UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAY 31 2007

REPLY TO THE ATTENTION OF:
(AR-18J)

Tony Sullins, Field Supervisor
Twin Cities Minnesota Field Office
United States Fish and Wildlife Service
4101 East 80th Street
Bloomington, Minnesota 55425-1665

Dear Mr. Sullins:

Pursuant to Section 7 of the Endangered Species Act, (87 Stat. 884, as amended; 16 U.S. C. 1531 et seq.), the United States Environmental Protection Agency (USEPA) has reviewed the biological information and analysis related to a Prevention of Significant Deterioration (PSD) permit for Faribault Energy Park (FEP) to determine what impact there may be to any threatened or endangered species in the area around the proposed facility. The purpose of this letter is to seek concurrence from the United States Fish and Wildlife Service (USFWS) on our determination that the proposed project is not likely to adversely affect any federally listed species in relation to the proposed air quality permit for this facility.

The parties utilized the informal consultation process as specified in the "Endangered Species Act Consultation Handbook, procedures for conducting consultation and conference activities under Section 7 of the Endangered Species Act (ESA) (March 1998 final)", by the USFWS and National Marine Fisheries Service. The USEPA prepared this biological evaluation following the guidance provided in the ESA consultation handbook, as well as the recommended content suggested in the ESA regulations found in 50 CFR Part 402.12(f). As part of developing the biological assessment, the designated representative for the USEPA prepared a Recommended Scope of Analysis for FEP, dated December 12, 2006, describing the general topics of need, species of concern, effects analysis, and literature search, needed in the biological evaluation. FEP then prepared the February 5, 2007, document entitled, "Endangered Species Act Analysis".

Project Description

FEP has proposed to modify their plant to be changed from a simple cycle to a combined cycle combustion turbine. To accomplish this, FEP will install a duct burner and backup emergency generator which is not included in their current permit.

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Pollutant	Potential Emissions from Project (tons per year)
Particulate Matter (PM)	241
Particulate Matter with a diameter of 10 microns or less (PM_{10})	241
Sulfur Dioxide (SO_2)	440
Nitrogen Oxides (NO_x)	1459
Carbon Monoxide (CO)	462
Volatile Organic Compounds (VOC)	74
Flourides	neg
Lead	0.118

Action Area

Upon agreement with the USFWS, the USEPA has defined the action area for this consultation to be a 3 kilometer (km) radius from the emissions stack(s). It has been shown that, in most cases, the maximum deposition of pollutants will occur within this area. According to information provided by the USFWS, no officially designated critical habitat for any listed species occurs in the areas likely to be affected by these projects.

List of Species

The Recommended Scope of Analysis, stated that impacts to the Bald Eagle, Minnesota Dwarf Trout Lily (MDTL) and Prairie Bush Clover be evaluated as part of this project. On March 22, 2007, the USFWS submitted a list of species to be evaluated as part of this consultation. That document indicated that the MDTL was the only species likely to be present within the 3 km action area. This information was forwarded to FEP, with the recommendation that the only species that should be evaluated for this project is the MDTL.

Summary of Analysis

The ESA consultation process began in December 2006, when representatives from Stanley Consultants contacted Jennifer Darrow, of the USEPA, on behalf of FEP. On December 12, 2006, the USEPA provided a draft document to FEP entitled, "Recommended Scope of Analysis for FEP for Endangered Species". The USEPA has conducted this analysis in accordance with this scoping document and the information submitted from FEP in response.

The scoping document provided by the USFWS indicated that the modeling for this analysis should follow the general guidance provided in Chapter 3 of the USEPA's Screening Level Ecological Risk Assessment protocol for assessing chemical fate and

transport, the modeling should show air concentrations and deposition rates for appropriate pollutants, and that the total impacts should be evaluated looking at the combined effects of the vapor phase, particle phase and particle-bound phase of pollutants. The document indicated that Industrial Source Complex Short Term 3 was an acceptable model for the analysis.

