

5. Comparison of Alternatives

This section summarizes the comparative impacts of the No-Build Alternative and Route Alternatives 1, 2, and 3. Due to the differences in length and function of the various segment alternatives, the potential impacts of the proposed segments are not directly comparable and are not discussed herein. The section summarizes potential mitigation for the direct and indirect effects identified in Section 3.0 and the potential irreversible and irretrievable commitment of resources under the build alternatives. Finally, the section discusses the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity.

5.1. Comparative Impacts of Alternatives

Four main alternatives were carried forward for analysis in the environmental impact statement (EIS): Route Alternative 1; Route Alternative 2; Route Alternative 3; and the No-Build Alternatives. Route segments identified by the Applicants (Otter Tail Power et al., 2008a; Otter Tail Power et al., 2008b) were also included for analysis in the EIS. In general, potential impacts do not vary greatly between the build alternatives. Route Alternative 3 is significantly longer than Route Alternatives 1 and 2; as such, more acreage would be affected for resources located along Route Alternative 3 than Alternatives 1 and 2. The nature and extent of potential impacts to the Leech Lake Reservation (LLR) and Chippewa National Forest (CNF) lands would be similar to those for the entire lengths of Route Alternatives 1, 2, or 3. Route Alternative 3 was designed to avoid the LLR as much as possible; as such, impacts to resources within the LLR boundaries would be much less for Route Alternative 3 than for Route Alternatives 1 and 2.

Table 5-1: Comparative Impacts of Route Alternatives

Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Treaty Trust Resources				
Direct impacts	Long-term loss of an important gathering area for tribal members.	Some long-term loss of gathering opportunities for tribal members.	Minimal loss of gathering opportunities for tribal members due to avoidance of the LLR.	No effect.
Aesthetics				
Direct impacts	Loss of scenic resources; loss of trees would change view; contrast to surrounding landscape. Conversion of 579 acres of forested area. Impact to spiritual and significant cultural area of the Leech Lake Band of Ojibwe; Anishinaabe cultural and spirituality is tied to land and the surrounding environment so any disturbance to this visual or aesthetics of Route Alternative 1 corridor would have a direct affect to the Leech Lake People. Impacts to Ten Section management area	Loss of scenic resources; loss of trees would change view; contrast to surrounding landscape. Conversion of 439 acres of forested area. Alternative 2, which follows U.S.-2, would be visible to visitors and residents due to less forest cover to shield views and would be located near more recreational areas.	Loss of scenic resources; loss of trees would change view; contrast to surrounding landscape. Conversion of 813 acres of forested area.	No effect.
Air Quality and Climate				
Direct Impacts	Fugitive dust and vehicle emissions during construction.	Fugitive dust and vehicle emissions during construction.	Fugitive dust and vehicle emissions during construction. Alternative 3 would result in the greatest duration of construction effects due to its length.	No effect.

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Indirect Impacts	Minor decrease in carbon sequestration potential due to loss of existing trees.	Minor decrease in carbon sequestration potential due to loss of existing trees.	Minor decrease in carbon sequestration potential due to loss of existing trees.	No effect.
Geology and Soils				
Topography	No effect.	No effect.	No effect.	No effect.
Geology	No effect.	No effect.	No effect.	No effect.
Soils	Soils would be disturbed during construction; erosion and compaction are possible. Temporary soil impacts from transmission line structures for entire route are 876 acres and long-term impacts are 3 acres. Temporary soil impacts to LLR from transmission line structures are 618 acres and long-term impacts are 2 acres. Temporary soil impacts to CNF from transmission line structures are 341 acres and long-term impacts is 1 acre. Long-term impacts from substation construction and expansion could range up to 7.8 acres.	Soils would be disturbed during construction; erosion and compaction are possible. Temporary soil impacts from transmission line structures for entire route are 931 acres and long-term impacts are 3 acres. Temporary soil impacts to LLR from transmission line structures are 631 acres and long-term impacts are 2 acres. Temporary soil impacts to CNF from transmission line structures are 281 acres and long-term impacts is 1 acre. Long-term impacts from substation construction and expansion are 3.5 acres.	Soils would be disturbed during construction; erosion and compaction are possible. Temporary soil impacts from transmission line structures for entire route are 1,070 acres and long-term impacts are 5 acres. Temporary soil impacts to LLR from transmission line structures are 4 acres and long-term impacts are 0 acres. Temporary soil impacts to CNF from transmission line structures are 846 acres and long-term impacts are 3 acres. Long-term impacts from substation construction and expansion are 3.5 acres.	No effect.
Water Resources				

