APPENDIX A
Content of ER Order
EIS Scoping Decision

MINNESOTA
DEPARTMENT OF
COMMERCE

August 27, 2007

TO: Glen Wilson, Commissioner
Edward Garvey, Deputy Commissioner
THROUGH: Marya White, Manager
FROM: William Cole Storm, Staff
Department Routing & Siting Unit (Tel: 651-296-9535)
RE: Department Staff Recommendation:
(1) Content of the Environmental Report, PUC Docket No. ET2/CN-07-678
(2) Scoping Decision Environmental Impact Statement, PUC Docket No. ET2/GS-07-715
Great River Energy's proposed Elk River Peaking Station

ACTION REQUIRED: Signature of the Commissioner on the "Content of the Environmental Report" and on the "Scoping Decision for the Environmental Impact Statement." Once signed, the Department of Commerce (Department) staff will mail notices of the orders to interested parties and begin preparation of the two documents.

BACKGROUND: May 18, 2007, Great River Energy (GRE) submitted an application for a Certificate of Need (CON) for the proposed Elk River Peaking Station. The PUC issued an Order finding the CON application to be substantially complete on June 19, 2007. The docket number for this filing is ET2/CN-07-678.

On June 14, 2007, GRE submitted an application for a Site Permit for the proposed Elk River Peaking Station. The PUC issued an Order finding the Site Permit application to be complete on August 1, 2007, and authorized the Department to initiate the full review process under Minn. Rules 7845.5010 to .6500. The docket number for this filing is ET2/GS-07-715.

Certificate of Need Docket

As part of PUC review of an application for a certificate of need of a large electric power generating plant (LEPGP), the Department is required to prepare a document called an Environmental Report (ER). Minn. Rules 7849.7030. The ER must contain information on the human and environmental impacts of the proposed project associated with the size, type, and timing of the project, system configurations, and voltage. The environmental report must also contain information on alternatives to the proposed project and address mitigating measures for anticipated adverse impacts.

Minnesota Rule 7849.7100, Joint Proceeding, provides that Department may elect to prepare an environmental impact statement in lieu of the environmental report required under part 7849.7030 if the applicant and the PUC agree to the additional time that will be required to prepare the environmental impact statement. Due to the difference in timing of the CON and Site Permitting process, combining the two environmental review documents does not appear to be warranted. In addition, the applicant requested that the documents not be combined.

Site Permit Docket

The addition of this generating unit at the Elk River site falls within the definition of a LEPGP in the Power Plant Siting Act and, thus, requires a Site Permit from the Commission prior to construction. Minnesota rules 7845.5010 to .6500 provide for three different procedures for obtaining a site permit: full review, alternative review, and local review. GRE is applying for a site permit following the full review process. The project is not eligible for the alternative process because the proposed unit will be fueled by both natural gas and fuel oil. In the full review process, the applicant must identify in the application the preferred site for the power plant and one alternative site, respectively Elk River and Rosemount.

The Department Energy Facility Permitting (EFP) staff prepares a document called an Environmental Impact Statement (EIS). An EIS is a written document that describes the human and environmental impacts of a proposed large electric power generating plant (and selected alternative sites) and methods to mitigate such impacts. The public has the opportunity to comment on the scope of the EIS and the draft EIS through comment periods and at the Department sponsored information/scoping meetings.

Scoping Process for ER and EIS

Two public information/scoping meetings were held, August 17, 2007 (Elk River) and August 18, 2007 (Rosemount). Approximately 12 persons, excluding Department/PUC staff and the applicant's representatives, attended the meetings. The purpose of the public meetings was to provide the public with information about the project, afford the public an opportunity to ask questions and present comments, and to solicit input on the content of the ER and the scope of the EIS documents.

During the initial public information/scoping meetings concerns raised regarding need included fuel type, load service area, simple cycle versus combined cycle operation, and cost of electricity. On the siting application concerns raised included air emissions, water usage, potential for future expansion, future plans for the alternative site (i.e., Rosemount), and potential noise impacts.

One comment letter was received regarding GRE's proposed Elk River peaking station; a request that the use of utility scale batteries be considered in place of the natural gas facility. These issues, along with the typical LEPGP siting impacts, have been incorporated into the proposed Orders on the Content of the Environmental Report and the Scope for the Environmental Impact Statement.

SCHEDULE: The Environmental Report will be completed by November, 2007. The draft EIS also will be completed in November 2007.

CC: Deb Pile, Supervisor

In the Matter of Great River Energy's Application for Certificate of Need for a Large Electric Power Generating Plant in Sherburne County.

CONTENT OF THE ENVIRONMENTAL REPORT
COMMISSIONER DECISION

PUC Docket No. ET2/CN-07-678

The above matter has come before the Commissioner of the Department of Commerce (the Department) for a decision on the content of the Environmental Report (ER) to be prepared in consideration of the Application for a Certificate of Need from Great River Energy (GRE) on the proposed Elk River Peaking Station project.

The Department's Energy Facility Permitting (EFP) staff held public meetings on July 31, 2007, and August 1, 2007, in the towns of Elk River and Rosemount, respectively. The purpose of the meetings was to provide the public with information on the two projects and to solicit input into the content of the ER. The public was given until August 13, 2007, to submit written comments.