ESA Effects Analysis

Impacts to the MDTL were evaluated against the minimum ambient air concentrations for pollutants that have an affect on the most sensitive vegetation. Stanley Consultants utilized the USEPA document entitled, "A Screening Procedure for the Impacts of Air Pollution on Sources of Plants, Soils and Animals", to obtain minimum reported effects levels. Maximum concentrations of SO_2, NO_x, CO, beryllium and lead, as modeled for PSD purposes, were compared to the reported sensitive levels obtained from this document. The worst case predicted concentrations obtained from the dispersion modeling analysis performed for the PSD permit application were used to compare air pollution impacts from the facility to reportable sensitive vegetation levels.

Deposition modeling was performed to evaluate the non-accumulative soil deposition for nitrogen, as NO_X, and from PM_{10}. The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), Version 07026, was used for the deposition modeling. The AERMOD model is capable of predicting short-term and annual pollutant dispersion parameters for single or multiple stacks in simple or complex terrain. Both wet deposition and dry deposition modeling were performed.

Nitrogen deposition was one of the areas of greatest concern for the MDTL. Based on a literature survey conducted by Cambridge Environmental and on additional information provided by the USFWS from previous reports evaluating flora endangered species, the USEPA has been utilizing benchmark values between 0.5 and 1.0 grams per meter squared per year ($g/m^2/yr$). The closest nitrogen background deposition rate was obtained from monitoring stations in Dakota County, which is northeast of FEP. The background deposition rate for 2005 from the representative monitoring location is 0.442 g/m^2.

Using the AERMOD model, the worst case impact from the proposed project would result in a deposition rate of 0.01102 $g/m^2/yr$ at the highest receptor location. As previously discussed, AERMOD is a conservative model, likely to over predict the project impacts. Additional impacts to consider include the actual anticipated operation of FEP, which will be much less than a continuous operation of 8760 hours per year, as modeled. The 2458.77 tons per year increase in NO_x emissions from permitted and new emission sources at this site assumes operation at maximum capacity, 8760 hours per year. Historic actual operation under the permitted simple cycle operation has been much lower, approximately 14.3% of maximum potential operation. Based on these factors, we conclude that the increases in nitrogen deposition from the proposed project will not likely adversely affect the threatened or endangered species.

Finally, PM_{10} deposition on plant leaves was considered. Through a literature survey conducted by Cambridge Environmental, a benchmark of 10 $g/m^2/yr$ was selected. The highest modeled deposition rate for PM_{10} was 0.00139 $g/m^2/yr$. The USEPA concludes that PM_{10} deposition is not likely to adversely affect the threatened or endangered species.

ESA Determination

After reviewing the analysis provided by Stanley Consultants, the modeled impacts from the FEP project would not have an adverse impact on sensitive vegetation, including the MDTL, in the action area.

Considering this analysis (see enclosure) in its entirety, the USEPA concludes that the proposed construction of this project may affect, but is not likely to adversely affect the MDTL. The USEPA respectfully requests the USFWS concurrence on this determination.

Sincerely yours,

Pamela Blakley

Pamela Blakley, Chief
Air Permits Section

Enclosure

Recommended Scope of Analysis for Faribault Energy Park, Rice County, Minnesota
for Endangered Species Act
December 12, 2006

Purpose of analysis:

The analysis is intended to determine whether the proposed project at Faribault Energy Park (FEP) is likely to directly or indirectly adversely affect federally listed species. This recommended scope of analysis or roadmap recommends using USEPA's ecological risk assessment process to inform the decision points in section 7 of the Endangered Species Act. Portions of the USEPA's draft Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (EPA 530-D-99-001A) provides useful guidance for this analysis. Although this guidance was designed specifically to assess the impact of hazardous waste combustion facilities, it offers general approaches for assessing the fate of chemicals released to the air that can be applied to all types of industrial facilities.

Overall, the evaluation should focus on emissions from the facility. To complete this analysis we need an understanding of the background concentrations and deposition patterns. The anticipated emissions from permitted but not yet operational facilities should be included in background. The anticipated concentration in air or deposition at sites supporting listed species should be compared against NOEL (No observed effects level) benchmarks thought to be protective of the appropriate group (e.g., plants). The evaluation should look at the incremental addition in the context of background concentrations.

