Exhibit 2: Site Evaluation Sheets

NOTE: Site Evaluation Sheets are included for only those sites that were considered to be obtainable (Sites 2, 4, 7, 8, 10, 11, 16 and 17 were considered unobtainable) and of sufficient size (Sites 1 and 3 were considered to be too small) to allow for development of the Project. The Site Evaluation Sheet for Site 14 is included as it was originally considered to be available; this decision was reviewed and reversed at the time of Excelsior's submission of its application for a Joint Permit to the Minnesota Public Utilities Commission.

MESABA ENERGY PROJECT: IGCC POWER STATION SITE EVALUATION SHEET

Site Identification

Site No.: 5 Site Name: Manganika Lake T: 58N R: 18W Section: 23, 24, 25, 26 Acres: ~1375

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +16 CN OS Other:

Rail Discussion: No opportunity for two rail suppliers.

Other Transportation: Good access via CR 102, CR 7, US Highway 169, and Maxwell Road.

Water Supply: Virginia WWTP effluent, Thunderbird Mine Pit dewatering, East/West Pit dewatering, West Two Rivers Reservoir, Mountain Iron WWTP effluent, and other surface water runoff.

Water Supply Discussion: It is doubtful that the necessary water supplies for peak two-phase operation can be assembled into a dependable portfolio.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 16L, 37L on site; MP 38L contiguous with eastern property boundary.

HVTL Discussion: Good access to Forbes Substation.

General Description

Site is completely within city limits of Mountain Iron and is split in half by CR 7. The western half is being developed into lake lots (around Mashkenode Lake) and would preclude development there; significant cultural resources found nearby this lake. Rail loop would encircle Manganika Lake, cause significant wetland impacts and require reconfiguration of roads and other infrastructure. City appeared interested in working with Excelsior to acquire land.

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☒ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics
P2, P5, P9	T1, T2				

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Water supply for two phase operation is logistical concern. West Two Rivers Reservoir use is unlikely as reservoir was created by US Steel for its own use. Close proximity to residential properties likely to create insurmountable concerns. Wetland impacts deemed problematic.
Technical	Site development would create significant disruptions of roadway infrastructure and impact new residential development.
Site Control	

Other Discussion

Approximately 45 acres of wetlands impacted inside IGCC Power Station footprint; ~ 38% of surrounding area considered to have potential for development is covered by wetlands. Site located 31 miles from BWCA and 56 miles from VNP. See Figure 26 for configuration of site in general area.

Further Analysis

Water for two phase operation would be required to come from numerous sources, many of which are not predictable (that is , the East and West Pit dewatering from Minntac, surface runoff, wastewater treatment effluent, the Wacootah and Iroquois Mine Pits, Thunderbird Mine Pit, the Ispat Inland Mine Pit, and other abandoned mine pits). West Two Rivers Reservoir cannot be used as it is owned by U.S. Steel.

The biggest problem with this site is due to development constraints that would place the IGCC Power Station footprint too close to existing residential areas within the Mountain Iron city limits. Wetland impacts associated with site development would be significant.

Conclusions

Unworkable due to site constraints and feasibility of establishing predictable water supplies for two phase operation.

MESABA ENERGY PROJECT: IGCC POWER STATION SITE EVALUATION SHEET

Site Identification

Site No.: 6 Site Name: West Aurora T: 58N R: 15, 16W Section: 13 (R16W), 7,8, 17, 18 Acres: ~2,500

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +30 CN OS Other:

Rail Discussion: Two rail supplier option not available. Rail access to site will require significant cut and fill.

Other Transportation: Good access to State Highway 135.

Water Supply: Embarrass Lake, Mine Pit No. 6 and others from Cliffs Erie

Water Supply Discussion: Poor water availability at this site. Wide fluctuations of lake not acceptable. Logistics associated with obtaining water from Cliffs Erie are problematic.

HVTL: ☒ 115 kV ☐ 230 kV ☐ Other Line Nos.: MP 38L on-site; 39L contiguous with south boundary.

HVTL Discussion: Lengthy, but fair access to Forbes Substation.

General Description

High ground in northeast corner of property most suitable for development. However, large waste rock dump and residential developments in city of Aurora constrain site development. Site is ~26 miles to BWCA; 55 miles to VNP. See Figure 27 for illustration of Station footprint within region assumed for site development..

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☐ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics
P2, P5	T1, T2				

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Water supply is likely to be insufficient for two phases and Embarrass Lake would undergo wide variation in water levels. Distance is considered too far to be pumped from abandoned mine pits on Cliffs-Erie property. St. James Mine Pit source of Aurora's water supply. The only feasible part of the site on which to build would encroach upon nearby residential developments.
Technical	Waste rock presents constructability issues in the best part of the site on which to build; wetlands would preclude construction in areas south of the rail track.
Site Control	

Other Discussion

Approximately 27 acres of wetlands would be affected by IGCC Power Station footprint; ~23% of surrounding area considered to have potential for development is covered by wetlands. See Figure 26 for an illustration of how the site would be configured within the area.

Further Analysis

DNR Lakefinder indicates Embarrass Lake is 442 acres in size with a littoral zone of 408 acres, a maximum depth of 19 ft. and a median depth of 11 ft. Assuming that the volume of water in the littoral zone is 4,488 acre-feet (i.e., 408 acres x 11 ft.) or 1.462 billion gallons and that there is no flow into the lake from other another source; at the annual average rate of appropriation for the IGCC Power Station of 7,400 gpm the Station would consume all the water in the littoral zone in about 137 days. This makes Embarrass Lake a poor prospect for this site from a permitting perspective.

The biggest issue with respect to this site is its site development constraints. The site is bounded by a mine dump to the West (mine dumps pose a constructability issue because of the uncertainty associated in knowing whether or not bedrock has been encountered), residential areas to the East, the highway to the north, and the rail line and wetlands to the South.

Conclusions

Deemed unworkable from a site development perspective.

MESABA ENERGY PROJECT: IGCC POWER STATION SITE EVALUATION SHEET

Site Identification

Site No.: 9 Site Name: East Range Site T: 59N R: 14W Section: 28, 32, 33 Acres: ~810

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN ~44 CN ~3/4 Other:

Rail Discussion: CN is only rail supplier at this location. Lake Superior access would require upgrade of existing track to accommodate unit coal trains.

Other Transportation: Good access via CR 666 and CR 110.

Water Supply: Abandoned mine pits (2WX, 6, Denora, Stephens, Knox, 2, & 3) and Colby Lake; wastewater effluent from nearby industrial developments.

Water Supply Discussion: Widely fluctuating levels of mine pits are of minor concern as pits are on private land and have no current recreational use, but water quality is relatively poor

HVTL: ☒ 115 kV ☐ 230 kV ☒ Other Line Nos.: MP 43L, 38L, 39L, 34L

HVTL Discussion: MP 43L is 138 kV HVTL leading to Syl Laskin Substation where 38L, 39L, and 34L HVTLs originate. Distance to Forbes Substation is significant with the 38L and 39/37L routes being ~ 35 miles each.

General Description

This site is the alternate site described in the Joint Application and Environmental Supplement. The site is located almost completely within the city limits of Hoyt Lakes and is mostly undisturbed with the exception of being periodically logged. The site is the closest of any to the BWCA and VNP being 25 and 54 miles distant, respectively.

Exclusions

Site Selection Criteria: ☐ Permitting ☐ Technical ☐ Site Control

Practicability: ☐ Cost ☐ Technology ☐ Logistics

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting
Technical
Site Control

Other Discussion

Approximately 15 acres of NWI wetlands affected by IGCC Power Station footprint; ~ 35% of surrounding area considered to have potential for development is occupied by wetlands. See Figure 27 for illustration of Station footprint within area assumed for site development.

§ 404 (b)(1) Compliance Summary Matrix

Section No.	ACOE	Description of Compliance Criteria	Complies	Does Not Comply
§230.10(a)	1	Overcome presumption that practicable, less environmentally damaging alternative site, outside special aquatic sites, exists	X	
	2	No alternative that is practicable, is less damaging to the aquatic ecosystem, and has no other significant environmental effects		
§230.10(b)	3	Discharge must not violate state water quality standards or CWA Section 307 toxic effluent standards or bans		
	4	Project not jeopardize the continued existence of an endangered species		
§230.10(c)	5	Must not cause significant adverse effects ("MNCSAE") on municipal water supplies, plankton, fish, shellfish, wildlife, special aquatic sites or other aspects of human health or welfare		
	6	MNCSAE on life stages of aquatic life and other wildlife dependent on aquatic ecosystems		
	7	MNCSAE on ecosystem diversity, productivity, or stability		
	8	MNCSAE on recreational, aesthetic or economic values		
§230.10(d)	9	All appropriate and practicable steps taken to minimize adverse impacts		

Conclusions

MESABA ENERGY PROJECT: IGCC POWER STATION SITE EVALUATION SHEET

MESABA ENERGY PROJECT: IGCC POWER STATION SITE EVALUATION SHEET

Site Identification

Site No.: 12 Site Name: Buhl T: 58N R: 20W Section: 17-20 Acres: 850

Rail Provider: ☐ BN ☒ CN ☐ Other Distance (mi): BN +5 CN <1 Other:

Rail Discussion: No existing rail presently serves this site, but at one time CN track served the area.

Other Transportation: Good access via US Highway 169 and CR 453

Water Supply: Sherman Mine Pit, Fraser Mine Pit, Iron Word

Water Supply Discussion: Water availability is uncertain at this site (other factors eliminated consideration of this site).

HVTL: ☐ 115 kV ☒ 230 kV ☐ Other Line Nos.: MP 80L to Forbes

HVTL Discussion: Forbes Substation about 10 miles

General Description

This present owner of the site has refused to sell the part of the site that is north of US 169. Most of the site south of US 169 is a mine dump (which causes constructability issues). Coal delivery issues may exist due to terrain obstacles for the rail track. Constructability concerns regarding the mine dumps on the site south of US 169 preclude serious consideration of the site. See Figure 28 for illustration of Station footprint within area assumed for site development..

Exclusions

Site Selection Criteria			Practicability		
☒ Permitting	☒ Technical	☐ Site Control	☐ Cost	☐ Technology	☐ Logistics
P2	T1, T2				

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	Wetlands to the south of the mine dumps would preclude siting of IGCC Power Station footprint.
Technical	Constructability issues due to the presence of mine dumps and problems with rail grade are expected. Availability of adequate water supply is concern.
Site Control	

Other Discussion

IGCC Power Station footprint must be located away from mine dumps and the only location on site is where wetlands are more prevalent; IGCC Power Station foot print alone would impact approximately 68 acres of wetlands. See Figure 28.

Further Analysis

Constructability issues (see footnote 16 on page 14 for a discussion of the general concern associated with building on a mine dump) would force development of the site footprint into an area having a high proportion of wetlands.

Conclusions

Site development precluded due to constructability issues and constraints posed by wetland areas.

Site Identification

Site No.: 13 Site Name: West Chisholm T: 58N R: 20W Section: 17-20 Acres: 785

Rail Provider: ☐ BN ☐ CN ☐ Other Distance (mi): BN CN Other:

Rail Discussion: No rail supplier presently can provide service to this site because of grade differences.

Other Transportation:

Water Supply:

Water Supply Discussion:

HVTL: ☐ 115 kV ☐ 230 kV ☐ Other Line Nos.:

HVTL Discussion:

General Description

This site is on a mine dump and provides some constructability issues. Originally, the site was thought to be capable of being served by the rail system delivering taconite pellets produced by Hibbing Taconite to Lake Superior. This however, was not possible as trains could make it up the hill to Hibtac only because they were empty. The grade is too steep to provide access to unit coal trains.

Exclusions

Site Selection Criteria

☐ Permitting ☒ Technical ☐ Site Control

T2

Practicability

☐ Cost ☐ Technology ☐ Logistics

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting

Technical

Site Control

The site is not accessible via loaded unit train coal trains due to grade change between site and main track.

Other Discussion

Infeasible to consider this site.

Further Discussion

None required, rail access is not feasible.

Conclusion

Rail access is not feasible.

MESABA ENERGY PROJECT: IGCC POWER STATION SITE EVALUATION SHEET

Site Identification

Site No.: 14 Site Name: Hibbing Industrial Park T: 57N, 58N R: 20W Section: 3,4 (57N), 33,34 (58N) Acres: 860

Rail Provider: ☒ BN ☒ CN ☐ Other Distance (mi): BN OS CN OS Other:

Rail Discussion: Possibility of two suppliers at this site. However, BN has expressed concerns about unit coal train traffic through Hibbing.

Other Transportation: Good access via US Highway 169.

Water Supply: Abandoned Mine Pits (Hull-Rust dewatering, Iron World)

Water Supply Discussion: Uncertain about how much water is available from Iron World and dewatering from Hull-Rust Mine Pit.

HVTL: ☐ 115 kV ☐ 230 kV ☒ Other Line Nos.: Xcel has 500 kV HVTL that traverses the Site on Route to Forbes Substation

HVTL Discussion: Alternate path to Blackberry Substation is available.

General Description

This site is located in a planned industrial park that has been incorporated into a comprehensive plan for the communities of Hibbing, Chisholm and Buhl. The site is currently owned by IRR and committed to other development.

Exclusions

Site Selection Criteria			Practicability		
☐ Permitting	☒ Technical	☒ Site Control	☐ Cost	☐ Technology	☐ Logistics
	T1	C1			

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting	
Technical	The site is constrained to the north by the Iron Formation, to the south by residential developments, and to the east by mineral mining operations. In order to accommodate the IGCC power station dual rail potential, additional land must be acquired within the Iron Formation or from other landowners outside the boundary of the current owner's property making acquisition more difficult.
Site Control	The IRR has committed the site to another developer's project.

Other Discussion

The IGCC Power Station footprint will impact about 35 acres of wetlands. The potential for dual rail access will be difficult given the proximity of the site to the iron formation (to the north) and residential properties to the south and east. See Figure 28 for illustration of Station footprint within area assumed for site development.

Further Analysis

See Figures 7 and 28 to see the difficulty of positioning the site footprint within the site boundary and off the Iron Formation.

Conclusions

The site is currently committed to another developer's project and unavailable for development at this time by Excelsior.

MESABA ENERGY PROJECT: IGCC POWER STATION SITE EVALUATION SHEET

Site Identification

Site No.: 15 Site Name: West Range Site T: 56N R: 24W Section: 2,3,10-12 Acres: ~1,730

Rail Provider: ☒ BN ☒ CN ☐ Other Distance (mi): BN ~2 CN ~2 Other:

Rail Discussion: Both suppliers have access to the site.

Other Transportation: Good access by US 169 and CR 7.

Water Supply: Canisteo Mine Pit, Hill-Annex Mine Pit Complex, Lind Pit, West Hill Mine Pit, and Prairie River.

Water Supply Discussion: One of the best places in the TTRA where adequate water supplies are assured for two phase operation.

HVTL: ☐ 115 kV ☐ 230 kV ☒ Other Line Nos.: New 345 kV outlet facilities planned ~9 miles in length

HVTL Discussion: Blackberry Substation is point of interconnection.

General Description

A large block of land has been optioned from RGGS; option provides for Excelsior to purchase mineral rights to 550 acres of property and to obtain easements across RGGS land in accordance with commercially reasonable terms. See Figure 29 for illustration of Station footprint within area assumed for site development.

Exclusions

Site Selection Criteria: ☐ Permitting ☐ Technical ☐ Site Control

Practicability: ☐ Cost ☐ Technology ☐ Logistics

Discussion of Exclusions, If Any

Site Selection Criteria

Permitting

Technical

Site Control

Other Discussion

IGCC Power Station footprint would impact only 11 acres of NWI wetlands.

Further Analysis

Section No.	ACOE	Description of Compliance Criteria	Complies	DNC
§230.10(a)	1	Overcome presumption that practicable, less environmentally damaging alternative site, outside special aquatic sites, exists	X	
	2	No alternative that is practicable, is less damaging to the aquatic ecosystem, and has no other significant environmental effects		
§230.10(b)	3	Discharge must not violate state water quality standards or CWA Section 307 toxic effluent standards or bans		
	4	Project not jeopardize the continued existence of an endangered species		
§230.10(c)	5	Must not cause significant adverse effects ("MNCSAE") on municipal water supplies, plankton, fish, shellfish, wildlife, special aquatic sites or other aspects of human health or welfare		
	6	MNCSAE on life stages of aquatic life and other wildlife dependent on aquatic ecosystems		
	7	MNCSAE on ecosystem diversity, productivity, or stability		
	8	MNCSAE on recreational, aesthetic or economic values		
§230.10(d)	9	All appropriate and practicable steps taken to minimize adverse impacts		

Conclusions

Conclusions on ACOE Compliance Summary Items Nos. 2-9 will be provided as part of future documentation.

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APPENDIX F2
Floodplain and Wetlands Assessment

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F2.1 REGULATORY BACKGROUND

Executive Order 11988 Floodplain Management directs each Federal agency to evaluate the potential effects of its actions on floodplains and to ensure that flood hazards and floodplain management are considered in its planning programs. Executive Order 11990 Protection of Wetlands directs all Federal agencies to consider wetlands protection in decision making and to evaluate the potential impacts of any new construction proposed in a wetland. As stated in these Executive Orders, Federal agencies shall avoid direct or indirect support of development in a floodplain or new construction in a wetland wherever there is a practicable alternative. Department of Energy (DOE) requirements with respect to Executive Orders 11988 and 11990 are found in Title 10, Code of Federal Regulations (CFR) Part 1022, Compliance with Floodplain and Wetland Environmental Review Requirements.

Pursuant to 10 CFR 1022.11, DOE shall determine whether the Proposed Action would be located within a base floodplain (100-year) or critical action floodplain (500-year) and/or a wetland. In order to determine whether a Proposed Action would be located within a base or critical action floodplain, information available relative to site conditions from the following sources, as appropriate, would be reviewed: Flood Insurance Rate Maps (FIRM) or Flood Hazard Boundary Maps prepared by the Federal Emergency Management Agency (FEMA), information from a land-administering agency (e.g., Bureau of Land Management) or from other government agencies with floodplain-determination expertise [e.g., U.S. Army Corps of Engineers (USACE), Natural Resources Conservation Service (NRCS)], information contained in safety basis documents as defined at 10 CFR Part 830, and DOE environmental documents [e.g., National Environmental Policy Act (NEPA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) documents]. To determine whether a Proposed Action would be located within a wetland, information available relative to site conditions from the following sources, as appropriate, would be reviewed: USACE "Wetland Delineation Manual" Wetlands Research Program Technical Report Y-87-1 (January 1987) or successor document, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) or other government-sponsored wetland or land use inventories, NRCS Local Identification Maps, U.S. Geological Survey Topographic Maps, and DOE environmental documents (e.g., NEPA and CERCLA documents). If there is no floodplain/wetland impact identified, the action may proceed without further consideration of the remaining procedures set forth below.

If a Proposed Action is located in or affects floodplains or wetlands, a floodplain/wetlands assessment shall be undertaken. DOE shall prepare the floodplain or wetland assessment concurrent with and included in the appropriate NEPA document to be used as a basis for determining floodplain and/or wetland impacts which may result from the implementation of a Proposed Action. In accordance with 10 CFR 1022.13, assessments shall consist of a description of the Proposed Action including a map showing its location with respect to the floodplain and/or wetland as well as a discussion of its positive and negative, direct and indirect, and long- and short-term impacts on the floodplain/wetland. In addition, the assessment shall consider alternatives to the Proposed Action that avoid adverse impacts (including alternate sites, alternate actions, and no action) and evaluate measures that mitigate the adverse effects of actions in a floodplain or wetland.

Per DOE NEPA regulations, this Floodplain and Wetlands Assessment was written in support of an EIS for the Mesaba Energy Project. If DOE determines that there is no practicable alternative to implementing the Proposed Action in a floodplain, then a statement of findings must be prepared and can be included in the Final EIS (FEIS). The statement of findings (10 CFR 1022.14) shall include a brief description of the Proposed Action including a location map, an explanation indicating why the action is proposed to be located in the floodplain, a list of alternatives considered, a statement indicating whether the Proposed Action conforms to applicable floodplain protection standards, and a brief description of steps to be taken to minimize potential harm to or within the floodplain.

F2.2 PROJECT DESCRIPTION

As described in Section 1.3 of the EIS, DOE's Proposed Agency Action is to provide a total of $36 million in co-funding through a cooperative agreement with Excelsior Energy, Inc. to demonstrate technologies under the Clean Coal Power Initiative (CCPI) Program. Excelsior proposes to design, construct, and operate the Mesaba Energy Project, which is a two-phased nominal 606 $MWe_{[net]}$ (1,212 $MWe_{[net]}$ total) Integrated Gasification Combined Cycle (IGCC) power plant to be located in northeastern Minnesota.

The DOE purpose and need for Agency Action (EIS Sections 1.4.1.2 and 1.4.2.2) are to commercially demonstrate IGCC technology, which includes advanced gasification and air separation systems, feedstock flexibility, improved environmental performance characteristics, and improved thermal efficiency. Excelsior's purpose and need for the proposed project are described in EIS Section 1.4.1.1 and 1.4.2.1 and Appendix F1. The proposed IGCC power plant would be designed for long-term commercial operation following a 12-month minimum demonstration period. The project would represent Phase I of a proposed two-phased Mesaba Generating Station; however, the EIS considers both phases of the proposed power plant as connected actions. DOE may also provide a loan guarantee pursuant to the Energy Policy Act of 2005 for a portion of the private sector financing of the project. As described in EIS Section 2.1.1.2, DOE's decision in the EIS relates to the co-funding of a project selected competitively in accordance with the objectives of the CCPI Program, and DOE has not participated in the identification or selection of alternative sites or corridors for the Mesaba Energy Project.

In conformance with Minnesota Rules described in EIS Section 1.5.2, Excelsior has proposed two alternative locations, the West and East Range Sites, for construction of the Mesaba Energy Project in the Taconite Tax Relief Area. Excelsior's process for screening candidate sites and selecting the potential alternative sites is described in EIS Appendix F1. Both of the sites are currently undeveloped, unoccupied, wooded lands located in the immediate vicinity of former iron ore mining operations. The West Range Site is located on approximately 1,708 acres of land, the majority of which is owned by RGGS Land & Minerals Ltd. within the city limits of Taconite in Itasca County, Minnesota (see Figure 2.3-1 of the EIS). The East Range Site is located on approximately 1,322 acres of land owned by Cliffs-Erie, LLC within the western boundary of Superior National Forest and the city limits of Hoyt Lakes in St. Louis County, Minnesota (see Figure 2.3-5 of the EIS). The features of Excelsior's proposed project at the West Range Site are described and illustrated in EIS Section 2.3.1. The features at the East Range Site are described and illustrated in EIS Section 2.3.2.

