollutants, some potential risk is likely from dermal exposure (contact with skin). The dermal dose is based on the same assumptions and methodology as for soil ingestion except that it is assumed that the average daily contact with soil is 0.27 grams per day and the absorption rate of all organics through the skin is one percent of the organics present (Kimbrough, 1984).

Dermal

The potential for risk from dermal exposure exists (contact with skin). The dermal dose is based on the same assumptions and methodology as for soil ingestion except that it is assumed that the average daily contact with soil is 0.27 grams per day and the absorption rate of all organics through the skin is one percent of the organics present (Kimbrough, 1984). Table 6.8-20 provides the results of the risk assessment from dermal contact for a 1500 TPD facility based upon the average operating scenario emission rates previously discussed. As this table shows, the overall cancer risk due to the project is not significantly increased by inclusion of the risk from dermal exposure to carcinogens. If the dermal risk were added to the calculated risk from inhalation and ingestion for the maximally exposed individual (1500 TPD facility), the total cancer risk from the project as shown in Table 6.8-22 would be $3.12 \text{ E-}6$ using the USEPA TEF; $2.52 \text{ E-}5$ using the Swiss EPA; and $1.21 \text{ E-}5$ using the California method. These values may be compared to the risk from inhalation and ingestion shown in Table 6.8-23, and it may be concluded that there is not a significant change in risk due to inclusion of dermal exposure.

Similarly, Table 6.8-21 provides the results of the risk assessment from dermal contact for the 1500 TPD facility based upon the worst case operating scenario SWARU emissions. As the table shows the overall cancer risk is not significantly increased by inclusion of the risk of cancer from dermal exposure to carcinogens. If the dermal risk were included along with inhalation and ingestion for the maximally exposed individual (1500 TPD), the total cancer risk from the project as shown in Table 6.8-23 would be: $2.31 \text{ E-}5$ using U.S. EPA TEF's; $1.71 \text{ E-}4$ using SWISS EPA and $7.86 \text{ E-}5$ using California. These values can be compared to the cancer risk for inhalation and ingestion shown in Table 6.822 to show that there is no significant increase in risk by including dermal exposure.

6.8.11 Results of Risk Assessment for Maximally Exposed Individual

The risk assessment was undertaken utilizing three different toxic equivalency factors (TEFs) for estimating the equivalent amount of 2, 3, 7, 8-TCDD emitted. The three methods were previously described as: the USEPA, the Swiss EPA, and the California method. Results are presented for all three cases.

The risk assessment was also calculated for two distinct potential operating scenarios. One scenario is representative of facilities emissions based on an average emissions rate for 21 North American and European facilities (the average case). The second scenario represents worst case facility emissions based on an emissions rate for the SWARU RDF facility in Canada. The total PCDD and PCDF emissions from the SWARU facility were 8,820 ng/m³. The next highest emissions rate for an RDF facility as previously shown in Table 6.8-3 is 1,545 ng/m³ for an Occidental Chemical RDF plant in New York. As can be seen in that table, the emissions for the SWARU plant are significantly above the average.

USEPA TEF Method - 1500 TPD Facility

Tables 6.8-8 and 6.8-9 provide the results of the calculation of the 2,3,7,8 TCDD toxic equivalents for the average and worst-case operating scenarios using the USEPA TEF's for the maximum size, 1,500 tpd facility. Table 6.8-10 shows the cancer risk estimate from inhalation and ingestion of pollutants emitted by the facility for the maximally exposed individual for the average case operating scenario. The maximally exposed individual represents that receptor where the highest modeled ambient concentrations were predicted. The maximally exposed receptor is located northwest of the UPA facility in the midst of the downtown area of the City of Elk River (3,000 m from UPA at 315°). The maximally exposed individual represents a theoretical maximum exposure for a person located 24 hours per day, 365 days per year, for 70 years at the point of highest concentration. It is unlikely that a particular individual would be continuously exposed for 70 years to the maximum emissions from the facility. The analysis therefore provides a theoretical worst case. This receptor also represents the point of maximum population density being located in

TABLE 6.8-8
 CALCULATION OF 2,3,7,8 TCDD EQUIVALENTS FOR
 USEPA TEF USING AVERAGE EMISSIONS RATES
 (BASED ON AVERAGE OF 21 FACILITIES)
 1500 TPD FACILITY

<u>Congener</u>	<u>Emissions Rate (ng/m3)¹</u>	<u>Ambient Air Concentrations (ug/m3)²</u>	<u>Total 2,3,7,8 Equivalents (ug/m3)³</u>
TCDD	72.8	2.89 E-7	2.89 E-9
2,3,7,8 TCDD	1.12	4.44 E-9	4.44 E-9
PCDD	135	5.35 E-7	2.15 E-8
HXCDD	131	5.18 E-7	7.66 E-9
HPCDD	108	4.27 E-7	2.15 E-10
TCDF	271	1.07 E-6	3.84 E-9
PCDF	385	1.53 E-6	1.24 E-8
HXCDF	157	6.24 E-7	2.04 E-9
HPCDF	79.4	3.15 E-7	<u>1.59 E-10</u>
TOTAL			5.51 E-8

Source: ERT, 1986

Note:

1. Emission rates for congeners based on average of 21 facilities shown in Table 6.8-3.
2. Modelled concentrations at receptor calculated as follows:

$$\text{Congener Emissions } \left(\frac{\text{ng}}{\text{m}^3} \right) \times 115.628 \left(\frac{\text{m}^3}{\text{sec}} \right) \text{ Flow Rate} \times \left(\frac{1}{10^9} \right) \times$$

$$0.03429 \left(\frac{\mu\text{sec}}{\text{m}^3} \right) = \mu\text{g}/\text{m}^3 \text{ at receptor}$$

3. Total 2,3,7,8 equivalents calculated as: ambient air concentrations ($\mu\text{g}/\text{m}^3$) x proportion (Table 6.8-7) x potency factor (Table 6.8-7) for non-2,3,7,8 isomers + $\mu\text{g}/\text{m}^3$ x proportion x potency factor for 2,3,7,8 isomers = 2,3,7,8 TCDD equivalents ($\mu\text{g}/\text{m}^3$)
4. Emissions Rates for Westchester, NY facility based upon data provided in "NYSDEC, 1986" reported in ng/sec, adjusted to ng/m³ based on average of 1544.33 dry standard cubic feet per second provided by Al Columbus, 1986 (NYSDEC).
5. Emissions Rates for Occidental, NY facility based upon data provided in "NYSDEC, 1985" reported in g/sec adjusted to ng/m³ based on 2,333.33 dry standard cubic feet per second provided by Robert Waterfall, NYSDEC, 1986.

TABLE 6.8-9
 CALCULATION OF 2,3,7,8 TCDD EQUIVALENTS FOR
 USEPA TEF USING WORST-CASE SWARU EMISSIONS RATES
 (BASED ON SWARU EMISSIONS IN TABLE 6.8-3)
 1500 TPD FACILITY

<u>Congener</u>	Emissions Rate <u>(ng/m3)¹</u>	Ambient Air Concentrations <u>(ug/m3)²</u>	Total 2,3,7,8 Equivalents <u>(ug/m3)³</u>
TCDD	760	3.01 E-6	3.01 E-8
2,3,7,8 TCDD	34.5	1.37 E-7	1.37 E-7
PCDD	714	2.83 E-6	1.14 E-7
HXCDD	686	2.72 E-6	4.03 E-8
HPCDD	298	1.18 E-6	5.98 E-10
TCDF	2,560	1.02 E-5	3.63 E-8
PCDF	2,260	8.97 E-6	7.29 E-8
HXCDF	1,060	4.21 E-6	1.38 E-8
HPCDF	194	7.69 E-7	<u>3.88 E-10</u>
TOTAL			4.45 E-7

Source: ERT, 1986

Note:

1. Emission rates for congeners based on SWARU emissions shown in Table 6.8-3.

2. Ambient air concentrations calculated as:

$$\text{Congener Emissions } \left(\frac{\text{ng}}{\text{m}^3} \right) \times 115.628 \left(\frac{\text{m}^3}{\text{sec}} \right) \text{ Flow Rate} \times \left(\frac{1}{10^9} \right) \times$$

$$0.03429 \left(\frac{\mu \text{ sec}}{\text{m}^3} \right) = \mu\text{g/m}^3 \text{ at receptor}$$

3. Total 2,3,7,8 equivalents calculated as: ambient air concentrations ($\mu\text{g/m}^3$) x proportion (Table 6.8-7) x potency factor (Table 6.8-7) for non-2,3,7,8 positional isomers + ambient concentration ($\mu\text{g/m}^3$) x proportion (Table 6.8-7) x potency factor (Table 6.8-7) for non-2,3,7,8 isomers = 2,3,7,8 equivalents ($\mu\text{g/m}^3$)

TABLE 6.8-10
RISK ASSESSMENT FOR MAXIMALLY EXPOSED INDIVIDUAL -
US EPA TEF AND AVERAGE EMISSIONS RATE

Risk Calculations (US EPA) - Average Emissions Rate - 1500 TPD Facility

	Emissions Rate ⁽¹⁾ ($\mu\text{g}/\text{m}^3$ or $\mu\text{g}/\text{g}$)	Inhalation ⁽²⁾ ($\text{mg}/\text{kg}/\text{day}$)	Ingestion ⁽³⁾ ($\text{mg}/\text{kg}/\text{day}$)	Potency Slope ⁽⁴⁾	Risk ⁽⁵⁾
Hexachlorobenzene	1.82	1.95E-12	6.08E-12	1.67E+00	1.34E-11
Trichlorophenol	25.3	2.73E-11	8.45E-11	1.99E-02	2.22E-12
Total PCB's	0.409	4.4E-13	1.37E-12	4.34E+00	7.85E-12
2,3,7,8-TCDD Equiv.	see table 6.8-8	1.5E-11	4.65E-12	1.56E+05	3.1E-6
Arsenic	158	7.95E-12	2.48E-11	1.50E+01	4.9E-10
Beryllium	4.13	2.08E-13	0	2.60E+00	5.4E-13
Cadmium	1,170	5.89E-11	0	6.10E+00	3.59E-10
Chromium	321	1.61E-11	0	4.10E+01	6.62E-10
Nickel	112	5.63E-12	0	1.15E+00	6.48E-12
PAH	501	2.52E-11	7.85E-11	1.15E+01	1.19E-09
				Total	3.1 E-6

Source: ERT, 1986.

Notes:

(1) Emissions based on data shown in Table 6.8-5 except for 2, 3, 7, 8 TCDD

(2) Inhalation calculated as: emissions ($\mu\text{g}/\text{m}^3$) \times 115.628 (m^3/sec) \times ($\frac{1}{10^9}$) \times

$$0.03429 \left(\frac{\mu \text{ sec}}{\text{m}^3} \right) \times 20 \left(\frac{\text{m}^3}{\text{day}} \right) \times \frac{1}{70 \text{ kg}} \times \frac{1}{1000} \times .95 \text{ dose} =$$

mg/kg/day for hexabenzene, trichlorophenol, and PCB

o Inhalation calculated as: emissions ($\mu\text{g}/\text{g}$) \times 5.405 ($\frac{\text{g}}{\text{sec}}$) \times

$$\frac{1}{10^9} \times 0.03429 \left(\frac{\mu \text{ sec}}{\text{m}^3} \right) \times 20 \left(\frac{\text{m}^3}{\text{day}} \right) \times \frac{1}{70 \text{ kg}} \times \frac{1}{1000} \times .95 \text{ dose} =$$

mg/kg/day for arsenic - PAH

o 2,3,7,8 inhalation calculated as ambient air concentration ($\mu\text{g}/\text{m}^3$) \times 20 m^3/day \times $\frac{1}{70}$ kg \times $\frac{1}{1000}$ \times .95 dose.