Benchmarks:

For these analyses, commonly accepted NOEL (no observed effects levels) benchmarks should be used. Where more than one benchmark can be found, the most conservative value should be used, unless an explanation is given to justify a less conservative benchmark. When there is no commonly accepted benchmark, there should be a search of the scientific literature for relevant toxicity information to provide a basis for risk assessment for the species of concern.

Modeling protocol:

Modeling should follow the general guidance provided in Chapter 3 of USEPA's SLERA protocol for assessing chemical fate and transport. The modeling should show air concentrations and deposition rates for all pollutants (where appropriate). The air emissions resulting from the project should be modeled at the facility level, not on a unit basis. Total impacts should be evaluated looking at the combined effects of the vapor phase, particle phase and particle-bound phase of pollutants. ISCST3 is an acceptable model for this analysis. For chemicals amenable to deposition, models in the SLERA

guidance should be used to estimate concentrations in soil, surface water, and sediment in conjunction with relevant fate and transport parameters.

Background Levels:

Site specific background concentrations in air, soil, water and sediment should be considered in the effects analysis.

Suite of pollutants to consider:

The assessment should cover all air pollutants emitted from the facility including ozone, sulfur compounds, oxides of nitrogen, carbon monoxide, particulates, and hazardous air pollutants. USEPA will provide the analysis for ozone for this project.

Types of impact to consider:

1) Long term, depending upon pollutant. Compare the worst year of concentrations in air or deposition on soil (over the last 5 years) with appropriate bench marks for chronic effects.
2) Direct effects to listed plants and animals from exposure to the vapor phase, particle phase and particle-bound phase of pollutants.
3) The indirect effects to animals from ingestion of plants, fish, and invertebrates that have accumulated these pollutants.

Listed Species:

The species that should be evaluated for impacts from the project are the Bald Eagle, Dwarf Trout Lily and Prairie Bush Clover.

Endangered Species Act Analysis

Introduction

This analysis is intended to determine whether the proposed project at the Faribault Energy Park (FEP) is likely to directly or indirectly adversely affect federally listed endangered species. FEP has proposed to modify their plant to be changed from a simple cycle to a combined cycle combustion turbine. To do this FEP will install a duct burner and backup emergency generator which is no included in the current permit. The increase in emissions has triggered a PSD review for the project. States in EPA Region V that have proposed PSD projects are required to perform an ecological risk assessment to inform the decision points in section 7 of the Endangered Species Act.

Endangered Species of Concern

The endangered species of concern which will be evaluated for impacts are those that are listed on the United States Fish and Wildlife Service (FWS) website as distributed in the county where the project is located. The FEP project is located in Faribault, Minnesota, which is in Rice County. The listed species in that county are the Bald Eagle, Dwarf Trout Lilly, and Prairie Bush Clover.

Some statewide plant species like the Prairie Bush Clover can be ruled out of the evaluation if the land use and land cover in the immediate area contains nonagricultural grassland, which is habitat for the Prairie Bush Clover. The land use within a 3 kilometer radius around the facility was evaluated using the United States Geological Survey (USGS) National Land Coverage Database

(NLCD 2001) land use and land cover map. Form this map it was determined that none of the land surrounding the plant, within a 3 kilometer radius, is considered nonagricultural grassland. Because of the absence of nonagricultural grassland in the project area it can be concluded that this project will have not impact on preservation of the Prairie Bush Clover, and thus it is being excluded from this evaluation. Therefore the Bald Eagle and Dwarf Trout Lilly remain as the main species of concern for this analysis. Impacts from the FEP project will be evaluated for these two species.