F2.3 BASIS FOR ASSESSING FLOODPLAIN AND WETLAND IMPACTS

A floodplain or wetlands assessment is required to discuss the positive and negative; direct and indirect; and long- and short-term effects of the Proposed Action on the floodplain and/or wetlands (10 CFR 1022.13(a)(2)). In addition, the effects on lives and property and on natural and beneficial values of floodplains must be evaluated. For actions taken in wetlands, the assessment should evaluate the effects of the Proposed Action on the survival, quality, and function of the wetlands. If DOE finds no practicable alternative to locating activities in floodplains or wetlands, DOE must design or modify its actions to minimize potential harm to these resources (10 CFR 1022.14(a)).

For the purposes of this Floodplain and Wetlands Assessment, the region of influence for direct impacts to floodplains and wetlands includes the areas of land disturbance. The region of influence for indirect impacts includes those floodplain and wetland areas adjacent to locations that would experience direct impacts. For the Mesaba Energy Project, indirect impacts are expected to be of lesser consequence than direct impacts, because all land disturbing activities would be performed in accordance with appropriate regulatory requirements and BMPs for sediment and erosion control and pollution prevention. Of most importance for

avoiding or minimizing impacts on floodplains and wetlands is the careful pre-planning of activities and investigations that aim to identify and assess potential impacts before they occur.

The potential for a Proposed Action to have an adverse impact on floodplains and wetlands has been evaluated by DOE based on whether the Proposed Action located at either alternative site would cause any of the conditions listed in Table F2-1.

Table F2-1. Approach to Impact Assessment

Resource	Basis for Assessing Adverse Impact
Floodplains	Cause construction of aboveground facilities in or otherwise impede or redirect flows in the 100-year floodplain or other flood hazard areas that would adversely affect the qualities or functions of jurisdictional floodplains. Substantially alter flood water discharges and adversely affect drainage patterns, flooding, and/or erosion and sedimentation causing risk to human lives and property.
Wetlands	Cause construction in (dredging or filling of) wetlands or otherwise alter drainage patterns that would adversely affect the qualities or functions of jurisdictional wetlands.

F2.4 FLOODPLAINS

For the purposes of this assessment, the DOE No Action Alternative is assumed to be equivalent to a "No Build" Alternative (see EIS Section 2.1.1.2). Under the No Action Alternative, there would be no changes to water resources in the project area and floodplains would continue to function in their current form.

Although for its Proposed Action, DOE has not participated in the identification or selection of alternative sites or corridors for the Mesaba Energy Project, DOE evaluated the comparative impacts of Excelsior's proposed project at two alternative sites in the EIS and in this floodplain assessment. The following subsections provide descriptions of potential impacts to floodplains associated with both of Excelsior's site alternatives under consideration for the Proposed Action. The locations of floodplain areas were determined with the use of FEMA Flood Insurance Rate Maps (see EIS Sections 3.6.2.1 and 3.6.2.2 for information on the specific FEMA Flood Insurance Rate Maps that were consulted). Maps showing the locations of floodplains in relation to the West and East Range Sites are provided in Section 3.6 (Floodplains) of this EIS (Figures 3.6-1 and 3.6-2). Potential impacts of the Mesaba Energy Project are described in EIS Section 4.6.

F2.4.1 West Range Site Floodplain Impacts

There would be no anticipated impacts to floodplains for the West Range Site with respect to the placement of the Mesaba IGCC Power Plant, the HVTL Alternatives, the Cooling Tower Blowdown Pipelines, Segments 2 and 3 of the Process Water Supply Pipelines, potable water and sewer pipelines, or the transportation corridors because these structures would be situated outside of the boundaries of any 100-year floodplain areas. No 500-year floodplains have been identified that could be impacted by the implementation of the Proposed Action at the West Range Site. No impacts would be expected to result in any locations considered high-hazard areas (portions of riverine floodplains nearest the source of flooding that are frequently flooded and where the likelihood of flood losses and adverse impacts on the natural and beneficial values served by floodplains is greatest).

Proposed utilities that could potentially affect floodplains due to their siting within or near 100-year floodplains include: Natural Gas Pipeline Alternatives 1, 2, and 3, and the Process Water Supply Pipeline – Segment 1 (Lind Pit to Canisteo Pit). These linear corridors are described and illustrated in EIS Section 2.3.1.

F2.4.1.1 West Range Natural Gas Pipeline Alternatives 1, 2, and 3

The Natural Gas Pipeline Alternatives 1, 2, and 3 would each cross at least one 100-year floodplain area. Alternative 1 would cross the Swan River and an adjacent 100-year floodplain. Alternative 2 would cross both the Swan River and the Prairie River and adjacent 100-year floodplains. Alternative 3 would cross the Prairie River and adjacent 100-year floodplains.

During the construction phase of the Mesaba Energy Project there may be some temporary impacts to the floodplain areas caused by the installation of necessary pipelines. These temporary impacts may result from the presence of construction equipment, materials stockpiles, etc. being temporarily situated within the boundaries of the 100-year floodplain areas, which could redirect flood flows during a major storm event. However, these impacts would be minimized through the use of appropriate engineering procedures and BMPs, which would ensure that river and stream flows be maintained during construction. For example, the natural gas pipelines would be directionally drilled beneath these and all other water body crossings at approximately 100 feet from the edge of each water body. This method would ensure that no permanent impacts would occur to floodplains from the placement of structures within water bodies that could divert or otherwise impede stream flows. Upon completion of construction activities within the floodway, the construction equipment and stockpiles would be removed, and contours would be restored to their original grade and seeded, stabilized, or planted with plants native to the region.

F2.4.1.2 West Range Process Water Supply Pipeline – Segment 1 (Lind Pit to Canisteo Pit)

Segment 1 of the Process Water Supply Pipeline would be located in relatively close proximity to a 100-year floodplain area adjacent to the Prairie River. There would be no anticipated impacts associated with this pipeline due to it being placed outside of the floodplain as well as it not crossing any rivers or streams associated with the neighboring floodplain area. All construction equipment and materials would be kept out of the floodplain area.

F2.4.2 East Range Site Floodplain Impacts

There would be no anticipated impacts to floodplains for the East Range Site with respect to the placement of the Mesaba IGCC Power Plant, the Process Water Supply Pipelines, potable water and sewer pipelines, or the transportation corridors, because these structures would be situated outside of the boundaries of any 100-year floodplain areas. No 500-year floodplains have been identified that could be impacted by the implementation of the Proposed Action at the East Range Site. No impacts would be expected to result in any locations considered high-hazard areas (portions of riverine floodplains nearest the source of flooding that are frequently flooded and where the likelihood of flood losses and adverse impacts on the natural and beneficial values served by floodplains is greatest).

Proposed utilities that could potentially affect floodplains due to their potential placement within or near 100-year floodplains include HVTL Alternatives 1 and 2 and the Natural Gas Pipeline Alternative 1. These linear corridors are described and illustrated in EIS Section 2.3.2.

F2.4.2.1 East Range HVTL Alternatives 1 and 2

Excelsior proposes to use three existing 115 kV HVTL corridors - the combined 39L/37L corridor and the 38L corridor - as routes for the two 345-kV HVTLs required to interconnect the Project to the regional electric grid. To avoid long and costly interruptions of power and dangerous conditions associated with "hot line" construction methods, Excelsior proposes to acquire an additional 30 feet of ROW along one of these two routes between the Laskin and Forbes Substations. The HVTL Alternative 1 would involve adding the 30 feet of ROW to the 39L/37L corridor (which crosses the Partridge River, Cedar Island Lake, the East Two River, and 100-year floodplains adjacent to each of these surface waters). The HVTL Alternative 2 would involve adding the 30 feet of ROW to the 38L corridor (which crosses the Partridge River, the Embarrass River, the East Two River, and 100-year floodplains adjacent to each of these surface waters).

No permanent impact on flood elevations would occur, because permanent structures would be limited to HVTL towers that have small footprints and these structures would be located outside of floodplains to the extent practicable.

F2.4.2.2 East Range Natural Gas Pipeline Alternative 1

The Natural Gas Pipeline Alternative 1 would cross 100-year floodplains along the Partridge River and an area between Fourth Lake and Esquagama Lake. As previously described for the West Range Site (Section F2.3.2.1), the construction of pipelines may cause some temporary impacts to floodplains, however these impacts would be minimized through the use of appropriate engineering procedures and BMPs to maintain existing river and stream flows. Following construction activities, efforts would be taken to restore floodway contours as closely as possible to their original condition as well as the right of ways (ROWs). Therefore, no permanent impacts to floodplains would be anticipated.

F2.4.3 Conclusions

DOE finds that, for both the East Range and West Range alternative sites, that Excelsior has proposed all permanent structures to be located outside the 100 year and 500 year floodplains to the extent practicable. The only temporary impacts and, in one instance, small permanent impact (for the placement of an HVTL tower) would be as a result of utility connections.

F2.5 WETLANDS

F2.5.1 Introduction

For the purposes of this assessment, the DOE No Action Alternative is assumed to be equivalent to a "No Build" Alternative (see EIS Section 2.1.1.2). Under the No Action Alternative, there would be no changes to water resources in the project area and wetlands would continue to function in their current form.

Although for its Proposed Action, DOE has not participated in the identification or selection of alternative sites or corridors for the Mesaba Energy Project, DOE evaluated the comparative impacts of Excelsior's proposed project at two alternative sites in the EIS and in this wetlands assessment. The following subsections provide descriptions of potential impacts to wetlands associated with both of Excelsior's site alternatives under consideration for the Proposed Action. This section summarizes these potential impacts on wetlands due to construction and operation activities, including how such impacts would be minimized or avoided due to construction practices, or where temporary impacts may be restored.

Wetland areas were determined through the use of USFWS NWI mapping, soils survey, and aerial photographs. Also, detailed wetland delineations were performed by Excelsior's contractors in the areas of the potential power plant site footprints and the immediate vicinity. The area within which wetlands were delineated for the West Range is depicted in Figure F2-1, which may be found at the back of this appendix. The East Range delineated wetlands are depicted in Figure F2-2. Land access restrictions have not allowed for field delineations to be performed along the utility and transportation corridors. DOE evaluated the methods, results, and conclusions of the wetland delineations performed by the contractors.

There are three methods of classifying wetlands that have relevance to this project. They will be discussed in the chronplogic order of their development.

First, USFWS Circular 39 *Wetlands of the United States* (Shaw and Fredine, 1956) is a wetland classification inventory developed by the USFWS, which was initiated due to the steady decline of wetland habitats available to wildlife. The purpose of the Circular 39 wetland inventory is to identify the correlation between wetlands and wildlife, and identify areas susceptible to habitat loss from activities such as draining, filling or otherwise human-related alteration of water resource habitats. Aerial photographs, USGS topographic maps, charts of the U.S. Coast and Geodetic Survey, Federal and state agency mapping, soil maps, and county highway maps were used to provide information identifying the locations of wetlands for the inventory (Shaw and Fredine, 1956).

The USFWS inventory identified 20 types of wetland habitats used by wildlife, which primarily focused on waterfowl habitat. Wetland habitats identified by Circular 39 were grouped into four categories: 1) Inland Fresh Areas (Types 1-8); 2) Inland Saline Areas (Types 9-11); 3) Coastal Fresh Areas (Types 12-14); and, Coastal Saline Areas (Types 15-20). Inland Fresh Areas are the only wetland group occurring in Minnesota. There are eight wetland types associated with the Inland Fresh Area group

Second, *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979) has been used in the NWI maps prepared by the U.S. Fish and Wildlife Service. This approach has a hierarchial structure for five major systems -- Marine, Estuarine, Riverine, Lacustrine, and Palustrine.

Third, *Wetland Plants and Plant Communities of Minnesota and Wisconsin* (Eggers and Reed, 1997) was produced for the primary purpose of assisting the U.S. Army Corps of Engineers personnel working with the regulatory program under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The guide specifically addresses wetland plants and plant communities of Minnesota and Wisconsin, and is organized by wetland plant community. In general, the wetland plant communities are organized according to water permanence and depth, and degree of soil saturation. Thus, the guide progresses from deepwater wetlands (I. Shallow, Open Water Communities) to temporary water-holding wetlands (VIII. Seasonally Flooded Basins). Photographs and descriptions are provided for each of the fifteen wetland plant communities, along with representative plant species of each. Interested readers may view the document online at http://www.npwrc.usgs.gov/resource/plants/mnplant/intro.htm.

A comparison of Eggers and Reed, 1997, Cowardin et al., 1979, and Shaw and Fredine, 1971 is presented in Table F2-2.

Table F2-2. Comparison of Wetland Classification Systems in Minnesota

Wetland Plant Community Types (Eggers and Reed, 1997)	Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979)	Fish and Wildlife Service Circular 39 (Shaw and Fredine 1971)
Shallow, Open Water	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating, and floating-leaved	Type 5: Inland open fresh water
Deep Marsh	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating, and floating-leaved; and emergent; persistent and nonpersistent	Type 4: Inland deep fresh marsh
Shallow Marsh	Palustrine; energent; persistent and nonpersistent	Type 3: Inland shallow fresh marsh
Sedge Meadow	Palustrine; emergent; narrow-leaved persistent	Type 2: Inland fresh meadow
Fresh (Wet) Meadow	Palustrine; emergent; broad- and narrow-leaved persistent	Type 1: Seasonally flooded basin or flat; Type 2: Inland fresh meadow
Wet to Wet-Mesic Prairie	Palustrine; emergent; broad- and narrow-leaved persistent	Type 1: Seasonally flooded basin or flat; Type 2: Inland fresh meadow
Calcareous Fen	Palustrine; emergent; narrow-leaved persistent; and scrub/shrub, broad leaved deciduous	Type 2: Inland fresh meadow
Open Bog	Palustrine; moss/lichen; and scrub/shrub; broad-leaved evergreen	Type 8: Bog
Coniferous Bog	Palustrine; forested: needle-leaved evergreen and deciduous	Type 8: Bog
Shrub - Carr	Palustrine; scrub/shrub; broad-leaved deciduous	Type 6: Shrub swamp
Alder Thicket	Palustrine; scrub/shrub; broad-leaved deciduous	Type 6: Shrub swamp
Hardwood Swamp	Palustrine; forested; broad-leaved deciduous	Type 7: Wooded swamp
Coniferous Swamp	Palustrine; forested; needle-leaved deciduous and evergreen	Type 7: Wooded swamp
Floodplain Forest	Palustrine; forested; broad-leaved deciduous	Type 1: Seasonally flooded basin or flat
Seasonally Flooded Basin	Palustrine; flat; emergent; persistent and nonpersistent	Type 1: Seasonally flooded basin or flat

Source: Eggers and Reed (1997)

Maps showing the locations of wetlands in relation to the West and East Range Sites are provided in Section 3.7 (Wetlands) of this EIS (Figures 3.7-1 and 3.7-2).

Potential indirect impacts would be common to any wetland area adjacent to a location that would experience direct impacts. The main potential indirect impacts that could occur would include increased sedimentation into undisturbed wetland areas that could result from construction activities in neighboring locations as well as changes in local hydrology, resulting in increased surface runoff in some areas, while decreasing surface runoff and subsurface flows in other areas. The utilization of standard engineering design measures and BMPs would reduce indirect impacts to adjacent wetlands.

The process followed to avoid and minimize potential wetland impacts to the maximum extent practicable based on preliminary engineering is described in Section F2.5.2. The details of that analysis is presented in Section F2.5.3 for the West Range and Section F2.5.4 for the East Range. Future efforts at minimizing and mitigating wetland impacts during permitting and final design are discussed in Section F2.5.5.

F2.5.2 Wetland Avoidance and Minimization

F2.5.2.1 Description of the Process

The avoidance and minimization of impacts to wetlands lies at the heart of the Section 1022 analysis. Section 1022 says that:

> *DOE shall exercise leadership and take action to:…Avoid to the extent possible the long- and short-term adverse impacts associated with the destruction of wetlands…and avoid direct and indirect support of…new construction in a wetland wherever there is a practicable alternative.*

The project elements described in Chapter 2 of the FEIS are the result of project planning efforts that included measures to avoid and minimize wetland impacts to the greatest extent possible. Based upon meetings and telephone conferences among DOE, USACE, and Excelsior some additional alternatives have been developed and evaluated in this attempt to avoid and minimize wetland impacts that had been identified in the DEIS. At the same time, the alternatives included in the DEIS were reexamined to attempt to further reduce potential wetland impacts. The following sections identify and analyze the alternative power station footprints, railroad alignments, access roads and utility lines that have been considered to avoid and minimize wetland impacts as a result of constructing Phase I and Phase II of the Mesaba Energy Project.

The avoidance and minimization analysis has proceeded in a hierarchical fashion. The most important factor is the location of the IGCC power station. There were four IGCC Power Station Footprint alternatives evaluated at both the West Range (Section F2.5.3.1) and at the East Range (Section F2.5.2.4.1) to attempt to avoid and minimize wetland impacts. Because the rail line and coal train operations greatly influence the location, orientation, and elevation of the IGCC Power Station Footprint, alternative rail alignments were evaluated for each of the Footprint alternatives. Differences in wetland impacts due to road access and utility lines were also noted as appropriate. Once the best overall location for the IGCC power station was identified, a finer look was taken of the road connections and utility alternatives (i.e. Sections F2.5.3.2 through F2.5.3.7 for the West Range and Sections F2.5.4.3 through F2.5.4.7 for the East Range.

The wetland avoidance and minimization analysis described in Sections F2.5.3 and F2.5.4 is based upon preliminary engineering As described in more detail in Section F2.5.5 whenever the Least Environmentally Damaging Practicable Alternative (LEDPA) is selected by the USACE, additional efforts to avoid and minimize wetland impacts would be considered during final design and future stages of the 404 permitting process.

F2.5.2.2 IGCC Power Station Facility

As described in subsequent sections, four alternative locations within both the West Range Site and the East Range Site were considered to identify the potential to avoid and minimize wetland impacts. However, as described in this section, the layout within the plant footprint is assumed to remain the same for all alternative sites. This is due to the fact that the layout within the IGCC Power Station Footprint is the result of substantial engineering efforts to develop the optimal layout to accommodate both Phase I and Phase II of the IGCC Power Station. This layout also reflects the balance between a large number of design considerations, many of which have been derived through over ten years of experience operating the Louisiana Gasification Technologies Inc. and Wabash River Coal Gasification Repower Project in Plaquemine, Louisiana and Terre Haute, Indiana, respectively. Such considerations include maximizing access for material handling and storage facilities to the rail yard, adjacent placement of related plant processes, minimizing the total footprint acreage to help reduce wetland impacts and site preparation costs, while maintaining sufficient distance between large process equipment to facilitate safe access for construction, operation, and maintenance of the facility. One example of optimization through adjacent placement is the air separation unit, which is near the combustion turbines (a source of air via air extraction and the nitrogen delivery point) and the gasifiers (the oxygen delivery point). Rearranging the plant layout is likely to disrupt this optimization, which may reduce the plant's ability to operate efficiently, and was therefore not considered for wetland avoidance and minimization. A visual rendering of the proposed IGCC layout is shown in Figure F2-3. A conceptual plot plan is shown in Figure F2-4 (Excelsior, 2009).

The IGCC plant will be constructed in two phases. Mesaba One is expected to be constructed between 2010 and 2014. Construction of Mesaba Two is expected to begin in 2012. The comparisons in Appendix F2 have been conducted on both phases. Section 4.7 discusses potential wetland impacts by phase.

The construction laydown areas used for stockpiling materials for Phase I will be placed within the footprint of Phase II in a manner that avoids wetland impacts. The construction laydown area for stockpiling materials for Phase II will be maintained offsite in nearby local areas. Excelsior would establish offsite construction staging and laydown areas for Phase II construction on lands selected from among potential sites as described in Chapter 2. All of the sites are located on lands that have been disturbed or cleared during prior uses by mineral extraction companies, and all have access to local roadways. Excelsior would select appropriate sites for the necessary acreage prior to construction of Phase II taking into consideration availability at that time. Sites used would be restored to prior existing conditions following completion of Phase II construction. Only areas of sites without wetlands would be utilized so there would be no additional impacts to wetlands.

These same procedures would be used for disposal of excess cut material.

F2.5.3 West Range Wetland Avoidance and Minimization

F2.5.3.1 West Range IGCC Power Station Footprint and Rail Alternatives

The following sections describe four IGCC Power Station Footprint alternatives considered to avoid and minimize wetland impacts. Because the rail line and coal train operations greatly influence the location, orientation, and elevation of the IGCC Power Station Footprint, alternative rail alignments were evaluated for each of the Footprint alternatives. The other linear project elements, including the site access road, HVTL, natural gas pipeline, process water lines, and water and sewer lines, were also considered for the Northeast and West alternatives when there were differences from the Central alternative.

The alternatives discussed are as follows:

- Central – DEIS (This is the alternative presented in the DEIS. The acreage of wetlands filled under this alternative has been corrected to account for the grading that would be necessary outside the power station footprint.);
- Central – FEIS (a modified Central alternative where the IGCC power station is slid approximately 280 feet to the northwest to minimize wetlands impacts);
- Northeast – (new alternative to move the IGCC power station to the uplands to the northeast to avoid wetland impacts); and
- West – (new alternative to move the IGCC power station to the uplands to the west to avoid wetland impacts).

The rail spur from the main CN/BNSF track would be shared by two entities, the IGCC Power Station and Essar Steel Minnesota, LLC ("ESM", previously refered to as "Minnesota Steel"). Originally, rail sidings that are to help manage incoming and outgoing material shipments for ESM were to be located within the wye where the spur for the IGCC Power Station diverged from the spur continuing on to ESM. The rail sidings at that original location required an elevation of 1390 ft msl be maintained at the IGCC Power Station's rail spur. Subsequent changes in the design (a longer siding was deemed necessary) and relocation of ESM's rail sidings to a point about three quarter's of a mile further beyond and outside the wye allowed the elevation of Excelsior's proposed rail loop to be raised from 1390 to 1405. This will reduce the cut required for construction of this alternative and minimize the resulting volume of excess material.