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Surface Water	No major effect. If water bodies cannot be spanned, shore erosion, sedimentation, and changes in turbidity may occur. Crosses 4 water basins and 6 water courses along entire route. Crosses 3 water basins and 5 water courses on the LLR. Crosses 4 water basins and 5 water courses on CNF.	No major effect. If water bodies cannot be spanned, shore erosion, sedimentation, and changes in turbidity may occur. Crosses 2 water basins and 7 water courses along entire route. Crosses 2 water basins and 7 water courses on the LLR. Crosses 2 water basins and 2 water courses on CNF.	No major effect. If water bodies cannot be spanned, shore erosion, sedimentation, and changes in turbidity may occur. Crosses 9 water basins and 27 water courses along entire route. Avoids the LLR. Crosses 8 water basins and 15 water courses on CNF.	No effect.
Groundwater	No major effect.	No major effect.	No major effect.	No major effect.
Floodplains				
Direct Effects	No major effect. If water bodies cannot be spanned, erosion or sedimentation may result in a loss of surrounding floodplains. Possible location of 8 structures in the FEMA designated areas.	No major effect. If water bodies cannot be spanned, erosion or sedimentation may result in a loss of surrounding floodplains. Possible location of 4 structures in the FEMA designated areas.	No major effect. If water bodies cannot be spanned, erosion or sedimentation may result in a loss of surrounding floodplains. Possible location of 46 structures in the FEMA designated areas with 16 in the CNF.	No effect.
Wetlands				
Direct Effects	Potential loss or conversion of wetlands.	Potential loss or conversion of wetlands.	Potential loss or conversion of wetlands. The highest amount of wetland type conversion would occur for Alternative 3.	No effect.

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
	Potential effects to NWI wetlands: temporary impacts to 83 acres, wetland conversion of 209 acres, and <1 acre of long-term impacts along entire route.	Potential effects to NWI wetlands: temporary impacts to 59 acres, wetland conversion of 166 acres, and <1 acre of long-term impacts along entire route.	Potential effects to NWI wetlands: temporary impacts to 101 acres, wetland conversion of 269 acres, and <1 acre of long-term impacts along entire route.	
	113 structures are estimated in NWI wetlands.	93 structures are estimated in NWI wetlands.	120 structures are estimated in NWI wetlands.	
Indirect Effects	Conversion of wetland types may result in a change in wildlife species composition, diversity, and abundance.	Conversion of wetland types may result in a change in wildlife species composition, diversity, and abundance.	Conversion of wetland types may result in a change in wildlife species composition, diversity, and abundance.	No effect.
Biological Resources				
Direct Effects	Conversion of existing vegetation communities (1,048 acres).	Conversion of existing vegetation communities (1,018 acres).	Conversion of existing vegetation communities (1,759 acres).	No effect.
	Disturbance of intact diverse native plant communities.	Disturbance of intact diverse native plant communities.	Disturbance of intact diverse native plant communities.	
	Introduction or spread of noxious weeds in cleared ROWs.	Introduction or spread of noxious weeds in cleared ROWs.	Introduction or spread of noxious weeds in cleared ROWs.	
	Short-term impacts to wildlife from conversion of forested habitat.	Short-term impacts to wildlife from conversion of forested habitat.	Short-term impacts to wildlife from conversion of forested habitat.	
	Long-term conversion of wildlife habitat in areas that remain cleared and increased long-term fragmentation and edge effect (5.2 miles of new corridors).	Long-term conversion of wildlife habitat in areas that remain cleared and increased long-term fragmentation and edge effect (5.1 miles of new corridors).	Long-term conversion of wildlife habitat in areas that remain cleared and increased long-term fragmentation and edge effect (2.3 miles of new corridors).	
	Would establish a long-term ROW in canopy forest.			
Species of Special Concern				

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Direct Effects	<p>Potential for habitat conversion.</p> <p>Destruction of non-motile plant species, if located within ROW.</p> <p>Disturbance of intact diverse native plant communities.</p> <p>Affect to Ten Section Area by converting forested land and resulting in habitat conversion and edge effect.</p> <p>MnDNR and LLDRM have preliminarily determined Route Alternative 1 would jeopardize the only known one-flowered broomrape population in Northern Minnesota.</p>	<p>Potential for habitat conversion.</p> <p>Destruction of non-motile plant species, if located within ROW.</p> <p>Disturbance of intact diverse native plant communities</p> <p>Affects periphery of Ten Section Area by converting forested land and resulting in habitat conversion and edge effect.</p>	<p>Potential for habitat conversion.</p> <p>Destruction of non-motile plant species, if located within ROW.</p> <p>Disturbance of intact diverse native plant communities</p>	No effect.

Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Cultural Resources and Values including TCPs				
Direct Effects	<p>Potential loss or disturbance of cultural resources or sites</p> <p>Potential impacts on the viewshed of historical structures or landscapes.</p> <p>Potential to disturb unrecorded archaeological sites.</p> <p>Long-term loss of TCPs and locations where they are gathered.</p> <p>Impact to the vitality of the spiritual well-being of tribal residents who use TCPs.</p> <p>Presence of transmission line would alter cultural experience in areas identified as culturally significant, including Ten Section and Guthrie Till Plain areas.</p>	<p>Potential loss or disturbance of cultural resources or sites</p> <p>Potential impacts on the viewshed of historical structures or landscapes.</p> <p>Potential to disturb unrecorded archaeological sites.</p> <p>Long-term loss of TCPs and locations where they are gathered.</p> <p>Impact to the vitality of the spiritual well-being of tribal residents who use TCPs.</p>	<p>Potential loss or disturbance of cultural resources or sites</p> <p>Potential impacts on the viewshed of historical structures or landscapes.</p> <p>Potential to disturb unrecorded archaeological sites.</p>	No effect.
Land Use				
Direct Effects	<p>Temporary and long-term loss of land use by private owners.</p> <p>Temporary and long-term land impacts within ROW: 879 acres of which 579 acres of forested land will have long-term impacts.</p> <p>Conversion of 4 acres for new Cass Lake substation. Additional acreage may be required for possible expansion at Nary Junction.</p>	<p>Temporary and long-term loss of land use by private owners.</p> <p>Temporary and long-term land impacts within ROW: 934 acres of which 439 acres of forested land will have long-term impacts.</p>	<p>Temporary and long-term loss of land use by private owners.</p> <p>Temporary and long-term land impacts within ROW: 1391 acres of which 813 acres of forested land will have long-term impacts.</p>	No effect.

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
	Total LLR temporary and long-term impacts: 620 acres; 433 acres of long-term forested land impacts. Total CNF temporary and long-term impacts: 342 acres; 294 acres of long-term forested land impacts.	Total LLR temporary and long-term impacts: 633 acres; 338 acres of long-term forested land impacts. Total CNF temporary and long-term impacts: 282 acres; 202 acres of long-term forested land impacts.	Total LLR temporary and long-term impacts: 4 acres; 1 acres of long-term forested land impacts. Total CNF temporary and long-term impacts: 840 acres; 584 acres of long-term forested land impacts.	
Indirect Effects	Potential for increased trespassing through creation of easements.	Potential for increased trespassing through creation of easements.	Potential for increased trespassing through creation of easements.	No effect.
Socioeconomics				

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Direct Effect	<p>Short-term influx of income during construction and increased tax base (property taxes from the Applicant) during operation of the project.</p> <p>Economic benefit to businesses and surrounding communities through increased electrical capacity and reliability.</p> <p>Potential decrease in property values.</p> <p>Least potential to directly affect residences.</p> <p>579 acres of forest land lost from timber harvesting.</p> <p>Greatest potential for impacts to subsistence uses from conversion and fragmentation of habitat and introduction of invasive species. Potentially affects up to 662 acres of total ROW within the LLR.</p>	<p>Short-term influx of income during construction and increased tax base (property taxes from the Applicant) during operation of the project.</p> <p>Economic benefit to businesses and surrounding communities through increased electrical capacity and reliability.</p> <p>Potential decrease in property values.</p> <p>439 acres of forest land lost from timber harvesting.</p> <p>Moderate potential for impacts to subsistence uses from conversion and fragmentation of habitat and introduction of invasive species. Potentially affects up to 660 acres of total ROW within the LLR.</p>	<p>Short-term influx of income during construction and increased tax base (property taxes from the Applicant) during operation of the project.</p> <p>Economic benefit to businesses and surrounding communities through increased electrical capacity and reliability.</p> <p>Potential decrease in property values.</p> <p>Greatest potential to directly affect residences</p> <p>638 acres of forest land lost from timber harvesting.</p> <p>Least potential for impacts to subsistence uses from conversion and fragmentation of habitat and introduction of invasive species. Potentially affects up to 4 acres of total ROW within the LLR.</p>	<p>Would not meet the area's need for reliable electric supply.</p>
Indirect Effects	<p>Increased timber sales in the vicinity of the project during construction, but loss of future timber resources.</p>	<p>Increased timber sales in the vicinity of the project during construction, but loss of future timber resources.</p>	<p>Increased timber sales in the vicinity of the project during construction, but loss of future timber resources.</p>	<p>No effect.</p>
Environmental Justice				

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Direct Effects	Crosses the homeland of Minority Community. Will result in long-term loss of gathering lands and temporary disruption to hunting and gathering will occur during construction.	Crosses the homeland of Minority Community. Will result in long-term loss of gathering lands and temporary disruption to hunting and gathering will occur during construction.	Largely avoids the LLR. Will result in loss of a small amount of gathering lands and temporary disruption to hunting and gathering will occur during construction.	No effect.
Indirect Effects	Long-term aesthetic impacts to a Minority Community. Aesthetic intrusion would alter cultural experience in areas identified as culturally significant, including Ten Section and Guthrie Till Plain areas.	Long-term aesthetic impacts to a Minority Community.		
Recreation and Tourism				
Direct Effects	Removal of forested land within the LLR CNF. Possible location of the ROW within the Bemidji Slough or Bemidji State Game Refuge. Potential Bemidji Slough impacts: 5 acres temporarily and 675 square feet long-term. Potential Bemidji State Game Refuge impacts: 65 acres temporarily and 0.2 acres long-term.	Removal of forested land within the LLR CNF. Possible location of the ROW within the Bemidji State Game Refuge. Potential Bemidji State Game Refuge impacts: 124 acres temporarily and 0.3 acres long-term.	Removal of forested land within the LLR CNF. Possible location of the ROW within the Bemidji Slough or Bemidji State Game Refuge. Potential Bemidji Slough impacts: 4.3 acres temporarily and 561 square feet long-term. Potential Bemidji State Game Refuge impacts: 111 acres temporarily and 0.3 acres long-term.	No effect.