Dwarf Trout Lilly Impacts

The Dwarf Trout Lilly that may potentially grow in the area around FEP, was evaluated against the minimum ambient air concentrations for pollutants that have an effect on the most sensitive vegetation. The minimum reported levels where effects have been reported are obtained from the EPA document called "*A Screening Procedure for the Impacts of Air pollution Sources on Plants, Soils, and Animals*". Table 3.1 in that document lists air pollutant concentrations reported to have impacts on sensitive, intermediate, and resistant vegetation. For the purpose of this endangered plant species analysis only the sensitive levels were analyzed. The listed pollutants with sensitive vegetation effect levels in table 3.1 that are emitted from the project at FEP are sulfur dioxide (SO_2), Nitrogen Dioxide (NO_2), and Carbon Monoxide (CO). Where there are no sensitive levels the intermediate sensitivity levels were used. There were only intermediate sensitivity levels listed for Hazardous Air Pollutants (HAPs) emitted by this project for Beryllium and Lead. The worst case predicted concentrations obtained from the dispersion modeling analysis performed for the Prevention of Significant Deterioration (PSD) permit application were used to compare air pollution impacts from the facility to reportable sensitive vegetation levels listed in Table 3.1 of the referenced report. The following table shows this comparison:

Pollutant	Averaging Time	Maximum PSD Modeling Impact ($\mu g/m^3$)	MN Background Concentrations ($\mu g/m^3$)	Total Impact from FEP ($\mu g/m^3$)	Sensitive Plant Level ($\mu g/m^3$)	Intermediate Plant Level ($\mu g/m^3$)
SO_2	1 hr	55.89	181	236.89	917	
	3 hr	44.87	128	172.87	786	
*NO_2	4 hr	68	17	85	3760	
	8 hr	57.59	17	74.59	3760	
CO	1 week	63.88 (8-hr)	0	63.88	1,800,000	
Beryllium	1 month	0.0005	0	0.0005		0.01
Lead	3 month	0.000038 (1 month)	0	0.000038		1.5

*NO_2 concentrations are modeled NO_x concentrations multiplied by 0.75. The PSD model was rerun for the 4 and 8 hour averaging periods. There were no listed NO_2 background concentrations for the 4 and 8 hour averaging periods.

The background concentration for NO_2 is the established Minnesota annual NO_x background concentration. There were no listed background NO_x concentrations for the 4 and 8 hour averaging periods.

Based on the information in the above table the modeled impacts from the FEP project would not have an adverse impact on sensitive vegetation, including the Dwarf Trout Lily, in the area around the plant.

Bald Eagle Impacts

Bald Eagles may live and feed in the area around the FEP. This analysis will compare the ambient air concentrations from the FEP project PSD modeling analysis and Risk Assessment modeling to reported harmful pollutant levels to animals or their food source. According to Section 3.4 of the EPA document "*A Screening Procedure for the Impacts of Air pollution Sources on Plants, Soils, and Animals*", the only air pollutants that could cause adverse effects to animals or their food sources from ambient air concentrations are Lead and Beryllium. For these two pollutants the maximum predicted monthly concentrations from the FEP project are 5.0×10^{-4} $\mu g/m^3$ for Beryllium and 3.8×10^{-5} $\mu g/m^3$ for Lead. The protective levels thought to protect human health established in the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Beryllium and the National Ambient Air Quality Standards (NAAQS) for Lead would also be protective for most animals as well. The NESHAP for Beryllium is a monthly concentration of 0.01 $\mu g/m^3$. As stated above the monthly modeled concentration for Beryllium for the FEP project is well below that level. The NAAQS for Lead is 1.5 $\mu g/m^3$ on a three month averaging period. As stated above the monthly predicted Lead concentration for the FEP project is well below the three month Lead NAAQS. This information in this paragraph demonstrates that ambient air pollutant concentrations from the FEP project would not be harmful to animals in the area around the FEP.