It should also be noted that numbers (e.g. wetlands acres filled, volume of cut and fill, length of rail line, etc. are discussed in the text of the following sections they are also summarized for comparison purposes in Section F2.5.3.1.5 in Table F2-3a. Text comparisons of noise, visibility, utility, and operational issues are summarized in Table F2-3b.

F2.5.3.1.1. Central DEIS Alternative

As depicted and analyzed in the DEIS, the IGCC Power Station Footprint is located in a topographic saddle between two substantial hills to minimize overall natural resource impacts. See Figure F2-5. The established elevation of the northeast portion of the footprint is principally determined by: i) the elevation of the main BNSF and CN rail line from which the spur serving the IGCC Power Station emanates; and ii) design limitations imposed by unit coal train operations. Grading disturbances within and around the IGCC Power Station Footprint are minimized by terracing the area such that the grade increases from northeast to southwest (Excelsior, 2009).

The IGCC Power Station Footprint is oriented to allow a straight-line approach to the power station's coal dumper from the rail alignment established as a result of locating the track between Dunning and Big Diamond Lake (in a manner to minimize residential impacts). The footprint is located between the two large wetland complexes in the southern and northern portions of the site (Excelsior, 2009). This placement of the Footprint would require filling of 34.58 acres of wetlands and would also bisect a wetland located in the southern-most corner of the Phase I Footprint (the northwestern area of A1), causing indirect impacts to 7.34 acres of wetlands that would be difficult to mitigate. It would require approximately 3,550,000 cubic yards of cut and 2,350,000 cubic yards of fill, for a net volume of material to be disposed of 1,200,000 cubic yards.

Rail Alternative 1-A (identified as preferred in the DEIS)

The originally proposed rail alignment (Alternative 1-A) would encircle the large wetland complex in the northern portion of the site (Wetland A4) as shown on Figure F2-5. This alignment would be 21,539 feet in total length with a rail loop of 9,838 feet at an elevation of 1390 feet. The rail alignment and loop would

require 3,725,000 cubic yards cut and 610,000 cubic yards fill and would directly impact 17.93 acres of wetland Excelsior, 2009). An additional 58.3 acres of wetland would be enclosed within the rail loop and has to potential to have some of its wetland functions indirectly impacted from the construction and operation of the rail loop. The loop would restrict access of the 58.3 acres of wetlands to large fauna including mammals, could impede the movement of reptiles and amphibians, and could interfere with wetland hydrology.

One of the benefits of Alternative 1-A is the fact that the length of track along the plant boundary allows for continuous rail sidings to exiting the loop in the eastern portion of the site, extending the length of the northeasterly plant footprint and rejoining the loop track at the northwesterly plant corner. This allows an engine to traverse the rail loop to move from one end of a train to the other while using the siding and makes train operations and management more efficient.

Rail Alternative 1-B

Wetlands within the West Range Railroad Alternative 1B alignment totaled 18 wetland basins, as delineated during the 2005 field surveys. Permanent wetland losses caused by filling of wetlands would be 13.96 acres (Excelsior, 2009). In addition there would be potential indirect impacts to 43.37 acres of wetlands encircled by the rail loop. See Figure F2-6.

F2.5.3.1.2. Central FEIS Alternative

The IGCC Power Station Footprint is located near the center of the West Range site in a topographic saddle and between two large wetland complexes as shown on Figure F2-7 (Excelsior, 2009). The preferred IGCC Power Station Footprint has been shifted approximately 280 feet to the northeast from the original Station Footprint in order to reduce the raea of wetlands to be filled and to eliminate the potential indirect impacts to A1 by maintaining existing flow patterns.

Construction of the IGCC Power Station Footprint would impact 31.34 acres of wetland habitat. The impact footprint includes the Power Station footprint and grading of the adjacent area at a 3:1 slope to meet the natural grade of the surrounding area. The site has been designed in a tiered fashion to minimize grading on the sloping site topography. It would require approximately 3,100,000 cubic yards of cut and 2,350,000 cubic yards of fill and result in a total of 750,000 cubic yards of excess material (Excelsior, 2009). Wetland impacts from the IGCC Power Station Footprint, including areas of grading limits, are shown on Figure F2-7.

Road access to the IGCC Power Station would be from County Road (CR) 7 to the south and west as shown in Figure F2-7. This road alignment provides the shortest access to CR 7 and minimizes impacts to wetlands. Wetland impacts will include wetland fill for roadway construction and temporary impacts from ROW establishment.

Rail Alternative 3A

In an effort to avoid encircling the wetland complex Wetland A4, and in response to comments received on the DEIS, consideration was given to encircle the IGCC Power Station Footprint instead. Alternative 3A includes looping the rail around the IGCC Power Station Footprint (see Figure F2-8). This alternative avoids impacts to Wetland A4 to the north, but would result in additional impacts to wetlands in the southern portion of the site. This rail line would be 27,299 feet in total length (approx 5,760 feet longer than the preferred) with a rail loop of 21,500 feet at an elevation of 1,405 (compared to 1,390). It would require 4,668,000 cubic yards cut and 595,000 cubic yards fill and would result in filling of 12.00 acres of wetland (Excelsior, 2009).

The coal dumper and coal handling facilities would remain in the same location as Alternative 1-A, which would maintain maximum distance between the coal train and the adjacent residences during unloading. The

coal dumper would be at an approximate elevation of 1405. However, once around the south side of the plant (where wetland elevation is between 1410 and 1420) construction of the rail line would require a cut of 10 to 20 feet in depth through the wetland areas. The cut through the wetland area could indirectly impact the adjacent wetland basin by altering the hydrology. These wetlands drain to the south and west, away from the rail line, which would minimize the potential hydraulic effect. Construction of an impermeable berm along the south side of the railroad cut would further protect wetland hydrology, but would result in a wider rail bed cross section and therefore more impacts to wetlands. Figure F2-9 shows the typical cross sections through both cut and fill areas.

Construction of the rail loop around the IGCC Power Station would constrain the rail sidings within the loop and limit the flexibility of internal rail operations for slag, sulfur, and other material transfers. The IGCC Power Station Footprint would be encircled by the rail loop at a significantly lower elevation, requiring bridge(s) for road access to the site. The process water lines and utilities would be routed along the access road, but would have to be constructed over 20 feet below existing grade beneath the rail cut. This would create a wide impact area for deep utility construction, as well as create issues with pumping water, sewer, and process water.

Rail Alternative 3B

The proposed rail line (Railroad Alternative 3B) preferred by Excelsior for the Final EIS will intersect the northeastern portion of the plant footprint and loop around the hill in the northeastern portion of the site as shown on Figure F2-7. This rail loop will be 22,070 feet in total length, with a rail loop of 15,303 feet at an elevation of 1,405. It will require 2,620,000 cubic yards cut and 620,000 cubic yards fill and will result in 5.73 acres of wetland fill (Excelsior, 2009).

Although rail yard operations will be less than optimal because the onsite rail sidings will be dead-end spurs instead of continuous sidings, this rail alternative reduces the area of wetland fill from 17.9 acres (DEIS rail alternative 1A) to 5.7 acres and avoids potential indirect impacts to 58.3 acres of encircled wetlands.

F2.5.3.1.3. Northeast IGCC Power Station Footprint

An IGCC Power Station Footprint in the northeast portion of the site (see Figure F2-10) would avoid the two large wetland complexes on the West Range Site (Wetlands A1 and A4) and reduce the wetland impacts from the plant footprint to 10.92 acres (Excelsior, 2009). The relocation would require rotation of the plant layout to ensure proper alignment with the rail line as it enters the site from the southeast. The relocated footprint and rotation would require reconfiguration of the access road, natural gas service, HVTL lines, process water supply and sewer and water utilities. The reconfiguration of these Project elements is also shown on Figure F2-10.

Although wetland impacts would be reduced by this alternative plant location, this area of the site is occupied by a large hill that currently represents a visual landmark in the general vicinity, has a maximum elevation of about 1,485 feet (a difference in elevation of approximately 75 feet from the center of the site), and approximately 135 feet from the low point on the site to the highest point on the site. Establishing a suitable construction site consisting of three tiers at elevations of approximately 1,405 (to accommodate the railroad), 1,425, and 1,440 feet mean sea level (msl) would require about 6,143,000 cubic yards of cut and 301,000 cubic yards of fill. This would result in an excess of 5,842,000 cubic yards of material that would require disposal (see Table F2-3a in Section F2.5.3.1.5). When combined with the excess material that would be result from construction of a rail line, the amount of excess material requiring disposal would be between 7.8 and 8.6 million cubic yards. Raising the elevation of the second and third tiers by 10 feet on the Northeast Footprint would reduce the amount of material cut and increase the amount of fill in certain areas, for a net decrease in cut of 2.4 million cubic yards. However, raising these two tiers would also aggravate the aesthetic

impacts of noise and visibility given the lack of screening relative to the Central Footprint. See Tables F2-3a and 3b.

The power block and the switchyard of the original Northeast Footprint were tiered at the same height as the Central Footprint. At their respective elevations of 1,435 and 1,450 feet, the power block and switchyard associated with the reduced tiering would each be approximately 10 feet higher than the original location of the IGCC Power Station Footprint. As noted above, the increased elevation, combined with the loss of occlusion from a nearby forested hilltop, would increase the visibility of the IGCC Power Station in the surrounding area. For example, the base of the highest tier on the the Central Footprint is about 45 feet lower than the peak elevation of the hill upon which the Northeast Footprint is located. When one considers that the trees on the peak would be about 30 to 40 feet in height, the peak adds about 75 to 85 feet of screening, the loss of which would represent significant shielding.

A noise analysis of the Northeast alternative location showed that the closest sensitive receptor locations (those along the northern boundary of Big Diamond Lake) would fall within the same noise isobars as those for the Central location (between 45 and 50 dBA) representing no noticeable increase in noise. The isobar footprint was and is considered a "worst case" model allowing for no topographical or added attenuation.

The IGCC Power Station Footprint would extend across the alignment of the previously approved Naswhwauk Public Utilities Commission natural gas pipeline. This would require that the gas pipeline route be altered to avoid the Station Footprint, or that the Station Footprint be shifted further northwest. Relocation of the gas pipeline would result in construction nearer the western shore of Dunning Lake and nearer areas identified as having high potential for archaeological resources. Also, the Northeast Station Footprint itself is on an area identified as having moderate potential for encountering such resources. Shifting the Station Footprint slightly to the northwest could avoid the need to realign the gas pipeline, but would result in greater amounts of wetland fill.

Railroad Alternatives for the Northeast Site Footprint

Two rail alternatives were evaluated to serve the northeast site alternative and both are also shown on Figure F2-10 (Excelsior, 2009). Railroad Alternative 4A would loop south of the Northeast footprint. This rail line would be 20,643 feet in total length, with a 12,634-foot rail loop at an elevation of 1,405 feet. This alternative would require 2,871,000 cubic yards cut and 805,000 cubic yards fill with an excess balance of 2,066,000 cubic yards of material and would result in filling about 9.92 acres of wetland (compared to 5.73 for Alternative 3B). Railroad Alternative 4B would loop around the relocated IGCC Power Station Footprint. This rail loop would be 22,070 feet in total length, with a rail loop of 15,303 feet at an elevation of 1405 feet. It would require 2,620,000 cubic yards cut and 620,000 cubic yards fill with an excess balance of 2,000,000 cubic yards of material and would result in filling about 4.27 acres of wetland (compared to 5.73 for Alternative 3B).

For Alternative 4A, and a short segment of Alternative 4B where co-located with Alternative 4A, the southern portion of the rail loop would impact wetland area. At the point where the rail intersects the wetland along the southern portion of the loop, the elevation of the rail line would be 10 to 20 feet below the existing grade. These wetland basins flow to the southwest, so the cut through the wetland would be upgradient. However, protection from indirect impacts would be provided by constructing an impermeable berm along the south side of the rail line, thereby increasing the width of disturbance through the wetland area and, concomitantly, increasing wetland impacts relative to what would have occured from the railway track alone. The cut and fill calculations summarized above reflect such increased impacts.

Because Alternative 4B would encircle the Station Footprint, the design would need to accommodate space for the access road and HVTL. Water and sewer utilities and process water lines would be constructed beneath the rail grade, but road crossings would require a bridge.

For both rail Alternatives 4A and 4B the coal dumper would be located 2,000 feet southeast of the proposed dumper location for Alternative 1A and would result in the tail end of the coal train being visible for a longer period of time to residents near Big Diamond and Dunning Lakes during unloading. Trains would be within sight distance for approximately one additional hour during the unloading process (based on a 4-hour unloading process for an 8,000 foot unit coal train).

Associated Facilities for the Northeast Site Footprint

Rotation of the IGCC Power Station Footprint would reposition the Power Station's access road and administration offices along the northeastern margin of the site (Excelsior, 2009). This location would require that road access extend from CR 7 around the rear of the IGCC Power Station Footprint and would require a substantially longer access road. Road access could be provided around the east side of the footprint for either rail alternative. Road access could be provided around the west side of the plant, with the alignment dependent upon the location of the rail line. With the exception of the west access using rail Alternative 4A, any of the road alternatives would require one or more bridge crossings over the rail line.

Similarly, water and sewer service would be required at the administrative building at the rear of the IGCC Power Station Footprint. Water and sewer utilities would be routed along the entrance road out to CR 7 and then south to Taconite. These utilities could share the access road corridor for either a west or east access. However, the greater elevation of the plant would require additional pumping requirements for water supply for the 10 feet higher tiering to reduce excess cut material.

Process water lines would need to be routed to the center of the IGCC Power Station Footprint. This utility would likely be routed along with the sewer and water utilities and would follow the implemented roadway corridor. The IGCC Power Station's higher elevation would require that process water be pumped 10 feet higher than the preferred plan, resulting in slightly greater head and additional pumping requirements.

The HVTL lines transmitting electricity from the IGCC Power Station switchyard cannot be routed over buildings and power station equipment, but would have to be routed around the east side of the IGCC Power Station Footprint and further east to meet the existing HVTL corridor where it would turn south. If the eastern road alignment were established, the HVTL alignment could share the same corridor. If the western access were established, the HVTL would be established in a separate corridor or in association with the rail loop if Alternative 4B were constructed.

F2.5.3.1.4. West IGCC Power Station Footprint

An IGCC Power Station Footprint in the western portion of the site (see Figure F2-11) would avoid the two large wetland complexes on the West Range Site (Wetlands A1 and A4) and reduce wetland impacts to 18.26 acres (Excelsior, 2009). However the far westerly portion of the West Range Site has not been field delineated. Small, ephemeral wetlands such as those discovered in similar portions of the site that were field delineated are likely to be present in addition to those shown on the NWI.

Rotation of the IGCC Power Station Footprint would allow maximum wetland avoidance, but would not allow for proper alignment of the footprint with the rail line. The lack of a straight rail line along the front margin of the IGCC Power Station Footprint would restrict rail operations, including both the offloading of coal and the loading of ash, sulfur, and/or slag. The location of the coal dumper would require that coal and

other materials be transferred to and from the IGCC Power Station by conveyor from an unloading area near the coal dumper as shown on Figure F2-11.

Although wetland impacts would be reduced by this alternative location for the Station Footprint, this area of the site is also occupied by a large hill, with a maximum elevation of about 1,480 feet and a total difference in elevation of about 130 feet from that point to the northeast corner of the site boundary. Establishment of a three tiered construction site (with elevations at approximately 1,405, 1,420, and 1,440 feet msl) would require 6,631,000 cubic yards of cut and 128,000 cubic yards of fill. This would result in an excess of 6,503,000 cubic yards of material that would require disposal. When combined with the excess material that would result from construction of a rail line the amount of excess material requiring disposal would be between 8.5 and 10 million cubic yards.

Raising the elevation of the second and third tiers on the West Footprint by 10 feet would reduce the amount of material cut and increase the amount of fill in certain areas. The net excess cut material could be reduced 2.6 million cubic yards. However, raising these two tiers would also aggravate the aesthetic impacts of noise and visibility given the lack of screening relative to the Central Footprint.

The location of the IGCC Power Station Footprint along the western boundary of the site would place the plant within 2,000 feet of one residence on CR 349 and within 3,000 feet of the residences along CR 7. In comparison, the preferred site would be approximately 3,300 feet from the same single residence on CR 349 and over 4,000 feet from the residences along CR 7. This proximity is compounded by the increased visibility and noise issues as described above for the Northeast alternative. This would be especially significant for these residents for this alternative. As noted above, without the shielding of the western-most hill within the IGCC Power Station's Buffer Land, the Power Station would likely be in plain view of these and other residences. The unmitigated noise contour for the West Footprint would be increased by about 5 dBA at the closest residences relative to the noise level from the Central Footprint. Therefore, complying with Minnesota noise standards would likely require equipment additions to mitigate such impacts.

Railroad Alternatives for the Western Site Footprint

Two rail alternatives were evaluated to serve the west site alternative. Alternative 5B would loop around the hill in the northeastern portion of the site (see Figure F2-11), similar to Alternative 4B. This rail loop would be 22,070 feet in total length, with a rail loop of 15,303 feet at an elevation of 1405. It would require 2,590,000 cubic yards cut and 775,000 cubic yards fill and would result in fill in 5.91 acres of wetland. Railroad Alternative 5C would loop around the center of the site (see Figure F2-11). This rail line would be 20,532 feet in total length, with a rail loop of 13,273 feet at an elevation of 1405. It would require 3,940,000 cubic yards cut and 1,412,000 cubic yards fill and would result in fill in 17.69 acres of wetland (Excelsior, 2009).

For both rail alternatives 5B and 5C the coal dumper would be located 2,000 feet southeast and, as described above for rail alternatives 4A and 4B, would result in the tail end of the coal train being visible to residents near Big Diamond and Dunning Lakes during unloading for a longer period of time. Trains would be within sight distance (approximately 854 feet) for approximately one additional hour during the unloading process (based on a 4-hour unloading process for an 8,000 foot unit coal train).

The location of the coal dumper in both rail alternatives 5B and 5C would require a conveyance system to transfer coal from the dumper location to the active and passive coal storage areas. Further, the lack of or poor intersection of the rail with the IGCC Power Station Footprint in these alternatives would require the plant tracks and loading areas for slag, sulfur, and other materials be located in the area between the coal dumper and the plant. This siding area would disturb an additional 25 to 40 acres. This layout of the plant tracks

would complicate rail operations and material handling by requiring additional tracking or conveyors to transport material into this area.

Both rail loop alternatives would indirectly impact wetlands on south side of loop to some degree. Alternative 5C would result in the greatest wetland impact by bisecting two large wetland basins. The rail line would cross these wetlands at an elevation ten to 20 feet below the elevation of the wetland. Although the crossing would be upgradient of the southerly flow from these wetlands, excavation in the basin could result in indirect impacts to wetland hydrology. To avoid this potential effect, calculation of wetland impacts assumes that an impermeable berm would be constructed along the southern margin of the rail crossing.

Associated Facilities for the Western Site Footprint

Rotation of the IGCC Power Station Footprint would reposition the plant access and administration offices along the western margin of the site. This location would require that road access from CR 7 immediately north to the IGCC Power Station Footprint. The access road, and the sewer and water and process water utilities that would parallel the road, would impact wetland habitat. Shifting the IGCC Power Station Footprint further east to avoid wetland impacts at the rear of the plant would result in additional impacts to wetlands east of the Station Footprint and affect the rail and conveyor operations.

An isobar noise footprint was created for the West location. The sensitive receptors along the northern boundary of Big Diamond Lake were found to fall within the same noise isobars for the West plant location as to those of the Central location (between 45 and 50dBA) representing no noticeable increase in noise for the West alternative. However, additional receptors along CR 7 and to the immediate west show a slight increase in noise (1dBA) with the West alternative over the Central. Noise levels for the two closest residents located immediately southwest of the West Footprint are increased on the order of 5 dBA. The isobar footprint was and is considered a "worst case" model allowing for no topographical attenuation. An additional 1-3dBA due to the higher elevation of stacks and machinery and an elimination of topograpghic shielding would be expected at the closest sensitive receptors.

The HVTL lines transmitting electricity from the IGCC Power Station switchyard cannot be routed over the buildings and power station equipment, but would have to be routed eastward to the existing HVTL corridor where it would turn south. The infrastructure corridor along the western boundary of the buffer land is very crowded and would be plainly visible to residences along CR 7.

F2.5.3.1.5. Summary of West Range IGCC PowerStation Footprint and Rail Alternatives

The differences in wetlands acreage and cut and fill requirements for the four plant alternatives and their associated rail alternatives are summarized in Table F2-3a. As can be seen in the table the Central DEIS alternative has the greatest wetland impacts among all the plant locations no matter which of the two rail alternatives (1A or 1B) are combined with it. Since the Central DEIS location with Rail Alternative 1A was the preferred alternative in the DEIS it will be carried forward in the FEIS as one alternative that is completely analyzed. In comparing the remaining three alternative sites, the Northeast alternative (with enhanced tiering) with Rail 4B has the least wetland impact 15.2 acres. The wetland acres filled are summarized below.