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Indirect Effects	Changes to vegetation and land cover within easement may impact wildlife habitat and affect hunting areas. Creation of easements may increase the opportunities for OHV/snowmobile trails. Unexpected noise levels (during construction) or viewshed changes may affect non-motorized recreational activities.	Changes to vegetation and land cover within easement may impact wildlife habitat and affect hunting areas. Creation of easements may increase the opportunities for OHV/snowmobile trails. Unexpected noise levels (during construction) or viewshed changes may affect passive recreational activities.	Changes to vegetation and land cover within easement may impact wildlife habitat and affect hunting areas. Creation of easements may increase the opportunities for OHV/snowmobile trails. Unexpected noise levels (during construction) or viewshed changes may affect passive recreational activities.	No effect.
Agriculture				
Direct Effects	Loss of agricultural land (52 acres temporarily and 0.7 acres long-term) and prime farmland (1.3 acres long-term). Largest loss of agricultural and farmland on LLR. Potential interference with agricultural activities (maneuvering equipment around poles and aerial spraying).	Loss of agricultural land (31 acres temporarily and 0.3 acres long-term) and prime farmland (0.7 acres long-term). Potential interference with agricultural activities (maneuvering equipment around poles and aerial spraying).	Loss of agricultural land (119 acres temporarily and 2 acres long-term) and prime farmland (3.6 acres long-term). No affect to agricultural/farmland on LLR. Potential interference with agricultural activities (maneuvering equipment around poles and aerial spraying).	No effects.
Forestry				
Direct Effects	Long-term loss of forested land and timber resources.	Long-term loss of forested land and timber resources.	Long-term loss of forested land and timber resources.	No effect.

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
	Conversion of about 579 acres of forested area to managed shrub and grasslands along entire route; 433 acres in LLR; 294 acres in CNF. 4 acres of forest land lost for new Cass Lake substation. Lost opportunity for silvicultural research in Pike Bay Experimental Forest. Affect to Ten Section Area by converting forested land and result in loss of old growth.	Conversion of about 439 acres of forested area to managed shrub and grasslands along entire route; 335 acres in LLR; 202 in CNF. Affect to Ten Section Area by converting forested land and result in loss of old growth.	Conversion of about 813 acres of forested area to managed shrub and grasslands along entire route; 1 acre in LLR; 584 acres in CNF.	
Mining	No major effect.	No major effect.	No major effect.	No effect.
Community Services	No major effect.	No major effect.	No major effect.	No effect.
Utility Systems				
Direct Effects	Potential interference with omnidirectional and unidirectional antenna, resulting in TV and radio interference. Electrical interference on underground pipelines.	Potential interference with omnidirectional and unidirectional antenna, resulting in TV and radio interference. Electrical interference on underground pipelines.	Potential interference with omnidirectional and unidirectional antenna, resulting in TV and radio interference. Electrical interference on underground pipelines.	Demand on existing transmission system would increase and brownouts (leading to blackouts) could occur.
Traffic and Transportation				
Direct Effects	Short-term road traffic and rail delays during construction. Electrical interference to railroads.	Short-term road traffic and rail delays during construction. Electrical interference to railroads.	Short-term road traffic and rail delays during construction. Electrical interference to railroads.	No effect.

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Resource	Route Alternative 1 and associated Segment Alternatives	Route Alternative 2 and associated Segment Alternatives	Route Alternative 3 and associated Segment Alternatives	No-Build Alternative
Indirect Effects	Loss of living snow fences along highways, resulting in snow drift for drivers. Follows 25 miles of existing highway ROW. Potential conflicts with future roadway expansion.	Loss of living snow fences along highways, resulting in snow drift for drivers. Follows 60 miles of existing highway ROW. Potential conflicts with future roadway expansion.	Loss of living snow fences along highways, resulting in snow drift for drivers. Follows 32 miles of existing highway ROW. Potential conflicts with future roadway expansion.	No effect.
Safety and Health	No effect.	No effect.	No effect.	No effect.
Noise				
Direct Effects	Noise generated from operation of construction equipment.	Noise generated from operation of construction equipment.	Noise generated from operation of construction equipment.	No effect.