The other effect air pollution impacts could have on Bald Eagles in the area are on the Eagle's food supply. If HAPs are deposited into the waters where the Bald Eagles feed, accumulated concentrations in fish could be toxic to the Eagles. According to "*A Screening Procedure for the Impacts of Air pollution Sources on Plants, Soils, and Animals*", Table 3.7, trace elements emitted by the FEP project could be toxic to animals if ingested. The following table shows the dietary concentrations of certain pollutants emitted by the FEP project that may be harmful to animals compared to the annual predicted ambient air concentrations from the FEP project:

Trace Element	Toxic Dietary Concentration ($\mu g/m^3$)	Maximum Annual Modeled Concentration ($\mu g/m^3$)
Arsenic	0.0036	0.00045
Cadmium	0.018	0.00034
Lead	0.096	0.000013
Manganese	0.6	0.0014
Nickel	1.2	0.00033
Selenium	0.006	0.0017

The table above shows that annual ambient air concentrations of trace elements that are toxic to animals are well below the levels where these elements are toxic to animals. In addition this approach is very conservative since all of the maximum predicted concentrations of these trace elements would not deposit in the bodies of water in the area around the FEP. Only a portion of these annual concentrations would ultimately end up in the bodies of water and accumulate in the fish that the Eagles eat. The above comparison demonstrates that the levels of HAPs emitted by the FEP project would not harm animals that eat fish or other food in the area around the FEP.

Conclusion

The impacts from the FEP project to endangered species that may be in the area of the project are negligible. The PSD modeling analysis performed for the criteria pollutants demonstrates that the facility meets the requirements for PSD review and is therefore protective of human health and the environment surrounding the project area. A more refined look at some protective benchmarks found in the EPA document "*A Screening Procedure for the Impacts of Air pollution Sources on Plants, Soils, and Animals*" demonstrates further that these species would not be harmed by the air pollutant emissions from the FEP project.

Faribault Energy Park - U.S. EPA Benchmark Screening Analysis

Chemical Emitted	Modeled Annual Air Concentration ($\mu g/m^3$)	Modeled Annual Media Concentrations: Modeled Annual Water Concentration ($\mu g/l$)	Modeled Annual Media Concentrations: Modeled Annual Sediment Concentration ($\mu g/kg$)	Modeled Annual Media Concentrations: Modeled Annual Soil Concentration ($\mu g/kg$)	U.S. EPA, Region 5, RCRA Ecological Screening Levels: Air ($\mu g/m^3$)	U.S. EPA, Region 5, RCRA Ecological Screening Levels: Water ($\mu g/l$)	U.S. EPA, Region 5, RCRA Ecological Screening Levels: Sediment ($\mu g/kg$)	U.S. EPA, Region 5, RCRA Ecological Screening Levels: Soil ($\mu g/kg$)
Acrolein	6.50E-05	6.50E-08	2.45E-08	4.33E-08	5.78E+02	1.90E-01	1.52E-03	5.27E+03
Arsenic-Total	1.50E-04	1.50E-07	5.66E-08	1.00E-07		1.48E+02	9.79E+03	5.70E+03
Barium-Total	4.60E-04	4.60E-07	1.74E-07	3.07E-07		2.20E+02		1.04E+03
Benzene	9.60E-04	9.60E-07	3.62E-07	6.40E-07	9.76E+03	1.14E+02	1.42E+02	2.55E+02
Benzo(a)anthracene	4.20E-07	4.20E-10	1.58E-10	2.80E-10		2.50E-02	1.08E+02	5.21E+03
Benzo(a)pyrene	2.10E-07	2.10E-10	7.92E-11	1.40E-10		1.40E-02	1.50E+02	1.52E+03
Benzo(b)fluoranthene	2.50E-07	2.50E-10	9.43E-11	1.67E-10		9.07E+00	1.04E+04	5.98E+04
Benzo(k)fluoranthene	1.90E-07	1.90E-10	7.17E-11	1.27E-10			2.40E+02	1.48E+05
Beryllium-Total	3.10E-06	3.10E-09	1.17E-09	2.07E-09		3.60E+00		1.06E+03
Cadmium-Total	1.20E-04	1.20E-07	4.53E-08	8.00E-08		1.50E-01	9.90E+02	2.22E+00
Chrysene	3.90E-07	3.90E-10	1.47E-10	2.60E-10			1.66E+02	4.73E+03
Copper-Total	8.90E-05	8.90E-08	3.36E-08	5.93E-08		1.58E+00	3.16E+04	5.40E+03
Dibenz(a,h)anthracene	3.00E-07	3.00E-10	1.13E-10	2.00E-10			3.30E+01	1.84E+04
Dichlorobenzenes*	1.30E-04	1.30E-07	4.91E-08	8.67E-08	8.18E+05	6.14E+01	1.93E+03	4.12E+04
Dimethylbenz[a]anthracene [7,12-]	1.70E-06	1.7E-09	6.41509E-10	1.13333E-09		0.548	6.64E+04	1.63E+04
Ethylbenzene	6.00E-05	6.00E-08	2.26E-08	4.00E-08	3.04E+05	1.40E+01	1.75E+02	5.16E+03
Indeno(1,2,3-cd)Pyrene	3.70E-07	3.70E-10	1.40E-10	2.47E-10		4.31E+00	2.00E+02	1.09E+05
Lead-Total	1.70E-04	1.70E-07	6.42E-08	1.13E-07		1.17E+00	3.58E+04	5.37E+01
Mercury-Total	2.75E-05	2.75E-08	1.04E-08	1.83E-08		1.30E-03	1.74E+02	1.00E+02
Methylcholanthrene [3-]	1.90E-07	1.90E-10	7.17E-11	1.27E-10		8.91E-02	8.19E+06	7.79E+01
Naphthalene	1.30E-04	1.30E-07	4.91E-08	8.67E-08	8.01E+04	1.30E+01	1.76E+02	9.94E+01
Nickel-Total	9.40E-03	9.40E-06	3.55E-06	6.27E-06		2.89E+01	2.27E+04	1.36E+04
Toluene	8.10E-04	8.10E-07	3.06E-07	5.40E-07	1.04E+06	2.53E+02	1.22E+03	5.45E+03
Xylenes-Total**	1.10E-04	1.10E-07	4.15E-08	7.33E-08	1.35E+05	2.70E+01	4.33E+02	1.00E+04
Zinc-Total	3.00E-03	3.00E-06	1.13E-06	2.00E-06		6.57E+01	1.21E+05	6.62E+03