Power Station Footprint and Rail Alternative	Wetlands Filled, acres	Figure Reference
Central DEIS – 1A	52.51	F2-5
Central FEIS – 3B	37.09	F2-7
Northeast (enhanced) – 4B	15.19	F2-10
West (enhanced) – 5B	24.17	F2-11

Table F2-3a. West Range IGCC Plant and Rail Alternatives Comparison (wetlands and grading)

Alternative	Wetlands Impacted, acres		Grading, cu yd		
	Filled	Indirect	Cut	Fill	Net for Disposal
DEIS Central					
IGCC DEIS	34.58	7.34	3,550,000	2,350,000	1,200,000
Rail 1A	17.93	58.3	3,725,000	610,000	3,115,000
Rail 1B	13.96	43.37			
Total -1A	**52.51**	**65.60**	**7,275,000**	**2,960,000**	**4,315,000**
Total -1B	48.54	50.67	8,500,000	2,000,000	6,500,000
FEIS Central					
IGCC FEIS	31.36		3,100,000	2,350,000	750,000
Rail 3A	12.00		4,668,000	595,000	4,073,000
Rail 3B	5.73		2,620,000	620,000	2,000,000
Total -3A	43.36		7,768,000	2,945,000	4,823,000
Total -3B	**37.09**		**5,720,000**	**2,970,000**	**2,750,000**
Northeast					
IGCC standard tiering	10.92		6,143,000	301,000	5,842,000
IGCC enhanced tiering	10.92		4,391,000	956,000	3,435,000
Rail 4A	9.92		2,871,000	805,000	2,066,000
Rail 4B	4.27		2,620,000	620,000	2,000,000
Total -4A enhanced	20.84		7,262,000	1,761,000	5,501,000
Total -4B enhanced	15.19		7,011,000	1,576,000	5,435,000
West					
IGCC standard tiering	18.26		6,631,000	128,000	6,503,000
IGCC enhanced tiering	18.26		4,357,000	489,000	3,868,000
Rail 5B	5.91		2,590,000	775,000	1,815,000
Rail 5C	17.69		3,940,000	1,412,000	2,528,000
Total -5B	24.17		6,947,000	1,264,000	5,683,000
Total -5C	35.95		8,297,000	1,901,000	6,396,000

Before selecting an alternative with reduced wetlands impacts to fully evaluate in the FEIS, one must consider other factors. One factor that is also summarized in Table F2-3a is the grading requirements of the alternatives. The Central FEIS alternative has the least amount of excess material to be disposed of as summarized below.

Power Station and Rail Alternative	Excess Material to be Disposed, cubic yards	Excess Material as % of Central FEIS
Central DEIS – 1A	4,300,000	157
Central FEIS – 3B	2,800,000	100
Northeast (enhanced) – 4B	5,400,000	198
West (enhanced) – 5B	5,700,000	207

The Central FEIS would have about ½ of the excess material for disposal as compared to the Northeast and West alternatives. The other distinguishing factors to consider (noise, aesthetics, utilities and operations) that were discussed in Sections F2.5.3.1.1 through F2.5.3.1.4 are summarized in Table F2-3b.

Table F2-3b. West Range IGCC Plant and Rail Alternatives Comparison (other factors)

Alternative	Noise	Visibility	Utilities	Operations/Other
DEIS Central				
IGCC DEIS	Baseline as described in FEIS	Baseline as described in FEIS	Baseline as described in FEIS	Baseline as described in FEIS
Rail 1A	Baseline as described in FEIS	Baseline as described in FEIS	Baseline as described in FEIS	Baseline as described in FEIS
Rail 1B				A longer ROW , with slightly steeper grades than 1A
FEIS Central				
IGCC FEIS	Essentially the same as DEIS alt	Essentially the same as DEIS alt	Essentially the same as DEIS alt	Essentially the same as DEIS alt
Rail 3A			Utility lines would be required to be placed deep underneath existing grade to go under rail line, resulting in maintenance issues and increased energy consumption for pumping water, sewer, and process water	Bridge over the rail track would be required to provide access to the Power Station Siding would limit the flexibility of internal rail operations for slag, sulfur, and other material transfers
Rail 3B				Rail yard operations would be less than optimal because the onsite rail sidings will be dead-end spurs instead of continuous sidings
Northeast				
IGCC enhanced tiering		Removal of the top of a large hill that is a visual landmark. Increased visibility of power station.	Would require City of Nashwauk to reposition its permitted natural gas pipeline to avoid it traversing beneath the coal pile storage area, rail sidings, and other project elements. New ROW through forested land would be 4,000 feet longer than Central.	Site would be on an area judged to have moderate potential for encountering archeological resources, and relocated Nashwauk pipeline in a high potential area.
Rail 4A		Tail end of the coal train would be visible for a longer period of time to residents near Big Diamond and Dunning Lakes during unloading		
Rail 4B		Tail end of the coal train would be visible for a longer period of time to residents near Big Diamond and Dunning Lakes during unloading	Utility lines would be required to be placed deep under rail line, resulting in increased maintenance issues and energy consumption for pumping water, sewer,	Bridge over the rail track would be required to provide access to the Power Station

Table F2-3b. West Range IGCC Plant and Rail Alternatives Comparison (other factors)

Alternative	Noise	Visibility	Utilities	Operations/Other
			and process water	
West				
IGCC enhanced tiering	The unmitigated noise contour for the West Footprint would be increased by about 5 dBA at the closest residences. Complying with Minnesota noise standards would likely require equipment additions to mitigate such impacts.	The plant would be closer to one residence on CR 349 and several residences along CR 7.		Lack of a straight rail line along the IGCC footprint would restrict rail operations, would require that coal and other materials be transferred to and from the IGCC Power Station by conveyor from an unloading area near the coal dumper
Rail 5B		Tail end of the coal train would be visible for a longer period of time to residents near Big Diamond and Dunning Lakes during unloading	New ROW through forested land would be 1,500 feet longer than Central	Located 1,800 feet from the Power Station Footprint, requiring that coal be actively conveyed over this distance to the inactive and active coal piles.
Rail 5C		Tail end of the coal train would be visible for a longer period of time to residents near Big Diamond and Dunning Lakes during unloading		

In comparing the Northeast and West alternatives, the Northeast has many advantages:

- Less wetlands to be filled – 15.19 vs 24.17 acres;
- Slightly less material to be disposed of – 5.4 vs 5.7 million cubic yards;
- Less noise impacts to residences to the west;
- Less asthetic impacts to the residences to the west; and,
- Would not require a long conveyor to transfer coal.

There are a few disadvantages regarding the Northeast as compared to the West:

- For the Northeast site the City of Nashwauk would have to reposition its permitted natural gas pipeline;
- Utility lines would have to be placed deep under the rail line, resulting in maintenance issues, additional pumping costs, and energy consumption; and
- A bridge over the railroad would be required to provide access to the Power Station.

In this comparison the Northeast location would be preferable to the West location.

In comparing the Central FEIS to the Northeast, the Central FEIS has many advantages:

- Signicantly less material to be disposed of – 2.8 vs 5.4 million cubic yards;
    - Lower cost;
    - Less land covered;
    - Less energy consumed; and

  - Less impacts from truck traffic – noise, dust, internal combustion engine emissions, and damage to roads—due to shorter haul distances.
- Would not require the City of Nashwauk to reposition its permitted natural gas pipeline into an area of high archeological potential;
- Would not require removing the top of the tallest hill in the area;
- Would have less visibility both of the plant and the coal train;
- Would not require that utility lines would have to be placed deep under the rail line, resulting in lower pumping costs and energy consumption, and lessening maintenance issues;
- Would not require a bridge over the railroad to obtain access to the Power Station.

There are two disadvantages to the Central FEIS location as compared to the Northeast:

- More wetlands would be filed – 37.09 vs 15.19 acres;
- Rail yard operations would be less than optimal because the onsite rail sidings would be dead end spurs instead of continuous sidings.

DOE has concluded that because of the additional costs, energy consumption (in both construction and operation), maintenance issues, and environmental and socio-economic impacts associated with the Northeast and West sites, they are not practicable alternatives. Thus, the Central FEIS alternative with Rail 3B will be analyzed further in Appendix F2 (both the road and utility connections and more detailed discussions of the wetlands proposed to be impacted) and the FEIS.

F2.5.3.2 Access Road for the Central Alternative

The original proposed road corridor (see Access Road 2 Figure F2-6) was designed with the intention of intersecting a new CR 7 alignment proposed by Itasca County that would extend eastward off the existing CR 7 just south of West Range Site, run east between Dunning Lake and Big Diamond Lake, and then turn south between Arcturus Mine and Big Diamond Lake to intersect with U.S. 169 (shown as Access Road 1 in Figure F2-6). The realignment was proposed to improve truck traffic access to the IGCC Power Station and the Essar Steel Minnesota, LLC (ESM) mining and steelmaking plant site and to reduce conflicts between slow, heavy trucks and passenger vehicles. Due to the lack of sufficient of state bonding money for the project and the reluctance of Excelsior and/or ESM to cover construction costs, Itasca County dropped its plans to construct the new roadway. Additional options for road access to the West Range Site were subsequently investigated.

The proposed road alignment (see Figure F2-7**)** would reduce the length of the road and would reduce wetland impacts from 5.67 acres to 0.194 acres. Wetland hydrology will be maintained via culvert(s) under the roadway to avoid indirect impacts to wetland habitat (Excelsior, 2009).

F2.5.3.3 Power Transmission Alternatives for the Central Alternative

F2.5.3.3.1. HVTL Alternatives 1 and 1A

Alternatives 1 and 1A are shown in Figure F2-12**.** These alternate routes shares about 3.3 miles of ROW. Alternative 1A parallels about 2 miles of the secondary road known as Twin Lakes Road. It crosses or abuts the Swan River in several locations and crosses numerous areas that have been cleared but are unoccupied (Excelsior, 2009).

Wetland Fill

Wetland fill would be limited to those areas where power poles will be placed within wetlands. Each pole is assumed to require an estimated 28 square feet of fill. It is assumed that power poles will be placed evenly, every 800 feet along the alignment. Using this assumption, 16 power poles would be placed within wetland

habitat and would result in approximately 0.01 acres of wetland fill for Alternative 1 (either WRA-1 or WRB-1) or Alternative 1A (either WRA-1A or WRB-1A).

Wetland Type Conversion (Tree and Shrub Clearing)

Construction across greenfield and establishment of new ROW will require clearing of vegetation in upland and wetland areas. Impacts to wetland vegetation would be of two types, temporary impacts to scrub-shrub habitat in temporary work spaces outside the permanent ROW and permanent conversion of scrub-shrub habitat within the permanent ROW and forested habitat within the permanent ROW. Temporary conversion would include removal of scrub-shrub vegetation in the temporary construction ROW but outside the permanent ROW. These areas would be allowed to revegetate following construction. Permanent conversion would include removal of scrub-shrub vegetation within the permanent ROW and removal of forest vegetation within the construction ROW. The permanent ROW would be maintained free of woody vegetation, resulting in conversion of scrub-shrub and forested wetland to emergent wetland habitat. Although forested wetland cleared outside of the permanent ROW but within the construction ROW would still be allowed to revegetate, it is considered a permanent type conversion because of the length of time that regeneration would require. There would be 2.3 acres of temporary scrub-shrub wetland impacts and 36.2 acres of permanent wetland type conversions for Alternative 1. There would be 3.9 acres of temporary scrub-shrub wetland impacts and 25.3 acres of permanent wetland type conversions for Alternative 1A.

Water Crossings

Since a portion of HVTL Alternative 1A follows the same alignment as HVTL Alternative 1, there are two similar water crossings: a perennial stream between Big and Little Diamond Lakes and the Swan River, a protected water listed by the MDNR Protected Waters Inventory. There are four additional water crossings over the Swan River along the southern portion of the HVTL Alternative 1A alignment. Wetland impacts within the bed of any portions of these water bodies will be avoided. The total length of water crossings for HVTL Alternative 1 is estimated at 123 linear feet and Alternative 1A is estimated at 533 linear feet.

Alternative 1 is preferred to Alternative 1A because of fewer crossings of the Swan River, avoidance of county recreatrional lands, and greater distances from residences.

F2.5.3.3.2. Plan B HVTL Alternative

Excelsior Energy considered a range of alternate HVTL configurations, including staggered and unstaggered 230kV and 345kV transmission concepts, each of which offered varying levels of cost and reliability.

Phase 1

The preferred Route WRB-1 is identical to the preferred Route WRA-1 but involves the use of a double circuit 230kV HVTL instead of a 345kV double circuit. The Plan B preferred route would also require the same additional new six miles of ROW and, therefore, the Proponent must propose at least one alternative HVTL route.

The alternate Route WRB-1A is identical to the preferred Route WRA-1A with the exception that Route WRB-1A will involve use of a double circuit 230kV HVTL.

Phase 2

The difference between the proposed HVTL plan and Plan B is in the provision of service for Phase II. The preferred route WRB-2 for Phase II under Plan B would be the route not selected in Phase I of Plan B. In

other words, the wetland impacts accompanying the preferred HVTL alignments under Plan B would approximate the sum of the wetland impacts associated with the Plan A preferred *and* alternate routes. Again, this is because three 230 kV circuits are required under Plan B; two of the three circuits can traverse the same route, but the third must travel in a separate route to avoid crowding within one ROW.

The alternate route for Plan B Phase II, namely WRB-2A, would involve use of the existing 28L and 62L corridors as shown in Figure F2-13. Wetland impacts associated with this route would result in little (0.03 acre) potential for additional direct or indirect wetland impact because it would use an existing HVTL system in existing maintained ROW.

Water Crossings

There are five water crossings associated with Plan B Phase II Alternate Route WRB-2A, all of which are protected waters listed in the MDNR Protected Water Inventory. These crossings include the Swan River and one of its tributaries, Snowball Creek, Oxhide Creek, and Oxhide Lake. Wetland impacts within the bed of any portions of these water bodies will be avoided. The total length of water crossings for Plan B Phase II Alternate Route WRB-2A is estimated at 283 linear feet.

F2.5.3.4 Natural Gas Pipeline Alternatives for the Central Alternative

F2.5.3.4.1. West Range Natural Gas Pipeline Alternative 1

The Nashwauk Public Utilities Commission has recently received (April 2008) a Route Permit from the MPUC and plans to construct a 24-inch diameter natural gas pipeline past the IGCC Power Station Footprint to serve the Minnesota Steel Industries steel plant. If this pipeline is constructed as proposed, Excelsior would likely tap into it at the point where it turns eastward from the West Range site and would not construct a parallel pipeline (Alternative 1) as proposed in the Joint Application (Excelsior, 2009). If the Nashwauk gas pipeline was not constructed, and Excelsior were to construct Alternative 1 it would result in the following impacts:

- Temporary impacts to 3.9 acres of emergent wetlands;
- Temporary impacts to 0.8 acres of shrub-scrub wetlands; and
- Permamant type conversion of 16.4 acres of forested and shrub-scrub wetlands to emergent wetlands.

F2.5.3.4.2. West Range Natural Gas Pipeline Alternative 2

Alternative 2 would follow the same route as the Proposed Alternative, running south from the IGCC Power Station, for approximately 7.5 miles. The route for Alternative 2 would then turn to the west to La Prairie. The route of Natural Gas Pipeline Alternative 2 is shown in Figure F2-14.

Impacts to wetland vegetation would be of three types, temporary impacts to emergent wetlands, temporary impacts to scrub-shrub habitat in temporary work spaces outside the permanent ROW and permanent conversion of scrub-shrub habitat within the permanent ROW and forested habitat within the permanent ROW. Temporary impacts to emergent wetlands would be restored following construction. Temporary conversion would include removal of scrub-shrub vegetation in the temporary construction ROW but outside the permanent ROW. These areas would be allowed to revegetate following construction. Permanent conversion would include removal of scrub-shrub vegetation within the permanent ROW and removal of forest vegetation within the construction ROW. The permanent ROW would be maintained free of woody

vegetation, resulting in conversion of scrub-shrub and forested wetland to emergent wetland habitat. Although forested wetland cleared outside of the permanent ROW but within the construction ROW would still be allowed to revegetate, it is considered a permanent type conversion because of the length of time that regeneration would require. There would be 1.5 acres of temporary impacts to emergent wetlands, 0.02 acres of temporary impacts to scrib-shrub wetlands, and 11.0 acres of permanent type conversion.

There are four water crossings associated with Natural Gas Pipeline Alternative 2. The Swan River will be crossed twice by Natural Gas Pipeline Alternative 2 at approximate Mileposts 5+4330 (feet) and 10+4180, as shown in Figure F2-10. Other water crossings include the Prairie River at Milepost 0+1980 and a perennial stream between Big Diamond and Little Diamond Lakes at Milepost 13+1690. Construction methods for Natural Gas Pipeline Alternative 2 will be the same as those for the Proposed Natural Gas Pipeline. The combined length of the water crossing for natural gas Pipeline Alternative 2 is estimated at 313 linear feet.

F2.5.3.4.3. West Range Natural Gas Pipeline Alternative 3

Alternative 3 would follow the same route from the IGCC Power Station Footprint as the Proposed Alternative, running south from the IGCC Power Station along existing ROW to TH 169. The route for Alternative 3 would then turn west and run adjacent to TH 169 through Coleraine and Bovey and then turn south to La Prairie. The route of Natural Gas Pipeline Alternative 3 is shown in Figure F2-14.

Alternative 2 would follow the same route as the Proposed Alternative, running south from the IGCC Power Station, for approximately 7.5 miles. The route for Alternative 2 would then turn to the west to La Prairie. The route of Natural Gas Pipeline Alternative 2 is shown in Figure F2-14.

Impacts to wetland vegetation would be of three types, temporary impacts to emergent wetlands, temporary impacts to scrub-shrub habitat in temporary work spaces outside the permanent ROW and permanent conversion of scrub-shrub habitat within the permanent ROW and forested habitat within the permanent ROW. Temporary impacts to emergent wetlands would be restored following construction. Temporary conversion would include removal of scrub-shrub vegetation in the temporary construction ROW but outside the permanent ROW. These areas would be allowed to revegetate following construction. Permanent conversion would include removal of scrub-shrub vegetation within the permanent ROW and removal of forest vegetation within the construction ROW. The permanent ROW would be maintained free of woody vegetation, resulting in conversion of scrub-shrub and forested wetland to emergent wetland habitat. Although forested wetland cleared outside of the permanent ROW but within the construction ROW would still be allowed to revegetate, it is considered a permanent type conversion because of the length of time that regeneration would require. There would be 7.9 acres of temporary impacts to emergent wetlands, 0.3 acres of temporary impacts to scrib-shrub wetlands, and 4.3 acres of permanent type conversion

While the wetland impacts associated with Alternative 3 are less than the preferred alternative, the route for Alternative 3 travels through portions of the towns of Coleraine and Bovey, and the route's close proximity to a high number of residences makes it unlikely that the MPUC would grant a permit for this route rather than Alternative 1, as evidenced by the MPUC's decision for the Nashwauk pipeline. There are 935 residences within a half mile of Alternative 3 (compared to 153 for Alternative 1), including 7 residences within 100 feet (compared to zero for Alternative 1).

There are four water crossings associated with Natural Gas Pipeline Alternative 3. The Prairie River will be crossed by Natural Gas Pipeline Alternative 3 at approximate Milepost 0+2300 (feet), as shown in Figure F2-14. Other water crossings include a tributary of the Prairie River at Milepost 2+880, a perennial stream that drains to Holman Lake at Milepost 9+3200, and a perennial stream between Big Diamond and Little Diamond Lakes at Milepost 11. Construction methods for Natural Gas Pipeline Alternative 3 will be the same as those

for the Proposed Natural Gas Pipeline. The combined length of the water crossing for Natural Gas Pipeline Alternative 3 is estimated at 236 linear feet.

F2.5.3.5 Process Water Pipelines for the Central Alternative

F2.5.3.5.1. Process Water Alternatives

The Mississippi River was considered as a potential water source for the supply of water to the Phase I & II IGCC Power Station. However, the process water pipeline would be approximately 10 miles long and require several pump stations, electrical facilities, support structures, and land acquisitions in order to provide adequate flow for the plant. Such an alternative would also not help resolve the flooding issues in the Canisteo Mine Pit and the Hill-Annex Mine Pit Complex. For these reasons, this alternative was determined to be unnecessary and removed from further consideration.

Consideration was also given to supplying process water by drilling a number of ground water wells and developing those wells. This alternative was rejected after review of available information that showed most wells in the area will likely produce between 200 and 300 gallons per minute. This alternative would require the development, operation and maintenance of up to 50 ground water wells, pump stations, force mains, electric services, and support structures to provide adequate flow for the IGCC Power Station. The geographical size of this well field, the effects of the well field on other nearby wells, and the supporting infrastructure that would have to be maintained would present insurmountable logistical problems. For these reasons, and the fact that it also does not address the serious flooding issues presented by the Canisteo and Hill Annex Mine pits, this alternative was determined to be impracticable and removed from further consideration (Excelsior, 2009).

F2.5.3.5.2. Pipeline Corridor Location Alternatives

Large wetlands were avoided when initially establishing the ROW for the Proposed Process Water Pipelines. When wetland delineations occur and the wetland boundaries are known, further sequencing measures will be taken to avoid and minimize temporary wetland impacts. Exact pipeline routes will be established during the design phase and these routes will be sited in such a way as to avoid wetlandswhere possible. Construction activities will be planned during the winter months to further minimize impacts to wetlands as a result of pipeline installation.

The Proposed Process Water Pipelines will be located so they share permanently maintained ROW with other utilities as much as possible. For example, Segment 3 of the Proposed Process Water Pipeline will parallel the Proposed Railroad, Site Access Road, CR 7, and a portion of Segment 2. Segment 2 of the Proposed Process Water Pipeline will parallel the Site Access Road, Sanitary Sewer Pipeline, Potable Water Pipeline, and a portion of Segment 3, as shown in Figure F2-15.

F2.5.3.6 Process Water Blowdown for the Central Alternative

The proposed IGCC Power Station was originally designed to treat all contact wastewaters with a zero liquid discharge (ZLD) system in order to protect local receiving waters. Non-contact wastewaters were to be discharged into Holman Lake. In order to further minimize environmental impacts and eliminate permitting issues associated with discharging such wasterwaters, Excelsior announced in a January 21, 2008 press release that all non-contact wastewaters would be treated by a separate ZLD system, thereby eliminating all direct wastewater discharges. This ZLD treatment also allows the elimination of blowdown pipelines, which further reduces wetland impacts. The use of a ZLD system has eliminated 3.04 acres of permanent type conversion wetland impacts and 1.57 acres of temporary impacts to wetlands that would have resulted from the construction of the discharge water blowdown lines as described in the DEIS.

F2.5.3.7 Potable Water and Sanitary Sewer Alternatives for the Central Alternative

Excellsior evaluated two alternatives for potable water and sanitary sewer: (1) construction of on-site water and wastewater and treatment facilities; and (2) connection to the municipal facilities of the City of Taconite. See Figure F2-16.

On site water treatment considered was construction of a facility with the capacity to treat 7,500 gallons per day of raw water from the Canisteo Mine Pit and Hill-Trumbull/Hill-Annex Mine Pit Complex to provide potable water to the IGCC Power Station. Construction of a building to house the filtration system, a 5,000 gallon underground reservoir, and pump would be required as part of this alternative.