5.2. Mitigation of Impacts

The HVTL route permit would require certain mitigation measures to prevent or minimize both short-term and long-term impacts on resources from construction and operation of the Project. Additional mitigation measures were agreed to by the Applicants in the Application for a Route Permit (Otter Tail Power et al., 2008a), submitted in June 2008. Mitigation measures for each resource area are discussed in detail in Section 3.0 and summarized in Table 5-2.

Table 5-2: Summary of Mitigation Measures

Resource	Mitigation Measures
Aesthetics	Limits imposed in the HVTL permit for the removal of vegetation and trees.
	HVTL permit requirements for cleanup of construction waste.
	HVTL permit requirement to span water bodies when possible.
	ROW, access roads, temporary work spaces, and other private lands restoration required by the HVTL permit and as agreed upon in the vegetative management plan.
	Communication with landowners regarding specific pole placement.
	Use of uniform structure designs that blend into the natural environmental (i.e., wood poles).
	Placement of structures at the maximum possible distance from trails, water bodies, and highways.
	Limit number and placement of construction staging areas. Possible use of Enbridge cleared right of way.
	Cross water bodies in the same location as existing transmission lines.
	Double-circuit the Project with existing transmission or distribution lines to the extent possible.
Air Quality and Climate	Parallel existing transmission line and pipeline easement to the extent possible.
	The height of the structures may be reduced, as feasible, to minimize impacts within areas of high scenic importance. Use of H-frame structures for the Mississippi River crossing would have a lower profile than single pole structures.
	Use of Best Management Practices (BMPs) to control fugitive dust during construction: monitor dust generation; operate vehicles at reduced speeds; and use of water and dust abatement methods.
	Maintain construction vehicles, limit idling time, and could use 15 ULSD in all on/off road construction equipment.
	Limit burning of vegetative and construction debris for the entire project. Use alternative methods such as chipping the debris for mulching, for use as a fuel source or other uses. No burning of slash or construction piles will be allowed on or near the Leech Lake Reservation.
Soil and Geology	No burning on or near the boundaries of the Leech Lake Reservation; in order to reduce the potential for Black Carbon and other emissions. Burning permit would be required from Leech Lake Band of Ojibwe.
	Restoration of the natural landscape would commence shortly upon cessation of construction activities, as is typically required as a condition of the HVTL permits issued by the Commission.
	HVTL permit requirement to re-grade areas disturbed to construction to reflect topography existing before construction.
	Avoid disturbance of soils and excavation in steeply sloped areas.
	Implementation of Soil Erosion and Sediment Control Plan, required by the HVTL permit.
Development of BMPs under a Storm Water Pollution Prevention Plan (SWPPP), including installation of silt fencing, straw bales or ditch blocks and/or covering bare soils with mulch, plastic sheeting, or fiber rolls to protect drainage ways and streams from sediment runoff from exposed soils.	
Restore compacted soils to their native state through tillage operations.	

Resource	Mitigation Measures
	<p>Limit setup and staging sites to previously disturbed areas.</p> <p>Identification of wet organic soils through mapping and, if necessary on-site investigations and soil borings.</p> <p>To the extent practicable, complete construction in the wet organic soils when the ground is frozen.</p> <p>Develop procedures for the proper storage and disposal of all hazardous and non-hazardous wastes generated during construction.</p> <p>Use controlled staging areas for refueling and hazardous material loading/unloading.</p> <p>Revegetate all disturbed areas once construction is complete. Seed mixes could be specified based upon site characteristics and in accordance with regulatory permits.</p> <p>In the event that previously contaminated soils are discovered during construction, the Applicants could stop work immediately, contact the appropriate state or tribal agency, and consult with the agency with respect to an acceptable plan of action.</p>
Water Resources	<p>HVTL permit requirement to span all water bodies to the extent possible.</p> <p>Plant or seed non-agricultural areas disturbed by transmission line structures to prevent runoff. Ensure that native seed mixes from the plants already indigenous to the immediate area of disturbance are used for the seeding.</p> <p>HVTL permit requirement to co-locate with existing transmission facilities along certain segments of a permitted route.</p> <p>Development of BMPs under a SWPPP including location of structures and disturbed areas away from water bodies; location of fueling activities and fuel and chemical storage away from water bodies; installation of sediment and erosion control; use of turbidity control methods; spread topsoil and seed in a timely manner; avoid use of fertilizer, pesticides, or herbicides near water bodies; implement procedures to minimize and control inadvertent fluid returns during horizontal direction drilling (if used).</p> <p>Compensatory mitigation if required under the Section 404 permit could include the restoration, establishment, enhancement, or preservation of wetlands or other aquatic resources to off-set Project impacts.</p>
Floodplains	<p>HVTL permit requirement to return floodplain contours to their pre-construction profile if disturbed during construction.</p> <p>HVTL permit requirement to span all water bodies and associated floodplains to the extent possible.</p> <p>Plant or seed non-agricultural areas disturbed by transmission line structures to prevent runoff. Use native seed mixes from the indigenous plants and plant indigenous plants located in the immediate disturbed soil area; ensure seeding and/or plantings are done in a time congruent with seeding and growth of the area, not during a time that would preclude germination or rooting.</p> <p>Use construction techniques to minimize run-off into floodplains during construction.</p>
Wetlands	<p>HVTL permit requirement to span wetlands to the extent possible.</p> <p>Plant or seed non-agricultural areas disturbed by transmission line structures to prevent runoff. Use native seed mixes from the indigenous plants and plant indigenous plants located in the immediate disturbed soil area; ensure seeding and/or plantings are done in a time congruent with seeding and growth of the area, not during a time that would preclude germination or rooting.</p>