(3) Ingestion dose assumes half life of 12 years for dioxins: (see Equation 1 on following page)

(4) potency slopes as shown on Table 6.8-2

(5) Inhalation dose potency slope \times ingestion dose \times potency slope = Risk

Equation 1

$$\frac{864 \times \frac{\mu\text{K}}{\text{m}^3} \times 365 \text{ days}}{16 \frac{\text{K} \cdot 10^{-1}}{\text{cm}^3}} \times 30^2 \text{ years} + \frac{864 \times \frac{\mu\text{K}}{\text{m}^3} \times 365 \text{ days}}{16 \frac{\text{K} \cdot 10^{-1}}{\text{cm}^3}} \times 30 \times 40 \text{ years}$$

70 years

multiplied by $0.1 \cdot 10^1 \frac{\text{cm}}{\text{sec}} + 70 \text{ kg} + 10^6 \times 0.1 \text{ (half life)} = \text{mg/kg/day}$

downtown Elk River. The cancer risk from a 1,500 tons per day facility based on an average operating conditions scenario emissions rate is estimated to be 0.31 per hundred thousand. If it is assumed that a 1,500 tons per day facility emits at a rate comparable to the SWARU RDF plant in Canada, worst-case operating scenario, the worst-case cancer risk is 2.3 per hundred thousand as shown in Table 6.8-11.

Swiss EPA TEF Method - 1500 TPD Facility

Tables 6.8-12 and 6.8-13 provide the results of the calculation of the 2,3,7,8 TCDD toxic equivalents for the average and worst-case operating scenarios using the Swiss EPA TEF's. Table 6.8-14 depicts the cancer risk estimate from inhalation and ingestion for the maximally exposed individual of pollutant emissions from a 1,500 tons per day facility based on an average operating scenario emission rate at 2.5 per hundred thousand. Assuming the worst-case operating conditions, SWARU emissions rate, the cancer risk is 17 per 100,000 as shown in Table 6.8-15 for a 1,500 tons per day facility.

California TEF Method - 1500 TPD Facility

Tables 6.8-16 and 6.8-17 provide the results of the calculation of the 2,3,7,8 TCDD equivalents for the average and worst-case operating scenarios using California EPA TEF's. Table 6.8-18 represents an estimate of the cancer risk from inhalation and ingestion for the maximally exposed individual. The cancer risk from a 1,500 tons per day facility based on an average operating scenario emissions rate is 1.2 per hundred thousand. Assuming the worst-case operating scenario, SWARU emissions rate, the cancer risk is 7.8 per 100,000 as shown in Table 6.8-19 for a 1,500 tons per day facility.

TABLE 6.8-11
RISK ASSESSMENT FOR MAXIMALLY EXPOSED INDIVIDUAL -
USEPA TEF AND AVERAGE EMISSIONS RATE

Risk Calculations (US EPA) - Worst Case (SWARU) - 1500 TPD Facility

	Emissions Rate(1) ($\mu\text{g m}^3$ or $\mu\text{g/g}$)	Inhalation(2) (mg/kg/day)	Ingestion(3) (mg/kg/day)	Potency Slope(4)	Risk(5)
Hexachlorobenzene	2.46	2.65E-12	8.25E-12	1.67E+00	1.82E-11
Trichlorophenol	57.0	6.14E-11	1.91E-10	1.99E-02	5.02E-12
Total PCB's	0.456	4.9E-13	1.53E-12	4.34E+00	8.76E-12
2,3,7,8-TCDD Equiv.	see Table 6.8-9	1.21E-10	2.64E-11	1.56E+05	2.29E-5
Arsenic	210	1.06E-11	3.29E-11	1.50E+01	6.51E-10
Beryllium	4.13	2.08E-13	0.00E+00	2.60E+00	5.4E-13
Cadmium	1110	5.58E-11	0.00E+00	6.10E+00	3.41E-10
Chromium	490	2.46E-11	0.00E+00	4.10E+01	1.01E-9
Nickel	200	1.01E-11	0.00E+00	1.15E+00	1.16E-11
PAH	1,380	6.95E-11	2.16E-10	1.15E+01	3.29E-9
				Total	2.29E-5

Source: ERT, 1986.

Notes:

(1) Emissions based on data shown in Table 6.8-5 except for 2, 3, 7, 8 TC, DD

(2) Inhalation calculated as: emissions ($\mu\text{g/m}^3$) \times 115.628 (m^3/sec) \times ($\frac{1}{10^9}$) \times 0.03429 ($\mu \text{ sec/m}^3$)

\times 20 ($\frac{\text{m}^3}{\text{day}}$) \times ($\frac{1}{70}$) \times $\frac{1}{1000}$ \times .95 dose = mg/kg/day for hexachenzene, trichlorophenol and PCB

2,3,7,8 TCDD inhalation calculated as ambient air concentration ($\mu\text{g/m}^3$) \times 20 (m^3/day) \times $\frac{1}{70}$ kg

\times $\frac{1}{1000}$ \times .95 dose = mg/kg/day for 2,3,7,8 TCDD equivalents

Air dose calculated as: emissions ($\mu\text{g/g}$) \times 5.405 ($\frac{\text{g}}{\text{sec}}$) \times ($\frac{1}{10^9}$) \times 0.03429 ($\frac{\mu \text{ sec}}{\text{m}^3}$) \times ($\frac{\text{m}^3}{\text{day}}$)

\times $\frac{1}{70}$ kg \times $\frac{1}{1000}$ \times .95 dose = mg/kg/day for arsenic through PAH

(3) Ingestion dose assumes half life of 12 years for dioxin. Calculated as shown in Table 6.8-10.

(4) Potency slopes from Table 6.8-2

(5) Inhalation dose \times potency slope + ingestion dose \times potency slope = Risk

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TABLE 6.8-12

CALCULATION OF 2,3,7,8 TCDD EQUIVALENTS FOR SWISS EPA TEF USING
AVERAGE EMISSIONS RATES
(BASED ON AVERAGE OF 21 FACILITIES)
1500 tpd Facility

<u>Congener</u>	Emission Rates (ng/m ³) ¹	Ambient Air Concentrations (ug/m ³) ²	Total 2,3,7,8 Equivalents (ug/m ³) ³
TCDD	72.8	2.89 E-7	2.89 E-9
2,3,7,8 TCDD	1.12	4.44 E-9	4.44 E-9
PCDD	135	5.35 E-7	5.35 E-8
HXCDD	131	5.18 E-7	5.18 E-8
HPCDD	108	4.27 E-7	4.27 E-9
TCDF	271	1.07 E-6	1.07 E-7
PCDF	385	1.53 E-6	1.53 E-7
HXCDF	157	6.24 E-7	6.24 E-8
HPCDF	79.4	3.15 E-7	<u>3.15 E-9</u>
		Total	4.42 E-7

Source: ERT, 1986.

Notes:

- (1) Emissions rates for congeners based on average of 21 facilities shown in Table 6.8-3.
- (2) Ambient concentration of receptor calculated as:

$$\left(\frac{\text{ng}}{\text{m}^3}\right) \times 115.628 \left(\frac{\text{m}^3}{\text{sec}}\right) \times \left(\frac{1}{10^9}\right) \times 0.03429 \left(\frac{\mu \text{ sec}}{\text{m}^3}\right) = \mu\text{g}/\text{m}^3$$

- (3) Total 2,3,7,8 equivalents calculated as:
ambient air concentration ($\mu\text{g}/\text{m}^3$) x proportion (Table 6.8-7) for non 2,3,7,8 isomers x potency factor (Table 6.8-6) + ($\mu\text{g}/\text{m}^3$) x proportion (Table 6.8-7) (for 2,3,7,8 isomers) x potency factor (Table 6.8-6) = 2,3,7,8 TCDD equivalents ($\mu\text{g}/\text{m}^3$).

TABLE 6.8-13
 CALCULATION OF 2,3,7,8 TCDD EQUIVALENTS FOR SWISS EPA TEF USING
 AVERAGE WORST CASE SWARU EMISSIONS RATES
 (BASED ON SWARU EMISSIONS IN TABLE 6.8-3)
 (1500 tpd Facility)

<u>Congener</u>	Emission Rates (ng/m ³) ¹	Ambient Air Concentrations (ug/m ³) ²	Total 2,3,7,8 Equivalents (ug/m ³) ³
TCDD	760	3.01 E-6	3.01 E-8
2,3,7,8 TCDD	34.5	1.37 E-7	1.37 E-7
PCDD	714	2.83 E-6	2.83 E-7
HXCDD	686	2.72 E-6	2.72 E-7
HPCDD	298	1.18 E-6	1.18 E-8
TCDF	2,560	1.02 E-5	1.02 E-6
PCDF	2,260	8.97 E-6	8.97 E-7
HXCDF	1,060	4.21 E-6	4.21 E-7
HPCDF	194	7.69 E-7	<u>7.69 E-9</u>
		Total	3.08 E-6

Source: ERT, 1986.

Notes:

- (1) Emissions rates for congeners based on worst case SWARU emissions in Table 6.8-3
- (2) Ambient concentration at receptor calculated as:

$$\left(\frac{\text{ng}}{\text{m}^3}\right) \times 115.628 \left(\frac{\text{m}^3}{\text{sec}}\right) \times \frac{1}{10^9} \times 0.03429 \left(\frac{\mu\text{sec}}{\text{m}^3}\right) = \mu\text{g}/\text{m}^3$$

- (3) Total 2,3,7,8 equivalents calculated as:
 ambient air concentration (ug/m³) x proportion (for non 2,3,7,8 isomers in Table 6.8-7) x potency factor (Table 6.8-6)
 + concentration (ug/m³) x proportion (for 2,3,7,8 isomers in Table 6.8-7) x potency factor Table 6.8-6 = 2,3,7,8 TCDD equivalents (ug/m³)

TABLE 6.8-14
RISK ASSESSMENT FOR MAXIMALLY EXPOSED INDIVIDUAL -
SWISS EPA TEF AND AVERAGE EMISSIONS RATE

Risk Calculations (SWISSEPA) - Average Emissions Rate - 1500 TPD Facility

	Emissions Rate ⁽¹⁾ ($\mu\text{g}/\text{m}^3$ or $\mu\text{g}/\text{g}$)	Inhalation ⁽²⁾ ($\text{mg}/\text{kg}/\text{day}$)	Ingestion ⁽³⁾ ($\text{mg}/\text{kg}/\text{day}$)	Potency Slope ⁽⁴⁾	Risk ⁽⁵⁾
Hexachlorobenzene	1.82	1.95 E-12	6.08E-12	1.67 E+00	1.34 E-11
Trichlorophenol	25.3	2.73 E-11	8.45E-11	1.99 E-2	2.22 E-12
Total PCB's	0.409	4.4 E-13	1.37 E-12	4.34 E+00	7.85 E-12
2,3,7,8-TCDD Equiv.	See Table 6.8-12	1.2 E-10	3.73 E-11	1.56 E+05	2.5 E-5
Arsenic	158	7.95 E-12	2.48 E-11	1.50 E+01	4.9 E-10
Beryllium	4.13	2.08 E-13	00.00 E+00	2.60 E+00	5.4 E-13
Cadmium	1,170	5.89 E-11	0.00 E+00	6.10 E_00	3.59 E-10
Chromium	321	1.61 E-11	0.00 E+00	4.10 E+00	6.62 E-10
Nickel	112	5.63 E-12	0.00 E+00	1.15 E+00	6.48 E-12
PAH	501	2.52 E-11	7.85 E-11	1.15 E+00	<u>1.19 E-9</u>
				Total	2.5 E-5

Source: ERT, 1986.

Notes:

(1) Emissions based on data shown in Table 6.8-5 except for 2, 3, 7, 8 TCDD

(2) Inhalation calculated as: emissions ($\mu\text{g}/\text{m}^3$) x 115.628 (m^3/sec) x ($\frac{1}{10^9}$) x 0.03429 ($\mu \text{ sec}/\text{m}^3$)

x 20 ($\frac{\text{m}^3}{\text{day}}$) x ($\frac{1}{70 \text{ kg}}$) x $\frac{1}{1000}$ x .95 dose = mg/kg/day for hexabenzene, trichlorophenol and PCB

o 2,3,7,8 Inhalation Dose calculated as: ambient air concentration ($\mu\text{g}/\text{m}^3$) x 20 m^3/day x $\frac{1}{70}$ kg

x $\frac{1}{1000}$ x .95 dose = mg/kg/day for 2,3,7,8 TCDD equivalents

o Inhalation Dose calculated as: emissions ($\mu\text{g}/\text{g}$) x 5.405 ($\frac{\text{g}}{\text{sec}}$) x ($\frac{1}{10^9}$) x 0.03429 ($\frac{\mu \text{ sec}}{\text{m}^3}$) x m^3/day

x $\frac{1}{70 \text{ kg}}$ x $\frac{1}{1000}$ x .95 dose = mg/kg/day for arsenic through PAH

(3) Soil dose assumes half life of 12 years. See Table 6.8-10 for calculation methodology.