On-site treatment of domestic wastewater generated at the site would consist of constructing a stabilization pond and wastewater treatment facility (WWTF) on the project site. The facility would be constructed with the capacity to treat 45,000 gallons of domestic wastewater per day (the maximum projected flow from Mesaba One and Two). Once treated, effluent from the WWTF would be routed off-site, most likely to Little Diamond Lake via an 8-inch diameter gravity sewer pipeline.

The alternative of connecting to the City of Taconite's systems was selected for the following reasons (Excelsior, 2009):

- it is advantageous to the community in expanding their service area and upgrading their facilities;
- avoids issues surrounding new and expanded discharges to impaired waters;
- the onsite alternatives do not adequately address water and wastewater requirements during construction that are higher by a factor of seven than the requirements during operation;
- does not result in any additional wetland impacts, since water and sewer lines can be entirely routed in ROWs of roads and other utilities; and
- given the prevalence of wetland habitat surrounding the IGCC Power Station Footprint, additional development in the area would very likely create additional wetland impacts.

F2.5.3.8 Summary of West Range Road and Utility Alternatives

The temporary and permanent impacts to wetlands associated with the road and utility alternatives are summarized in Table F2-4.

Table F2-4. Summary of West Range Road and Utility Alternatives Wetland Impacts

	Permanent Impacts, acres					Temporary Impacts, acres		
	Type Conversion			Fill	Total Fill + Type Conver-sion	Emergent Wetlands	Shrub-scrub	Total
	Shrub-scrub to Emergent	Forested to Emergent	Total					
Road Access								
DEIS Preferred		1.07	1.07	5.67	6.74	0.17	2.81	2.98
FEIS Preferred			0.00	0.19	0.19		0.13	0.13
HVTL								
DEIS/FEIS Preferred								
Alternative 1		36.16	36.16	0.01	36.17		2.33	2.33
Alternative 1A		25.34	25.34	0.01	25.35		3.90	3.90
Plan B (WRB-1/1A)		61.50	61.50	0.02	61.52		6.23	6.23
Plan B (WRB-1/2)		36.16	36.16	0.04	36.17		2.33	2.33
Plan B (WRB-1A/2)		25.34	25.34	0.04	25.35		3.90	3.90

Table F2-4. Summary of West Range Road and Utility Alternatives Wetland Impacts

	Permanent Impacts, acres					Temporary Impacts, acres		
	Type Conversion			Fill	Total Fill + Type Conver-sion	Emergent Wetlands	Shrub-scrub	Total
	Shrub-scrub to Emergent	Forested to Emergent	Total					
Natural Gas Pipeline								
DEIS/FEIS Preferred								
Alternative 1	4.50	11.88	16.38		16.38	3.90	0.84	4.74
Alternative 2	7.59	3.39	10.98		10.98	1.46	0.02	1.48
Alternative 3	2.47	1.79	4.26		4.26	7.93	0.33	8.26
Process Water Pipeline								
DEIS/FEIS Preferred								
Water Line 1	0.00	0.00	0.00		0.00	0.00	0.00	0.00
Water Line 2	0.12	1.98	2.10		2.10	0.00	0.18	0.18
Water Line 3	1.23	1.14	2.37		2.37	1.26	1.15	2.41
Process Water Blowdown								
Pipeline								
DEIS Preferred								
Line 1 to Holman Lake	2.86	0.00	2.86		2.86		1.40	1.40
Line 2 to Canisteo Pit	0.09	0.09	0.18		0.18		0.17	0.17
FEIS								
Line 1 to Holman Lake			0.00		0.00			0.00
Line 2 to Canisteo Pit			0.00		0.00			0.00
Potable Water & Sanitary								
Sewer Pipeline								
DEIS/FEIS Preferred			0.00		0.00		0.00	0.00

F2.5.4 East Range Wetland Avoidance and Minimization

F2.5.4.1 East Range IGCC Power Station Footprint Alternatives

The following sections describe four IGCC Power Station Footprint alternatives considered to avoid and minimize wetland impacts. The alternatives discussed are as follows:

- Prefered (Figure F2-17 - This is the alternative presented in the DEIS. The acreage of wetlands filled under this alternative has been corrected to account for the grading that would be necessary outside the power station footprint.);
- Northeast Shift of 50 feet (Figure F2-18);
- Southeast Shift (Figure F2-21); and
- Southern Shift (Figure F2-19).

F2.5.4.1.1. Preferred East Range IGCC Power Station Footprint

As shown on Figure F2-17**,** the IGCC Power Station Footprint is located on the west side of the East Range site property boundary, situated between an existing 138kV HVTL corridor leading to MP's Syl Laskin Substation and a large wetland complex to the south and east (Wetland C). The Station Footprint is oriented

to accommodate an acceptable i) curvature angle of the rail spur at the point where it splits from the existing CN track at the southwestern-most portion of the site and ii) approach to the railcar dumper.

As positioned in Figure F2-17, the IGCC Power Station Footprint would impact 17.15 acres of wetland habitat. The impact area includes the Station Footprint and the 3:1 grading at its boundaries required to achieve the natural grade of the surrounding area. The Station Footprint is located on a hill that drops about 40 feet in elevation from northwest to southeast; therefore, site has been designed in a tiered fashion to minimize grading on the sloping topography. Such grading would require approximately 3,349,900 cubic yards of cut and 1,146,400 cubic yards of fill and result in a total of 2,203,500 cubic yards of excess material (Excelsior, 2009).

The IGCC Power Station would be constructed in two phases. Mesaba One is expected to be constructed between 2010 and 2014; construction of Mesaba Two is expected to begin in 2012. Mesaba One would be constructed in the northern portion of the Station Footprint because of the desire to provide the longest straight line approach to the railcar dumper and to minimize the length of conveyors needed for stockpiling feedstocks in this unit's active and passive storage areas.

F2.5.4.1.2. Alternative Placement of the IGCC Power Station Footprint: Avoiding & Minimizing Wetland Impacts

The IGCC Power Station Footprint was moved around within the site boundaries to evaluate the potential for avoiding and minimizing wetland impacts. Looking at Figure F2-17 confirms that the Station Footprint cannot be moved any further northwest to minimize impacts to Wetland C given its placement directly adjacent to the western site boundary, the existing HVTL corridor, and the adjacent waste rock stockpiles and berm around the tailings basin. Any significant shift of the Station Footprint to the north would require concomitant movement to the east to keep from encroaching on others' property. Figure F2-18 shows a shift of approximately 50 feet to the northeast. This shift would slightly reduce impacts to the large complex (Wetland C) in the southwest corner of the Station Footprint, but would slightly increase Wetland C impacts to the northeast, and would increase total impacts from 17.15 acres to 17.30 acres.

Any shift of the Station Footprint to the west would also require a shift to the south, which would clearly increase impacts to the Wetland C complex located in the southern portion of the site. Alternative locations for the Station Footprint within the East Range site boundaries are limited by the large Wetland C complex that extends from the northeastern corner to the southwestern corner of the site. The southeastern portion of the site contains upland area, but insufficient area to accommodate the IGCC Power Station Footprint without filling wetlands. An attempt to position the Station Footprint in the southern-most portion of the East Range site, shown on Figure F2-19, would result in 62.67 acres of wetland fill. This alternative would also require alternative rail and road access. The rail loop would require an additional 5.34 acres of wetland fill and the road an additional 1.23 acres. In total, positioning the Station Footprint in this location would result in 69.24 acres of wetland impact. More importantly, repositioning the Station Footprint in the southernmost portion of the East Range site would bring the IGCC Power Station to within 2,000 feet of the closest residences and eliminate any screening of the Station's ongoing industrial operations. The increased noise and aesthetic impacts associated with repositioning the Station Footprint in this location would be expected to be opposed by Hoyt Lakes residents.

In testimony presented by the MDNR's James M. Sellner on January 30, 2008 before Administrative Law Judge Steve M. Mihalchick,[1] Mr. Sellner indicated that the State currently had under lease to Steel Dynamics

[1] State Of Minnesota, Office Of Administrative Hearings, For The Public Utilities Commission, *In the Matter of the Joint Application by Excelsior Energy for the following Pre-Construction Permits: Large Electric Generating Plant*

for future mining a large portion of the 2WX Mine Pit. Further, Mr. Sellner doubted that blasting, vibration and fly rock could co-exist next to a power plant of this size. Mr. Sellner concluded by stating:

> *"Our recommendation is that the footprint of the Hoyt Lakes power plant be located so that those mineral taconite resources and nonferrous mineral resources from those areas be protected. We're not opposed to the power plant, just trying to protect those underlying resources in that area."*

On February 29th, 2008, the MDNR's Matthew Langan submitted a letter to the Administrative Law Judge Steve M. Mihalchick underscoring Mr. Sellner's comments. Mr. Langan stated that there is potential that Mesabi Nugget may reopen the Area 2WX mining site and that the existing placement of the East Range IGCC Power Station in close proximity to future mining in 2WX "could encumber state taconite reserves resulting in millions of dollars of lost revenue for the state's school and tax-forfeit trusts." Mr. Langan noted that typical blast perimeters around taconite mining operations range from 3,000 to 5,000 feet. To avoid such encumbrance, Mr. Langan stated that the final location of the facilities on the East Range Project Site should be reviewed in conjunction with mining and operating plans being developed for Mesabi Nugget's expansions.

The MDNR's testimony strongly recommends that the IGCC Power Station Footprint should be moved further from the Iron Formation and Mine Pit 2WX to avoid dangers associated with blasting debris being carried into the IGCC Power Station Footprint and/or to avoid increased mining costs. The East Range site is capable of accommodating the IGCC Power Station Footprint while maintaining the recommended blast radius. However, referring to Figure F2-17, any movement of the Station Footprint to increase the distance between it and Mine Pit 2WX would increase wetland impacts.

F2.5.4.2 East Range Rail Access

F2.5.4.2.1. Preferred East Range Rail Access

The proposed rail spur to the East Range IGCC Power Station (Railroad Alternative 1) would intersect the southeastern margin of the Station Footprint and loop as shown on Figure F2-17. This rail loop would provide optimal rail yard operations because it allows the onsite rail sidings to be continuous and reconnect with the track without dead-end spurs. The spur would be 17,878 feet in total length with a rail loop of 9,836 feet at an elevation of 1,465 feet msl. The preferred rail alignment and loop would require 2.39 million cubic yards cut and 0.12 million cubic yards fill and would impact 13.38 acres of wetland (Excelsior, 2009). An additional 51.26 acres of two remnant wetlands would be enclosed within the rail loop. This wetland complex is supported by surface flow via a tributary to Colby Lake from offsite to the north. The preferred railroad alternative would cross this tributary in two locations. Culverts would be installed in these locations in order to maintain current volumes of flow. Culverts would be installed in other locations throughout the rail loop as well in order to ensure maintenance of hydrologic connectivity throughout the wetland.

The Railroad Alternative 1 corridor would require crossing approximately six linear feet of streams and bodies of water. The tributary to Colby Lake that flows through Wetland C is crossed twice by the center loop.

Site Permit, High Voltage Transmission Line Route Permit and Natural Gas Pipeline Routing Permit related to the Mesaba Energy Project in Itasca and St. Louis Counties, OAH Docket No. 12-2500-17512-2; MPUC Docket No. E-6472/GS-06-668, Public Hearing Volume IV - Pages 525 – 632, Evening Session January 30, 2008 Hoyt Lakes Arena, Hoyt Lakes, Minnesota. Mr. Sellner's testimony appears on pages 550-553.

F2.5.4.2.2. East Range Railroad Alternative 2

Railroad Alternative 2 (*see* Figure F2-20) would extend from existing CN track southwest of the East Range Site, unload coal at the IGCC Power Station, and exit the site and join existing CN track east of the site. This alternative would not include a rail loop. The track for Alternative 2 would be 18,430 feet in total length with an elevation of 1,465 feet msl. It would require 2,180,000 cubic yards cut and 123,000 cubic yards fill and would require filling 18.34 acres of wetland (Excelsior, 2009).

Alternative 2 is less than optimal because it would not include a rail loop. Coal train loops have become the standard for most coal fired power plants because the system is a very efficient method for handling coal. The disadvantage is that is takes more land to construct a rail loop.

The track profile grade for Alternative 2 is acceptable but not ideal. The unloading areas would be located on a minor incline to the east. Train unloading operations would extend across CR 666 which would require reconstruction of a segment of the roadway to provide a highway bridge over the tracks. Forest Road 117 would need to be relocated or closed during coal unloading operations. Extension of the train unloading area outside of the plant area would also cause issues with security, visual impacts, coal dust and adjacency to the active CN RR line.

Railroad Alternative 2 would cross approximately 6 linear feet of streams and bodies of water, the tributary to Colby Lake and Wyman Creek.

F2.5.4.2.3. East Range Railroad Alternative 3

The option of routing the rail loop around the plant site was investigated to determine the potential to reduce wetland impacts. Railroad Alternative 3 (*see* Figure F2-21) would have a rail loop surrounding the plant site. While it appears a loop surrounding the plant site would reduce the need for wetland impacts through Wetland C (as incurred for Rail Alternatives 1 and 2), further investigation showed that it was impossible to encircle the plant site and avoid Wetland C while maintaining required railroad curvature. Furthermore, encircling the plant site required additional area between the plant site and the existing HVTL and tailings basin and required the plant site to be shifted to the southeast, therefore incurring more wetland impacts. In order to provide enough width for the rail bed to surround the IGCC Power Station, the Station Footprint was shifted to the southeast approximately 500 feet. The shifted plant layout would result in 41.90 acres of impact (24.75 acres more than preferred) to the Wetland C complex traversing the center of the East Range Site.

The track for Alternative 3 would be 24,860 feet in total length with an elevation of 1,465 feet msl. It would require 5,257,000 cubic yards cut and 354,000 cubic yards fill and would result in filling 27.01 acres of wetland (Excelsior, 2009). Note that this estimate of wetland impact represents only that additional wetland fill that would result from construction of the rail line and loop; it does not include wetland fill that would result from construction of the Station Footprint.

- Alternative 3 would result in increased wetland impacts relative to the preferred alternative.
- Would require bridge crossing for site access road.
- This alternative requires the greatest track length by approximately 7,000 feet.
- Would require more than double the excavation efforts than the preferred (Alternative 1).
- The track in the southwest corner of the site may impact the adjacent tailings basin dike. Special geotechnical techniques may be required during design and construction of this alternative.
- Because the Station Footprint is shifted to the southeast, a greater distance is maintained between it and blasting associated with future mining activities in Mine Pit 2WX.

F2.5.4.2.4. Summary of East Range Railroad Alternatives

Rail track length, wetland impacts, and cut and fill quantities are summarized for each East Range IGCC Power Station railroad alternative in Table F2-5. Alternative 1 was chosen as the preferred alternative because it had the shortest track length, the least wetland impacts, and it minimized grading necessary for construction.

Table F2-5. Wetland Impacts Associated With Alternative East Range Railroad Alignments

Alternative	Rail Loop Length	Track length	Wetland Fill[1]	Cut Quantity	Fill Quantity	Net Cut
	FT	FT	Acres	CYD	CYD	CYD
Alternative 1	9,836	17,878	13.38	2,390,000	123,000	2,267,000
Alternative 2	Not Applicable	18,430	18.34	2,180,000	116,000	2,064,000
Alternative 3	24,448	24,860	27.01	5,257,000	354,000	4,903,000

[1] From Rail Loop only

The combined wetland impacts of the alternative IGCC Power Station locations and the rail Aletrnative 1 are shown in Table F2-6. The Preferred Site was selected in order ito minimize wetland impacts.

Table F2-6. Wetland Impacts Associated With Alternative East Range IGCC Power Station Footprint Alignments

Site	Plant Site Wetland Impact (acres)	Associated Railroad Wetland Impacts[1] (acres)	Total Wetland Impact (acres)
Preferred Site	17.15	13.38	30.53
Northeast Shift	17.30	13.38	30.68
Southeast Shift[2]	41.90	27.01	68.91
Southern Site	62.67	5.34	69.24[3]

[1] Railroad alternatives are described in a separate section.
[2] *See* description of Southeastern Shift with East Range Railroad Alterative 3.
[3] Includes 1.23 acres of additional wetland impacts to accommodate a new access road.

F2.5.4.3 East Range Plant Access Road

F2.5.4.3.1. Preferred East Range Road Access

An access road would be constructed to provide access to the IGCC Power Station from the existing CR 666, as shown in Figure F2-22. CR 666 passes just to the east of the proposed site and is the only feasible option to serve the site via the public road system. The proposed road access is located to cross wetland areas at the intersection with CR 666 and near the Station Footprint at their narrowest point to minimize wetland fill to just 0.44 acres (Excelsior, 2009).

Proper placement of culverts throughout the road alignment would mitigate potential indirect wetland impacts to nearby wetlands by maintaining existing hydrologic connectivity.

F2.5.4.3.2. East Range Road Access Alternatives

The originally designed access road, as shown in the DEIS, consisted of a loop roadway with two access points onto CR 666 (see Figure F2-22**)** and was designed allow separation of ingress and egress, and/or separation of heavy truck traffic. The revised access road alignment minimizes wetland impacts by

eliminating the upper portion of the looped access. The remaining roadway is essentially the same as the southern portion of the originally proposed loop and would have only a single access point to CR 666. The revised southern roadway alignment further minimizes wetland impacts by crossing the wetlands in the area at their narrowest point. The combination of the two minimization efforts reduces wetland impacts from 5.53 acres (0.49 acres of temporary impact, 1.81 acres of permanent type conversion, and 3.23 acres of fill) to approximately 0.44 acres of fill. Wetland hydrology would be maintained via culvert(s) under the roadway to avoid indirect impacts to wetland habitat.

F2.5.4.4 East Range Power Transmission

F2.5.4.4.1. East Range Preferred HVTL Alternatives

The preferred transmission plan for the East Range IGCC Power Station consists of constructing two new 345kV HVTLs within three existing ROWs to link the IGCC Power Station to the Forbes Substation POI as shown on Figure F2-23. Even though one 345kV HVTL would be sufficient to accommodate the combined full load output of Mesaba One and Mesaba Two, both new lines must be constructed concurrently with installation of Mesaba One to address the single failure criterion (see Section 1.2.4). Each line would follow existing routes now occupied by 115kV HVTLs owned by Minnesota Power and that interconnect the Syl Laskin Energy Center with the Forbes and Virginia Substations (the 37L and 38L HVTL connect to the Forbes Substation; the 39L HVTL connects to the Virginia Substation). One of the new 345 kV HVTLs – the preferred 39L/37L option – would traverse sections of two ROWs. Both new 345 kV HVTLs would require approximately two miles of additional HVTL ROW to connect the IGCC Power Station with the Syl Laskin Substation. An additional 30 feet of ROW would be acquired parallel to the applicable sections of the 39L and 37L routes.

Wetland impacts along the HVTL alignment would include wetland fill for power pole placement, temporary impacts to scrub-shrub habitat in temporary work spaces (areas within the construction ROW but outside the permanent ROW), and conversion of scrub-shrub and forested habitat within the permanent ROW.

F2.5.4.4.2. East Range HVTL Alternatives

Instead of applying the new 30-feet of ROW to the 39L/37L route, the possibility of adding the new ROW to the 38L route was investigated. This alternative was rejected because of the increased impacts to existing nearby landowners.

F2.5.4.4.3. Wetland Fill

Permanent wetland impacts would be limited to those areas where power poles are placed within wetlands. Each pole would require an estimated 28 square feet of fill. Wetland impacts are calculated for the HVTL alignment assuming that power poles would be placed every 800 feet along the alignment. Using this assumption, a total of 139 power poles (73 for Line 38 and 66 for Line 37/39) would be placed in wetland areas, resulting in 3,892 square feet (0.09) acres of permanent wetland impacts along the 68.42 mile alignment (33.58 miles for Line 38 and 34.84 for Line 37/39).

The location of power poles would be more accurately specified during project design. Placement of the poles would consider avoidance of wetland habitat to the greatest extent feasible. In addition to avoiding wetland impact, location of the poles outside wetland habitat improves construction access and stability of the poles. However, the maximum distance between poles of approximately 1,000 feet would limit avoidance of long expanses of wetland habitat.

Temporary wetland disturbance during construction would be minimized by performing construction during winter months or through use of construction mats to minimize rutting by equipment and disturbance of wetland vegetation. Where construction within wetland habitat could not be avoided, best management practices would be employed to minimize disturbance. Extra workspace areas, access roads, and contractor staging areas would be located outside of wetland areas to the greatest extent possible. Where wetland disturbances cannot be avoided, temporary roads and work areas would be removed and the affected wetlands restored following completion of construction.

F2.5.4.4.4. Wetland Type Conversion (Tree and Shrub Clearing)

The majority of the East Range HVTL is proposed within an existing 100-foot power utility ROW which would avoid clearing of trees and shrubs. Tree clearing would be required on the additional 30-feet of new ROW and on the new approximately two-mile section of ROW to the Syl Laskin Substation. The proposed new 30-foot ROW would parallel the existing 100-foot ROW for the 37/39 Line and would alter wooded or shrub wetland habitat. Construction of the new 100-foot ROW between the East Range IGCC Power Station and the Syl Laskin Substation would require clearing of shrub swamp.

Impacts to wetland vegetation would be of two types, temporary impacts to scrub-shrub habitat in temporary work spaces outside the permanent ROW (0.2 acres) and permanent conversion of scrub-shrub habitat within the permanent ROW and forested habitat within the permanent ROW (59.62 acres). Temporary conversion would include removal of scrub-shrub vegetation in the temporary construction ROW but outside the permanent ROW. These areas would be allowed to revegetate following construction. Permanent conversion would include removal of scrub-shrub vegetation within the permanent ROW and removal of forest vegetation within the construction ROW. The permanent ROW would be maintained free of woody vegetation, resulting in conversion of scrub-shrub and forested wetland to emergent wetland habitat. Although forested wetland cleared outside of the permanent ROW but within the construction ROW would still be allowed to revegetate, it is considered a permanent type conversion because of the length of time that regeneration would require.

F2.5.4.4.5. Water Crossings

There are 21 crossings of streams or water bodies associated with HVTL Alternative 1.The total length of water crossings for HVTL Alternative 1 is estimated at 1,194 linear feet.