Resource	Mitigation Measures
	<p>Development of BMPs under a SWPPP, NPDES permit, License to Cross Public Waters permit, Public Waters work permit, and Section 10 permit, including location of fueling activities and fuel and chemical storage away from water bodies; installation of sediment and erosion control; use of turbidity control methods; spread topsoil and seed in a timely manner; avoid use of fertilizer, pesticides, or herbicides near wetlands; implement procedures to minimize and control inadvertent fluid returns during horizontal direction drilling (if used).</p> <p>Schedule construction during frozen ground conditions.</p> <p>Access wetlands through the shortest route resulting in the least amount of physical impact to the wetland during construction.</p> <p>Assemble structures on upland areas before transporting into wetlands.</p> <p>Use of construction mats and specially designed all terrain vehicles to minimize impacts within wetlands when construction during winter (frozen) months is not possible.</p> <p>Restore wetlands as required by the USACE St. Paul District to replace wetland functions and values lost due to regulated activities pursuant to Section 404 of the Clean Water Act and St. Paul District Policy for Wetland Compensatory Mitigation in Minnesota, and in concert with other district policies and guidance.</p>
Biological Resources	<p>Reseed disturbed areas following construction with a LLDRM/CNF approved native species seed mix to restore native vegetation cover. Seed mix will be developed in conjunction with appropriate resource agencies taking into consideration culturally important species.</p> <p>Develop a noxious weed management program, including a noxious weed and vegetation management plan.</p> <p>Conduct a field review of ROW and construction staging sites prior to construction to identify areas that contain noxious weeds and should be avoided.</p> <p>Power-wash or manually remove material from construction vehicles prior to the start of construction and if equipment has traveled from an area contaminated by noxious weeds to an uncontaminated area.</p> <p>Siting the Project within or adjacent to existing ROWs to minimize impacts to wildlife habitat.</p> <p>Limit clearing and maintenance of the ROW within previously forested areas to the extent practicable.</p> <p>Install marked transmission line shield wires to the extent practicable within major flyways.</p> <p>Develop an Avian Protection Plan (APP).</p>
Species of Special Concern	<p>Placement of the ROW within the 1,000-foot-wide route to avoid known species of special concern, active nesting locations, and active breeding locations.</p> <p>Conduct ROW clearing outside of the breeding season.</p> <p>Notify appropriate agencies if previously unknown nesting/breeding sites are identified during construction.</p> <p>An <i>Orabanche uniflora</i> Mitigation Plan will be developed if the Project Route is placed in close proximity of the known population(s).</p>
Cultural Resources	<p>Avoid identified archaeological and historic resources through adjustment of the ROW within the selected 1,000-foot-wide route.</p> <p>Vegetative restoration of the ROW and construction areas using local native ecotype species. Seed mix will be developed in conjunction with appropriate resource agencies taking into consideration culturally important species.</p>

Resource	Mitigation Measures
	<p>Implement BMPs for water resources (see above) to minimize potential effects to wild rice.</p> <p>Use of single pole structures within the city of Cass Lake to minimize visual and aesthetic impacts to the viewshed of historical properties.</p>
Land Use	<p>Co-locating the Project along existing ROWs, including highways, railways, existing transmission lines, and pipelines.</p> <p>Communicate with MnDNR LLDRM, and CNF to identify and avoid sensitive forested areas.</p> <p>Reseed state and federal forested land with a seed mix recommended by the appropriate agency's management. Seed mix will be developed in conjunction with appropriate resource agencies taking into consideration culturally important species.</p> <p>Limit construction staging and lay-down areas to previously disturbed areas.</p> <p>Use the minimum necessary width and length for transmission line access roads.</p> <p>Communicate with private land owners regarding exact placement of structures and disturbed areas.</p> <p>Adjust conductor spans to avoid sensitive land use areas.</p> <p>Limit construction activities to the ROW, unless access permission is obtained from adjacent landowners.</p> <p>Repair or replace fences, gates, and similar improvements that are removed or damaged during Project construction.</p>
Socioeconomics	<p>Communicate with landowners regarding exact placement of structures and disturbed areas.</p> <p>Use the minimum necessary width and length for transmission line access roads.</p> <p>Limit construction activities to the ROW, unless access permission is obtained from adjacent landowners.</p> <p>Easement payments to landowners are required to compensate landowners for loss of use of the utility easement on their property.</p> <p>Co-locating the Project along existing ROWs, including highways, railways, existing transmission lines, and pipelines, to avoid crossing additional, undisturbed properties and affecting property values.</p>
Environmental Justice	<p>Communicate with private landowners regarding exact placement of structures and disturbed areas.</p> <p>To prevent long-term disruption to hunting and gathering resources, the HVTL permit would require restoration of the rights-of-way, temporary work spaces, access roads, and other lands affected by constructions. The HVTL permit would require the Applicants to work with the MnDNR, LLDRM, CNF, landowners, and local wildlife management programs to restore and maintain the rights-of-way to provide a useful and functional habitat for plants, nesting birds, small animals, and migrating animals to minimize habitat fragmentation.</p> <p>The Applicants could work with the LLDRM to allow them to collect and transplant (in whole or in part) traditionally important plants from the entire ROW.</p> <p>Opportunities could be provided to the LLDRM Plant Resource Department in order to conduct long-term management of portions of or the entire ROW through the LLR to reduce the occurrence of non-native invasive species and support traditionally important plants.</p>

