

APPENDIX D

Cumulative Impact Analyses –

**Approach, Air (D1), Health Risk (D2),
Water Resources (D3), Wetlands (D4),
Wildlife Habitat (D5), Rail Traffic (D6)**

(Note: Color versions of figures in this Appendix are included in the file posted at the DOE NEPA website: http://www.gc.energy.gov/NEPA/final_environmental_impact_statements.htm)

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D. APPROACH TO CUMULATIVE IMPACTS ANALYSIS

D.1 PURPOSE

The U.S. Department of Energy (DOE) and Minnesota Department of Commerce (MDOC) are preparing an Environmental Impact Statement (EIS) for the Mesaba Energy Project in the Iron Range of northeastern Minnesota as announced in a Notice of Intent published in the *Federal Register* on October 5, 2005. This paper specifically and exclusively provides an intended approach for addressing cumulative environmental impacts of the Mesaba Energy Project that will satisfy the Federal National Environmental Policy Act (NEPA) requirements and the Minnesota Rules promulgated in accordance with the Minnesota Power Plant Siting Act (Statutes 116C.51 through 116C.69).

D.2 BACKGROUND

D.2.1 Federal Requirements

The President's Council on Environmental Quality (CEQ) defined "cumulative impact" in regulations implementing the procedural provisions of NEPA as follows:

"Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7)

In its implementing procedures for NEPA, DOE has stated its policy "...to follow the letter and spirit of NEPA; comply fully with the CEQ Regulations; and apply the NEPA review process early in the planning stages for DOE proposals" (10 CFR 1021.101). Therefore, DOE regulations require the consideration of cumulative impacts in published NEPA documents.

D.2.2 State Requirements

Minnesota Rules Chapter 4410, Parts 4410.0020 through 4410.6500 implement the environmental review procedures established by the Minnesota Environmental Policy Act (MEPA). Part 4410.1700, Subpart 7, Item B, specifically requires the responsible governmental unit (RGU) to consider the "cumulative potential effects of related or anticipated future projects." However, because it involves a large electric power generating plant (LEPGP), the Mesaba Energy Project is not subject to the requirements of Chapter 4410 (see Part 4400.1700, Subpart 12). Instead the project is subject to Minnesota Rules Chapter 4400, which does not require the consideration of cumulative impacts comparable to Part 4410.1700, Subpart 7. Therefore, no specific state requirement for consideration of cumulative impacts for the Mesaba Energy Project is indicated. However, MDOC may consider cumulative impacts in response to comments received during the state scoping process.

D.3 REASONABLY FORESEEABLE FUTURE ACTIONS

Based in part on the Scoping Environmental Assessment Worksheet (EAW) for the proposed Minnesota Steel Project near Nashwauk, Minnesota, which is subject to Minnesota Rules Part 4410.1700, Subpart 7, Item B (defined above), the following past and ongoing actions and potential projects represent

“reasonably foreseeable future actions” in the vicinity of the preferred and alternative sites for the proposed Mesaba Energy Project.

D.3.1 Ongoing Actions

- National Pollutant Discharge Elimination System (NPDES) permitted discharges to the Swan River and Prairie River.
- NPDES permitted discharges to the St. Louis River watershed.
- Logging of state and county lands in the Arrowhead Region.
- Logging on private lands in the Arrowhead Region.
- Butler Taconite and predecessor natural ore operations.
- Keewatin Taconite Company and predecessor natural ore operations.
- Hibbing Taconite Company and predecessor natural ore operations.
- Cliffs-Erie and predecessor natural ore operations.
- Other taconite operations located in the Arrowhead Region.
- Minnesota Power plant operations in Itasca County (Clay Boswell), St. Louis County (Syl Laskin, M.L. Hibbard), and Lake County (Taconite Harbor).
- Public utility power plants in Hibbing and Virginia.
- UPM-Kummene Blandin Paper Mill in Grand Rapids and proposed expansion.
- Non-utility electric power plants in Arrowhead Region (Silver Bay, Alliant Energy, Lake Superior Paper).
- Planned or ongoing roadway improvements or substantial tracts of commercial/residential development that have been identified in any comprehensive planning documents, or that have been approved by the county or city.

D.3.2 Potential Future Emissions Sources

- Proposed Minnesota Steel Project – north of Nashwauk
- Proposed PolyMet Mining project – north of Hoyt Lakes
- Proposed Mesabi Nugget plant – north of Hoyt Lakes
- Proposed Laurentian Wood-Fired Generation Plants – near Hibbing and Virginia (The Laurentian Energy project is a semi-public partnership involving Hibbing Public Utilities and Virginia Public Utilities to provide renewable energy to Xcel Energy. Two wood-fired boilers for power generation, less than 25 MW each, would be built at each existing facility.)