Having reviewed the matter, and having consulted with staff, I hereby make the following Order on the content of the ER:

MATTERS TO BE ADDRESSED

The ER will address the following matters for each of the proposed projects:

1.0 INTRODUCTION
- 1.1 Project Description
- 1.2 Project Location
- 1.3 Project Purpose
- 1.4 Sources of Information

2.0 REGULATORY FRAMEWORK
- 2.1 PUC Certification Requirement
- 2.2 Environmental Report Requirement

3.0 ALTERNATIVES TO THE PROPOSED LEPGP
- 3.1 No-build Alternative
- 3.2 Demand Side Management
- 3.3 Purchase Power
  - 3.3.1 Long term Purchase Power
  - 3.3.2 Short term Purchase Power
- 3.4 Alternative Fuels/Generation
  - 3.4.1 Fossil Fuel Technologies
  - 3.4.2 Utility Scale Batteries
  - 3.4.3 Combined-cycle

3.4.4 Renewable Resource Technologies
3.4.5 Emerging Technologies
3.5 Up-grading Existing Facilities
3.6 New Transmission
4.0 POTENTIAL IMPACTS AND MITIGATION
4.1 Air Emissions
4.3 Water Resource Requirements
4.4 Solid and Hazardous Waste Generation
4.5 Noise
4.6 Traffic
4.7 Land Requirements
4.8 Aesthetics/Visual Impacts
4.9 Public Service Requirements
5.0 PERMITS AND APPROVALS REQUIRED

ISSUES OUTSIDE OF THE ENVIRONMENTAL REPORT

The ER will only identify the general potential impacts from the construction, operation, and maintenance of the proposed LEPGP and the measures generally available to mitigate these potential impacts. Site specific concerns will be addressed in the subsequent LEPGP Site Permitting process and the Environmental Impact Statement (EIS).

SCHEDULE

The ER shall be completed in November 2007.

Signed this 30 day of Aug, 2007

STATE OF MINNESOTA
DEPARTMENT OF COMMERCE

Glenn Wilson

Glenn Wilson, Commissioner

MINNESOTA DEPARTMENT OF COMMERCE

In the Matter of Great River Energy's Application for Site Permit for a Large Electric Power Generating Plant in Sherburne County.

ENVIRONMENTAL IMPACT STATEMENT SCOPING DECISION

PUC Docket No. ET2/GS-07-715

The above matter has come before the Commissioner of the Department of Commerce (the Department) for a decision on the scope of the Environmental Impact Statement (EIS) to be prepared in consideration of the Application for a Large Electric Power Generating Plant (LEPGP) Site Permit from Great River Energy (GRE) on the proposed Elk River Peaking Station project.

The Department's Energy Facility Permitting (EFP) staff held public meetings on July 31, 2007, and August 1, 2007, in the towns of Elk River and Rosemount, respectively. The purpose of the meetings was to provide the public with information on the two projects and to solicit input into the scope of the EIS. The public was given until August 13, 2007, to submit written comments.

Having reviewed the matter, and having consulted with staff, I hereby make the following decision on the Scope of the EIS:

MATTERS TO BE ADDRESSED

The EIS will address the following matters:

1.0 OVERVIEW
2.0 INTRODUCTION
- 2.1 Project Description
  - 2.1.1 Description of Power Generating Equipment and Processes
  - 2.1.2 Air Emissions Control Equipment
  - 2.1.3 Water Use
  - 2.1.4 Wastewater
  - 2.1.5 Solid and Hazardous Waste Generation
  - 2.1.6 Fuel Supply
  - 2.1.7 Construction
  - 2.1.8 Electrical Interconnection
  - 2.1.9 Pipeline
- 2.2 Purpose
- 2.3 Sources of Information

3.0 REGULATORY FRAMEWORK
- 3.1 Certificate of Need Requirements
- 3.2 LEPGP Site Permit Requirements

4.0 ALTERNATIVES SITE: ROSEMOUNT

5.0 ENVIRONMENTAL SETTING
- 5.1 Air Quality
- 5.2 Land Use
- 5.3 Natural Resources
- 5.4 Visual Aesthetics
- 5.5 Archeological and Historic Resources
- 5.6 Transportation
- 5.7 Socioeconomics
- 5.8 Noise

6.0 HUMAN and ENVIRONMENTAL IMPACTS
- 6.1 Air Quality
  - *Criteria Air Pollutant Emissions*
  - *NAAQS Modeling*
  - *HAPs*
  - *Air Emissions Risk Analysis*
  - *Other*
- 6.2 Land Use
  - *Zoning & Displacement*
  - *Agricultural & Farmland*
- 6.3 Natural Resources
  - *Flora*
  - *Fauna*
  - *Rare & Unique Natural Resources*
  - *Recreational Sites*
  - *Prohibited Sites*
  - *Forestry*
  - *Mining*
- 6.4 Visual Asethetics
- 6.5 Archeological and Historic Resources
- 6.6 Transportation
- 6.7 Socioeconomics
- 6.8 Water Resources
  - *Surface Water*
  - *Groundwater*
  - *Wetland/Floodplains*
  - *Stormwater Management*
- 6.9 Waste Management & Disposal
- 6.10 Noise
- 6.11 Public Services

7.0 SUMMARY OF MITIGATIVE MEASURES

8.0 ACRONYMS, ABBREVIATIONS and DEFINITIONS

ISSUES OUTSIDE OF THE ENVIRONMENTAL REPORT

The Department will not, as part of the draft EIS, consider whether a different size or different type plant should be built. Nor will the Department consider the no-build option.

SCHEDULE

The draft EIS shall be completed in November 2007.