F2.5.4.5 East Range Natural Gas Pipeline

F2.5.4.5.1. East Range Preferred Gas Pipeline

For the East Range Site, the proposed natural gas pipeline would be constructed, owned and operated by Northern Natural Gas ("NNG"), and would be an extension of NNG's interstate pipeline system shown on Figure F2-24. NNG represents the only feasible option for supplying Mesaba One and Two with natural gas because it is the only pipeline company within the immediate vicinity of the East Range Site. NNG's existing pipeline serves Cliffs-Erie (and the former LTV mining operation) and abuts the IGCC Power Station Footprint on its eastern boundary. In order to provide natural gas in the quantity and at the pressure required to supply the Project's two phases, installation of approximately 28.8 miles of new, 16- to 24-inch pipe would be constructed adjacent to NNG's existing 32.5-mile pipeline. A new pipeline can be laid within the same ROW (i.e., without having to expand the ROW's width).

The natural gas pipeline would be constructed below grade within the existing ROW. Construction of the natural gas pipeline would result in temporary impacts to wetlands existing within the ROW from excavation and installation of the pipe. Permanent impacts to wetlands would be avoided by restoring wetland habitat after installation of the pipe. Material excavated from the trench would be sidecast to one side of the trench or

the other. Preference would be given to sidecasting outside of wetland areas. Following pipe installation, soil would be returned to the trench in reverse of the removal (i.e. topsoil would be replaced on the surface). Disturbed wetland (and upland areas) would be reseeded with a native seed mix appropriate to the adjacent vegetative community. Indirect drainage effects to wetlands from groundwater conducted along the backfilled pipeline trench would be avoided by installing anti-seepage collars on the pipe in strategic locations.

Wetland impacts along the pipeline alignment would not include temporary disturbance of scrub-shrub habitat in temporary work spaces or permanent conversion of scrub-shrub and forested habitat within the permanent ROW because the existing ROW is maintained free of woody vegetation.

The location of the pipeline alignment would be determined during project design and would consider adjustments to avoid and minimize wetland habitat. Extra workspace areas, access roads, pipe storage yards, and contractor staging areas would be located outside of wetland areas to the greatest extent possible. Where avoidance of wetland disturbance is not possible, temporary roads and work areas would be removed and wetland restored in a manner similar to the pipeline trench following completion of construction.

Temporary Emergent Wetland Impacts

Only the portion of the proposed gas pipeline where the alignment enters the East Range Site has been field delineated. The potential wetland impacts resulting from the construction of the gas pipeline have been estimated from NWI wetland boundaries. In an effort to improve the accuracy of estimation of wetland habitat along the inaccessible linear utility corridors, an exercise comparing aerial photography, hydric soils, and the NWI was performed along 15 miles of the gas pipeline corridor. This revised wetland information is used where available to calculate wetland impacts. The NWI classifies a majority of the wetlands within the existing ROW for the gas pipeline as scrub shrub, forested, or coniferous bog. However, because the existing ROW is maintained to be free of trees and shrubs, these wetland types are no longer accurate. For wetland impact calculations, scrub shrub and forested wetlands within the ROW are considered wet meadows and coniferous bogs are considered open bogs.

Construction and installation of the proposed natural gas pipeline would disturb an estimated total of 24.79 acres of wetland along the entire 28.8 miles of existing ROW. This area assumes that open cut trenching is employed for construction, which would require use of the entire width of the ROW.

Water Crossings

The East Range Natural Gas Pipeline Alternative 1 would require crossing approximately 792 linear feet of streams and bodies of water, not including adjacent wetland habitat. Colby Lake (249P) and 12 streams and rivers impacted by Natural Gas Pipeline Alternative 1 are protected by the MDNR.

F2.5.4.6 East Range Process Water

The water supply system for the East Range site would consist of eight pipeline segments that would connect existing mine pits and provide process water to the IGCC plant as shown on Figure F2-25. As noted in Sections 1.1.1.3 and 3.1.2, plans are underway to resume mining in Mine Pit Nos. 6 and 2WX. In order to accomplish such activities, the pits and the immediate area surrounding them must be dewatered. Excelsior will work with the entities mining these pits to allow the IGCC Power Station to collect water resulting from such dewatering activities and ultimately use it as make up water to the cooling system. Given the status of the mining project's impending environmental review process (*see* Section 1.1.1.3), it is too early to project where and how such collection devices would be linked and subsequently piped to the IGCC Power Station. Until a mine permit application is submitted, Excelsior will continue to show the pipeline configurations between Mine Pits No. 6, 2WX, and the East Range Station Footprint as shown in Figures F2-17 and F2-25 as being conceptually indicative of its plans to use water directly obtained from the abandoned mine pits or

derived from their dewatering. The wetland impacts associated with these process water pipelines are small, (0.98 acres of temporary impacts and 1.33 acres of type conversion from forested wetland to emergent wetland) as the pipelines would be primarily routed across lands previously disturbed by mining or other developments.

It is unlikely that the increased number of smaller pipelines required to collect water from numerous dewatering wells, route it to a common collection header, and then convey it via a larger pipeline to the IGCC Power Station would cause a significant increase in wetland impacts relative to those calculated using the assumptions provided in the three following paragraphs. Such collection pipelines would likely be installed assuming they would be moved as mining progresses and/or as their productivity decreased, i.e., they would be temporarily placed and cause minimal wetland impact. In any case, the land over which they would traverse would ultimately be excavated.

The impacts are calculated assuming the pipelines would be constructed below grade within a 150-foot construction ROW. Wetland impacts would be avoided by restoring wetland habitat after construction. Wetland impacts along the pipeline alignments would include temporary impacts to emergent wetlands within the construction corridor, temporary disturbance of scrub-shrub habitat in temporary work spaces (areas within the construction ROW but outside the permanent ROW) and permanent conversion of scrub-shrub and forested habitat within the permanent ROW where prior disturbance has not removed woody vegetation. Although vegetation outside of the permanent ROW would be allowed to revegetate, impacts to forested wetlands even outside the permanent ROW are considered permanent because of the length of time required for restoration of forested habitat. Only the Process Water Pipeline segments constructed from Area 2WX to the IGCC Station Footprint and Area 6 and Stephens Mine to Area 2WX contain shrub scrub or forested wetland habitat.

The location of each pipeline alignment would be determined during project design and would consider adjustments to avoid and minimize wetland habitat. The construction ROW would be located to minimize sidecasting in wetland habitat. Extra workspace areas, access roads, pipe storage yards, and contractor staging areas would be located outside of wetland areas to the greatest extent possible. Where avoidance of wetland disturbance is not possible, temporary roads and work areas would be removed and wetland restored in a manner similar to the pipeline trench following completion of construction.

Only a small portion of the proposed process water supply pipeline segments have been field delineated during the 2004 and 2005 field surveys. The potential wetland impacts resulting from the construction of the pipelines in the remainder of the proposed alignments have been estimated from NWI wetland boundaries.

Several segments of the East Range Process Water Supply Pipeline system would cross 39 linear feet of streams.

F2.5.4.7 East Range Potable Water and Sanitary Sewer

Excelsior evaluated two alternatives for potable water and sanitary sewer: (1) construction of on-site water and wastewater and treatment facilities; and (2) connection to the municipal facilities of the City of Hoyt Lakes.

A micro-filtration system would be used to treat process water that would be pumped to the site from local mine pits. The filtration unit would treat water at a rate of 10gallons per minute to potable drinking water standards. Construction of a building to house the filtration system, a 5,000 gallon underground reservoir, and supply pump would be required. The reservoir is required because wide fluctuations of water use will occur during the course of the day in excess of the treatment rate of the filtration unit. The reservoir would

provide storage of water to cover the high use times. The pump would supply the water from the reservoir to the facility at the required flow rate and pressure.

The on-site waste water treatment alternative would consist of constructing a stabilization pond facility with the capacity to treat 45,000 gpd at a location near the IGCC facility. Also, a 12-inch effluent gravity sewer would be constructed to convey treated effluent to the mine drainage stream running northeast to southwest through the IGCC facility site. The stream discharges into Colby Lake. The length of this sewer pipe would be approximately 1,200 feet to reach the stream. One disadvantage of this alternative is the treatment facility would be required to have a capacity of 45,000 gpd but would receive only about 17% of this design flow after the construction of the IGCC plant is complete. Thus part of the facility would have to be abandoned and other modifications made to the facility at the completion of the IGCC facility construction.

The alternative of connecting to the City of Hoyt Lakes' systems was selected for the following reasons:

- avoids effluent from the system would discharge into Colby Lake, which is the source for the Hoyt Lakes drinking water treatment plant;
- the onsite alternatives do not adequately address water and wastewater requirements during construction that are higher by a factor of 10 than the requirements during operation;
- the water supply to the water treatment facility would dependant on the process water supply and would not provide treated water until process water is available on site; thus, potable water would not be available during the construction phase and would need to be supplied to the site by other means;
- does not result in any additional wetland impacts, since water and sewer lines can be entirely routed in ROWs of roads and other utilities; and
- given the prevalence of wetland habitat surrounding the IGCC Power Station Footprint, additional development in the area would very likely create additional wetland impacts.

Potable water would be provided by constructing a 6-inch pipeline approximately 11,000 feet from the East Range IGCC Power Station to the 12-inch water main that serves Minnesota Power, as shown on Figure F2-26. The proposed 6-inch pipeline would provide the required flow and pressure to Mesaba One and Two without the need for a booster station. The City of Hoyt Lakes treatment plant has the capacity to provide the potable water needs of the facility.

Sanitary sewer would be provided through connection to the City of Hoyt Lakes' wastewater collection and treatment system. This would consist of constructing approximately 9,500 feet of 12-inch gravity sewer pipeline, a pump station, and about 2,500 feet of 4-inch force main as shown on Figure F2-26. The wastewater piping would parallel the existing high voltage power line easement along the west side of the proposed property boundary south to Colby Lake. A pump station would be located on the north side of Colby Lake. The force main would be directionally drilled beneath Colby Lake and then connected to the existing city gravity sewer near Minnesota Power on the north end of Colby Lake Road. The 12-inch sewer pipe would have ample capacity to convey the estimated wastewater flow of 45,000 gallons per day during construction. The existing Hoyt Lakes wastewater treatment facility has capacity available to treat the estimated flow from the proposed project.

The pipelines would be constructed below grade within a 100-foot construction ROW. Only a portion of the proposed corridor for the East Range Potable Water and Sewer Pipeline has been field delineated. The potential wetland impacts resulting from the construction of the pipelines in the remainder of the proposed alignments have been estimated from NWI wetland boundaries. According to the NWI, up to 1.12 acres of Colby Lake lie within the construction limit and would be impacted during construction. This segment of the pipelines would be directionally drilled to avoid impacts to the lake and lakeshore. No other NWI wetlands

are identified within the 100-foot wide construction limit; however, field verification would be required for confirmation.

Construction of the Potable Water and Sewer Pipelines would require crossing approximately 460 linear feet of Colby Lake.

F2.5.4.8 Summary of East Range Road and Utility Alternatives

A summary of permanent wetland impacts, temporary wetland impacts, and permanent type conversions for the East Range Power Station, Buffer Land, and Associated Utilities Facilities is provided in **Table F2-7** below.

Table F2-7. Summary of East Range Road and Utility Alternatives Wetland Impacts

	Permanent Impacts, acres					Temporary Impacts, acres		
	Type Conversion			Fill	Total Fill + Type Conve r-sion	Emer-gent Wetlands	Shrub-scrub	Total
	Shrub-scrub to Emergent	Forested to Emergent	Total					
Road Access								
DEIS Preferred	0.00	1.81	1.81	3.23	5.04	0.00	0.49	0.49
FEIS Preferred	0.00	0.00	0.00	0.44	0.44	0.00	0.00	0.00
HVTL								
DEIS/FEIS Preferred								
Alternative 1 - 30 feet on 37/39 Line plus use of existing 38 Line ROW	19.21	40.41	59.62	0.04	59.66	0.00	0.20	0.20
Natural Gas Pipeline								
DEIS/FEIS Preferred								
Alternative 1	0.00	0.47	0.47	0.00	0.47	23.99	0.33	24.32
Process Water Pipeline								
DEIS/FEIS Preferred								
All Lines	0.26	1.07	1.33	0.00	1.33	0.79	0.19	0.98
Potable Water & Sanitary Sewer Pipeline								
DEIS/FEIS Preferred	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL								
DEIS Preferred	19.47	43.76	63.23	3.27	66.50	24.78	1.21	25.99
FEIS Preferred	19.47	41.95	61.42	0.48	61.90	24.78	0.72	25.5

F2.5.5 Future Wetland Impact Minimization and Mitigation

The wetland acreages impacted by the project as summarized in Sections F2.3.3.1, F2.3.3.2 (these could be changing) and in Section 4.7 represent the maximum potential impacts, as determined based on preliminary engineering designs. DOE expects that during the wetland permitting process and final design of the project additional efforts to avoid and minimize wetland impacts would be considered as described in the following sections. Once the USACE designates the Least Environmentally Damaging Practicable Alternative (LEDPA), Excelsior would initiate additional engineering investigations and proceed with final design. During final design additional refinements could result in a reduction in the wetland impacts from those

described in the FEIS. However, such opportunities may be not be equally available at the two sites. As noted in Section F2.5.4.1.2, the MDNR has indicated that placement of the IGCC Power Station on the East Range site should be reviewed in conjunction with mining and operating plans being developed for nearby mining expansions. Such joint review processes could affect the degree to which design refinements could be expected to reduce wetland impacts, Once final design is complete, Excelsior would mitigate all identified wetland impacts at a size, type, and location acceptable to the USACE and state agencies. In addition, DOE may also include language with respect to minimization and/or mitigation of impacts as a condition of the Record of Decision, if necessary to fulfill DOE's obligations under 10 CFR 1022.

Pursuant to 10 CFR 1022.13(a)(3) "DOE shall evaluate measures that mitigate the adverse effects of actions in a...wetland including but not limited to minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically sensitive areas." DOE, working with the USACE and Excelsior, has evaluated a variety of new alternatives in Appendix F2 in order to avoid and minimize wetland impacts to the extent possible based on current information and preliminary engineering work on the alternatives. As noted previously, there are methods and procedures that can be used in the final design, permitting and construction of the project that are described below.

F2.5.5.1 Minimize Area of Filling

There are a variety of design options to be exercised and evaluated during the design and permitting of the project that could reduce the area of wetlands to be filled. Some of the options available to the project proponent include:

- When placing fill, instead of employing grass embankments on a 3:1 slope down to the adjacent wetlands, design options could include 2:1 embankments, gabion walls or retaining walls to minimize the footprint of disturbance. The deeper the fill (and therefore the longer the side slope) the more important this is. This approach is effective for all areas of filling whether for the power plant, the access roads, or the new rail lines. These design alternatives can only be evaluated during final design, when additional soil boring information is collected.
- The final tiering of the plant site has the potential to affect wetlands filled. For example, the tiering alternatives presented for the Northeast and West locations at the West Range demonstrated that the elevation of different areas of the site could dramatically affect the volume of excess cut. In the same way, if the elevations of those perimeter portions of the site that result in the filling of wetlands could be lowered, the area of wetlands impacted could be reduced. For example, if 3:1 side slopes need to be employed, for every foot that the elevation could be reduced the toe of slope into the wetland could be pulled back three feet.
- If, because of grade issues, roads or especially railways need to be placed on high embankment areas with a corresponding wide footprint, consideration would be given to placing some of the rail line or roadway on elevated structures to minimize the wetlands impacted.
- In Section 4.7, both the permanent and temporary ROWs for the railroads and the entire permanent ROWs of the roads are assumed to be totally impacted, with all wetlands filled. During the design process, every attempt would be made to minimize the footprint of the actual permanent fill, thus reducing, potentially by a large amount, the actual wetlands to be filled.

F2.5.5.2 Maximize Hydrologic Connections

In order to maintain many of the wetland functions such as flood control, sediment trapping and wildlife habitat, adequate drainage across and through the road and rail ROWs must be maintained. Some of the options available include:

- Frequent spacing of culverts under roadways and railroads;

- Installing several larger culverts that are frequently flowing or inundated with open bottoms that allow the natural substrate of the stream to remain; and
- Grade for wide grass swales wherever practicable.

F2.5.5.3 Limit the Number of Wetland Functions Impacted

During the design and construction process, efforts would be taken to minimize the temporary impacts to wetlands and to minimize the permanently filled wetlands. Some of the options available include:

- The entire temporary and permanent utility ROWs have been assumed to be impacted in the calculations presented in Appendix F2 and Section 4.7. Once the USACE selects the LEDPA, Excelsior would delineate the wetlands in all of the utility corridors to be constructed. Once the exact location is determined, the following design and construction measures would be employed to the extent possible:
  - Locate above ground features (e.g. HVTL poles) outside wetlands;
  - Avoid temporary impacts by not placing construction materials, backfill material, or excavated soil in wetlands;
  - Limit the compression of temporarily disturbed wetland soils by minimizing heavy vehicular traffic across the compressible soils.
- In wetlands to be temporarily disturbed, stockpile the organic topsoil so that the existing substrate can be replaced after construction has been completed. Design roads and railroads to be as close to existing grade as possible, since the smaller the depth of fill, the smaller corresponding width of filling that would be required.

F2.5.5.4 Best Management Practices (BMPs)

The final selection and inclusion of appropriate BMPs would be made during the permitting and design of the project. They would be specified in the construction documents. There are a multitude of BMPs related to stormwater and other indirect impacts to wetlands, which are discussed at numerous websites, including:

USEPA: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

The Minnesota Pollution Control Agency: http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html *and* http://www.pca.state.mn.us/water/pubs/sw-bmpmanual.html

University of Minnesota Water Resources Center:
http://wrc.umn.edu/outreach/stormwater/bmpassessment/

Some additional information may be available for and included in the ROD. More detailed discussions concerning USACE permitting may be found in EIS Section 4.7.7. Discussions pertaining to stormwater permitting may be found in EIS Section 4.5.2.5.

F2.5.5.5 Ensure Implementation of Mitigation Measures and BMPs

- Ensure that suitable language is included in the contract documents for the contractor;
- Require the cont*ractor to provide environmental awareness and safety t*raining for all employees;
- Specify, in the contract, procedures and timing for regular inspection of all mitigation measures and BMPs to be employed during construction.

F2.5.5.6 Wetland Replacement Plan

F2.5.5.6.1. Wetland Replacement Siting – On Site Replacement

The wetland replacement plan would be developed in an amount, type, and location as agreed to by the agencies in the permitting process. An example discussion relating to the West Range is provided below.

On site or project specific mitigation opportunities within the West Range Site were evaluated as a first priority. There are no effectively drained wetlands nor any partially drained basins with restoration potential within the West Range Site, or in the surrounding area.

On site wetland replacement through wetland creation was evaluated as a second priority. Conceptually, wetland creation would involve the expansion of existing wetlands to create new wetland habitat. Several site characteristics make wetland creation on the site unfeasible.

- The West Range Site is located at the headwaters of two subwatersheds. This limits the contributing watershed area and the available surface hydrology for created wetland basins.
- With an inability to provide adequate surface hydrology, the ability to intersect the groundwater table to provide hydrology was assessed. Much of the topography and upland conditions adjacent to the West Range Site wetlands is rugged, steep hills. Excavation around existing wetlands to a depth to intersect groundwater would require large amounts of excavation, often as much as 50 to 90 feet.
- Areas of the site that are not wetland are typically upland forested habitat. It is understood that USACE policy discourages the use of undisturbed, forested uplands for the purposes of wetland mitigation.
- Creating wetland extensions would introduce a disturbance element within the adjacent existing wetlands and serve as a potential vector for invasive species into areas where there are currently no invasive species.

Although the on site mitigation opportunities are severely limited by the abovementioned factors, the potential to provide at least of portion of mitigation on site was evaluated. The corridors where the railroad and access roadway will be constructed into the project site will be cleared and otherwise disturbed during construction. The construction of these facilities will also result in wetland filling (as described above) and could provide opportunities for creation of wetland habitat by expanding wetland areas within those construction corridors. However, the same limiting factors described above apply to the linear transportation corridors. The topography limits the feasibility of creating wetland habitat adjacent to the new roadway or railroad. Although the feasibility appears to be minimal, the potential for mitigation within these corridors will continue to be assessed and evaluated as the roadway and railroad are designed.

F2.5.5.6.2. Off Site Wetland Replacement – Wetland Bank Credits

After exhaustion of effort to identify onsite mitigation opportunities, the availability of existing wetland banking credits was assessed. The State Wetland Bank Account Listing link on the Minnesota Board of Water and Soil Resources web site was reviewed to identify and contact potential existing wetland banks for wetland credit availability. All of the wetland banks located within the major watershed, Itasca County, and for that matter in all of northern Minnesota were contacted to identify available wetland credits. The following paragraphs summarize the findings regarding available mitigation credits in the State Wetland Bank Account Listing:

- There are no wetland banks in Itasca County and no available wetland credits shown on the List.

- There are no wetland banks in the two major watersheds or in adjacent major watersheds shown on the List.
- Four wetland bank sites are listed in neighboring counties in northern Minnesota; two in St. Louis County and two in Roseau County. The account managers for each site were contacted and informed us that credits were no longer available. All of the credits were sold by November 2006.

After review of the State Wetland Bank Account List, LGUs and agency staff in the project area were contacted to discuss and identify potential wetland mitigation opportunities that are not represented on the List. These include sites proposed for development, suitable for further investigations as a potential mitigation site, or developed sites not yet enrolled in the State Wetland Bank. Communication records with each respective agency are summarized below.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) Regulatory Branch Project Manager was contacted regarding suggestions on available and potential wetland mitigation opportunities for the project. No specific sites were known or recommended by the USACE. It was recommended that the U.S. Forest Service (USFS) be contacted to see if there were any opportunities to restore wetlands on decommissioned roads in the Chippewa National Forest (CNF). The USFS did not have available funding earmarked for the decommissionings but is offering the wetland credits to any entity willing to fund decommissionings. Complete funding to decommission a forest road is too cost prohibitive for the purpose of wetland mitigation. No other wetland replacement options or suggestions were recommended by the USACE.

U.S. Fish and Wildlife Service

The Ecological Services division in the Twin Cities Field Office of the U.S. Fish and Wildlife Service (USFWS) was contacted to identify any existing or potential wetland mitigation opportunities. Wildlife Biologists at the Field Office are involved in wetland permitting and planning actions in support of their regulatory program requirements and have a good knowledge of wetland mitigation in northern Minnesota. Similar to their federal counterparts at the USACE, the USFWS did not know of any existing or potential opportunities for wetland mitigation in the region.