Assumptions: Calculations for the Modeled Annual Air Concentrations ($\mu g/m^3$) from a unitized emission rate were used to calculate the Modeled Annual Media Concentrations. Using very conservative estimates, the concentration of air was assumed to partition completely from vapor-phase to accumulate within the media of interest. These conservative estimated values are compared with the U.S. EPA, Region 5, RCRA Ecological Screening Level Benchmarks to demonstrate compliance. The Modeled Annual Media concentrations were calculated by taking the modeled annual air concentration from the ISCT3 model results and converting that concentration into the units of the media benchmark values. To do this for the soil concnetration a bulk dry soil density of 1.5 g/cm^3 obtained from the draft Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, EPA530-D-99-001A, August 1999. For the sediment concentrations a bed sediment density of 2.65 kg/L obtained from the draft Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, EPA530-D-99-001A, August 1999.

*** Dichlorobenzenes refers to the sum of the three distinct chemical compounds (*ortho-,meta-,and para-*) shown below. The Ecological Sceening levels listed above are the sum of the values designated as Ecological Screening Levels for each distinct compound, which are listed below. Individual values were not measured.**

Chemical	CAS No.	Air ($\mu g/m^3$)	Water ($\mu g/l$)	Sediment ($\mu g/kg$)	Soil ($\mu g/kg$)
Dichlorobenzene [o-]	95-50-1	2.70E+05	1.40E+01	2.94E+02	2.96E+03
Dichlorobenzene [m-]	541-73-1	2.73E+05	3.80E+01	1.32E+03	3.77E+04
Dichlorobenzene [p-]	106-46-7	2.75E+05	9.40E+00	3.18E+02	5.46E+02

** Xylenes refers to the sum of the three distince chemical compounds (*ortho-, meta-, and para-*). The Ecological Screening levels listed above are for Xylenes-Total
The Modeled Annual Air Concentration (μg/m3) of one distinct Xylene compound found during model analysis is listed below.