Signed this 30 day of Aug, 2007

STATE OF MINNESOTA
DEPARTMENT OF COMMERCE

Glenn Wilson

Glenn Wilson, Commissioner

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APPENDIX B
NOISE DATA

Minn Noise Standards

Noise Area Classification	Daytime		Nighttime[1]	
	L50 (dBA)	L10 (dBA)	L50 (dBA)	L10 (dBA)
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

1) Historically, the Noise Area Classification 1 nighttime noise standards have only been applied in situations where persons are sleeping at the area.

Noise Attenuation

- When the distance is doubled from a *point* source, the sound level decreases by 6 dB.
- The formula for calculating sound attenuation is:

S2 = S1 - 20 * Log(d2/d1)
S2 = Noise level in dBA at distance d2 (dBA)
S1 = Measured sound level at d1 (dBA)
d1 = Distance from noise source to S1 noise measurement (ft)
d2 = Distance from noise source at which S2 is calculated (ft)

Noise Addition

- When the the number of noise sources with equal noise levels are doubled, the total noise level increases by 3 dBA. For example, if one CT produces 50 dBA at 400 feet, two CTs would produce 53 dBA, and four CTs would produce 56 dBA.
- The formula for calculating the total noise level from numerous sources is:

St = 10 log [Sum{10^(Spi/10)}]
St = Total noise level (dBA)
Si = Noise level from source i (dBA)

For example, with 4 CTs each at 50 dBA:

St = 10 log [(10^(50/10) +10^(50/10) +10^(50/10) +10^(50/10))]
56 dBA

SCCT Noise Levels

Great River Energy has three noise data points for the Elk River Peaking Project: 1) the near-field noise guarantee of 85 dBA, 2) the far-field noise guarantee of 63 dBA, and 3) actual far-field noise monitoring data for the Siemens V84 combustion turbines at Pleasant Valley Station. Far-field is defined as 400 feet from the envelope of the combustion turbine. Near-field is defined as three feet from the envelope of the combustion turbine. See figures 1 and 2.

Siemens Westinghouse

Source: Noise monitoring letter report, March 25, 2002; HDR, Tim Casey to Tim Steinbeck. Noise monitoring data from PVS with Unit 11 and 12 in operation on December 20, 2001.

Direction	Distance to Receptor	L90 (dBA)	L50 (dBA)	L10 (dBA)
North	400	55	56	59
Southwest	400	54	57	61
South	400	55	59	63
Avg		55	57	61

Data Extrapolation & Estimation for ERPS

Using the sound attenuation, noise levels at various distances can be calculated:

	Noise Level w/ Point-Source Attenuation from:		
Distance to Receptor	**Near Field Guarantee- 85 dBA @ 3 ft**	**Actual Far-field Data- 57 dBA @ 400 ft**	**Far-field Guarantee- 63 dBA @ 400 ft**
3	**85**	99	105
10	75	89	95
100	55	69	75
200	49	63	69
300	45	59	65
400	43	**57**	**63**
500	41	55	61
600	39	53	59
700	38	52	58
800	36	51	57
900	35	50	56
1,000	35	49	55
1,300	32	47	53
1,500	31	46	52
1,640	**30**	**45**	**51**
1,800	29	44	50
1,900	29	43	49
2,100	28	43	49

Summary & Conclusions

The nearest neighbor is ~1,640 feet from the proposed combustion turbine. Depending on the data source used, the predicted noise level at the nearest residence would be between 30 and 51 decibels. This analysis is conservative in that it does not take into consideration the noise attenuation that will be achieved by the barriers (topography, buildings, trees, etc) between the combustion turbine and the noise receptor. Based on the historic conservativeness of the guarantees relative to actual measurements and the conservativeness of the simple model, noise from the combustion turbine should not result in an exceedance of the Minnesota noise standard.

Elk River Peaking Station
Estimated Distance to Nearest Noise Receptor
Main St
Evans Ave
1st St
181st Ave NW
Mississippi River
Burlington Northern Santa Fe Railroad
169
1643 Feet
GRE Elk River Peaking Station Layout
Elk River Station
Parrish Ave NE
Twin Lakes Blvd
10
GRE Offices
101
N
Feet
0 125 250 500 750 1,000
GREAT RIVER ENERGY

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APPENDIX C
AIR EMISSIONS RISK ANALYSIS DATA

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Air Emissions Risk Analysis

Prepared for
Great River Energy

Elk River, Sherburne County

June 2007

RISK ANALYSIS SUMMARY

1.0 Introduction

An Air Emissions Risk Analysis (AERA) was conducted for the Great River Energy Elk River Station located in Sherburne County, Minnesota. Major components of the risk analysis include: emission calculations, air dispersion modeling, estimating potential incremental human health risks for inhalation and indirect exposure (consumption of locally grown garden), and a qualitative analysis that includes a discussion on uncertainty for the quantitative risk estimates and identifies issues for which public health impacts cannot be easily quantified.

The procedures used in conducting the AERA were based on screening procedures identified in the Minnesota Pollution Control Agency (MPCA) guidance documents and/or information posted to their website (http://www.pca.state.mn.us/air/aera.html).

- General guidance per the March 2004 (Version 1.0) AERA guide.
- Emission estimates per the "Emissions Estimating Guidance" (March 2006).
- Risk estimates using the MPCA's Risk Assessment Screening Spreadsheet (RASS; Version 20060829) to estimate potential incremental human health chronic and acute inhalation and multimedia risks.

The AERA process is designed to identify those sources, source groups, chemicals and associated exposure pathways that clearly do not pose unacceptable risks or hazards to the public as a result of their emissions. In this document, "risk" generally refers to estimated cancer risks and the potential for noncancer health effects. Noncancer health effects are described using a hazard quotient (HQ) for a single chemical or a hazard index (HI; the sum of HQs) for all noncancer chemical exposures. In the AERA process, "quantitative analysis" specifically refers to the estimation of cancer risks and hazard indices using the RASS.