(4) Potency slopes as shown in Table 6.8-2

(5) Inhalation dose x potency slope + ingestion dose x potency slope = Risk

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TABLE 6.8-15
RISK ASSESSMENT FOR MAXIMALLY EXPOSED INDIVIDUAL -
SWISS EPA TEF AND WORST CASE EMISSIONS RATE

Risk Calculations (SWISSEPA) - Worst Case - 1500 TPD Facility

	Emissions Rate ⁽¹⁾ ($\mu\text{g}/\text{m}^3$ or $\mu\text{g}/\text{g}$)	Inhalation ⁽²⁾ ($\text{mg}/\text{kg}/\text{day}$)	Ingestion ⁽³⁾ ($\text{mg}/\text{kg}/\text{day}$)	Potency Slope ⁽⁴⁾	Risk ⁽⁵⁾
Hexachlorobenzene	2.46	2.65 E-12	8.25 E-12	1.67 E+00	1.82 E-11
Trichlorophenol	57.0	6.14 E-11	1.91 E-10	1.99 E-02	5.02 E-12
Total PCB's	0.456	4.9 E-13	1.53 E-12	4.34 E+00	8.76 E-12
2,3,7,8-TCDD Equiv.	See Table 6.8-13	8.35 E-10	2.48 E-10	1.56 E+00	1.69 E-4
Arsenic	210	1.06 E-11	3.29 E-11	1.50 E+00	6.51 E-10
Beryllium	4.13	2.08 E-13	0.00 E+00	2.60 E+00	5.4 E-13
Cadmium	1110	5.58 E-11	0.00 E+00	6.10 E+00	3.41 E-10
Chromium	490	2.46 E-11	0.00 E+00	4.10 E+01	1.01 E-9
Nickel	200	1.01 E-11	0.00 E+00	1.15 E+00	1.16 E-11
PAH	1380	6.95 E-11	2.16 E-10	1.15 E+01	<u>3.29 E-9</u>
				Total	1.6 E-4

Source: ERT, 1986.

Notes:

- (1) Emissions based on data shown in Table 6.8-5 except for 2,3,7,8 TC DD
- (2) Inhalation Dose for hexabenzene, trichlorophenol, and PCB calculated as:

$$\text{emissions } (\mu\text{g}/\text{m}^3) \times 115.628 (\text{m}^3/\text{sec}) \times \frac{1}{10^9} \times 0.03429 \left(\frac{\mu\text{sec}}{\text{m}^3}\right) \times 20 \left(\frac{\text{m}^3}{\text{day}}\right) \times \frac{1}{70 \text{ kg}} \times \frac{1}{1000} \times .95 \text{ dose} = \text{mg}/\text{kg}/\text{day}$$

- o 2,3,7,8 inhalation dose calculated as: ambient air conc.³ (mg/m^3)³ $\times 20 \text{ m}^3 \times \frac{1}{170} \frac{1}{1000} \times \dots \times .95$
= mg/kg/day

- o Inhalation dose for arsenic through PAH calculated as: ($\mu\text{g}/\text{g}$) emissions $\times 5.405 (\text{g}/\text{sec}) \times \frac{1}{10^9} \times 0.03429 \left(\frac{\mu\text{sec}}{\text{m}^3}\right)$
 $\times 20 (\text{m}^3/\text{day}) \times \frac{1}{70 \text{ kg}} \times \frac{1}{1000} \times .95 \text{ dose} = \text{mg}/\text{kg}/\text{day}$

- (3) Soil dose assumes half life of 12 years. See table 6.8-11 for calculation methodology.
- (4) Potency slopes as shown in Table 6.8-2
- (5) Inhalation dose \times potency slope + ingestion dose \times potency slope = Risk

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TABLE 6.8-16
 CALCULATION OF 2,3,7,8 TCDD EQUIVALENTS FOR CALIFORNIA TEF USING
 AVERAGE EMISSIONS RATES
 (BASED ON AVERAGE OF 21 FACILITIES)
 1500 tpd Facility

<u>Congener</u>	Emission Rates (ng/m ³) ¹	Ambient Air Concentrations (ug/m ³) ²	Total 2,3,7,8 Equivalents (ug/m ³) ³
TCDD	72.8	2.89 E-7	2.89 E-9
2,3,7,8 TCDD	1.12	4.44 E-9	4.44 E-9
PCDD	135	5.35 E-7	3.8 E-8
HXCDD	131	5.18 E-7	4.66 E-9
HPCDD	108	4.27 E-7	6.4 E-9
TCDF	271	1.07 E-6	2.79 E-8
PCDF	385	1.53 E-6	1.1 E-7
HXCDF	157	6.24 E-7	4.72 E-9
HPCDF	79.4	3.15 E-7	<u>4.72 E-9</u>
		Total	2.04 E-7

Source: ERT, 1986.

Notes:

- (1) Emission rates for congeners based on average of 21 facilities shown in Table 6.8-3
- (2) Ambient concentration at receptor calculated as:

$$\left(\frac{\text{ng}}{\text{m}^3}\right) \times 115.628 \left(\frac{\text{m}^3}{\text{sec}}\right) \times \frac{1}{10^9} \times 0.03429 \left(\frac{\mu \text{ sec}}{\text{m}}\right) = \mu\text{g}/\text{m}^3$$

- (3) Total 2,3,7,8 equivalents calculated as:
 ambient air concentration (ug/m³) x proportion (Table 6.8-7)
 for non 2,3,7,8 isomers x potency factor (Table 6.8-6)
 + (ug/m³) x proportion (Table 6.8-7) (for 2,3,7,8 isomers)
 x potency factor (Table 6.8-6) = 2,3,7,8 TCDD equivalents (ug/m³)

TABLE 6.8-17
 CALCULATION OF 2,3,7,8 TCDD EQUIVALENTS FOR CALIFORNIA TEF USING
 WORST CASE SWARU EMISSIONS RATES
 (BASED ON SWARU EMISSIONS IN TABLE 6.8-3)
 1500 tpd Facility

<u>Congener</u>	<u>Emission Rates (ng/m³)¹</u>	<u>Ambient Air Concentrations (ug/m³)²</u>	<u>Total 2,3,7,8 Equivalents (ug/m³)³</u>
TCDD	760	3.01 E-6	3.01 E-8
2,3,7,8 TCDD	34.5	1.37 E-7	1.37 E-7
PCDD	714	2.83 E-6	2.01 E-7
HXCDD	686	2.72 E-6	2.45 E-8
HPCDD	298	1.18 E-6	1.78 E-8
TCDF	2,560	1.02 E-5	2.64 E-7
PCDF	2,260	8.97 E-6	6.46 E-7
HXCDF	1,060	4.21 E-6	3.19 E-8
HPCDF	194	7.69 E-7	<u>1.15 E-8</u>
		Total	1.36 E-6

Source: ERT, 1986.

Notes:

- (1) Emissions rates for congeners based on worst case SWARU emissions in Table 6.8-3
- (2) Ambient concentration at receptor calculated as:

$$\left(\frac{\text{ng}}{\text{m}^3}\right) \times 115.628 \left(\frac{\text{m}^3}{\text{sec}}\right) \times \frac{1}{10^9} \times 0.03429 \left(\frac{\mu \text{ sec}}{\text{m}^3}\right) = \mu\text{g}/\text{m}^3$$

- (3) Total 2,3,7,8 equivalents calculated as:
 ambient air concentration ($\mu\text{g}/\text{m}^3$) x proportion (for non 2,3,7,8 isomers in Table 6.8-7) x potency factor (Table 6.8-6)
 + concentration ($\mu\text{g}/\text{m}^3$) x proportion (for 2,3,7,8 isomers in Table 6.8-7) x potency factor Table 6.8-6 = 2,3,7,8 TCDD equivalents ($\mu\text{g}/\text{m}^3$)

TABLE 6.8-18

RISK ASSESSMENT FOR MAXIMALLY EXPOSED INDIVIDUAL -
CALIFORNIA TEF AND AVERAGE EMISSIONS RATE

Risk Calculations (CALIFORNIA) - Average Emissions Rate - 1500 TPD Facility

	Emissions Rate(1) ($\mu\text{g}/\text{m}^3$ or $\mu\text{g}/\text{g}$)	Inhalation(2) ($\text{mg}/\text{kg}/\text{day}$)	Ingestion(3) ($\text{mg}/\text{kg}/\text{day}$)	Potency Slope(4)	Risk(5)
Hexachlorobenzene	1.82	1.95 E-12	6.08 E-12	1.67 E+00	1.34 E-11
Trichlorophenol	25.3	2.73 E-11	8.45 E-11	1.99 E-03	2.22 E-12
Total PCB's	0.409	4.4 E-13	1.37 E-12	4.34 E+00	7.85 E-12
2,3,7,8-TCDD Equiv.	See Table 6.8-16	5.52 E-11	2.24 E-11	1.56 E+05	1.2 E-5
Arsenic	158	7.95 E-12	2.48 E-11	1.50 E+01	4.9 E-10
Beryllium	4.13	2.08 E-13	0.00 E+00	2.60 E+00	5.4 E-13
Cadmium	1,170	5.89 E-11	0.00E+00	6.10E +00	3.59 E-10
Chromium	321	1.61 E-11	0.00 E+00	4.10 E+01	6.62 E-10
Nickel	112	5.63 E-12	0.00 E+00	1.15 E+00	6.48 E-12
PAH	501	2.52 E-11	7.85 E-11	1.15 E+00	<u>1.19 E-9</u>
				Total	1.2 E-5

Source: ERT, 1986.

Notes:

(1) Emissions based on data shown in Table 6.8-5 except for 2, 3, 7, 8 TCDD

(2) Inhalation Dose calculated as: emissions ($\mu\text{g}/\text{m}^3$) x 115.628 (m^3/sec) x ($\frac{1}{109}$) x 0.03429 ($\mu \text{ sec}/\text{m}^3$)
x 20 ($\frac{\text{m}^3}{\text{day}}$) x $\frac{1}{70 \text{ kg}}$ x $\frac{1}{1000}$ x .95 dose = mg/kg/day for hexabenzene, trichlorophenol and PCB

o 2,3,7,8 TCDD inhalation calculated as: ambient air concentration ($\mu\text{g}/\text{m}^3$) x 20 m^3/day x $\frac{1}{70 \text{ kg}}$ x $\frac{1}{1000}$ x .95 = mg/kg/day

o Inhalation dose calculated as: emissions ($\mu\text{g}/\text{g}$) x 5.405 ($\frac{\text{g}}{\text{sec}}$) x ($\frac{1}{10^9}$) x 0.03429 ($\frac{\mu \text{ sec}}{\text{m}^3}$) x 20 ($\frac{\text{m}^3}{\text{day}}$)
x $\frac{1}{70 \text{ kg}}$ x $\frac{1}{1000}$ x .95 dose = mg/kg/day for arsenic through PAH

(3) Ingestion dose assumes half life of 12 years for dioxin. See Table 6.8-10 for calculation.