D.4 POTENTIALLY AFFECTED RESOURCES

Although the lists of ongoing activities and potential future emissions sources in the regions of influence for the West and East Range Sites are substantial, various factors affect the potential for cumulative impacts on potential resources. For example, potential impacts on vegetation and archeological resources generally would be limited to the locations of anticipated land disturbance, which are specific to the individual projects. However, the impacts of air emissions may extend many miles beyond the individual project areas. Based on consideration of the regions of influence for impacts on environmental resources, the following resources have been identified that may be affected by cumulative impacts from the Mesaba Energy Project (including Phase II) in combination with other reasonably foreseeable actions in the Arrowhead Region. The potential cumulative impacts have been listed respectively for the preferred West Range Site and the alternative East Range Site.

D.4.1 West Range Site

- Air quality in Federally administered Class I areas (e.g., Boundary Waters Canoe Area Wilderness [BWCAW], Voyageurs National Park [VNP]) including “regional haze.”
- Water quality in Federally administered Class I areas (e.g., BWCAW, VNP) due to deposition of pollutants and acidification.
- Deposition and bioaccumulation of mercury emissions in water resources/aquatic species.
- Effects of inhalation of air toxics emissions.
- Effects on water supplies, quantity, and quality in the Swan River watershed.
- Loss of wetlands in the Swan River watershed.
- Wildlife habitat loss, fragmentation, and obstruction of travel corridors in the Swan River watershed.
- Impacts of increased train traffic on regional communities between (and including) Grand Rapids and Hibbing along the US 169 corridor (noise, delays at grade crossings, obstruction of emergency vehicle access to service areas), taking into consideration the potential for disproportionate impacts on low-income populations (environmental justice).

D.4.2 East Range Site

- Air quality in Federally administered Class I areas (e.g., BWCAW, VNP) including “regional haze.”
- Water quality in Federally administered Class I areas (e.g., BWCAW, VNP) due to deposition of pollutants and acidification.
- Deposition and bioaccumulation of mercury emissions in water resources/aquatic species.
- Effects of inhalation of air toxics emissions.
- Effects on water supplies, quantity, and quality in the Partridge River watershed.
- Loss of wetlands in the Partridge River watershed.
- Wildlife habitat loss, fragmentation, and obstruction of travel corridors in the Partridge River watershed.
- Impacts of increased train traffic and lengths on regional communities between (and including) Hoyt Lakes, Virginia, and Iron Junction (noise, delays at grade crossings, obstruction of emergency vehicle access to service areas), taking into consideration the potential for disproportionate impacts on low-income populations (environmental justice).

D.5 RESOURCES NOT LIKELY TO BE AFFECTED CUMULATIVELY (WITH BASIS)

Based on currently available information, there are some resources that are not expected to experience measurable cumulative impacts, although the EIS for the Mesaba Energy Project will address the specific impacts of the project on these resources in accordance with NEPA and Minnesota Rules Chapter 4400. Also, as additional information becomes available or as a result of public comments received, the need for a cumulative impact analysis for these resource areas will be reassessed. The resource areas and the basis for not including a cumulative impact analysis for these areas at this time are as follows:

- Demographics – The Mesaba Energy Project (including Phase II) is estimated to create approximately 182 permanent jobs by 2013, which, when added to other foreseeable actions in the region, would not affect population and housing substantially given that the population of Itasca County is expected to grow by 3,600 persons and St. Louis County is expected to grow by 5,400 (between 2000 and 2010).

- Community Services – As in the case of demographics, the project, when added to other foreseeable actions, is not expected to affect demands on local community services substantially, other than the impacts from the frequency and length of trains.
- Land Use – The Mesaba Energy Project and other foreseeable projects would have relatively small areas of influence in the context of land use, and the areas of influence would not be expected to overlap.
- Environmental Justice – As in the case of land use, areas of influence for environmental justice would not be expected to overlap for the respective projects.
- Traffic – As in the case of demographics and land use, the respective foreseeable projects would not contribute substantial amounts of new automobile traffic and would not utilize the same roadways and intersections concurrently.
- Geology and Soils – Potential adverse impacts on earth resources would be site-specific in context (small areas of influence) and not substantially cumulative provided that appropriate erosion and sedimentation controls are implemented in accordance with state and Federal regulations.
- Cultural Resources – As in the case of geology and soils, potential adverse impacts would be site-specific.
- Materials and Waste Management – The Mesaba Energy Project and other foreseeable projects would have relatively small areas of influence in the context of material and waste management, and the areas of influence would not be expected to overlap.
- Noise – An increase to noise levels will likely result from the increase in the number, frequency and length of trains, plant noise, and truck traffic. Cumulatively, noise levels would not affect the local areas where each project is located. Impacts from the Mesaba Energy Project and other foreseeable projects would affect relatively small areas of influence that would not be expected to overlap.
- Light and Glare – As in the case of land use, areas of influence for light and glare would not be expected to overlap for the respective projects.
- Safety and Health – There is a potential for cumulative impacts of mercury deposition and bioaccumulation to water resources and aquatic species. Otherwise, the foreseeable projects are not expected to contribute to substantial cumulative impacts on safety and health based on distance between potential radii of influence areas.
- Biological Resources – No known populations of endangered plant species have been identified that would be impacted by the Mesaba Energy Project.