In general terms, risk analysis is a comparison of the toxicity of a chemical with the exposure to that chemical, and regardless of how risks are expressed, risks remain dependent on toxicity and exposure. To alter either one alters the risk. Therefore, an accurate assessment of risk requires thorough knowledge of the existing information concerning the toxicity of the chemical associated with the specific route of exposure, predicted intake, absorption, metabolism, excretion, tissue accumulation and species variation. Because of the limitation inherent in the risk assessment process it is very important to recognize that the risk characterization described in this or any AERA cannot predict actual health outcomes such as cancer. In other words, this or any AERA does not provide an estimate of actual risk to a real person.

Only one risk concept is evaluated in this analysis: the Maximum Exposed Individual (MEI). The MEI concept assumes that all maximum modeled air concentrations occur at one location. For chronic (long-term) risks, the MEI concept assumes that a person is present at the location of maximum modeled air concentrations and is outdoors continuously for a lifetime (24 hours per day, 365 days per year, for 70 years). For acute (1-hour) risks, the MEI concept assumes that a person can be present at the location of maximum modeled air concentrations for an hour.

The MEI concept is designed to more likely overestimate potential risks than underestimate risk and provides a worst-case exposure scenario and an upper bound (near 100th percentile) estimate of potential incremental health risks. The MEI concept is to be used as a screening tool to determine if more detailed analyses or the inclusion of other exposure concepts such as the Modified Central Tendency Exposure (MCTE) are warranted.

Two risk calculations are provided in this analysis. Risk estimates for the MEI scenario are calculated for the existing facility (pre-project) and for the post-project facility and provide the potential incremental risks for the project.

2.0 Emission Calculations

The chemicals evaluated in this AERA are primarily associated with the combustion of fuel oil, natural gas, and refuse-derived fuel. The chemical list is provided in Table 1.

Emissions were calculated in a conservative manner. Sources for emission factors included AP-42, EPA Combustion Turbines Emissions Database v.5, manufacturers guarantees, stack test data, and EPA TANKS 4.0.9d. The details of the emission calculations are provided electronically in the "emission calculation spreadsheet".

2.1 Peaking Turbine

Manufacturer's worst-case scenario information was used for criteria emission factors. AP-42 emission factors were used for hazardous air pollutant (HAP) emission calculations. In addition, non-AP-42 HAP pollutants found in the EPA Combustion Turbines Emissions Database v.5 were added to the turbine emissions. The turbine emissions are currently calculated using 8,760 hours per year, which provides for a conservatively high emissions scenario. Great River Energy anticipates annual needs of only 76 hours of fuel oil operation and 800 hours of natural gas operation; however, final permitted hours of operation will be determined through the air permitting process.

2.2 Refuse-Derived Fuel Burner

Emissions from the refuse-derived fuel (RDF) burner were based on historical stack test averages plus one standard deviation. The emission calculations are detailed in the "emission calculation" spreadsheet. The one exception to this emission calculation approach was for dioxins/furans.

For dioxins/furans the AERA evaluated the permit limit of 30 ng/DSCM (nanograms per dry standard cubic meter) total PCDD/PCDF on a 2,3,7,8-TCDD equivalents basis. Speciating the permit limit into the various 2,3,7,8-substituted isomers required an assessment of the available stack testing data. This data assessment included validating dioxin/furan congener concentrations in each sample. After the data validation step was completed, the next steps involved deriving an average composition to be applied to the permit limit of 30 ng/DSCM total PCDD/PCDF. First, the valid concentration for each 2,3,7,8-substituted isomer in a sample was divided by the Total PCDD/PCDF concentration reported for that sample. This provides a percent composition of each valid isomer in a sample. The average composition across the data set was then calculated for each 2,3,7,8-substituted isomer (Table 2). A memorandum detailing this analysis is available upon request.

Table 1. Chemical list for the Air Emissions Risk Analysis (AERA) conducted for the Great River Energy Elk River Station, Sherburne County, Minnesota.

PM	
PM_{10}	
CO	
SO_2	
NOx	
H_2SO_4 Mist	
VOC	
VOCs	**Metals and Semivolatiles**
1,3-Butadiene	Aluminum
2,2,4-Trimethylpentane	Arsenic
Acetaldehyde	Barium
Acrolein	Beryllium
Benzene	Boron
Carbon tetrachloride	Cadmium
Chlorobenzene	Calcium
Chloroform	Chromium
Dichlorobenzene	Cobalt
Ethyl benzene	Copper
Ethylene dichloride	Iron
Formaldehyde	Lead
Hexane	Magnesium
Hydrochloric acid	Manganese
Methylene chloride	Mercury
Naphthalene	Molybdenum
N-Nitrosodimethylamine (NDMA)	Nickel
N-Nitrosomorpholine (NMOR)	Selenium
Propylene oxide	Silver
Tetrachloroethylene	Sodium
Toluene	Strontium
Trichloroethylene	Tin
Trimethoxyamphetamines (TMA)	Vanadium
Vinyl chloride	Zinc
Vinylidene chloride	Chloride
Xylenes	Sulfate
	Semivolatiles
	Dioxins/Furans (as 2,3,7,8-TCDD equivalent)
	PAH (Total)

Table 2. Average composition of dioxin/furan congeners from stack test data at the Great River Energy RDF plant in Elk River, Minnesota, and derivation of a 2,3,7,8-TCDD equivalents for the existing permit limit.