(4) Potency slopes from Table 6.8-2

(5) Inhalation dose x potency slope + ingestion dose x potency slope = Risk

TABLE 6.8-19
RISK ASSESSMENT FOR MAXIMALLY EXPOSED INDIVIDUAL -
CALIFORNIA TEF AND WORST CASE EMISSIONS RATE

Risk Calculations (CALIFORNIA) - Worst Case - 1500 TPD Facility

	Emissions Rate ⁽¹⁾ ($\mu\text{g}/\text{m}^3$ or mg/g)	Inhalation ⁽²⁾ ($\text{mg}/\text{kg}/\text{day}$)	Ingestion ⁽³⁾ ($\text{mg}/\text{kg}/\text{day}$)	Potency Slope ⁽⁴⁾	Risk ⁽⁵⁾
Hexachlorobenzene	2.46	2.65 E-12	8.25 E-12	1.67 E+00	1.82 E-11
Trichlorophenol	57.0	6.14 E-11	1.91 E-10	1.99 E-02	5.02 E-12
Total PCB's	0.456	4.9 E-13	1.53 E-12	4.34 E+00	8.76 E-12
2,3,7,8-TCDD Equiv.	See Table 6.8-17	3.70 E-10	1.31 E-10	1.56 E+05	7.81 E-5
Arsenic	210	1.06 E-11	3.29 E-11	1.50 E+01	6.51 E-10
Beryllium	4.13	2.08 E-13	0.00 E+00	2.60 E+00	5.4 E-13
Cadmium	1,110	5.58 E-11	0.00 E+00	6.10E +00	3.41 E-10
Chromium	490	2.46 E-11	0.00 E+00	4.10 E+01	1.01 E-9
Nickel	200	1.01 E-11	0.00 E+00	1.15 E+00	1.16 E-11
PAH	1,380	6.95 E-11	2.16 E-10	1.15 E+00	<u>3.29 E-9</u>
				Total	7.81 E-5

Source: ERT, 1986.

Notes:

- (1) Emissions based on data shown in Table 6.8-5 except for 2, 3, 7, 8 TCDD
 (2) Inhalation Dose for hexabenzene, trichlorophenol, and PCB calculated as:

$$\text{emissions } (\mu\text{g}/\text{m}^3) \times 115.628 (\text{m}^3/\text{sec}) \times \frac{1}{10^9} \times 0.03429 \left(\frac{\mu \text{ sec}}{\text{m}}\right) \times 20 \left(\frac{\text{m}^3}{\text{day}}\right) \times \frac{1}{70} \text{ kg}$$

$$\times \frac{1}{1000} \times .95 \text{ dose} = \text{mg}/\text{kg}/\text{day}$$

o 2,3,7,8 inhalation dose calculated as: ambient air conc. $(\mu\text{g}/\text{m}^3) \times 20 \text{ m}^3/\text{day} \times \frac{1}{70\text{kg}} \times \frac{1}{1000} \times .95 = \text{mg}/\text{kg}/\text{day}$

o Inhalation dose for arsenic through PAH calculated as: $(\mu\text{g}/\text{g}) \text{ emissions} \times 5.405 (\text{g}/\text{sec}) \times \frac{1}{10^9} \times 0.03429 \left(\frac{\mu \text{ sec}}{\text{m}}\right)$

$$\times 20 (\text{m}^3/\text{day}) \times \frac{1}{70} \text{ kg} \times 1/1000 \times .95 \text{ dose} = \text{mg}/\text{kg}/\text{day}$$

- (3) Ingestion dose assumes half life of 12 years
 (4) Potency slopes shown in Table 6.8-2
 (5) Inhalation dose x potency slope + ingestion dose x potency slope = Risk

TABLE 6.8-20
 MAXIMALLY EXPOSED INDIVIDUAL
 RISK DUE TO DERMAL CONTACT - AVERAGE CASE EMISSIONS
 1500 TPD FACILITY

Congener	Dermal Dose (mg/kg/day)			Potency	Dermal Risk		
	USEPA	Swiss	California		USEPA	Swiss	California
Hexachlorobenzene	1.64 E-13	1.64 E-13	1.64 E-13	1.67 E-0	2.74 E-13	2.74 E-13	2.74 E-13
Trichlorophenol	2.28 E-12	2.28 E-12	2.28 E-12	1.99 E-2	4.54 E-14	4.54 E-14	4.54 E-14
Total PCB's	3.7 E-14	3.70 E-14	3.70 E-14	4.34 E-0	1.61 E-13	1.61 E-13	1.61 E-13
2,3,7,8 TCDD	1.26 E-13	1.01 E-12	6.05 E-13	1.56 E+5	1.97 E-8	1.58 E-7	9.44 E-8
Arsenic	6.7 E-13	6.7 E-13	6.7 E-13	1.5 E+1	1.01 E-11	1.01 E-11	1.01 E-11
Beryllium	-	-	-	2.6 E0	-	-	-
Cadmium	-	-	-	6.1 E+0	-	-	-
Chromium	-	-	-	4.1 E+1	-	-	-
Nickel	-	-	-	1.15 E-0	-	-	-
PAH	-	-	-	1.15 E+01	-	-	-

Source: ERT, 1986

- Note:
- 1) Assumes average daily contact with soil is 0.27 grams per day
 - 2) Absorption rate through the skin is one percent. (Kimbrough, 1984)
 - 3) Dermal Dose = Ingestion Dose x .27 x 0.1 = mg/kg/day

Summary For Maximally Exposed Individual

Table 6.8-23 summarizes the modeled cancer risk assuming the three different TEF methods under two different operating scenarios and for the 1,500; 1,000; and 500 TPD facilities. When it is assumed that facility emissions will be equal to those for the SWARU facility, the expected cancer risk for the 1500 TPD facility exceeds the Minnesota Department of Health Risk Guideline of one per 100,000 using the U.S. EPA, Swiss EPA and California TEF's. Assuming an average operating scenario, the Minnesota guideline for a 1,500 TPD facility is equalled or slightly exceeded using the Swiss EPA and California TEF methods. Table 6.8-24 shows the risks a person can be exposed to on a daily basis. The risks shown there vary from 1 per 100,000 from benzene to a lifetime risk of 70 per hundred thousand for a person in a room with a smoker to as much as a one in four chance for the normal risk due to cancer. The maximum risk from the facility assuming SWARU emissions and a 1,500 TPD facility would be 17 per hundred thousand. The risks shown in this table may not necessarily be comparable in nature to the proposed facility but do provide a benchmark for review.

TABLE 6.8-21
 MAXIMALLY EXPOSED INDIVIDUAL
 RISK DUE TO DERMAL CONTACT - WORST CASE (SWARU)
 1500 TPD FACILITY

<u>Congener</u>	<u>Dermal Dose (mg/kg/day)</u>			<u>Potency</u>	<u>Dermal Risk</u>		
	<u>USEPA</u>	<u>Swiss</u>	<u>California</u>		<u>USEPA</u>	<u>Swiss</u>	<u>California</u>
Hexachlorobenzene	2.23 E-13	2.23 E-13	2.23 E-13	1.67 E-0	3.72 E-13	3.72 E-13	3.72 E-13
Trichlorophenol	5.16 E-12	5.16 E-12	5.16 E-12	1.99 E-2	1.03 E-13	1.03 E-13	1.03 E-13
Total PCB's	4.13 E-14	4.13 E-14	4.13 E-14	4.34 E-0	1.79 E-13	1.79 E-13	1.79 E-13
2,3,7,8 TCDD	7.1 E-13	6.70 E-12	3.54 E-12	1.56 E+5	1.11 E-7	1.05 E-6	5.52 E-7
Arsenic	8.88 E-13	8.88 E-13	8.88 E-13	1.5 E+1	1.33 E-11	1.33 E-11	1.33 E-11
Beryllium	-	-	-	2.6 E-0	-	-	-
Cadmium	-	-	-	6.1 E-0	-	-	-
Chromium	-	-	-	4.1 E+1	-	-	-
Nickel	-	-	-	1.15 E-0	-	-	-
PAH	-	-	-	1.15 E+1	-	-	-

Source: ERT, 1986

- Note:
- 1) Assumes average daily contact with soil is 0.27 grams per day
 - 2) Absorption rate through the skin is one percent. (Kimbrough, 1984)
 - 3) Dermal Dose = Ingestion Dose x .27 x 0.1 = mg/kg/day

TABLE 6.8-22
 CUMULATIVE RISK FOR MAXIMALLY EXPOSED INDIVIDUAL -
 ALL EXPOSURE PATHWAYS - 1500 TPD FACILITY

<u>Case</u>	<u>Inhalation and Ingestion</u>	<u>Inhalation, Ingestion, and Dermal Exposure</u>
<u>Average</u>		
<u>Emissions Rate</u>		
USEPA TEF	3.1 E-6	3.12 E-6
Swiss EPA TEF	2.5 E-5	2.52 E-5
California TEF	1.2 E-5	1.21 E-5
<u>Worst Case</u>		
<u>SWARU Emissions</u>		
USEPA TEF	2.3 E-5	2.31 E-5
Swiss EPA TEF	1.7 E-4	1.71 E-4
California TEF	7.8 E-5	7.86 E-5

Source: ERT, 1986

TABLE 6.8-23
 MAXIMALLY EXPOSED INDIVIDUAL CANCER RISK
 FROM PROPOSED RDF COMBUSTION

<u>Case</u>	<u>USEPA</u> <u>TEF</u>	<u>Swiss EPA</u> <u>TEF</u>	<u>California</u> <u>TEF</u>
Average			
Emissions Rate			
1500 TPD	3.1 E-6	2.5 E-5	1.2 E-5
1000 TPD	3.0 E-6	2.4 E-5	1.2 E-5
500 TPD	2.2 E-6	1.8 E-5	8.6 E-6
Worst Case			
Emissions Rate (SWARU)			
1500 TPD	2.3 E-5	1.7 E-4	7.8 E-5
1000 TPD	2.2 E-5	1.6 E-4	7.5 E-5
500 TPD	1.7 E-5	1.2 E-4	5.6 E-5

- 1) For 2 boilers ambient concentrations at the receptor are approximately 96% of those for three boilers.
- 2) For 1 boiler ambient concentrations at the receptor are approximately 72% of those for three boilers.

Source: ERT, 1986

TABLE 6.8-24
COMPARISON OF RISKS WITH
COMMON EXPERIENCE

<u>Activity</u>	<u>Lifetime Risk</u>
Natural radiation background at sea level	1.4×10^{-3}
Tobacco smoker (cancer only)	8.4×10^{-2}
Tobacco smoker (all effects)	2.1×10^{-1}
Person in room with smoker	7.0×10^{-4}
Air pollution (average over U.S., all cases)	1.75×10^{-2}
Air pollution (cancer risk only)	1.05×10^{-3}
Normal risk due to cancer	2.5×10^{-1}
Lifetime traffic accident	2.0×10^{-2}
Traffic accident using seat belts	1.0×10^{-2}
Worker standard upper-bound exposure to arsenic	4.0×10^{-3}
Vinyl chloride after control measures	1.0×10^{-5}
Benzene after control measures	1.0×10^{-5}
Haloforms in drinking water after controls	1.0×10^{-4}
Water quality criteria guidance	1.0×10^{-5} to 1.0×10^{-7}

Source:

- 1) Crouch and Wilson, 1980. E. Crouch and R. Wilson, 1980. "Estimates of Risk." Journal of Business Administration. 11 (1,2):299-317. For radiation through air pollution risks.
- 2) Elizabeth Anderson, USEPA, Risk Assessment Carcinogen Assessment Group, Video Presentation. From reports from 1976-1983.

6.8.13 Results of Risk Assessment for Average Individual Exposed to Emissions

In addition to the risk to the maximally exposed individual receptor, an estimate of the increased cancer risk to an average individual located anywhere in Elk River is shown in Table 6.8-25. Figure 6.8-2 shows that health risks decrease with distance from the facility. The average individual risk was calculated by evaluating the ambient concentration at various distances from the facility, weighting and summing the risks by exposed population. The table depicts the estimated risk under the two operating scenarios: average facility operating emissions and risk based on worst case operating emissions from the SWARU plant in Canada.

Utilizing data on average emissions for 21 facilities in Europe and North America, the expected increased cancer risk from the 1500 TPD facility is: 0.055 per hundred thousand using the USEPA method; 0.55 per hundred thousand using the Swiss EPA TEF; and 0.22 per hundred thousand when using the California method.

Assuming a worst case emissions rate based on the SWARU Canada facility results in an average risk estimate for the 1500 TPD facility of: 0.27 per hundred thousand for the USEPA method; 2.7 per hundred thousand for the Swiss EPA method; and 1.3 per hundred thousand for the California method.