Itasca Soil and Water Conservation District

The Itasca Soil and Water Conservation District (SWCD) is the WCA LGU for Itasca County and also has in depth knowledge of the land resources in the county, including potential wetland mitigation sites. The Itasca SWCD mentioned two potential mitigation sites; a confidential site in development, no additional information could be provided; and a 10 acre site in development that will be enrolled in the State Wetland Bank. No other existing or potential wetland replacement opportunities were provided by the Itasca SWCD.

Koochiching Soil and Water Conservation District

The Koochiching SWCD was contacted to identify available and potential wetland mitigation opportunities in the county. The county currently has approximately 20 acres of available wetland credit, but they are reserving these for future county projects and anticipates using them all by 2008 due to the extensive wetland base in the county.

F2.5.5.6.3. Off Site Wetland Replacement – Project Specific Replacement

After identification of existing wetland bank credits was unsuccessful, efforts were initiated to identify opportunities for off-site, project specific mitigation. These efforts consist of using GIS and available data to screen the surrounding area to identify suitable sites for development of wetland mitigation.

This screening effort is not yet complete. The following paragraphs describe the steps to be taken.

Search Area

The search area is within Wetland Bank Service Area #5 and in adjacent watersheds located in adjacent Wetland Bank Service areas including Service Areas #2 and #3. The West Range Site is located at the top of a watershed, just inside Service Area #5 along its border with Service Area #2.

- Major Watershed #9 – Mississippi River (Grand Rapids).
  - Adjacent Major Watersheds within the USACE Bank Service Area #4 including #7 Mississippi River (Headwaters, Lake Winnibigoshish), #8 Leech Lake River, #10 Mississippi River (Brainerd), and # 11 Pine River.
  - Adjacent Major Watersheds bordering Major Watershed #9 that are not Mississippi River tributaries but are within USACE Bank Service Area #4
- Itasca County where the West Range Site is located and adjacent counties within USACE Bank Service Area #5 including
- Counties adjacent to Itasca County including Aitken, Cass, and Crow Wing.
- Other counties adjacent to those in “e” that are also within the MNDNR defined Laurentian Mixed Forest Ecoregion including Lake of the Woods County, Beltrami County, Hubbard County, Crow Wing County, Carlton County, Pine County, and Lake County in adjacent Wetland Bank Service Areas.

Screening Process

The screening for potential mitigation sites will utilize the following data, either exclusively or concurrently. Numerical or other weighting of attributes will be used to identify characteristics suitable for mitigation (i.e., drainage, hydric properties, ownership, etc.)

The NWI database will be mapped in these areas using GIS to identify existing wetlands that may have been historically altered by ditching, partial drainage, or some other hydrological alteration or change in wetland type.

The MNDNR Protected Waters Inventory (PWI) digital maps will be reviewed to identify features suggesting hydrological alterations and or changes in wetland type. PWI maps also often show ditches and drainage signatures as well.

If available, county ditching and drainage maps and data will be mapped and/or reviewed to identify hydrologically altered wetlands. These may be coupled with or also determined by reviewing aerial photographs and USGS Quad maps as well to identify drainage features and ditches.

Subwatershed boundaries will be mapped and overlain on these resources and reviewed as stand alone maps to identify mitigation opportunities.

Tax forfeiture parcels and designated school trust lands that are mapped and available from the counties will be reviewed to identify tracts of land that are potentially available.

State and federally owned and/or managed parcels that are eligible for wetland mitigation projects will be reviewed if available. These are expected to be limited to state forest lands, some national forest holdings, or some other holding where policy allows for outside funded wetland mitigation.

Gravel pits and borrow pits will be mapped and reviewed.

Screening Criteria

Potential sites identified by screening will be mapped and subjected to additional, secondary screening criteria. The following are generalized and provided for example. Other criteria may be developed during the screening process.

1. Extent of altered wetland types (mostly vegetation) and hydrology will be ground truthed.
2. Existence of nuisance vegetation.
3. Restoration needs in terms of construction to restore hydrology will be estimated.
4. Number of parcels or ownerships that could be affected by the scope of a restoration on the subject wetland will be evaluated.
5. Roads, rail corridors, homes and utility lines potentially affected by or facilitating hydrological restoration of the subject wetland will be verified. Many of these will be shown on the above referenced maps and data sources and will be field verified.
6. Degree of degradation of ditching within the subject wetland will be determined by ground truthing.
7. Extent of beaver activity will be noted.
8. Proximity to towns and other developments.
9. Surrounding topography grades, slopes, and the configuration of the subject wetland basin will be noted.
10. Open water.
11. Dead wetland trees and snags.
12. Ditch and stream channel course configuration, flow direction, and general notes an rates and volumes will be determined when possible.
13. Proximity to lakes, rivers, and major waterbodies.

Depending on the number of sites evaluated and complexity of the above mentioned variables, a ranking matrix may be established were each variable is scored. Regardless, detailed written descriptions of each evaluated site will be prepared to prioritize potential sites and screen those from further consideration.

Priority sites will be further analyzed for their potential as viable wetland mitigation sites by developing conceptual mitigation plans. This will include identifying the methods, engineering structures and designs, and site acquisition approaches needed, as well as the extent of potential wetland replacement credit eligible for each potential site. Priority sites determined to be preferential by Excelsior the USACE, and the WCA TEP will be recommended for initiation of right-of-way acquisition accomplished through Excelsior designated land agents. Details of these sites, including restrictions and covenants, will be addressed in the wetland replacement plan if the land acquisition efforts are successful.

After identification of the preferred mitigation site, a wetland replacement plan will be developed. The plan will include a vegetation management plan and exotic species control plan as well as monitoring schedules, design details, applicable restrictions and covenants, and summaries of the anticipated wetland credits.

It is expected that the off site screening analysis will be completed early spring of 2008. The results will be summarized submitted as an addendum to this wetland permit application.

F2.5.6 West Range Wetland Impacts

The proposed project includes actions across the West Range Site, i.e., those within the IGCC Power Station Footprint and Buffer Land and the linear corridors along which the power transmission, gas pipeline, and other associated facilities traverse. Details about the project elements are described in Section 2.3. The following sections describe the wetland impacts that will result from the construction of each project element. Wetland impacts are described as wetland fill, temporary wetland disturbance, and wetland type conversion resulting from vegetation removal within each of the following sections. After all off the individual elements are discussed, a summary of wetland impacts across the West Range Site is presented in Table F2-22 in Section F2.5.6.9.

F2.5.6.1 IGCC Power Station Footprint

The IGCC Power Station Footprint is located near the center of the West Range site in a topographic saddle and between two large wetland complexes. There are two alternative locations: the preferred location as contained in the DEIS (the Central-DEIS, Figure F2-5) and a new location in which the plant would be slid 280 feet to the northwest (the Central-FEIS, Figure F2-7). Table F2-8 is a summary of wetland impacts for each phase of the DEIS and FEIS IGSS Power Station Footprint, including grading associated with each plant footprint.

Table F2-8. Comparison of Preferred and Original Plant Site Wetland Impacts

	Phase I[1] (acres)	Phase II (acres)	Total (acres)
Central - FEIS	13.62	17.74	31.36
Central - DEIS	20.96	13.62	34.58

[1] Impacts due to grading limits for the entire IGCC Power Station Footprint are included in the Phase 1 Impacts.
[2] Phase I and Phase II were reversed in the Original Site Plan.

The new site placement minimizes wetland fill within the plant footprint and maintains hydrologic connectivity and the existing flow pattern from northeast to southwest within Wetland A1. This would avoid potential indirect impacts to 7.34 acres of wetlands. Construction of the IGCC Power Station Footprint will impact 31.34 acres of wetland habitat. The impact footprint includes the Power Station footprint and grading of the adjacent area at a 3:1 slope to meet the natural grade of the surrounding area. Wetland impacts from the IGCC Power Station Footprint, including areas of grading limits, are summarized in Tables F2-9 (Central-DEIS) and F2-10 (Central-FEIS) and are shown on Figure F2-27, which also includes the Eggers & Reed classifications.

The IGCC plant will be constructed in two phases. Mesaba One is expected to be constructed between 2010 and 2014. Construction of Mesaba Two is expected to begin in 2012.

Table F2-9. Wetland Fill for West Range (Central DEIS) IGCC Power Station with Grading Limits

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions		Wetland Fill (acres)		
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	Phase I[2]	Phase II	Total
A1	PEMB/PSS1/PFO4	Type 3/6/8	Shallow Marsh/Shrub Carr/Coniferous Bog	High	Moderate	1.05	11.51	12.56
A4	PFO1C/F	Type 7	Hardwood Swamp	Moderate	High	18.08	1.51	19.59
A13	PFO1B	Type 7	Hardwood Swamp	High	High	0.40	0.00	0.40
A14	PFO1B	Type 7	Hardwood Swamp	High	High	0.45	0.00	0.45
A20	PFO1C	Type 7	Hardwood Swamp	High	High	0.19	0.00	0.19
A21	PEMC/PFO1C	Type 3/7	Shallow Marsh/ Hardwood Swamp	High	High	0.01	0.00	0.01
A23	PEMC/PFO1C	Type 3/7	Shallow Marsh/ Hardwood Swamp	High	High	0.24	0.00	0.24
A25	PFO1C	Type 7	Hardwood Swamp	High	High	0.18	0.00	0.18
A26	PFO1C	Type 7	Hardwood Swamp	High	High	0.03	0.00	0.03
A27	PFO1C	Type 7	Hardwood Swamp	High	High	0.07	0.00	0.07
A28	PEMC/PFO1C	Type 3/7	Sedge Meadow/ Hardwood Swamp	High	High	0.22	0.00	0.22
A29	PEMC/PFO1C	Type 3/7	Sedge Meadow/ Hardwood Swamp	High	High	0.00	0.08	0.08
A30	PEMC	Type 3	Shallow Marsh	High	High	0.00	0.04	0.04
A31	PFO1C	Type 7	Hardwood Swamp	High	High	0.00	0.48	0.48
B2	PFO1A	Type 7	Hardwood Swamp	High	High	0.04	0	0.04
					Total	**20.96 acres**	**13.62 acres**	**34.58 acres**
						Isolated by Power Station		
A1	PEMB/PSS1/PFO4	Type 3/6/8	Shallow Marsh/Shrub Carr/Coniferous Bog	High	Moderate	**7.34**		**7.34**

[1] Dominant wetland types for wetland complexes are shown in bold and represent the dominant type within the impact area as determined from field delineation data.
[2] Impacts due to grading limits for the entire plant site are included in the Phase 1 Impacts.

Table F2-10. Wetland Fill for West Range (Central FEIS) IGCC Power Station

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions[2]		Wetland Fill (acres)		
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	Phase I[3]	Phase II	Total
A1	PEMB/PSS1/PFO4	Type 3/6/8	Shallow Marsh/Shrub Carr/Coniferous Bog	High	Moderate	7.31		7.31
A4	PFO1C/F	Type 7	Hardwood Swamp	Moderate	High	5.36	16.00	21.36
A13	PFO1B	Type 7	Hardwood Swamp	High	High	0.06	0.29	0.35
A14	PFO1B	Type 7	Hardwood Swamp	High	High	0	0.44	0.44
A15	PEMC/PFO1C	Type 3/7	Shallow Marsh/ Hardwood Swamp	High	High	0.01	0.21	0.22
A20	PFO1C	Type 7	Hardwood Swamp	High	High	0	0.19	0.19
A21	PEMC/PFO1C	Type 3/7	Shallow Marsh/ Hardwood Swamp	High	High	0	0.01	0.01
A22	PEMC/PFO1C	Type 3/7	Shallow Marsh/ Hardwood Swamp	High	High	0	0.04	0.04
A23	PEMC/PFO1C	Type 3/7	Shallow Marsh/ Hardwood Swamp	High	High	0	0.24	0.24
A25	PFO1C	Type 7	Hardwood Swamp	High	High	0	0.18	0.18
A26	PFO1C	Type 7	Hardwood Swamp	High	High	0	0.03	0.03
A27	PFO1C	Type 7	Hardwood Swamp	High	High	0	0.07	0.07
A28	PEMC/PFO1C	Type 3/7	Sedge Meadow/ Hardwood Swamp	High	High	0.18	0.04	0.22
A29	PEMC/PFO1C	Type 3/7	Sedge Meadow/ Hardwood Swamp	High	High	0.08	0	0.08
A30	PEMC	Type 3	Shallow Marsh	High	High	0.04	0	0.04
A31	PFO1C	Type 7	Hardwood Swamp	High	High	0.48	0	0.48
B2	PFO1A	Type 7	Hardwood Swamp	High	High	0.10	0	0.10
					Total	**13.62 acres**	**17.74 acres**	**31.36 acres**

[1] Dominant wetland types for wetland complexes are shown in bold and represent the dominant type within the impact area as determined from field delineation data.
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.
Impacts due to grading limits for the entire IGCC Power Station Footprint are included in the Phase 1 Impacts.

F2.5.6.2 Rail Alignment

The rail line (Railroad Alternative 1A), which pairs with the Central DEIS plant location, will pass-by the plant footprint and loop around a wetland complex as shown on Figure F2-5. This rail loop will be 21,539 feet in total length, with a rail loop of 9,838 feet at an elevation of 1390. It will result in 17.93 acres of wetland fill. The wetland impacts summarized in Table F2-11 include all wetlands within the construction limits of the proposed rail line, including a 3:1 slope along the railroad embankments. It would also create the potential indirect impacts for wetlands within the loop (58.3 acres).

Table F2-11. Wetland Fill for West Range Railroad Alternative 1A

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions[2]		Wetland Fill (acres)
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	
A1	PEMB/PSS1/PFO4	Type 3/6/8	Shallow Marsh/Shrub Carr/Coniferous Bog	High	Moderate	3.15
A3	PFO1C	Type 7	Hardwood Swamp	High	High	0.10
A4	PFO1C/F	Type 7	Hardwood Swamp	Moderate	High	12.65
C12	PSSC1	Type 6	Alder Thicket	High	Moderate	0.62
C13	PSS1C/PFOC1	Type 6/7	Alder Thicket/ Hardwood Swamp	High	Moderate	0.22
C15	PSS1C	Type 6	Alder Thicket	High	Moderate	0.07
D8	PEMC/PFO1C/PFO4B	Type 3/7/8	Shallow Marsh/Hardwood Swamp/Coniferous Bog	High	Moderate	0.32
D10	PEMC/PSSA1C	Type 3/6	Sedge Meadow/ Shrub Carr	High	High	0.51
NWI	n/a	Type 6	Assumed Alder Thicket	n/a	n/a	0.30
					Total	**17.94 acres**
Center Loop						**Isolated within Rail Loop**
A4	PFO1C/F	Type 7	Hardwood Swamp	Moderate	High	**58.30 acres**

n/a = not available

The proposed rail line (Railroad Alternative 3B), which pairs with the Central FEIS plant location, will intersect the northeastern portion of the plant footprint and loop around the hill in the northeastern portion of the site as shown on Figures F2-7 and F2-27. This rail loop will be 22,070 feet in total length, with a rail loop of 15,303 feet at an elevation of 1405. It will result in 5.73 acres of wetland fill. The wetland impacts summarized in Table F2-12 include all wetlands within the construction limits of the proposed rail line, including a 3:1 slope along the railroad embankments.

Although rail yard operations will be less than optimal because the onsite rail sidings will be dead-end spurs instead of continuous sidings, this rail alternative reduces the area of wetland fill from 17.9 acres to 5.7 acres and avoids potential indirect impacts to 58.3 acres of wetlands. Changes in the design of the nearby short line rail that will serve the Minnesota Steel Industries, LLC plant will allow the elevation of Excelsior's rail loop

to be raised. This will reduce the cut required for construction of this alternative and minimize the resulting volume of excess material.

Table F2-12. Wetland Fill for Railroad Alternative 3B

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions[2]		Wetland Fill (acres)
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	
A1	PEMB/PSS1/PFO4	Type 3/6/8	Shallow Marsh/Shrub Carr/Coniferous Bog	High	Moderate	2.05
A3	PFO1C	Type 7	Hardwood Swamp	High	High	0.10
A4	PFO1C/F	Type 7	Hardwood Swamp	Moderate	High	0.27
A40	PEMC/PSS1C	Type 3/6	Shallow Marsh/ Alder Thicket	High	High	0.06
B15	PEMB/PSS1C/PFO1A	Type 2/6/7	Wet Meadow/ Alder Thicket	High	High	0.14
C12	PSSC1	Type 6	Alder Thicket	High	Moderate	0.62
C13	PSS1C/PFOC1	Type 6/7	Alder Thicket/ Hardwood Swamp	High	Moderate	0.22
C15	PSS1C	Type 6	Alder Thicket	High	Moderate	0.08
D8	PEMC/PFO1C/PFO4B	Type 3/7/8	Shallow Marsh/Hardwood Swamp/Coniferous Bog	High	Moderate	0.56
D10	PEMC/PSSA1C	Type 3/6	Sedge Meadow/ Shrub Carr	High	High	0.38
D12	PEMC/PFO1C	Type 3/7	Sedge Meadow/ Hardwood Swamp	High	High	0.01
D13	PEMC/PFO1C	Type 3/7	Sedge Meadow/ Hardwood Swamp	High	High	0.04
D14	PSS1C/PFO1C	Type 6/7	Shrub Carr/ Hardwood Swamp	High	High	0.61
NWI[3]	PSSB	Type 6	Assumed Alder Thicket	N/A	N/A	0.29
NWI[3]	PSSB	Type 6	Assumed Alder Thicket	N/A	N/A	0.16
NWI[3]	PSSB	Type 6	Assumed Alder Thicket	N/A	N/A	0.14
					Total	**5.73 acres**

[1] Dominant wetland types for wetland complexes are shown in bold and represent the dominant type within the impact area as determined from field delineation data.
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.
[3] NWI basins are those areas that have not been field investigated. Cowardin classifications are taken from the NWI. Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classification, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.

F2.5.6.3 Plant Access Road

The DEIS proposed road corridor (see Figure F2-6) was designed with the intention of intersecting a new CR 7 alignment proposed by Itasca County that would extend eastward off the existing CR 7 just south of West Range Site, run east between Dunning Lake and Big Diamond Lake, and then turn south between Arcturus

Mine and Big Diamond Lake to intersect with U.S. 169. The realignment was proposed to improve truck traffic access and reduce conflicts between slow, heavy trucks and passenger vehicles.

Due to the unavailability of state bonding money for the project, Itasca County does not intend to construct the new roadway in the foreseeable future. Because of this and to attempt to reduce wetland impacts additional options for road access to the West Range Site were investigated. Road access to the FEIS IGCC Power Station would be from CR 7 to the south and west as shown in Figures F2-7 and F2-27. This road alignment provides the shortest access to CR 7 and minimizes impacts to wetlands. Wetland impacts will include wetland fill for roadway construction and temporary impacts from ROW establishment.

F2.5.6.3.1. Wetland Fill

Wetland fill impacts for the access road construction were calculated assuming fill across the width of the 120-foot wide permanent ROW. Table F2-13 provides a summary of wetland within the construction limits of the proposed DEIS roadway (5.67 acres) and Table F2-14 for the FEIS roadway (0.19 acres).

Table F2-13. Wetland Fill for West Range DEIS Plant Access Road

Basin ID	Dominant Wetland Classification			Selected MnRAM Functions		Wetland Impact Area (acres)
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	
A1	PEMB/PSS1/ PFO4	Type 3/6/8	Shallow Marsh/**Shrub Carr**/Coniferous Bog	High	Moderate	3.44
A13	PFO1B	Type 7	Hardwood Swamp	High	High	0.24
A14	PFO1B	Type 7	Hardwood Swamp	High	High	0.14
A27	PFO1C	Type 7	Hardwood Swamp	High	High	0
C21	PSS1C	Type 6	Alder Thicket	High	Moderate	0.33
C22	PSS1C	Type 6	Alder Thicket	High	Moderate	0.09
C23	PSS1C/ PFO1C	Type 6/7	Alder Thicket/Hardwood Swamp	High	Moderate	0.36
C24	PFO2B	Type 8	Coniferous Bog	High	Moderate	0.34
C26	PFO1C	Type 7	Coniferous Swamp	High	High	0
C27	PFO1C	Type 7	Coniferous Swamp	High	Moderate	0.01
NWI Basin*	n/a	Type 4	Assumed Deep Marsh	n/a	n/a	0.43
NWI Basin*	n/a	Type 6	Assumed Alder Thicket	n/a	n/a	0
NWI Basin*	n/a	Type 7	Assumed Hardwood Swamp	n/a	n/a	0.19
NWI Basin*	n/a	Type 8	Assumed Coniferous Bog	n/a	n/a	0.10
					Total	**5.67 acres**

n/a = not available

Table F2-14. Wetland Fill for FEIS Plant Access Road

Basin ID	Dominant Wetland Classification			Selected MnRAM Functions[1]		Wetland Impact Area (acres)
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	
A11	PEMC	Type 3	Shallow Marsh	Moderate	High	0.004
F1	PSS1C	Type 6	Alder Thicket	High	High	0.19
					Total	**0.194 acres**

[1]Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.

F2.5.6.3.2. Temporary Wetland Impacts

Temporary wetland impacts associated with FEIS road construction assume a 200-foot wide construction ROW. This ROW will be shared with several process water pipelines and the potable water and sanitary sewer pipelines for a portion of its length. The total temporary wetland impacts are 0.21 acres (as compared to 2.98 acres for the DEIS alternative), which includes 0.08 acres of Type 3 shallow marsh and 0.13 acres of Type 6 alder thicket.

F2.5.6.4 Power Transmission Lines

Excelsior's proposed HVTL Route (a.k.a.WRA-1) for interconnecting Mesaba One and Two to the Blackberry Substation is shown on Figure F2-12. The only portion of the HVTL alignment that was accessible for wetland delineation is the segment north of Highway 169. Wetland impacts along the remainder of the alignment have been estimated from the NWI.