Dioxin/Furan Congener	Average Composition	Concentration @ 30 ng/DSCM [ng/DSCM]	TEF (DF) WHO2005	TEQ Calculation [ng/DSCM]
2,3,7,8-TCDD	0.13%	0.039	1	0.039
1,2,3,7,8-Dioxin penta	0.38%	0.113	1	0.113
1,2,3,4,7,8-Dioxin, hexa	0.48%	0.145	0.1	0.015
1,2,3,6,7,8-Dioxin, hexa	0.76%	0.228	0.1	0.023
1,2,3,7,8,9-Dioxin, hexa	0.60%	0.179	0.1	0.018
1,2,3,4,6,7,8-Dioxin, hepta	6.53%	1.960	0.01	0.020
Dioxin, octa	13.93%	4.178	0.0003	0.001
2,3,7,8-TCDF	0.00%	0.000	0.1	0.000
1,2,3,7,8-Dibenzofuran, penta	0.88%	0.263	0.03	0.008
2,3,4,7,8-Dibenzofuran, penta	1.19%	0.357	0.3	0.107
1,2,3,4,7,8-Dibenzofuran, hexa	1.56%	0.469	0.1	0.047
1,2,3,6,7,8-Dibenzofuran, hexa	1.61%	0.483	0.1	0.048
1,2,3,7,8,9-Dibenzofuran, hexa	0.53%	0.159	0.1	0.016
2,3,4,6,7,8-Dibenzofuran, hexa	2.08%	0.625	0.1	0.063
1,2,3,4,6,7,8-Dibenzofuran, hepta	8.03%	2.409	0.01	0.024
1,2,3,4,7,8,9-Dibenzofuran, hepta	1.16%	0.349	0.01	0.003
Dibenzofuran, octa	4.53%	1.359	0.0003	0.000
TEQDF-WHO2005 [ND= 1/2 DL]				**0.54**

3.0 Air Dispersion Modeling

Detailed air dispersing modeling was conducted with the AERMOD model for the AERA. The building inputs used for the BPIP analysis are the same as those submitted to the MPCA on April 1, 2002. The receptor grid had 25 meter spacing along the property boundary, 50 meter spaced Cartesian grid out to 500 meters, and a 200 meter polar grid with a radius of 4 km. Five years of meteorological data were obtained from the MPCA.

A one gram/second emission rate modeling run was conducted, and post-processing then used the emission rates from the existing (pre-project) facility and then from the post-project facility to estimate maximum air concentrations for 1-hour, monthly, and annual averaging periods. The electronic modeling files (input and output) are provided with this submittal.

The maximum off-property air concentrations for each modeled pollutant were obtained from the air dispersion modeling (maximum hourly, monthly, annual). These maximum air concentrations were input to the RASS and used to estimate potential incremental human health risks for the existing facility (pre-project) and the post-project facility.

4.0 Quantitative Risk Estimates Using the MPCA RASS

Estimated risks for the existing (pre-project) facility (Table 3), the post-project facility (Table 4), and the project-only risks (Table 5) are presented below. As identified in Table 5, potential incremental human health risks for the project are below the Minnesota Department of Health guidelines of 1E-05 for cancer (one cancer per 100,000 people) and 1.0 for noncancer (chronic, acute).

Risk driver pollutants for the project-only incremental multipathway risks are as follows:

- Cancer (farmer): dioxins/furans, 3E-04; PAHs (total), 6E-05.
    - For comparison, the project only dioxin/furan risk for a resident = 2E-06.
    - For comparison, the project only PAH (total) risk for a resident = 2E-07.
- Noncancer chronic: no risk drivers; all chemicals with HQs less than 0.1.
- Noncancer acute: Nitrogen dioxide (NO_2); HQ = 0.30.

Maximum estimated air concentrations occur at, or only a short distance from, the property boundary. Potential incremental risks for a farmer are calculated but there is currently no farming occurring at the Elk River Station property boundary. The current trend in the Elk River area is for farmland to be converted to residential land use. An assessment of reasonably foreseeable future land use indicates it is highly unlikely for new farms to be located in an urban area such as Elk River. The potential farmer risks in Table 5 are below the MDH guideline.

Conservatism in the analysis that leads to overestimates of potential risk include the following:

- Use of the MEI concept; maximum outdoor exposure (24 hours/day, 365 days/year; 70 years). This is an exposure that does not occur in an actual population.
- Assuming that all maximum modeled air concentrations occur at one location, and that a person lives at that location. Air dispersion modeling identifies that the maximum air concentrations for the risk driver pollutants occur at different locations and risk at specific receptor locations are lower than the maximum risks presented in Tables 3, 4, and 5.
- Potential metal emissions from the RDF ash handling silo are assumed to be 100% bioavailable. This is a conservative assumption and provides for an overestimate of potential risks.
- Worst case emission factors were used for the combustion turbine and these factors are predominantly from fuel oil. In addition, turbine operations were assumed for 8,760 hours per year. The operating scenario in conjunction with using worst case emission factors from fuel oil results in an analysis that essentially assumes the turbine will burn fuel oil. This operating is not expected to occur for the combustion turbine.
- Evaluating total PAHs as a group. The toxicity value for benzo(a)pyrene (BaP) is assigned to total PAHs in RASS. BaP is typically only a small percent of total PAHs. By assuming the total PAHs are as toxic as BAP overestimates the potential risks from PAHs.

Table 3. Estimated potential incremental risk for the existing (pre-project) facility at the Great River Energy Elk River Station, Sherburne County, Minnesota; Maximum Exposed Individual concept.