6.8.14 Community Risk

A community risk based on the potential for increased cancer risk to the general public for the proposed facility was also estimated. Although standards have not been developed for community risk, a risk estimate is provided to place the overall impacts in perspective. The population risk was estimated by applying the average individual cancer risk estimate to an assumed exposed population of 10,000 people within approximately 6 miles of Elk River.

Table 6.8-26 depicts the estimated increased population cancer risk from the facility assuming an average emission rate and the worst case emissions rate for the SWARU facility in Canada. Utilizing the facility average emissions rate results in an expected additional

TABLE 6.8-25
 AVERAGE INDIVIDUAL CANCER RISK
 FROM PROPOSED RDF COMBUSTION - 1500 TPD FACILITY

<u>Case</u>	<u>USEPA TEF</u>	<u>SWISS EPA TEF</u>	<u>CALIFORNIA TEF</u>
Facility Average	5.5 E-7	5.5 E-6	2.2 E-6
Worst Case	2.7 E-6	2.7 E-5	1.3 E-5

Source: ERT, 1986

- Notes: 1) Facility average was based on an average emissions rate for 21 European and North American RDF or mass burn facilities.
- 2) Worst case estimate was based upon emissions data for the SWARU facility.

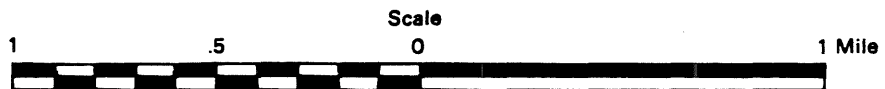
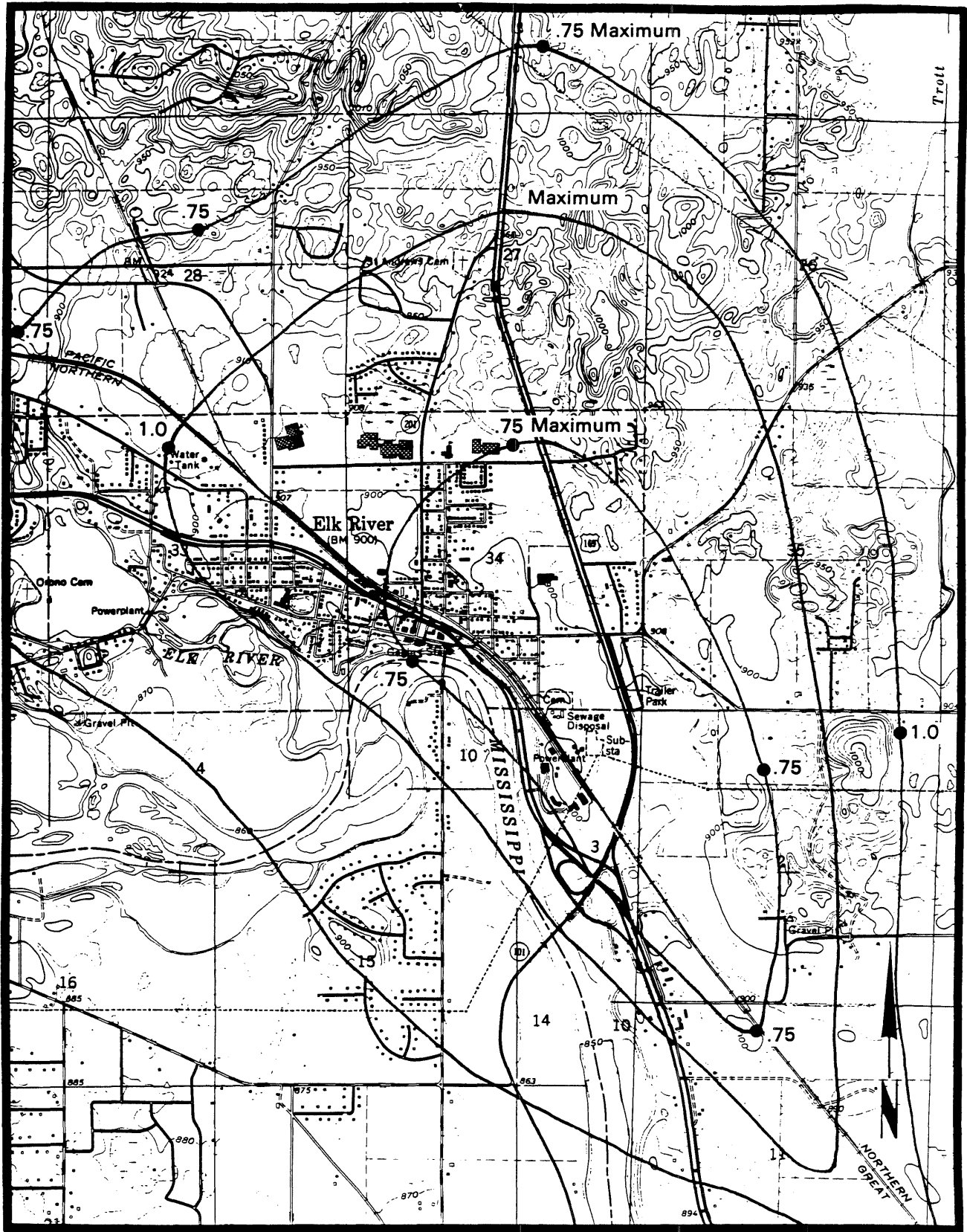


Figure 6 8-2 Ambient Concentrations

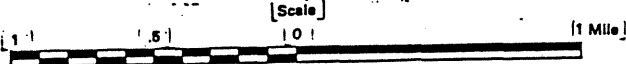


TABLE 6.8-26
 INCREASED POPULATION CANCER RISK FROM
 PROPOSED RDF COMBUSTION - 1500 TPD FACILITY

<u>Case</u>	<u>Additional Cancer Cases</u>		
	<u>USEPA TEF</u>	<u>SWISS EPA TEF</u>	<u>CALIFORNIA TEF</u>
Facility Average	0.01	0.06	0.02
Worst Case	0.03	0.27	0.13

Source: ERT, 1986

Note: Average Risk per individual multiplied by population of 10,000 yields increased population cancer risk.

increase in cancer cases of: 0.01 cancers in the population for the USEPA method; 0.06 cancers for the Swiss EPA method; and 0.02 additional cancers for the California method. Similarly, utilizing the worst case SWARU emissions rate operating scenario results in an expected additional increase in cancer cases of: 0.03 cancers in the population for the USEPA method; 0.3 cancers for the Swiss EPA method; and 0.013 cancers for the California method.

6.8.15 Allowable Daily Intakes (ADI's)

In addition to the previous analysis regarding potential cancer causing pollutants, several metals have been identified in the emissions data that are known to be toxic yet not known to be carcinogenic. The dose calculations are the same as the dose calculations for carcinogenic compounds and are a function of ambient pollutant concentration except that metals are not readily absorbed through the skin. The daily doses for the non-carcinogenic metals and the associated ADI's are presented in Table 6.8-27. The maximum impact for any substance for which an ADI was calculated was for lead, 13 percent of the ADI. All other substances present a daily dose of less than 1/10 of one percent of the ADI. Therefore, a significant risk due to the exposure to these materials is not expected.

6.8.16 Risk of Alternate Solid Waste Disposal

There are no known solutions for the disposal of solid waste that do not present some risk to the public health. Landfilling may produce exposure to toxic materials through groundwater contamination with heavy metals, toxic organics and certain inorganic compounds such as nitrates and nitrites. Landfills also release volatile organics to the air through venting of the fill material and to the groundwater through leachate. Exposure to toxic materials through groundwater can be minimized by providing alternate sources of drinking water or by removing contaminated groundwater from the site. The exposure to

TABLE 6.8-27
METAL DOSES AND ADI'S

<u>Metal</u>	<u>Average Emissions (g/sec)</u>	<u>Daily Dose mg/day</u>	<u>ADI mg/day</u>	<u>Percent of ADI</u>
Copper	3.98 E-3	9.2 E-6	-	-
Mercury	3.1 E-3	7.2 E-6	0.02	3.6 E-2
Lead	1.1 E-1	2.6 E-4	1.96 E-3	13
Manganese	4.4 E-3	1.0 E-5	0.74	1.4 E-3
Selenium	5.2 E-5	1.2 E-7	0.7	1.7 E-5
Tin	1.5 E-2	3.5 E-5	-	-
Vanadium	1.9 E-3	4.4 E-6	-	-
Zinc	1.9 E-1	4.4 E-4	Review	-
Pentachlorophenol	7.1 E-4	1.7 E-6	2.1	8.1 E-5
Antimony	No data		NA	-

Source: ERT, 1986

- Note: 1) Emissions rates from: Metropolitan Council, Hennepin Resource Recovery Facility FEIS, 1986.
- 2) Daily dose is summation of air dose and soil dose. Calculated as described previously.

landfill gas and the associated organic emissions is much more difficult to control. Landfills emit small quantities of toxic organic hydrocarbons. The USEPA has spent several years investigating health risks from these exposures. As of the time this EIS was written the U.S. EPA had not formed a conclusive health risk assessment for landfills (David Susman, Nov. 1985).

The production of compost does not destroy most volatile or toxic organics. The volatile organics are released to the atmosphere and the toxic organics remain in the compost. The rate of exposure to toxic organics from compost could be of the same magnitude as ingestion of soils depending on the end use of the compost. Many compost materials are provided to consumers with advisory precautions for its use. The advisories are intended to reduce the exposure of consumers to toxic metals and organics. The MPCA rules limit the use and exposure of the public to certain classes of compost. Studies of long term exposure to toxics from compost have not been conducted. No studies have been found while researching the EIS that provide a health risk assessment for compost production and use. This does not mean however, that there is not a substantial risk from the use of compost, or co-composting but rather that a health risk assessment has not been undertaken.

Refuse-derived fuel combustion data has been included in the data used to evaluate the proposed project along with mass burn data. The data for RDF facilities does not show significant variation from mass burn in emissions rates of toxic materials. It is expected that comprehensive analysis of RDF emissions will show the same level of health risk as that identified for the proposed facility.

6.8.17 Ash Characteristics

Several studies have been conducted on the properties of ash from resource recovery facilities (Rigio, 1982). The summary of the studies shows that the levels of lead and cadmium are the only solutes above the drinking water standards. The composite of fly ash and bottom ash typically is twice the drinking water standard for cadmium

and four times the drinking water standard for lead (1/100th the EP toxicity limits) in E.P. toxicity testing. The values for lead and cadmium from EP toxicity testing range as high as 31 mg/l and 5.3 ng/l respectively, which is in excess of the standards for hazardous wastes.

Fly ash when not combined with bottom ash typically tests as hazardous for both cadmium and lead. Fly ash is usually not a separate waste stream in plant processes. Dioxin has also been reported in ash from resource recovery facilities. Some research is being conducted regarding the dioxin concentration within the ash. No conclusive evidence is yet available regarding the long-term health effects of dioxin in resource recovery facility ash.

The following data are results of dioxin analysis from ash residue produced by the SWARU facility and indicate concentrations of PCDDs and PCDFs in the part per billion range (V. Ozacic et. al.). These concentrations are high enough to indicate some hazard potential, particularly if ash makes contact with aquatic ecosystems or humans. The human risk potential is reduced significantly by the anticipated absence of a logical exposure route, although this assumption has yet to be confirmed.

SWARU

ESP ash (ng/g)	Test 1	Test 2	Test 3
PCDDs and PCDFs	198	159	910
PCBs and CBs and CPs	2	43	92
Boiler Bottom ash (ng/g)			
PCDDs and PCDFs	1	ND	5
PCBs and CBs and CPs	3	2	3

ND=not detected at (.4 ng/g)

6.8.18 Food Chain Effects

Dioxin, the generic term for the group of 75 related compounds known as polychlorinated dibenzo-p-dioxins (PCDDs), is an unwanted but possibly unavoidable byproduct of certain manufacturing and combustion

processes. Dioxin can enter the environment through several pathways. These include inhalation, ingestion, dermal absorption, and through the food chain. Once in the environment, dioxin can be persistent. Its half-life in soil is on the order of 1 to 15 years ("Dioxin Facts", U.S. EPA, Public Affairs, Washington, D.C., July 1984).