D.6 RECOMMENDED CUMULATIVE ANALYSIS

D.6.1 Air Quality Impacts on Class I Areas

If not otherwise available in documents/reports previously generated by Excelsior, DOE and/or MDOC will request the following information from Excelsior as part of the Environmental Information Volume: air quality modeling to assess the cumulative impacts of continuous air emissions from Mesaba Energy Project emissions at the respective West and East Range Sites, taking into account projected emissions from the reasonably foreseeable projects listed in Section 3.2. The air quality model would provide an air quality analysis to determine the impacts on the national ambient air quality standards (NAAQS) and Prevention of Significant Impacts (PSD) increments associated with the construction and operation of the Mesaba Energy Project (including Phase II) combined with the proposed foreseeable projects. Excelsior would be required to obtain, from publicly available information, projected emissions from these foreseeable sources. These foreseeable sources are potentially new major sources of regulated

pollutant emissions that would be required to provide the following information in order to comply with the PSD regulations:

- Background concentrations of each regulated pollutant using distant and regional sources in order to establish baseline concentrations.
- Variance in land use and topography in the proposed locations for the future projects in order to determine air dispersion of pollutants.
- Highest concentration for each pollutant under the facilities' various worst-case operating scenarios (e.g., startup, normal operations, flaring, etc.) in order to establish potential to emit.
- Identification of all best available control technologies (BACT) through a BACT analysis in order to establish mitigation measures.

For instances in which the data is not publicly available, Excelsior will provide an estimated representation of the emissions based on similar types of operations and activities. Adjustment of modeling parameters for other existing and foreseeable emission sources to account for reductions in emissions based on potential changes in regulatory controls on emissions would also be performed. Additionally, an impact analysis to assess the cumulative impact of air emissions on visibility caused by any increase in emissions from the Mesaba Energy Project combined with the reasonably foreseeable projects would be conducted, including the cumulative visibility effects on Federal Class I areas within 250 kilometers of the Mesaba Energy Project and the future projects. Overall, the cumulative impact analysis for air quality will take into consideration recommendations by the U.S. Department of Agriculture (USDA) Forest Service, Superior National Forest, as a cooperating agency for the EIS.

D.6.2 Water Quality Impacts on Class I Areas

If not otherwise available in documents/reports previously generated by Excelsior, DOE and/or MDOC will request from Excelsior, as part of the Environmental Information Volume, deposition modeling to predict the cumulative effects of deposition on water quality in Class I areas within 250 kilometers, taking into account the existing and reasonably foreseeable emission sources. Overall, the cumulative impact analysis for water quality will take into consideration recommendations by the USDA Forest Service, Superior National Forest, and the U.S. Army Corps of Engineers (USACE), as cooperating agencies for the EIS.

D.6.3 Mercury Deposition and Bioaccumulation

If not otherwise available in documents/reports previously generated by Excelsior, DOE and/or MDOC will request from Excelsior, as part of the Environmental Information Volume, deposition modeling to predict the cumulative effects from deposition of mercury on bioaccumulation in fish and qualitative impacts on eagles, taking into account the existing and reasonably foreseeable emission sources.

D.6.4 Air Toxics Inhalation Risk

If not otherwise available in documents/reports previously generated by Excelsior, DOE and/or MDOC will request from Excelsior, as part of the Environmental Information Volume, air emission risk assessment modeling to predict the cumulative effects of inhalation of air toxics emissions. Emissions generated by the Mesaba Energy Project (including Phase II) in combination with future projects may potentially contribute other hazardous air pollutants such as acetophenone, 2-chloroacetophenone, hexane, hydrogen fluoride, manganese, methyl methacrylate, methyl tert butyl ether, 5-methylchrysene, sulfuric acid, cadmium, indeno(1,2,3-cd)pyrene, arsenic, and acrolein. It is possible that the atmospheric load contributed by the Mesaba Energy Project may increase the load emitted by the other potential future

emission sources listed in Section 3.2. However, based on the results of the current air emission modeling effort for the Mesaba Energy Project, the contribution is anticipated to be negligible.