[Existing Facility; Pre-project]

Air Toxics Screen [1]												
Total Inhalation Screening Hazard Indices and Cancer Risks				Total Indirect Pathway Screening Hazard Indices and Cancer Risks				Total Multipathway Screening Hazard Indices and Cancer Risks				
Acute	Subchronic Noncancer	Chronic Non-cancer	Cancer	Farmer Non-cancer [2]	Farmer Cancer [2]	Resident Non-cancer	Resident Cancer	Farmer Non-cancer [2]	Farmer Cancer [2]	Resident Non-cancer	Resident Cancer	
2.4E-01	1.5E-02	7.5E-02	7E-06	1.1E-04	2E-03		6E-06	7.5E-02	2E-03	7.5E-02	1E-05	
1.0E+00	1.0E+00	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	<<< Acceptable Level
OK	OK	OK	OK	OK	REFINE		OK	OK	REFINE	OK	OK	<<<OK or Not?

[1] Cancer risks rounded to one significant figure per U.S. EPA guidance (1989; 2005).
[2] Farmer risks are reported but farming is not a current land use at the Elk River Station property boundary. Reasonably foreseeable future land use indicates it is highly unlikely for a farmer to be located at the property boundary.

Table 4. Estimated potential incremental risk for the post-project facility at the Great River Energy Elk River Station, Sherburne County, Minnesota; Maximum Exposed Individual concept.

[Post-project]

Air Toxics Screen [1]												
Total Inhalation Screening Hazard Indices and Cancer Risks				Total Indirect Pathway Screening Hazard Indices and Cancer Risks				Total Multipathway Screening Hazard Indices and Cancer Risks				
Acute	Subchronic Noncancer	Chronic Non-cancer	Cancer	Farmer Non-cancer [2]	Farmer Cancer [2]	Resident Non-cancer	Resident Cancer	Farmer Non-cancer [2]	Farmer Cancer [2]	Resident Non-cancer	Resident Cancer	
6.1E-01	2.0E-02	9.9E-02	7E-06	2.2E-04	2E-03		7E-06	9.9E-02	2E-03	9.9E-02	1E-05	
1.0E+00	1.0E+00	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	<<< Acceptable Level
OK	OK	OK	OK	OK	REFINE		OK	OK	REFINE	OK	OK	<<<OK or Not?

[1] Cancer risks rounded to one significant figure per U.S. EPA guidance (1989; 2005).
[2] Farmer risks reported but farming is not a current land use at the Elk River Station property boundary. Reasonably foreseeable future land use indicates it is highly unlikely for a farmer to be located at the property boundary.

Table 5. Estimated potential incremental risk for the peaking plant (project only) proposed to be located at the Great River Energy Elk River Station, Sherburne County, Minnesota; Maximum Exposed Individual concept [1]

[Turbine Project Only]

Air Toxics Screen [1]												
Total Inhalation Screening Hazard Indices and Cancer Risks				Total Indirect Pathway Screening Hazard Indices and Cancer Risks				Total Multipathway Screening Hazard Indices and Cancer Risks				
Acute	Subchronic Noncancer	Chronic Non-cancer	Cancer	Farmer Non-cancer [2]	Farmer Cancer [2]	Resident Non-cancer	Resident Cancer	Farmer Non-cancer [2]	Farmer Cancer [2]	Resident Non-cancer	Resident Cancer	
3.7E-01	4.2E-03	2.4E-02	8.E-07	1.2E-04	3.E-04		1.E-06	2.4E-02	3.E-04	2.4E-02	2.E-06	
1.0E+00	1.0E+00	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	<<< Acceptable Level
OK	OK	OK	OK	OK	OK		OK	OK	OK	OK	OK	<<<OK or Not?

[1] Cancer risks rounded to one significant figure per U.S. EPA guidance (1989; 2005).
[2] Farmer risks reported but farming is not a current land use at the Elk River Station property boundary. Reasonably foreseeable future land use indicates it is highly unlikely for a farmer to be located at the property boundary.

In summary, estimated potential incremental risks from the proposed project are below the MDH guidelines. Based on the available information, adverse impacts to human health are not expected to be associated with potential emissions from the proposed project.

The details of the risk results are provided in the electronic versions of the RASS. A separate RASS file is submitted for the existing facility (pre-project) and the post-project facility.

For perspective, the reader should note that background cancer risk for males in Minnesota is 1 in 2 (0.5; 5E-01) regardless of where one lives in the state (MDH 2000); 50,000 cancer cases in a population of 100,000 people. Accounting for potential incremental resident cancer risk of 3E-08 from the project (one per 100,000,000 people) the number of cancer cases would remain at 50,000 because the potential incremental cancer risk from the project is very small. In other words, the additional incremental cancer risk is insignificant compared to background cancer risk. It is also important to understand that that the actual cancer risk, when compared to the estimated cancer risks in this AERA, are probably less than the calculated value and may be as low as zero.

5.0 Qualitative Screening Analysis

This discussion is part of Form AERA-02.

6.0 References

MDH 2000. Minnesota Department of Health, Statement of Need and Reasonableness (draft), Proposed Permanent Rules Relating to Health Risk Values, Minnesota Rules, Parts 4717.800 to 4717.8600. Page. 10. October 2000.

MPCA 2004. Air Emission Risk Analysis (AERA) Guidance. Version 1.0. Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul. March 2004.

U.S. EPA 1989. Risk assessment guidance for Superfund (RAGS). Volume 1. Human Health Evaluation Manual. Part A. Interim Final. USEPA. EPA/540/1-89/002.