The exposure pathway of interest in this subsection is through the eating of dioxin contaminated vegetables, beef and dairy products (i.e., milk). There has been considerable discussion regarding dioxin exposure through the food chain. The Center for Disease Control, as well as the U.S. EPA, have attempted to evaluate this pathway. Unfortunately, as yet mathematical models have not been developed to accurately quantify dioxin food chain risks. Some preliminary estimates of potential risks have been made; however, conclusive research has yet to be undertaken. This subsection discusses the findings to date regarding the risk from dioxin due to exposure through the food chain.

Consumption of Plants

Plants grown in soil containing dioxin at low concentrations are not likely to show toxic effects themselves. Dioxin is not absorbed readily by plants, and if absorbed, it does not seem to be translocated easily to other parts of the plant (Health Effects of Land Application of Municipal Sludge, Normal E. Kowal, EPA/600/1-85/015, September 1985).

Experiments on the uptake of dioxin by plants show that some uptake can occur, particularly in the roots. The majority of the contamination (86%) occurs in the portion of plants that are peelable; the edible portion containing only about 15% of the contamination (Seveso - On Environmental Assessment, Human and Environmental Risks of Chlorinated Dioxins and Related Compounds, H.K. Wipf and T. Schmid, Plenum Press, New York and London, 255-274, 1983). Several authors have concluded that there is only limited transfer of dioxin through the plant itself and that most contamination occurs on plant surfaces as a result of airborne dioxin contact.

Dr. Armond F. Yanders (Position Paper for the Dioxin Workshop Panel, Maine DEP, Dr. Armond F. Yanders, Director of Environmental Trace Substances Research Center, University of Missouri, Columbia, MO., February, 1986) has concluded that, "with the possible exception of the roots, plants do not accumulate dioxin to any appreciable extent, and that levels of dioxins found in washed, non-root portions will be lower than the levels of dioxin found" in dioxin contaminated soils.

Laboratory studies indicate that there is little or no uptake and translocation of lipohobic halogenated hydrocarbons by plants. Limited studies suggest that this conclusion is also true for dioxin (Potential Human Exposure to TCDD in Soil, George F. Fries, U.S. Department of Agriculture presented to Dioxin Work Group, Maine DEP, February 1986). TCDD residues in crops would be mainly on the surfaces of roots and leaves from the presence of dioxins in soils and in the air. Some research regarding consumption of dioxin contaminated vegetables has been undertaken. It has been concluded

that most of the contamination is associated with the surface. In carrots, over 97% of PCB contamination (based on experimentation) was removed by peeling. Some of the foliage contamination is believed to be removable by washing vegetables before cooking (George F. Fries, 1986). Dr. Yanders has also concluded that "consumption of non-root crops grown on soils containing levels of dioxin of 1 ppb or less is unlikely to pose a hazard to human or animal health" (Yanders, 1986).

In contrast, other authors such as Dr. Barry Commoner (Commoner, et. al., "Environmental Levels and Health Effects of Chlorinated Dioxins and Furans," p. 6 CBNS, presented at AAAs meeting, May, 1986) conclude that "current exposure of the U.S. population to PCDD/PCDF is unacceptable and should be reduced. This is evident from recent EPA regulatory action."

Consumption of Dairy Products or Meat

Although beef and dairy animals are unlikely to accumulate significant amounts of dioxin by consuming materials (forage) contaminated by dioxin (i.e., exposed to dioxin in air or in the soil) at low levels, the soil itself may pose more of a concern. Grazing animals commonly ingest some soil as well as the plant material they eat. Thus they can consume amounts of dioxin in and on the plant materials as well as deposited on the soil. The levels of dioxin found in human milk are not yet a cause for concern, but consumption of contaminated dairy products over a long period of time could result in dioxin accumulation above the "normal" background level (Yanders, 1986).

Dr. Yanders and other researchers have addressed the issue of the land application of dioxin contaminated sludges on grazing land. The direct application of sludge to land represents a significantly higher concentration of dioxin in soils than would occur as a result of the deposition of dioxin on soil from the emissions from a resource recovery plant. Nevertheless, some comparisons can be made. Dr. Yanders has concluded that the land application of sludge contaminated

with dioxin at levels less than 100 parts per trillion is unlikely to pose a hazard to human health for either meat or dairy products (Yanders, 1986).

Dr. Barry Commoner (Commoner, et al, 1986) has on the other hand concluded that "It has been shown that in humans, the PCDD/PCDF concentration in the lipid of breast milk is approximately equivalent to that in adipose tissue lipid... This computation reveals that an infant consuming milk from a mother with adipose levels equal to those determined for the U.S. population by the EPA survey is exposed to enough PCDD/PCDF to account for a risk of 23-64 per million in only one year of breast feeding." Dr. Commoner determines that the current exposure of the U.S. population to dioxin is unacceptable. Dr. Rappe and other authors (Christopher Rappe, et al, Polychlorinated Dibenzofurans (PCDFs) and Dibenzo-p-Dioxins (PCDDs) in cow milk from various locations in Switzerland, University of Sweden, S-901 87 Umea, Sweden) have reported cows milk samples containing dioxin at detectable limits. This report concludes that some of the levels detected are significant.

Emissions from the resource recovery facility will result in the deposition of dioxin onto agricultural land in the Elk River area. The dispersion modeling previously presented in the health risk assessment has indicated a dioxin concentration in soil from a 1,500 tons per day facility (worst case) of 8.7×10^{-5} mg/kg of soil. This translates to a soil concentration of 87 parts per trillion. The implication is that the soil concentrations of dioxin from the facility will be at or less than the level of 100 ppt which is believed by Dr. Yanders to be unlikely to pose a hazard to human health from either meat or dairy products. This is particularly true if vegetables are washed before being fed to animals and if grazing does not occur every day during the year. Dr. Barry Commoner (Commoner, 1986) on the other hand suggests that dioxin levels are currently at unacceptable levels and additional exposure to dioxin should not be allowed. The evidence regarding health risk from the consumption of dairy products containing dioxin is not conclusive at this time.

Models for bioconcentration of PCDDs and PCDFs from human food chain components have not been validated by the U.S. EPA at the present time. Review of the scientific literature revealed only one significant attempt to determine cumulative food chain associated TCDD equivalent dose, produced by the Danish EPA in 1984 (National Environmental Protection Agency, Copenhagen, Denmark, December, 1984).

Use of their algorithms for converting TCDD air equivalent deposition rates to human dose through food grown within the emission zone, indicated risks in the range of 1×10^{-4} from this component (Minnesota Department of Health, 1986). Interpretation of this information remains inconclusive since the translated document has not been verified for accuracy. Communication with the source agency (Danish, EPA), is now in progress to better resolve this issue for due attention.

Degradation of Dioxin

Dioxin emissions from the facility will contact vegetable, animals, and the soil. The dioxin will be taken up by these agricultural resources. If dioxin contacts the surface of a leaf or soil, it will be broken down by ultra-violet light (sunlight). It has been estimated that the half-life for dioxin is from one to fifteen years.

Conclusion

It is known that plants, animals, and ultimately humans will bio-accumulate dioxin through the food chain. Little conclusive evidence is available however, regarding the extent of the risk from this particular pathway.

It is known, however, that plants other than root plants don't appear to take up dioxin to any great extent. This has been shown as a result of research done in connection with the Seveso incident. It has been found that some animals do take up dioxin. It has also be found in trace amounts in human milk in Europe in particular, (Danish EPA, Formation and Dispersion of Dioxins..., December 1984). This study also indicated that the risk from consumption of agricultural products can be as much as 480 times greater than inhalation. In contrast, one author concludes that, if the dose children get through mother's milk is calculated, for the total body burden over a lifetime, this particular pathway appears insignificant (Dr. Renate D. Kimbrough, M.D., Presentation to Main DEP, Dioxin Workshop, Feb., 1986 p. 12). In contrast Dr. Commoner (Commoner, et. al., 1986) concludes that the current risk from dioxin exposure is unacceptable).

It appears that there is no definitive agreement on the risk of dioxin uptake through the food chain from emissions from resource recovery plants. Other authors might, however, conclude that food chain risks can be significant (i.e., Commoner, 1986; Rappe, et. al.).

Identification of a series of PCDDs and PCDFs in human samples, including human milk and adipose tissue, has been reported (C. Rappe, 1984). The report indicates that a 5 kg baby consuming 1000 ml of milk a day will receive a dose of 10 pg of 2,3,7,8-tetra-CDD $\text{kg}^{-1} \text{day}^{-1}$, which is higher than the ADI values discussed in some countries and much higher than the virtually safe dose discussed by Kimbrough et al. (1984).

6.8.19 Summary

This section has presented the results of a detailed health risk assessment related to the exposure of the public to pollutants to be emitted by the proposed resource recovery facility. Particular emphasis has been placed on the potential increased cancer risk due to the exposure to dioxin.

Three primary exposure pathways (inhalation, ingestion, and dermal exposure) were evaluated to determine the increased health risk to the general public. Certain assumptions were made in order to provide an upper bound (worst case) estimate of the potential risk to the public. These conservative assumptions were:

- A continuous exposure over a 70-year period was assumed.
- A half-life for dioxin in soil of 12 years was utilized in the analysis.
- 100% bioavailability from soil
- The analysis provides an estimate of increased risk for a hypothetical person exposed to the maximum ambient concentration of pollutants continuously (24 hours per day, 365 days per year) for 70 years.
- Three methods for calculation of the toxicity of the various dioxin isomers were utilized. Two of the methods used were a Swiss EPA and California approach which are believed to provide conservative or worst case results.

Various authors have recommended different approaches to calculating health risks from resource recovery facilities. Resultant risk estimates have varied as much as a factor of 100 times depending on the methodology used. It appears that the assumption which most significantly affects the health risk estimate is the use of a specific dioxin toxic equivalency factor (TEF). Since various dioxin isomers are believed to have different toxicities, several organizations have developed TEFs to provide an estimate of overall dioxin toxicity. Use of the U.S. EPA Method, as opposed to the Swiss EPA TEF method, can for example result in a health risk estimate ten times higher than the Swiss EPA approach.

The use of different half-lives, emissions assumptions, or the inclusion of additional exposure pathways (i.e., inhalation, ingestion, dermal exposure, food chain) appears to be of less significance than the selection of the Dioxin TEF.

Table 6.8-28 summarizes the estimated health risk for the maximally exposed individual assuming three exposure pathways (inhalation, ingestion, and dermal exposure). The results provided are for a 1500 TPD facility (the maximum sized facility with the greatest potential impacts) and the three possible dioxin toxic equivalency factors used in the assessment. They provide an estimate of the potential range of the maximum increased risk of cancer.

If it is assumed that the facility will operate similar to an average resource recovery facility (average emissions rate), the total cancer risk for the 1,500 tpd facility from pollutant emissions would be 0.31 per hundred thousand assuming U.S. EPA TEF, 2.5 per hundred thousand assuming Swiss EPA TEF, and 1.2 per hundred thousand assuming the California TEF. The Minnesota Department of Health Standard is one per one hundred thousand. This standard is exceeded if the Swiss EPA or California TEF approach is utilized. It should be noted that the results provided assume a continuous exposure for 70 years at the point of maximum ambient concentration.

The table also shows the expected health risk assuming pollutant emissions comparable to those for the SWARU RDF facility on Canada. It is not believed that the proposed facility will or should be allowed to operate in such a manner similar to the SWARU plant. The

TABLE 6.8-28

SUMMARY OF CUMULATIVE RISK FOR MAXIMALLY EXPOSED INDIVIDUAL -
 ALL EXPOSURE PATHWAYS - 1500 TPD FACILITY

<u>Case</u>	<u>Inhalation, Ingestion, and Dermal Exposure</u>
<u>Average</u>	
<u>Emissions Rate</u>	
USEPA TEF	3.1 E-6
Swiss EPA TEF	2.5 E-5
California TEF	1.2 E-5
<u>Worst Case</u>	
<u>SWARU Emissions</u>	
USEPA TEF	2.3 E-5
Swiss EPA TEF	1.7 E-4
California TEF	7.8 E-5

Source: ERT, 1986

results of the analysis show that if the proposed facility operated similar to the SWARU plant the health risk for a 1,500 tpd facility would be: 2.3 per hundred thousand for the U.S. EPA TEF, 17.1 per hundred thousand for the Swiss EPA TEF, and 7.9 per hundred thousand for the California TEF. In all cases, the Minnesota standard of one per hundred thousand would be exceeded.