Resource	Mitigation Measures
	Span water bodies, wetlands, and floodplains to the extent possible, to minimize effects on wild rice resources.
Recreation and Tourism	Co-locating the Project along existing ROWs, including highways, railways, existing transmission lines, and pipelines, to avoid previously undisturbed recreation areas and wildlife habitat.
	Communicate with private landowners and resource management agencies regarding exact placement of structures and disturbed areas.
	Placement of barriers and signs at or near road crossings to limit unauthorized off-highway vehicle (OHV) or other vehicle traffic on ROWs.
	Conduct construction at water access points during winter months when use of such areas for recreation tourism is minimal.
	Align the Project ROW perpendicular rather than parallel to existing trails to the extent practicable to minimize impacts to recreation trails.
	Post signs during construction to provide residents and visitors with advance notice of what recreational activities may be affected during construction.
Agriculture	HVTL permit required Agricultural Mitigation Plan.
	Communicate with private landowners regarding placement of structures and disturbed areas to minimize effects on farming operations.
	Co-locating the Project along existing ROWs, including highways, railways, existing transmission lines, and pipelines, to avoid previously undisturbed agricultural land.
	Use of a single pole structure for placement on agricultural land.
	Compensate landowners for crop damage and soil compaction that occurs during Project construction.
Forestry	HVTL permit requirement to restore ROW and disturbed areas, including restoration of compacted soils through tillage operations.
	Limits imposed in the HVTL permit for the removal of vegetation and trees.
	Limits imposed in the HVTL permit for the creation of temporary easements for access roads and construction/staging areas. The HVTL permit could require that these areas be selected to minimize tree removal.
	Restoration of previously forested land with native shrubs and grasses as identified in the vegetation management plan. Plant seedlings in temporary work areas.
	Conduct construction activities on CNF lands in accordance with the Forest-Wide Management Directions, as provided in the 2004 Final Forest Plan.
Mining	No mitigation measures identified.
Community Services	No mitigation measures identified.
Utility Systems	Proper maintenance, preventative maintenance, and selection of hardware for the transmission line.
	HVTL permit condition requiring the correction of interference to communication systems that the transmission line causes or creates.
	Modifying receiving antennae to correct radio interference.
	Detuning of transmission line structures if receiving antennae modifications do not eliminate interference with radio frequencies.
	Communicate with local radio broadcasting stations to confirm that blocking interference does not occur due to structure placement.

Resource	Mitigation Measures
	<p>Modification or replacement of antenna or amplifier for residents that experience TV signal interference.</p> <p>Reduction of AC interference on pipelines through reducing the impedance of the transmission structure grounds, grounding the pipeline in conjunction with de-couplers, burying gradient control wires along the pipeline or ground mats under aboveground facilities (such as at valves), and the use of dead fronts at test stations.</p> <p>Conduct computer modeling of AC interference to ensure that property mitigation is designed and installed prior to energizing the transmission line.</p> <p>Schedule planned service disruptions that are necessary during construction activities with the affected owners of existing transmission lines. Provide advance notice of service disruption to electric customers.</p> <p>Ensure that utility repair crews are present or on-call during construction activities to respond to unplanned incidents that may result in an interruption to electric service.</p>
Traffic and Transportation	<p>Construct transmission line in accordance with National Electric Safety Code (NESC) guidelines for the required clearances between transmission lines and transportation structures.</p> <p>HVTL permit requirement to comply with MnDOT and all applicable road authorities' management standard and policies, including written notice of construction to MnDOT and applicable road authorities.</p> <p>HVTL permit requirement to restore the ROW, temporary work spaces, access roads, abandoned ROW, and other lands affected during construction, including living snow fences.</p> <p>File a "Notice of Proposed Construction of Alteration" with the FAA and provide an opportunity for the FAA to comment about compatibility of the Project with airport operations.</p> <p>Obtain MnDOT and county permits as applicable for transmission line crossings of roadways. Use of ROW along the National Highway System requires approval of the Federal Highway Administration.</p> <p>Implement traffic control measures during construction, which could include flag persons, barriers, and flashing lights.</p> <p>Install temporary wood pole "guard structures" to safeguard the public and construction workers during removal of existing conductors or stringing of new overhead conductors over highways.</p> <p>Grounding tracks and communication cables on existing rail lines to prevent interference.</p> <p>Use of taller structures where the Project crosses the railroad to increase clearance between passing trains and conductors.</p> <p>Consolidate the Project with existing transmission line to reduce the number of railroad crossings.</p>
Safety and Health	<p>Use BMPs to minimize the potential for spills or leaks from equipment during construction, including frequent inspections of equipment; requiring portable spill containment kits for construction equipment; ensuring that equipment operations are present at the nozzle at all times when fueling is in progress; and prohibiting the refueling of equipment in wetlands.</p> <p>Use of protective devices (e.g., breakers and relays) that would de-energize the transmission line in the event of an emergency.</p> <p>Use of fences at substations to prevent access.</p>