U.S. EPA 2005. Human health risk assessment protocol for hazardous waste combustion facilities. Final. (HHRAP). EPA 530-R-05-006. September 2005.

APPENDIX D
EXAMPLE: LEPGP SITE PERMIT

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SITE PERMIT

FOR CONSTRUCTION OF A

LARGE ELECTRIC POWER GENERATING PLANT

IN

ISANTI COUNTY, MINNESOTA

ISSUED TO

GREAT RIVER ENERGY

DOC DOCKET NO. 05-92-PPS-GRE CAMBRIDGE STATION
PUC DOCKET NO. ET2/TR 05-1315

In accordance with the requirements of Minnesota Statute 116C.57 and Minnesota Rules Chapter 4400, this Site Permit is hereby issued to:

GREAT RIVER ENERGY

Great River Energy (GRE) is authorized by this permit to construct a new natural-gas fuel, simple-cycle electric generating facility capable of producing 170 megawatts (MW) on the site of the Cambridge Station Generating Plant in Isanti County, Minnesota, identified in this Permit and in compliance with the conditions specified in this Permit.

Approved and adopted this 10th day of November, 2005

BY ORDER OF THE COMMISION

_____

Burl W. Haar,
Executive Secretary

Issued: November 10, 2005

I. SITE PERMIT

The Minnesota Public Utilities Commission (MPUC) hereby issues this Site Permit to Great River Energy, pursuant to Minnesota Statute116C.57 and Minnesota Rules Chapter 4400, to construct a new natural-gas fuel, simple-cycle electric generating facility capable of producing 170 megawatts (MW) on the site of the Cambridge Station Generating Plant in Isanti County, Minnesota.

II. PROJECT DESCRIPTION

The project consists of adding one natural gas-fired, simple-cycle combustion turbine generator to GRE's existing Cambridge Station near Cambridge, Minnesota in Isanti County. The project will have a nominal summer generating capacity of 170 MW and is expected to be operated during periods when GRE's member demand is the highest (e.g. the air conditioning season).

The project location and site layout is shown in the attached figure.

The project description is more specifically described in the Site Permit Application and in the Environmental Assessment.

III. DESIGNATED SITE

The project site consists of two parcels currently owned by GRE. The larger portion of the site is an approximately 11-acre parcel in Section 21, T36N, R23W. The site will also include an approximately 2-acre parcel in Section 16, T36N, R23W that houses a service building across 349th Avenue NE, north of the larger parcel. The larger parcel has an existing fuel-oil fired 25-MW (nominal summer capacity) combustion turbine generator and associated substation, which will remain.

The site is more specifically described in the Site Permit Application and in the Environmental Assessment.

IV. PERMIT CONDITIONS

The following conditions shall apply to the construction of the facility.

> **A. Site Plan.** The Permittee shall submit to the MPUC three (3) copies of a work/site plan at least fourteen (14) days prior to the commencement of construction activity. This plan will include the cut/fill/grading diagrams, the location and placement of the various structures to be constructed, including all electrical equipment, pollution control equipment, roads, and other associated facilities. The Permittee shall have the right to move or relocate any of these structures after construction commences, but the Permittee shall file an amended site plan with the MPUC at least twenty-four (24) hours prior to implementation.

B. Construction Practices

1. Application. The Permittee shall follow those specific construction practices and material specifications described in the Site Permit Application, unless this Permit establishes a different requirement in which case this Permit shall prevail.

2. Field Representative. At least fourteen (14) days prior to commencing on-site activity, the Permittee shall advise the MPUC in writing of the person or persons designated to be the field representative for the Permittee with the responsibility to oversee compliance with the conditions of this Permit. This person's address, phone number, and emergency phone number shall be provided to the MPUC, who may make the information available to local residents and public officials and other interested persons. The Permittee may change its field representative at any time upon written notice to the MPUC.

3. Roads. At least fourteen (14) days prior to commencing on-site activity, the Permittee shall advise the MPUC and other appropriate governing bodies having jurisdiction over roads, of all state, county, and city roads that will be used during that phase of the project. Where practical, existing roadways shall be used for all activities associated with construction of the facility. Wherever practical, all-weather roads shall be used to deliver heavy components to and from the project site. The Permittee shall, prior to construction activities, make satisfactory arrangements with the appropriate state, county, and local governmental bodies having jurisdiction over the roads to be used for construction, for any repair and maintenance of those roads resulting from the transportation of equipment and materials. The Permittee shall notify the MPUC of such arrangements prior to the start of construction activities.

C. Completion of Construction.

1. Plans and Specifications. Within one hundred twenty (120) days after completion of construction of the facility, the Permittee shall submit to the MPUC the "as built" site layout.

2. GPS Data. Within one hundred twenty (120) days of completion of construction, the Permittee shall submit to the MPUC, in the format requested by the MPUC, geo-spatial information (GIS compatible maps, GPS coordinates, etc.) for the power plant and associated facilities.

D. Other Requirements. The Permittee shall comply with all applicable state rules and statutes. The Permittee shall obtain all required permits for the project and comply with the conditions of these permits. The anticipated permits and approvals required for the project are listed in Section 1.4.2 Other Project Permits of the Application for a Generating Plant Site Permit and in Table 3 of the Environmental Assessment.

E. Delay in Construction. If the Permittee has not commenced construction or improvement of the project within four (4) years from the date of issuance of this Permit, the MPUC shall consider suspension of the Permit in accordance with Minn Rule 4400.3750.