Chemical	Modeled Annual Air Concentration ($\mu g/m^3$)
Xylene [o-]	4.60E-05

MEMO

TO: Jennifer Darrow **DATE:** May 17, 2007

FROM: Mick Durham

SUBJECT: FEP Deposition Modeling Summary

Dispersion modeling was conducted for the purpose of estimating deposition of PM_{10} and nitrogen from the Faribault Energy Park (FEP) facility. This modeling was conducted to support the position that negative impacts to the threatened or endangered Dwarf Trout Lily were not expected.

Deposition modeling was conducted utilizing the AERMOD version 04300. Input parameters from the most recent dispersion modeling conducted for FEP were utilized. These inputs are summarized in the attached spreadsheet.

Processed AERMET data used for meteorological data input was obtained from the Minnesota Pollution Control Agency Data for AERMOD Applications website. This data incorporates surface observations from Rochester, Minnesota, and upper air data from St. Cloud, Minnesota. Profile base elevation is noted as 395 meters. Similarly, digital elevation model terrain data was obtained from the Minnesota Pollution Control Agency (MPCA) data for AERMOD applications website.

Non-regulatory default with the toxics option was selected to enable the input of dry deposition parameters to define season and land use. Criteria selected for defining seasons were based on professional meteorological judgment. Seasons were defined as follows:

1. Midsummer with lush vegetation	Jun., Jul., Aug.
2. Autumn with unharvested cropland	Sep., Oct.
3. Late autumn after frost, no snow	Nov.
4. Winter with snow on ground	Dec., Jan., Feb., Mar.
5. Transitional spring with partial green coverage or short annuals	Apr., May.

Land use categories selected were based on documentation contained in the file MPCA "Draft" Modeling Data for AERMOD (Version 04300) Applications (Version 1.0) dated October 10, 2005. This data notes that land use in the development of the meteorological inputs includes primarily agricultural land and some wooded areas. These categorizations were used in the land use categories for dry deposition parameters in order to maintain consistency between the input meteorological data and related dry deposition parameterization.