Resource	Mitigation Measures
	<p>Construct the Project in accordance with NESC standards regarding clearance, grounding, utility crossing, strength of materials, and ROW widths.</p> <p>Ground metal buildings, fences, and other large, permanent conductive objects in close proximity or parallel to the line to prevent electric field discharge.</p> <p>Minimize the length of the transmission line that parallels or is co-located with distribution of local service conductors to minimize the potential for stray voltage.</p> <p>Educating local livestock operations about techniques to reduce the potential for insulated electric fences to pick up an induced charge from the transmission line.</p>
Noise	<p>HVTL permit requirement for the Project to meet Minnesota noise standards.</p> <p>Limit construction to daytime work hours.</p> <p>Equip heavy equipment with sound attenuation devices, such as mufflers.</p> <p>Minimize noise impacts from substation through design, including setbacks from sensitive noise receptors, layout and landscaping choices, and use of low noise transformers.</p>

5.3. Irreversible and Irretrievable Commitment of Resources

Irreversible commitment of resources refers to the loss of future options for resource development or management, especially of nonrenewable resources such as cultural resources.

The construction of the Project would require the irretrievable commitment of non-recyclable building materials and fuel consumed by construction equipment. Under certain Route Alternatives and Route Segments, as identified in applicable sections of the DEIS, the Project would require the irreversible or irretrievable commitment of old growth forest, including the Ten Section area and Pike Bay Experimental Forest. In addition, Route Alternative 1 could result in the loss of the Orabanche uniflora species, for which an incidental take permit from the USFWS may be required.

5.4. Relationship between Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

Construction of the Project would have short-term impacts on environmental resources, primarily associated with installation of poles and conductors, clearing of the right-of-way (ROW), and use of construction lay-down areas. Temporary impacts from construction activities are discussed in Section 3.0 and Table 5-1 above. The HVTL permit would require the Applicants to restore the ROW, temporary work spaces, access roads, abandoned ROW, and other lands affected by construction of the Project. During the restoration process, the Applicants would be required by the HVTL to work with landowners, the Minnesota Department of Natural Resources (MnDNR), and local

wildlife management programs to ensure that the restored ROW would provide useful and functional habitat for vegetation and wildlife.

The short-term use of environmental resources would result in increased electrical reliability for the region in which the Project would be located. The Project and associated facilities (e.g., substations, breaker stations) would remain operational for over 50 years (Otter Tail Power et al., 2008a). Within that time, environmental resources would return to their long-term productivity, with the exception of those resources for which long-term impacts beyond a 50-year time period would occur. Estimate long-term impacts to resources within the 125-foot ROW are show in Table 5-3.

Table 5-3: Estimated Long-Term Impacts (acres) to Resources within a 125-foot Feasible Right-of-Way

Resource	Route Alternative 1	Route Alternative 2	Route Alternative 3
Forested lands	579	439	813
Soils	3	3	5
Wetland type conversion	209	166	269
Wetlands	<1	<1	<1
Shrub land	<1	<1	Up to 1.4
Cropland/Grassland	<1	<1	Up to 2.4
Agricultural land use	<1	<1	2.03
Prime farmland	1.3	<1	3.6

Construction and operation of the project would result in long-term impacts to soils, forested land, wetlands, shrub land, cropland/grassland, agricultural land, and prime farmlands. These resources would not return to productivity until the transmission line and associated facilities are removed. In the case of wetland conversion, impacts could be mitigated through reclamation, restoration, or permanently protecting other wetlands for an offset of wetland losses. For all other resource areas identified in the EIS, long-term impacts beyond the Project lifetime of 50 years are either not anticipated or expected to be avoided through mitigation measures.