Depending on the particular assumptions made, the risk estimate for a 1,500 tpd facility varies from a maximum risk of 17 per 100,000 to 0.31 per 100,000. The difference in risk is significant and depends on the assumptions made regarding the methodology to be used in determining the risks associated primarily with exposure to dioxin. There are currently many ways of assessing risk from dioxin exposure. The FEIS has presented the results of three methodologies which are believed to provide a range of the risks from operation of the facility. Other methodologies have been suggested by various authors (i.e. Commoner et al, 1986) which would provide risk estimates different from those presented in this FEIS.

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Kreiger, Robert 1986. Minnesota Department of Health.

APPENDIX A



Minnesota Department of Transportation
Transportation Building, St. Paul, MN 55155

June 11, 1986

RECEIVED 296-1652
JUN 16 1986

Clifford T. Anderson, Director
Office of Planning and Review
Minnesota Pollution Control Agency
1935 County Road B2
Roseville, Minnesota 55113-2785

MINN. POLLUTION
CONTROL AGENCY

Re: Anoka County Refuse Derived Fuel
Resource Recovery Facility
Draft Environmental Impact Statement (EIS)

Dear Mr. Anderson:

Thank you for the opportunity to review the Draft EIS on the proposed Anoka County Resource Recovery Facility. The Minnesota Department of Transportation (Mn/DOT) anticipates that the proposed facility will cause little adverse impact to our transportation facilities.

If you require any additional information from Mn/DOT, please contact Carl Hoffstedt, Transportation Planning Engineer at our District Office in Golden Valley, phone number (612) 593-8540.

Sincerely,

Cheryl Heide, Environmental Coordinator
Environmental Services



STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

BOX , 500 LAFAYETTE ROAD • ST. PAUL, MINNESOTA • 55146

DNR INFORMATION
(612) 296-6157

June 11, 1986

RECEIVED
JUN 16 1986

MINN. POLLUTION
CONTROL AGENCY

Mr. Clifford Anderson
Office of Planning and Review
Minnesota Pollution Control Agency
1935 West County Road B2
Roseville, Minnesota 55113

RE: ANOKA COUNTY REFUSE DERIVED FUEL RESOURCE RECOVERY FACILITY - DRAFT
ENVIRONMENTAL IMPACT STATEMENT (DEIS)

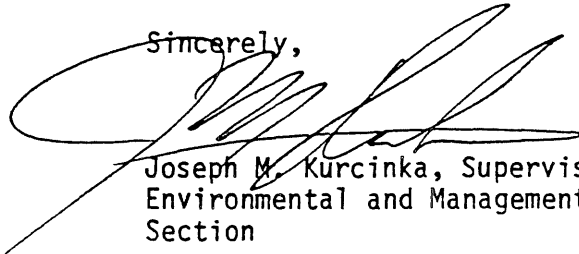
Dear Mr. Anderson:

The Department of Natural Resources (DNR) has reviewed the above-referenced project and we offer the following comments for your consideration.

In general we feel that the DEIS adequately addresses the issues of concern to our Department. There are no significant fish and wildlife resources that will be directly affected by the project. We are concerned about off-site impacts resulting from various factors, including erosion and runoff control and disposal of facility residue. The DEIS adequately addresses these issues as well.

Thank you for the opportunity to review this project.

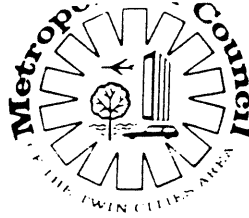
Sincerely,



Joseph M. Kurcinka, Supervisor
Environmental and Management Analysis
Section

JMK/DB:j1

c: Bob Hance
Earl Huber
Dale Homuth
Gregg Downing - EQB



Metropolitan Council
300 Metro Square Building
Seventh and Robert Streets
St. Paul, Minnesota 55101

Telephone (612) 291-5314

June 13, 1986

Mr. Eric Killberg
Minnesota Pollution Control Agency
1935 West County Road B2
Roseville, MN 55113-2785

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JUN 19 1986

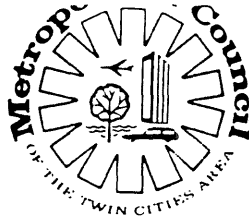
**MINN. POLLUTION
CONTROL AGENCY**

RE: Draft Environmental Impact Statement (DEIS)
Anoka County Refuse-derived Fuel Facility in Elk River
Metropolitan Council Referral File No. 13394-3

Dear Mr. Anderson:

At its meeting on June 12, 1986, the Metropolitan Council considered the DEIS for the Anoka County Refuse-derived fuel facility in Elk River. This consideration was based on the following statement from the Consent List which was approved by the Council.

This draft EIS is for the mixed municipal solid waste processing facility proposed by Anoka County and Northern States Power Company. Although the proposed site is in Sherburne County, the Metropolitan Area will experience impacts from the transportation of wastes and recovered materials and the proximity of the site or potential alternative locations. This thorough but technical analysis advances the state of knowledge that should be available to help governmental agencies make decisions affecting the approval of this project. With minor additions and improvements, it should meet the adequacy requirements of the Environmental Quality Board Rules. The Council's suggestion, in conjunction with its comments on the Environmental Assessment Worksheet, that alternative technologies and sites should be discussed, was carefully addressed in terms of alternative technologies. More discussion of alternative site location considerations appears to be warranted. Storm Water and Waste Water treatment plans were not reviewed by the Council staff because the treatment measure will occur outside the Metropolitan Area. The assessment of air quality impacts associated with RDF combustion at United Power Association boilers could be improved by indicating how the various types of control equipment considered



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300 Metro Square Building
Seventh and Robert Streets
St. Paul, Minnesota 55101

Telephone (612) 291-6359

contributed to the modeled emission results. The project will help implement the Council's Solid Waste Management Development Guide/Policy Plan provisions to encourage waste processing.

The Council approved the above statement as its comments on the EAW.

Sincerely,

A handwritten signature in cursive script that reads "Sandra S. Gardebring". A long horizontal line extends from the end of the signature to the right, then turns downward and then left, ending near the "cc:" line.

Sandra S. Gardebring
Chair

SSG:jr

cc: Greg Downing, Environmental Review Coordinator
Wayne Nelson, Metropolitan Council Staff



United Power Association

ELK RIVER, MINNESOTA 55330-0800 612-441-3121

June 5, 1986

Mr. Clifford T. Anderson, Director
Office of Planning and Review
Minnesota Pollution Control Agency
1935 West County Road B2
Roseville, Minnesota 55113-2785

RECEIVED
JUN - 6 1986

Dear Mr. Anderson:

MINN. POLLUTION
CONTROL AGENCY

United Power Association has reviewed the Draft Environmental Impact Statement for the Proposed Anoka County Refuse Derived Fuel Resource Recovery Facility and offers the following comments and clarifications particularly with respect to the description of the Elk River Generating Station.

In Section 4.1.6 on p. 4-14, it is stated that "electric power would be obtained by accessing the existing utility infrastructure." This statement can be clarified and made more specific as plans have developed. The electrical needs of the Resource Recovery Facility will be served by Anoka Electric Cooperative. A new 69 kilovolt transmission line, approximately 3/4 mile in length, will tap the existing area subtransmission system and deliver power to a new substation that will be built on site.

In the first paragraph of Section 4.1.10, it is stated that "on most days, Units I and II will fire at a rate of 700 tons/day." This statement is inaccurate to the extent that the maximum RDF usage in Units I and II will be 700 tons/day. It is expected that the Elk River Station will operate around the clock, seven days/week, while the Resource Recovery Facility will operate six days/week. Therefore, for a 1000 ton/day resource recovery facility, the average RDF available to burn at Elk River would be 600 tons/day (1000 TPD MSW X 0.7 = 700 TPD RDF X 6 days/week = 4200 tons RDF/week ÷ 7 = 600 TPD average RDF use at Elk River).

The last sentence of the first paragraph of Section 4.1.10 is redundant. It repeats an earlier sentence in the paragraph.

The changes outlined in Section 4.1.10 to allow the use of RDF at Elk River are generally accurate. However, we suggest that the phrase at the bottom of p. 4-16 "to minimize the risk of jamming from inconsistent RDF" be deleted. The second item on p. 4-18 would be more accurate if it read "modify the multiclone dust collector....." Finally, details of the bottom ash handling system have not been designed at this time. The phrase "consisting of a dry drag chain" should therefore be omitted from item 4 on p. 4-18.

The last paragraph on p. 4-18 is inaccurate in that our permitted water withdrawal rate from the Mississippi River is 50,000 gallons per minute, not 25,000.

At the top of p. 4-19, it is stated that the facility water usage in 1984 was 126,600 gallons per day. This average is correct, however, it should be recognized that the facility was operated very little in 1984. Water withdrawal during normal operation of the plant is considerably higher. For instance, the average water withdrawal for the period 1970 to 1980, when operation of the plant was considerably greater, was approximately 16,000,000 gallons per day. Water usage from the on-site well is independent of facility operation.

The titles of Tables 6.1-1, -2, -3, -10, -11, and -12 should be clarified to indicate that 500 TPD, 1000 TPD and 1500 TPD are the project input rates of municipal solid waste, not RDF.

The second paragraph of Section 6.3.2.2 on p. 6-42 states that combustion ash (bottom and fly) will be landfilled. While true, this statement requires clarification. If an existing area landfill is used, it is likely that the ash will be placed in a new disposal cell separate from existing operations. The design and operation of the new cell will be in accordance with the requirements of the Minnesota Pollution Control Agency (Minnesota Rules, part 7035.1700) and may contain such features as:

- a cell liner of impermeable material to protect groundwater;
- provisions to collect and treat leachate;
- surface water diversion around the cell;
- a water monitoring program to determine whether or not the ash or the leachate is causing pollution of underground or surface water; and
- a contingency plan to prevent off-site groundwater pollution.

In Section 6.6.2 on p. 6-85, it is stated that delivery of 350 tons of RDF per day to the power plant will result in 230 round trips. This is inaccurate. In fact, 350 tons/day delivered to Elk River will result in about 36 round trips.

The last full paragraph on p. 6-101 states that dry scrubbers show high removal efficiencies for dioxins and furans. This is misleading in that it is the dry scrubber/baghouse combination that shows high removal efficiencies for dioxins and furans with the baghouse segment of the combination being of most importance. We feel that the document should contain a discussion of the merits of a scrubber for controlling emissions from high efficiency utility boilers such as the Elk River Station.

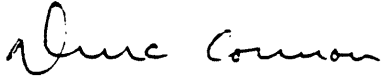
The last section of the document, Section 6.8, Health and Safety, would be more meaningful if definite conclusions about the impact and risk of burning RDF at the Elk River Station are clearly stated. Additionally, it would be helpful to the reader if the risks calculated in this section are compared to risks associated with common activities or aspects of modern living.

Mr. Clifford T. Anderson
June 5, 1986
Page 3

We appreciate the opportunity to comment on the Draft EIS and we are available to answer any questions or supply additional information if needed.

Sincerely yours,

UNITED POWER ASSOCIATION



Dan McConnon, Manager
Environmental and Lands Division

DM:sgb



Northern States Power Company

414 Nicollet Mall
Minneapolis, Minnesota 55401
Telephone (612) 330-5500

June 9, 1986

RECEIVED
JUN 11 1986

MINN. POLLUTION
CONTROL AGENCY

Mr Clifford T Anderson, Director
Office of Planning and Review
Minnesota Pollution Control Agency
1935 West County Road B-2
Roseville, Minnesota 55113

ELK RIVER RESOURCE RECOVERY FACILITY
Draft EIS Comments

Northern States Power Company has reviewed the Draft Environmental Impact Statement for the proposed Anoka County Refuse Derived Fuel Resource Recovery Facility and have prepared a number of comments and suggestions for improvements, which are enclosed.