V. PERMIT AMENDMENT

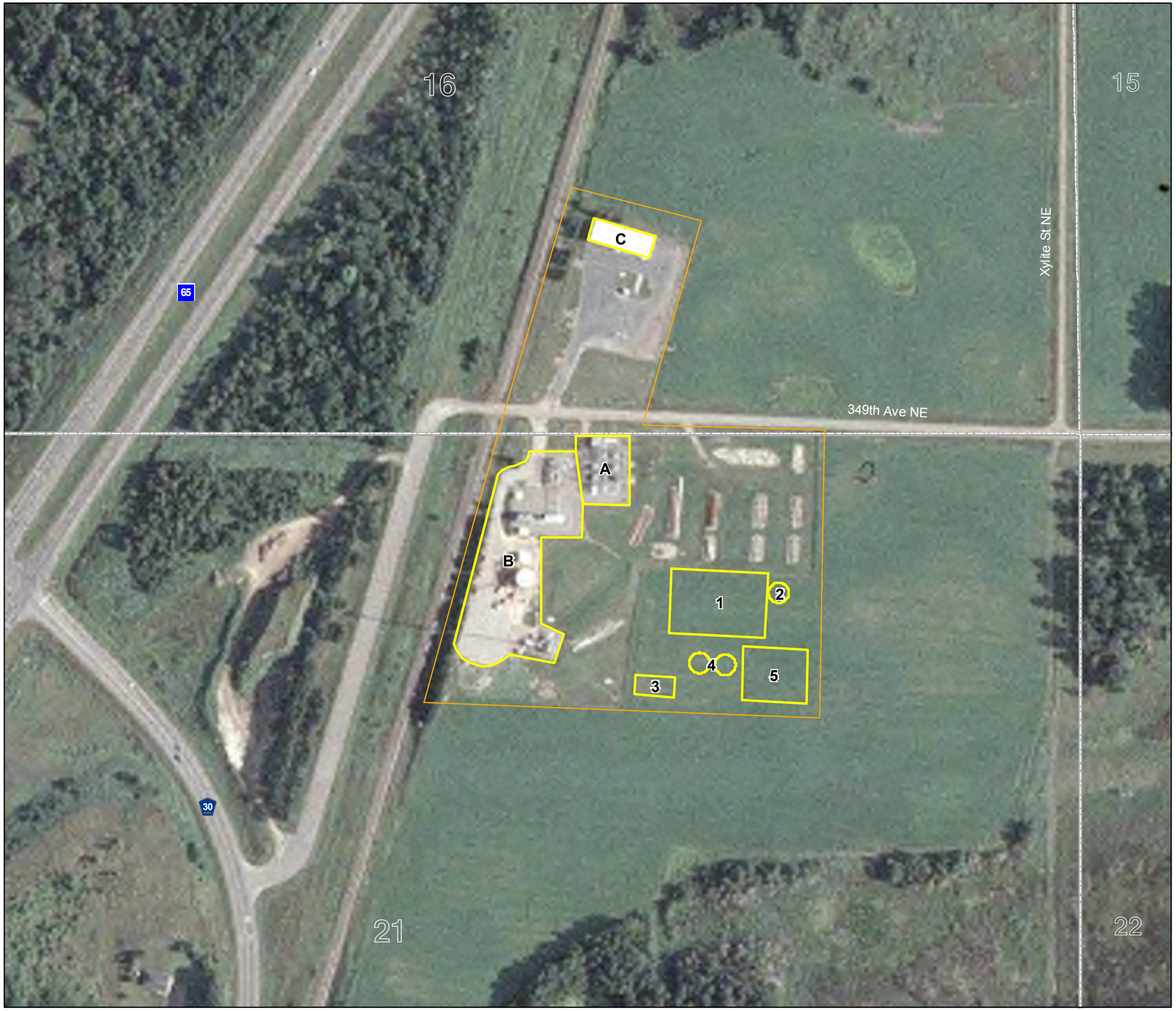
This permit may be amended at any time by the MPUC. Any person may request an amendment of this permit pursuant to Minn Rule 4400.3840, by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The MPUC may amend the permit after affording the Permittee and interested persons such process as is required.

VI. TRANSFER OF PERMIT

The Permittee may request at any time that the MPUC transfer this permit to another person or entity. The Permittee shall provide the name and description of the person or entity to whom the permit is requested to be transferred, the reasons for the transfer, a description of the facilities affected, and the proposed effective date of the transfer. The person to whom the permit is to be transferred shall provide the MPUC with such information as the MPUC shall require in determining whether the new permittee can comply with the conditions of the permit. The MPUC may authorize transfer of the permit after affording the Permittee, the new permittee, and interested persons such process as is required.

VII. REVOCATION OR SUSPENSION OF THE PERMIT

The MPUC may initiate action to revoke or suspend this permit at any time. The MPUC shall act in accordance with the requirements of Minnesota Rule part 4400.3950 to revoke or suspend the permit.



Section Lines

Property Boundary

Proposed Features
1. CTG and Related Equipment
2. Exhaust Stack
3. On-site Natural Gas Town Border Station
4. Raw and Treated Water Tanks
5. Retention Basin

Existing Features
A. Existing Substation
B. Existing Peaking Plant
C. Existing Crew and Storage Buildings

N

Feet
100 0 100 200 300 400 500

Meters
50 0 50 100

BARR

Figure 2-1

Project Layout
Cambridge Station
Great River Energy

March 2005

Barr Footer: Date: 3/10/2005 4:41:30 PM File: I:\Projects\2317\1076\GIS\Maps\property_bounds.mxd User: bal