D.6.5 Water Supply, Quantity, and Quality

If not otherwise available in documents/reports previously generated by Excelsior, DOE and/or MDOC will request from Excelsior, as part of the Environmental Information Volume, estimates of water withdrawals and effluent pollutant loadings, respectively in the Swan River and Partridge River watersheds, based on projections from water and sewer utilities and reasonably foreseeable projects identified in Section 3. These projections should then be added to the water withdrawals and discharges by Mesaba Energy Project (including Phase II) to predict the cumulative effects on water quantity and quality in the respective watersheds.

D.6.6 Loss of Wetlands

If not otherwise available in documents/reports previously generated by Excelsior, DOE and/or MDOC will request from Excelsior, as part of the Environmental Information Volume, estimates of wetland acreage that may be lost due to development of foreseeable projects identified in Section 3. Estimates of wetlands lost to development may be derived from available approved permits. In some cases the USACE lists permits that have been approved on its website and includes the acreages of wetlands impacted. In such situations, rough estimates of wetland acreage lost could be determined by coordinating with the regulatory agencies. The estimated acreage to be lost for development of foreseeable projects should then be added to the acreage expected to be lost for the respective Mesaba Energy Project (including Phase II) at preferred and alternative sites, and the cumulative acreage should be compared to the estimated total wetland acreage in respective watersheds, Swan River and Partridge River, for the West and East Range Sites. Consideration should be given to wetland acreage that would be replaced through mitigation, taking into account the comparative quality of wetlands lost/replaced and the effects of wetland fragmentation.

Overall, the cumulative impact analysis for wetlands will take into consideration recommendations by the USACE, St. Paul District, and the USDA Forest Service, Superior National Forest, as cooperating agencies for the EIS. When making recommendations about wetland impacts, a cooperating agency would be expected to provide appropriate data to support the suggested analysis, such as baseline acreage for past and present wetlands in the affected watersheds, descriptions of the functions and values of the wetlands to the respective watersheds, and the likelihood for wetland mitigation to be required within the watershed for ongoing and future projects.

D.6.7 Wildlife Habitat Loss, Fragmentation, and Obstruction of Movement

If not otherwise available in documents/reports previously generated by Excelsior, DOE and/or MDOC will request the following information from Excelsior as part of the Environmental Information Volume: estimates of wildlife habitat acreage that may be lost for development of foreseeable projects identified in Section 3. Overall, the cumulative impact analysis for wildlife habitat loss will take into consideration recommendations by the USDA Forest Service, Superior National Forest, as a cooperating agency for the EIS. When making recommendations about wildlife impacts, the cooperating agency would be expected to identify particular species of interest and provide estimates of habitat location (maps) and acreage in the Iron Range for use in the cumulative impact analyses. The cooperating agency would also be expected to provide estimates of locations (maps) and growth in acreage of non-native invasive and predator species in the Iron Range along with estimations of the types of human activities that have caused the influx and growth of these species.

The estimated acreage to be lost for development of foreseeable projects should be added to the acreage expected to be lost for the respective Mesaba Energy Project (including Phase II) preferred and alternative sites, and the cumulative acreage should be compared to the estimated total wildlife habitat acreage in respective watersheds for the West and East Range Sites based on general vegetated acreage and on specific estimates of habitat acreage for species of interest as provided by the cooperating agency. Consideration should be given to the cumulative effects on habitat fragmentation and the obstruction of wildlife travel corridors by combined project actions. Possible cumulative effects metrics could include increases in miles and density of roads (and trails) affecting habitat for lynx and wolf, and reductions in nest trees for eagles.

D.6.8 Impacts of Increased Frequency and Lengths of Trains

If not otherwise available in documents/reports previously generated by Excelsior, DOE and/or MDOC will request the following information from Excelsior as part of the Environmental Information Volume: estimates of rail traffic requirements, including frequencies and lengths of trains, to serve foreseeable projects identified in Section 3. The anticipated routes of trains should be projected and added to the rail traffic requirements and projected routes of trains for the Mesaba Energy Project (including Phase II) at respective West and East Range Sites. The results should be evaluated for cumulative impacts on communities along the respective rail routes between Grand Rapids and Hoyt Lakes, with particular consideration for at-grade crossings causing obstruction of emergency vehicle access to service areas, traffic delays, and increased noise. These cumulative impacts should be evaluated also for potential disproportionate effects on low-income populations in compliance with environmental justice requirements.

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