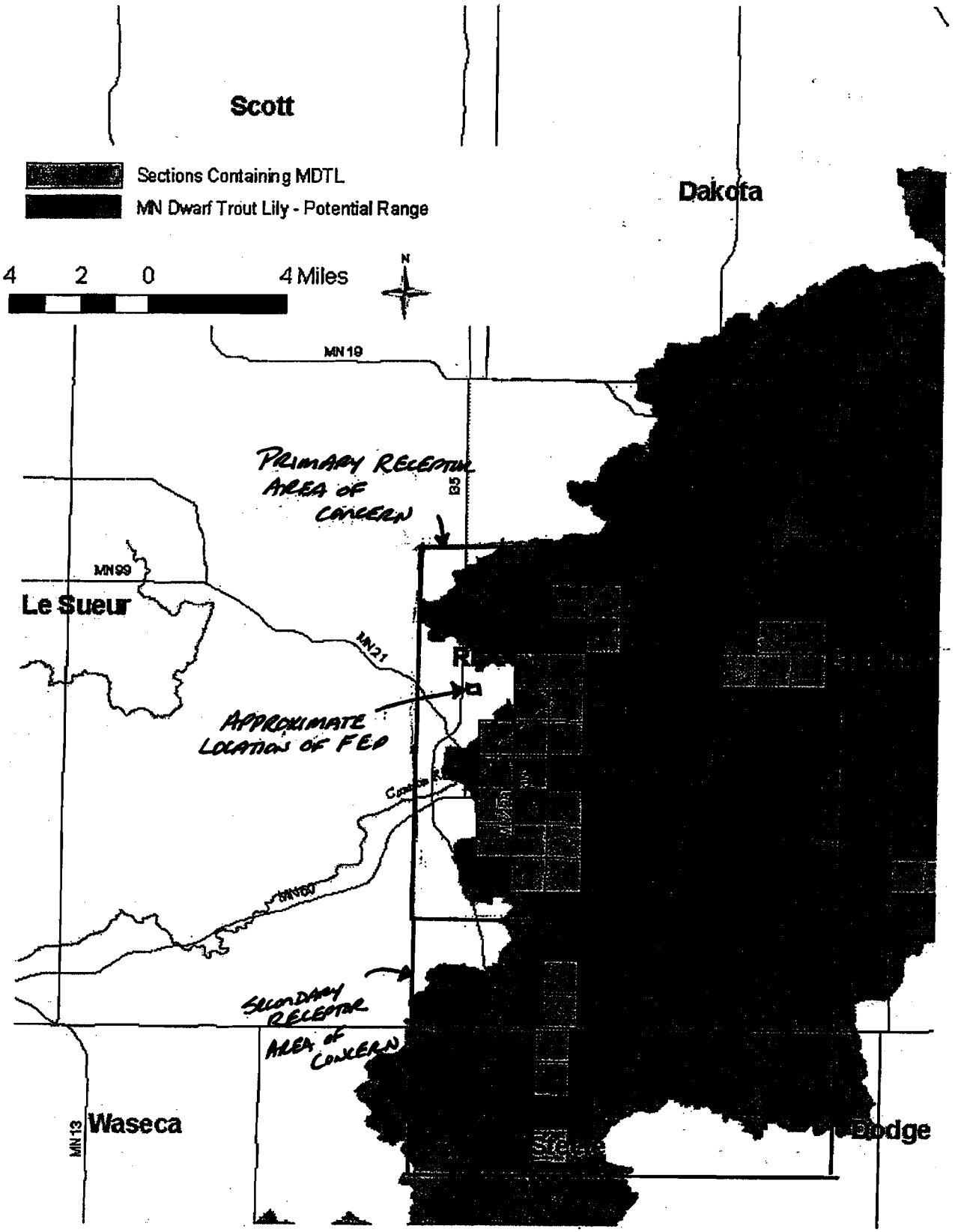
Particle deposition values were set to a single fraction with a diameter of 1 micron and a density of 1 g/cm^3. This characterization was applied to all source types. It is anticipated that particle size for the combustion turbine would likely be smaller; however a value of 1 micron was utilized as a conservative approach that is assumed to conservatively maximize deposition values through the more rapid settling and/or scavenging for larger particle sizes.

Gas deposition values utilized in the AERTOX options were selected based on an analysis conducted by the Montana Department of Environmental Quality comparing parameterization options which include gas deposition variables. This study is focused on parameterizations for the CALPUFF modeling system, however, it has been

assumed that estimates of physical variables such as gas diffusivity in air are independent of model selection provided that units used in the parameterization are the same. Gas deposition variables for diffusivity in air, cuticular resistance, and Henry's Law coefficient were set based on IWAQM data included in the report. No data was identified for diffusivity in water so the value for diffusivity in air was utilized. Specific values for NO_X were used for diffusivity and Henry's Law values. Cuticular resistance was not listed as pollutant specific.

Receptors were placed over a 638 km^2 region encompassing the primary and secondary areas of concern for the Trout Lily (see attached map). The receptor grid utilized extends approximately 5 km west of the facility and 17 km east of the facility. The domain extends approximately 7 km north of the facility and 22 km south of the facility. Terrain elevations and hill heights were incorporated through application of the AERMAP processor and utilized DEM data downloaded from the MPCA.

Modeling was conducted for the annual averaging period to yield annual deposition values in $g/m^2/yr$.


Scott
Sections Containing MDTL
MN Dwarf Trout Lily - Potential Range
Dakota
4 2 0 4 Miles
N
MN 19
PRIMARY RECEPTOR AREA OF CONCERN
I35
MN99
Le Sueur
MN21
APPROXIMATE LOCATION OF FED
MN60
SECONDARY RECEPTOR AREA OF CONCERN
MN13
Waseca
Dodge