If you need any additional information or clarification, please contact me.

J R Alders, Administrator
Routing and Siting

ah

Enclosure

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JUN 11 1986

MINN. POLLUTION
CONTROL AGENCY

COMMENTS ON THE ELK RIVER DRAFT EIS

<u>PAGE</u>	<u>COMMENT</u>
1-2	<p>"If the additional volume is committed prior to the finalization of financing arrangements <u>prior to the notice to proceed issued by Anoka County</u> the facility may include one or two additional lines which will allow a total (one-shift) daily tonnage of 1000 and 1500 tons respectively."</p> <p>The decision point for additional waste processing capability for the facility is technically not correct. Anoka County will issue a Notice to NSP and UPA to Proceed. At that time the matter of facility size must be resolved.</p>
1-4	<p>"The proposed site is zoned I-1, Light Industry and <u>C. Commercial.</u>"</p> <p>A small corner of the site on the southwest is zoned Commercial. We suggest the addition noted above.</p>
1-5	<p>There is no combustion of RDF at the Elk River Processing Facility. There may be dioxin and furan emissions at the UPA Elk River Power Plant as the result of using RDF as fuel. This may not be clear to the reader. We suggest the following change to clarify the discussion.</p> <p><u>"Operation of the proposed facility The combustion of RDF at the Elk River Power Plant will result in emissions of dioxins, furans, other organic compounds and trace metals."</u></p>
4-8	<p>Each processing line has the capacity to handle 50 tons of MSW per hour. If one line is installed the facility could process waste at the rate of about 50 tons per hour. If two lines are installed the facility could process lines at the rate of about 100 tons per hour and if three lines are installed the facility could process waste at the rate of about 150 tons per hour. We are concerned that this may not be completely clear to the reader and suggest the following change to clarify Section 4.1.3.</p> <p>"The proposed facility will be capable of processing 50 tons of MSW per hour, <u>per line.</u>"</p>
4-10	<p>Some slight adjustments in the layout of the site have been made since the drawing on page 4-10 was provided. A copy of the new site layout was provided to you recently. We suggest it be used instead of page 4-10.</p>

4-13 "The final RDF stream will consist of a composite of material from the shear secondary shredders (if installed)--, oversize material from the secondary disc screens ..."

Proper terminology for the shredder within the process line(s) is the "secondary" shredder. The proposers may bring a "shear" shredder to the site to shred oversize combustibles separated on the tipping floor if significant quantities of oversize materials appear at the facility and they can economically and reliably be incorporated into the RDF stream.

4-14 "Incoming material will be dumped on the tipping floor and inspected ~~before the hauler leaves the facility.~~"

As a practical matter it will be nearly impossible to inspect all loads dumped on the tipping floor before the hauler leaves, especially during peak delivery periods. All waste will be inspected before reaching the processing line(s). As noted later in the paragraph, extra attention will be given to loads from areas with a history of hazardous waste generation.

4-15 "Residuals (the heavy fraction) from the RDF process will amount to about 19 to 24 percent of the solid waste infeed."

The RDF process at the Elk River Resource Recovery facility is designed to recover as much as about 75 percent of the combustibles as RDF. The actual recovery rate depends on many factors affecting the quality of the waste stream. If RDF recovery is 75 percent and 6 percent of the waste is recovered as ferrous and aluminum recyclables the heavy fraction could be as low as about 19 percent.

4-17 The schedule on page 4-17 has slipped very slightly. Plans now call for permitting to be completed in August or September and construction to begin shortly thereafter. We suggest a footnote, recognizing the fact be appended to the table.

4-19 The discussion under section 4.2.1 1000 Tons Per Day Facility, is an explanation of the various alternate size alternatives for the facility and their surrounding circumstances. We are concerned that the reader may be confused by the title to the section. We suggest the section title be changed to "Alternate project Sizes".

"The permitted annual average input tonnage of 1526 tons per day is equivalent to a daily input of 1780

tons, based upon a six-day week."

The 1526 tons per day number is calculated based on a six-day week. The above sentence on page 4-19 should be removed. It is not at all clear where the author achieved the 2300 tons per day number in the next sentence. If it is calculated based on the 1780 number it should be adjusted. Regardless of its origin, the EIS should explain how the number was generated and the source of the information should be given. The number seems extremely high and unlikely to the proposers, especially in light of the waste flow designation measures that will be in place in participating Counties.

4-21 "The permitted annual volume of the 1500 ton per day RDF facility is equivalent to roughly ~~390,000~~ 327,000 of RDF annually."

We believe there is an error in arithmetic in the quoted sentence. The annual volume of RDF produced at a three line facility permitted for an average of 1526 tons per day would be 1526 tons/day x 306 operating days per year x .70 (RDF recovery rate), which equals approximately 327,000 .

5-38 Table 5.3-1 on page is apparently in error and should be revised. The column headings, A-E, are not identified clearly. We suggest they be explained. We assume that the percentages in the columns should add to 100 but they do not. Could you please clarify whats going on in the table? We expect aluminum and magnetics, combined, to be about 6 % of the waste stream.

6-16 Table 6.1-5 has a typographical error in the Flow Stack Parameter column. The two flow numbers should be 5.2×10^6 and 3.2×10^6 .

6-46 "This table indicates that approximately 72,600 c.y., 145,000 c.y., and ~~3,484,000~~ 217,800 c.y. will be needed respectively for the 500,1000, and 1500 tpd facilities.

There has been a serious error in arithmetic in the quoted sentence as noted above. The error was also made on page 6-48, line 7.

6-85 "Approximately 350 tons per day would be delivered to the power plant per-day resulting in 230-18 round trips each day."

Evidently there has been an error in arithmetic in the above sentence. RDF will be transported to the Elk River Power Plant in 20-ton completely enclosed transfer trailer trucks. 350 divided by 20 equals 18 trips. There will, therefore, be about 18 trips from the resource recovery facility to the power plant each day and 18 return trips each day.

Section 6.8 Health Risk Assessment

In a few locations in the health risk assessment section, we believe the authors need to document more thoroughly the data used for some of the calculations and the source of that data. The following comments identify specific areas where we felt documentation improvements could be made.

- 6-103 Table 6.8-1 presents emission data used to develop the Health Risk Assessment. Better citation is needed to specifically identify the sources of the dioxin and furan emissions data. We believe the specific dioxin and furan congener distribution used in the Health Risk Assessment needs to be given.
- 6-119 We find several of the actual exposure levels used in the Health Risk Assessment missing from the discussion. Values should be specified for key parameters such as: ground level air concentration used for the inhalation exposure; ingestion rates and percent absorption rates; dermal exposure rates and percent absorption; and dioxin/furan half-life or degradation rates.



COUNTY OF ANOKA

Office of the County Board of Commissioners

COURTHOUSE ANOKA, MINNESOTA 55303 612-421-4760

June 6, 1986

Mr. Clifford T. Anderson, Director
Office of Planning and Review
Minnesota Pollution Control Agency
1935 W. Co. Rd. B-2
Roseville, Minnesota 55113-2785

Dear Mr. Anderson:

We have reviewed the Draft Environmental Impact Statement For Proposed Anoka County Refuse Derived Fuel Resource Recovery Facility. The following comments are offered for improving the accuracy and clarity of the document while ensuring that the final EIS adequately addresses the items listed in the EIS Scoping Document.

1) Page 1-4: We do not believe that existing landfills will experience greater rates of utilization and consequently reduced operating life, as a result of the proposed project. Anoka and two other metropolitan counties are currently involved in a landfill siting process (see comments under 4 below). As a result of this process, new landfills will be developed for disposal of residuals from waste processing and recovery facilities. It is anticipated that the new landfill for Anoka County could be in operation in 1989 or 1990 to accept project reject wastes derived from processing of Anoka County's waste.

NSP/UPA/Anoka County are currently involved in contract negotiations with several other counties which are interested in participating in this project. These contracts will provide that project reject wastes derived from processing waste from each participating county will not be disposed of in any other participating county unless alternative disposal locations are mutually agreed upon.

- 2) Page 2-3, Table 2-1: a) The reference to Drainage Permit should be deleted because there is no watershed district in the project area. b) Under Conditional Use Permit, the Elk River City Council is the agency which will consider issuance of a conditional use permit. The Elk River Planning Commission will make a recommendation to the City Council.
- 3) Page 3-7: "providing for minimum risk avoidance" should be changed to "minimizing risk".
- 4) Page 3-7: The following paragraph can be added to the end of this section, which describes Anoka County's landfill abatement efforts:

Affirmative Action / Equal Opportunity Employer

Anoka County has begun a landfill siting process. Anoka, Hennepin and Washington counties are each required by State law and Metropolitan Council policy to prepare an EIS on their inventories of candidate landfill sites, and to select a site for a new landfill. We anticipate that these new landfills will be developed for disposal of residuals from waste processing and recovery activities. It is anticipated that process reject wastes derived from waste from Anoka County that is processed at the proposed processing facility will be disposed of at the new landfill for Anoka County. Anoka County has three potential sites that were approved for further study by the County, the MPCA and the Metropolitan Council. These potential sites are located in the Township of Oak Grove, the City of Ramsey, and on the Andover-Coon Rapids border. Anoka County has completed the EAW for the siting process. It is anticipated that the EIS and site selection will be completed during 1987, and that the landfill could be in operation in 1989 or 1990.

- 5) Page 4-17, Figure 4-4: The proposed schedule for project implementation shown is from the July, 1985 proposal from NSP. The current schedule calls for the project to be in operation by summer or fall of 1988. The source for the schedule shown is NSP, not Springsted, Inc.
- 6) Page 4-25: It is not clear what the source is for the statement that "yard waste represents approximately seventeen percent by volume of the total waste stream of Anoka County..." The best local information available is from the Hennepin County Comprehensive Recycling Study, Volume II, which shows that about 8.7% of the waste stream by weight is composed of yard waste on a year-round basis. The table at the bottom of the page would have more local significance if it contained the figures from the Hennepin County Study instead of national figures.
- 7) Pages 4-24 to 4-28, Source Separation/Recycling: It could be noted in this section that a major limitation of source separation is the availability of markets for some materials. The Metropolitan Council's Market Identification and Expansion Report, 1986 (copy attached) indicates that markets for plastics, tin cans, and mixed wastepaper are very limited, and that the local market for newspaper is weak while having the potential for market saturation.
- 8) Page 5-38, Table 5.3-1: The table would be more understandable if the sources for the five studies, A-E, were shown. Also, it appears that the average of 6% each for both aluminum and magnetics is incorrect.
- 9) Pages 5-39 to 5-42: The discussion on recycling and composting programs and facilities needs some clarification and changes: a) the reference on page 5-39 to Champlin (not in Anoka County) should be deleted; and b) Tables 5.3.2 and 5.3-3 should be combined into one table because there are drop-off recycling programs listed in both tables. Some of the information shown in these tables is not correct. Updated information as of April, 1986 is included in the attached draft of the relevant section of the Anoka County Solid Waste Management Master Plan 1985-1986 Revision.
- 10) Pages 6-46 to 6-49, Landfill Site Utilization: This section should include a discussion of the landfill siting process currently underway in the metropolitan area. (See 1 and 4 above).

- 11) Pages 6-71 and 6-77: The transportation assumptions for vehicle routing from Wright County do not appear to be consistent. Presumably it was assumed that vehicles would enter the City of Elk River via the Highway 101 bridge and then travel south on U.S. Route 10 to the processing facility.
- 12). A bibliography of references used in preparing the document should be included.

We appreciate this opportunity to comment on the DEIS.

If you have any questions, please call me at 421-4760, extension 1173.

Sincerely,

Norm Schiferl
Special Assistant to the County
Administrator

NS:dz
Enclosure

cc: Jim Alders, NSP
Dan McConnon, UPA
Anoka County Abatement Team
Dave Gurney, Pope-Reid Associates, Inc.
Colleen Herrmann, Assistant County Attorney