Figure F2-12 shows Excelsior's Preferred HVTL Route for interconnecting to the Blackberry Substation. The preferred 345kV double circuit HVTL route (Route WRA-1) extends east from the IGCC Power Station's high voltage switchyard to Minnesota Power's (MP) existing 45 Line ROW along new greenfield ROW. The route would then head south from the southern boundary of the Buffer Land about 1.6 miles to the retired Greenway Substation along existing ROW. The route continues south from the Greenway Substation approximately 6.2 miles over new ROW to intersect MP's 230kV 83 Line and 115kV 20Line. At that point, the route follows the existing MP ROW about one mile east to the Blackberry Substation. Route WRA-1 is shown in more detail in Figures 2-28a, b, c. Approximately 3.7 miles of the HVTL would be constructed in new greenfield ROW with the remainder co-located with existing HVTL ROW or the proposed natural gas pipeline (lengths of which will include greenfield areas). Where new ROW will be established in greenfield areas, a 150-foot ROW will be established for construction. A permanent 100-foot ROW will be maintained to be clear of trees and shrubs.

The HVTL would share ROW with the natural gas pipeline along approximately 4.7 miles of the proposed alignment, from Birch Drive to the West Range site property boundary, minimizing tree clearing and wetland impacts.

Temporary wetland disturbance during construction would be minimized by performing construction during winter months or through use of construction mats to minimize rutting by equipment and disturbance of wetland vegetation. Where construction within wetland habitat can not be avoided, best management practices will be employed to minimize disturbance. Extra workspace areas, access roads, and contractor staging areas will be located outside of wetland areas to the greatest extent possible. Where avoidance of wetland disturbance is not possible, temporary roads and work areas would be removed and wetland restored following completion of construction.

Wetland impacts along the HVTL alignment will include wetland fill for power pole placement, temporary impacts to scrub-shrub habitat in temporary work spaces (areas within the construction ROW but outside the permanent ROW), and conversion of scrub-shrub and forested habitat within the permanent ROW.

F2.5.6.4.1. Wetland Fill

Wetland fill would be limited to those areas where power poles will be placed within wetlands. Each pole is assumed to require an estimated 28 square feet of fill. It is assumed that power poles will be placed evenly, every 800 feet along the alignment. Using this assumption, 15 power poles would be placed within wetland habitat and would result in approximately 0.01 acres of wetland fill as summarized in Table F2-15.

The actual location of the power poles will be determined during project design, once the final HVTL alignment is approved and defined by the MPUC. Placement of the poles will consider avoidance of wetland habitat to the greatest extent feasible. In addition to avoiding wetland impact, location of the poles outside wetland habitat will improve construction access and stability of the poles. However, the maximum distance between poles is approximately 1,000 feet which could limit avoidance across long expanses of wetland habitat.

Table F2-15. Wetland Fill for HVTL Alignment WRA-1

Basin ID	Wetland Classification			Selected MnRAM Functions[2]		Wetland Fill	
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	# Poles	Area (acres)
A1	PEMB/PSS1/PFO4	Type 3/6/8	Shallow Marsh/Shrub Carr/Coniferous Bog	High	Moderate	1	0.0006
NWI Basin[1]	n/a	Type 6	Assumed Alder Thicket	Unknown	Unknown	4	0.0026
NWI Basin[1]	n/a	Type 7	Assumed Hardwood Swamp	Unknown	Unknown	4	0.0026
NWI Basin[1]	n/a	Type 8	Assumed Coniferous Bog	Unknown	Unknown	6	0.0039
					Total	**15**	**0.01**

[1] NWI basins are those areas that have not been field investigated. Cowardin classifications are taken from the NWI. Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classification, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.
[2]Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.

F2.5.6.4.2. Wetland Type Conversion (Tree and Shrub Clearing)

Construction across greenfield areas and establishment of new ROWs will require clearing of vegetation in upland and wetland areas. Impacts to wetland vegetation would be of two types, temporary impacts to scrub-shrub habitat in temporary work spaces outside the permanent ROW and permanent conversion of scrub-shrub habitat within the permanent ROW and forested habitat within the permanent ROW. Temporary conversion would include removal of scrub-shrub vegetation in the temporary construction ROW but outside the permanent ROW. These areas would be allowed to revegetate following construction. Permanent conversion would include removal of scrub-shrub vegetation within the permanent ROW and removal of forest vegetation within the construction ROW. The permanent ROW would be maintained free of woody vegetation, resulting in conversion of scrub-shrub and forested wetland to emergent wetland habitat. Although forested wetland cleared outside of the permanent ROW but within the construction ROW would still be

allowed to revegetate, it is considered a permanent type conversion because of the length of time that regeneration would require. Table F2-16 provides a summary of wetland type conversion that would result from construction of the HVTL Alternative WRA-1.

Table F2-16. Wetland Conversion for HVTL Alignment WRA-1

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions[2]		Temporary Scrub-Shrub Wetland Impacts[3]	Permanent Wetland Type Conversion[4]
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality		
A1	PEMB/**PSS 1B**/PFO4	Type 3/**6**/8	Shallow Marsh, **Shrub Carr**, Coniferous Bog	High	Moderate	0.56 2.14 already clear	1.77
E5	PEMH	Type 8	Coniferous Bog	High	Moderate	0 (already clear)	0 (already clear)
NWI Basin[1]	n/a	Type 6	Assumed Alder Thicket	n/a	n/a	1.77	7.63
NWI Basin[1]	n/a	Type 7	Assumed Hardwood Swamp	n/a	n/a	0	6.84
NWI Basin[1]	n/a	Type 8	Assumed Coniferous Bog	n/a	n/a	0	19.92
					Total	**2.33 acres**	**36.16 acres**

[1] NWI basins are those areas that have not been field investigated. Cowardin classifications are taken from the NWI. Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classification, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.
[3]Temporary removal of scrub-shrub vegetation outside the 100-foot permanent ROW. Natural revegetation will be allowed following completion of construction.
[4]Permanent conversion of scrub-shrub vegetation within 100-foot permanent ROW and scrub-shrub and forested vegetation within the 150-foot construction ROW.

F2.5.6.4.3. Water Crossings

There are two water crossings associated with the HVTL alignments. (See Figure F2-28a,b,c). These crossings include a perennial stream between Big & Little Diamond Lakes and the Swan River. Wetland impacts within the bed of either water body will be avoided. The total length of water crossings for the HVTL WRA-1 alignment is estimated at 123 linear feet. A summary of the length of each water body crossing for the HVTL alignment is provided in Table F2-17.

Table F2-17. Water Crossings – HVTL WRA-1 Alignment

Water Crossing Location	Milepost (mile + linear feet)	MNDNR PWI?	Length of Crossing (linear feet)
Perennial stream between Big & Little Diamond Lakes (Basin E1)	0+3980	No	3
Swan River	3+1630	Yes	120
		Total	**123 linear feet**

F2.5.6.5 Natural Gas Pipeline

The Nashwauk Public Utilities Commission has recently received (April 2008) a Route Permit from the MPUC and plans to construct a 24-inch diameter natural gas pipeline past the IGCC Power Station Footprint to serve the Minnesota Steel Industries steel plant. If this pipeline is constructed as proposed, Excelsior would likely tap into it at the point where it turns eastward from the West Range site and would not construct a parallel pipeline as proposed in the Joint Application. However, because construction on the Nashwauk natural gas pipeline has not yet commenced, the Application assumes that Excelsior will construct its own natural gas pipeline.

The proposed alignment for the natural gas pipeline serving the West Range IGCC Power Station would require approximately 13.1 miles of utility right of way. The pipeline would essentially parallel the Nashwauk Public Utilities Commission's natural gas pipeline from the GLG natural gas pipeline near Blackberry to the West Range site as shown on Figure F2-14. The natural gas pipeline route is detailed in Figures F2-29a,b,c,d.

The natural gas pipeline will be constructed below grade within a 70-foot permanent ROW. Construction of the pipeline will result in temporary impacts to wetlands existing within the 100-foot construction ROW. Wetland fill impacts will be avoided by restoring wetland habitat after construction. Wetland impacts along the pipeline alignment will include temporary impacts to emergent wetlands within the construction corridor, temporary disturbance of scrub-shrub habitat in temporary work spaces (areas within the construction ROW but outside the permanent ROW) and permanent conversion of scrub-shrub and forested habitat within the permanent ROW where prior disturbance has not removed woody vegetation. Although vegetation outside of the permanent ROW will be allowed to revegetate, impacts to forested wetlands even outside the permanent ROW are considered permanent because of the length of time required for restoration of forested habitat.

As noted above, the exact location of the pipeline alignment will be determined during project design and will consider adjustments to avoid and minimize wetland habitat. The construction ROW will be located to minimize sidecasting in wetland habitat. Extra workspace areas, access roads, pipe storage yards, and contractor staging areas will be located outside of wetland areas to the greatest extent possible. Where avoidance of wetland disturbance is not possible, temporary roads and work areas will be removed and wetland restored following completion of construction.

Directional drilling will be employed where the gas pipeline crosses streams and protected watercourses. Although directional drilling is more expensive, where employed it will avoid temporary disturbance to streams and adjacent wetlands. The natural gas pipeline will cross four rivers and streams.

F2.5.6.5.1. Temporary Emergent Wetland Impacts

Permanent impacts to wetlands would be avoided by restoring wetland habitat after installation of the pipe. Material excavated from the trench would be sidecast to one side of the trench or the other. Preference would be given to sidecasting outside of wetland areas. Following pipe installation, soil would be returned to the trench in reverse of the removal (i.e. topsoil will be replaced on the surface). Disturbed wetland (and upland areas) would be reseeded with a native seed mix appropriate to the adjacent vegetative community. Indirect drainage effects to wetlands from groundwater collected and conveyed along the backfilled pipeline trench would be avoided by installation of anti-seepage collars on the pipe in strategic locations.

Table F2-18. Temporary Emergent Wetland Impacts for Natural Gas Pipeline

Basin ID	Dominant Wetland Classification			Selected MnRAM Functions[1]		Temporary Emergent Impact [2] (acres)
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	
E1	PEMC	Type 3	Shallow Marsh	High	Moderate	0.43
E2	PEMB	Type 2	Wet Meadow	High	Moderate	0.23
E4	PEMC	Type 3	Shallow Marsh	Moderate	Moderate	0.08
E6	PEMC	Type 3	Shallow Marsh	High	Moderate	0.17
E7	PEMC	Type 3	Shallow Marsh	High	High	0.33
NWI Basin[1]	n/a	Type 1	Assumed Floodplain Forest	Unknown	Unknown	0.70
NWI Basin[1]	n/a	Type 2	Assumed Wet Meadow	Unknown	Unknown	1.75
NWI Basin[1]	n/a	Type 3	Assumed Shallow Marsh	Unknown	Unknown	0.21
					Total	**3.90 acres**

[1] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.
[2] Temporary Emergent Impacts are wetland impacts to wetland Types 1-5 within the 150-foot temporary construction ROW.

F2.5.6.5.2. Wetland Type Conversion (Tree and Shrub Clearing)

If the Nashwauk Public Utilities Commission natural gas pipeline is not constructed and Excelsior's natural gas pipeline is constructed first, approximately 11.14 miles of the pipeline would be constructed in new greenfield ROW. Construction across greenfield areas and establishment of new ROW would require clearing of trees and shrubs in upland and wetland areas.

Impacts to wetland vegetation would be of two types, temporary impacts to scrub-shrub habitat in temporary work spaces outside the permanent ROW and permanent conversion of scrub-shrub habitat within the permanent ROW and forested habitat within the permanent ROW. Temporary conversion would include removal of scrub-shrub vegetation in the temporary construction ROW but outside the permanent ROW. These areas would be allowed to revegetate following construction. Permanent conversion would include removal of scrub-shrub vegetation within the permanent ROW and removal of forest vegetation within the construction ROW. The permanent ROW would be maintained free of woody vegetation, resulting in conversion of scrub-shrub and forested wetland to emergent wetland habitat. Although forested wetland cleared outside of the permanent ROW but within the construction ROW would still be allowed to revegetate, it is considered a permanent type conversion because of the length of time that regeneration would require. Table F2-19 provides a summary of wetland type conversion that would result from construction of the natural gas pipeline.

The location of the temporary construction and permanent rights-of-way will be determined during final design, once the final pipeline alignment is approved and defined by the MPUC. The pipeline design will consider adjustments to avoid and minimize wetland habitat.

Table F2-19. Wetland Conversion for Natural Gas Pipeline

Basin ID	Dominant Wetland Classification			Selected MnRAM Functions[2]		Temporary Scrub-Shrub Impacts[3] (acres)	Permanent Scrub-Shrub and Forested Conversion[4] (acres)
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality		
A1	PEMB/PS S1B/PFO4	Type 3/6/8	Shallow Marsh, Shrub Carr, Coniferous Bog	High	Moderate	0.01	1.50
E1	PEMC	Type 3	Shallow Marsh	High	Moderate	0	0
E2	PEMB	Type 2	Wet Meadow	High	Moderate	0	0
E4	PEMC	Type 3	Shallow Marsh	Moderate	Moderate	0	0
E5	PEMH	Type 8	Coniferous Bog	High	Moderate	0	0.13
E6	PEMC	Type 3	Shallow Marsh	High	Moderate	0	0
E7	PEMC	Type 3	Shallow Marsh	High	High	0	0
NWI Basin[1]	n/a	Type 1	Assumed Floodplain Forest	Unknown	Unknown	0	0
NWI Basin[1]	n/a	Type 2	Assumed Wet Meadow	Unknown	Unknown	0	0
NWI Basin[1]	n/a	Type 3	Assumed Shallow Marsh	Unknown	Unknown		0
NWI Basin[1]	n/a	Type 6	Assumed Alder Thicket	Unknown	Unknown	0.83	3.00
NWI Basin[1]	n/a	Type 7	Assumed Hardwood Swamp	Unknown	Unknown	0	9.16
NWI Basin[1]	n/a	Type 8	Assumed Coniferous Bog	Unknown	Unknown	0	2.59
					Total	**0.84 acres**	**16.38 acres**

[1] NWI basins are those areas that have not been field investigated. Cowardin classifications are taken from the NWI. Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classification, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.
[3]Temporary removal of scrub-shrub vegetation outside the 70-foot permanent ROW. Natural revegetation will be allowed following completion of construction.
[4]Permanent conversion of scrub-shrub vegetation within 70-foot permanent ROW and scrub-shrub and forested vegetation within the 100-foot construction ROW.

F2.5.6.5.3. Water Crossings

There are four water crossings associated with the proposed gas pipeline, as shown in Table F2-20. The Swan River will be crossed twice by the gas pipeline at approximate mileposts 4+2170 (feet) and 9+4560, as shown in Figures F2-29 a,b,c,d. Other water crossings include a tributary of the Swan River at Milepost 5+1460 and a perennial stream between Big Diamond and Little Diamond Lakes at Milepost 12+2000. The Natural Gas Pipeline will be directionally drilled under waterbodies starting approximately 100 feet from the edge of each waterbody. This will minimize impacts to wetlands associated with water crossings. Temporary wetland impacts are limited to those areas on either side of the waterbody where the pipeline emerges and open cut trenching begins.

The Swan River is listed as a protected water in the MNDNR Protected Waters Inventory. A License for Utility Crossings of Public Lands and Waters granted by the MNDNR Division of Lands and Minerals will be required to complete the water crossings of the Swan River.

Table F2-20. Water Crossings – Proposed Natural Gas Pipeline

Water Crossing Location	Milepost (mile + linear feet)	MNDNR PWI?	Length of Crossing (linear feet)
Swan River	4+2170	Yes	60
Tributary of Swan River	5+1460	No	10
Swan River	9+4560	Yes	60
Perennial stream between Big & Little Diamond Lakes	12+2000	No	3
		Total	**133 linear feet**

F2.5.6.6 Process Water Pipelines

The water supply system for the West Range site consists of three mine pits, three pumping stations, and an engineered orifice to draw water from the Prairie River as shown on Figure F2-15. The system would include three pipeline segments; one from Lind Mine Pit to the Canisteo Mine Pit (referred to as Segment 1), one from the Gross-Marble Mine Pit to the Canisteo Mine Pit (referred to as Segment 3), and one from the Canisteo Mine Pit to the West Range site (referred to as Segment 2).

Routing for the pipelines will be primarily on public property adjacent to existing transportation corridors. The pipelines will be constructed below grade within a 100-foot permanent ROW. Construction of the process water utilities will result in temporary impacts to wetlands existing within the 150-foot construction ROW. Wetland fill impacts will be avoided by restoring wetland habitat after construction. Wetland impacts along the pipeline alignments will include temporary impacts to emergent wetlands within the construction corridor, temporary disturbance of scrub-shrub habitat in temporary work spaces (areas within the construction ROW but outside the permanent ROW) and permanent conversion of scrub-shrub and forested habitat within the permanent ROW where prior disturbance has not removed woody vegetation. Although vegetation outside of the permanent ROW will be allowed to revegetate, impacts to forested wetlands even outside the permanent ROW are considered permanent because of the length of time required for restoration of forested habitat.

F2.5.6.6.1. Segment 1 - Lind Mine Pit to Canisteo Mine Pit

Process Water Pipeline Segment 1 will be constructed from the pump station on the northeast end of Lind Mine Pit, north to County Road 61 and then east to the Buckeye Mine pit, the southernmost portion of the Canisteo Mine Pit complex. The alignment traverses areas previously disturbed by mining and the existing County Road 61 corridor. The NWI does not identify any wetland habitat within the proposed ROW of Process Water Segment 1 as shown on Figure F2-30.

F2.5.6.6.2. Segment 2 - Canisteo Mine Pit to the West Range Site

Process Water Pipeline Segment 2 will be constructed from the pump station on the east side of the Canisteo Mine Pit, east to Highway 7 and then north along the west side of Highway 7 to the West Range Site via the proposed access road. The alignment traverses areas previously disturbed by mining and the existing Highway

7 corridor, but will cross wetland habitat immediately east of the Canisteo Pump Station and along the new and existing roadway corridors. Access was available to the full length of Process Water Pipelines Segment 2 and wetland delineation was conducted. Wetlands along the corridor are shown on Figure F2-31. Table F2-21 provides a summary of wetland impacts resulting from construction of Process Water Pipeline Segment 2.

F2.5.6.6.3. Segment 3 - Gross-Marble Mine Pit to Canisteo Mine Pit

Process Water Pipeline Segment 3 will be constructed from the pump station on the west side of the Gross Marble Mine Pit, west to the west end of the Arcturus Mine Pit and then north along the Excelsior railroad alignment. At a point just south of the West Range site, the alignment will continue east to Highway 7 and then south along the west side of Highway 7 to the Canisteo Pump Station. The alignment traverses areas previously disturbed by mining, the new rail corridor and the existing Highway 7 corridor, but will cross some greenfield in the area south of the West Range site. Access was available to some segments of the alignment and wetland delineation was conducted where possible. Wetlands identified on the NWI were used along segments where wetland delineation was not performed. Wetlands along the corridor, both results of delineation and NWI, are shown on **Figure F2-32**. **Table F2-21** provides a summary of wetland impacts resulting from construction of Process Water Pipeline Segment 3.

Table F2-21. Wetland Impacts for Process Water System

Basin ID	Dominant Wetland Classification			Selected MnRAM Functions[1]		Temporary Emergent Wetland Impacts[1]	Temporary Scrub-Shrub Wetland Impacts[2]	Permanent Wetland Type Conversion[3]
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality			
Lind Mine Pit to the Canisteo Mine Pit (Segment 1) Total Length: 2.18 miles Greenfield ROW: 0.17 miles								
--	--	--	--	--	--	0	0	0
Canisteo Mine Pit to the West Range Site (Segment 2) Total Length: 2.15 miles Greenfield ROW: 0.73 miles								
C10	PSS1A	Type 6	Alder Thicket	High	Moderate	0	0.12	0.04
C27	PFO1C	Type 7	Coniferous Swamp	High	Moderate	0	0	0.93
C28	PFO1C	Type 7	Coniferous Swamp	High	Moderate	0	0	1.05
F1	PSS1C	Type 6	Alder Thicket	High	High	0	0.06	0.08
					Segment 2 Subtotal	**0**	**0.18**	**2.10**
Gross-Marble Mine Pit to Canisteo Mine Pit (Segment 3) Total Length: 4.83 miles Greenfield ROW: 2.23 miles								
C10	C10	PSS1A	Type 6	Alder Thicket	High	0	0.84	0.76
C19	PEMH	Type 5	Shallow Open Water	High	Moderate	0.64	0	0
C21	PSS1C	Type 6	Alder Thicket	Moderate	Moderate	0	0.08	0.16
C22	PSS1C	Type 6	Alder Thicket	High	Moderate	0	0.02	0

Table F2-21. Wetland Impacts for Process Water System

Basin ID	Dominant Wetland Classification			Selected MnRAM Functions[1]		Temporary Emergent Wetland Impacts[1]	Temporary Scrub-Shrub Wetland Impacts[2]	Permanent Wetland Type Conversion[3]
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality			
C23	PSS1C	Type 6	Alder Thicket	Moderate	Moderate	0	0.08	0.18
C24	PFO2B	Type 8	Coniferous Bog	Moderate	Moderate	0	0	0.14
C28	PFO1C	Type 7	Coniferous Swamp	High	Moderate	0	0	0.05
NWI	PUBF	Type 4	N/A	N/A	N/A	0.62	0	0
NWI	PSS/EM5B	Type 6	N/A	N/A	N/A	0	0.13	0.13
NWI	PFO/SSB	Type 7	N/A	N/A	N/A	0	0	0.46
NWI	PFOB	Type 8	N/A	N/A	N/A	0	0	0.49
					Segment 3 Subtotal	**1.26**	**1.15**	**2.37**
					Grand Total	**1.26 acres**	**1.33 acres**	**4.47 acres**

[1]Temporary disturbance of emergent wetland habitat within the 150-foot construction ROW.
[2]Temporary removal of scrub-shrub vegetation outside the 100-foot permanent ROW. Natural revegetation will be allowed following completion of construction.
[3]Permanent conversion of scrub-shrub vegetation within 100-foot permanent ROW and scrub-shrub and forested vegetation within the 150-foot construction ROW.

Previously inaccessible areas will be investigated to identify and delineate wetland habitat when possible. The pipeline alignment will be altered to avoid wetland habitat to the greatest extent possible. Construction workspace will be located to minimize sidecasting in wetland habitat. Extra workspace areas, access roads, pipe storage yards, and contractor staging areas will be located outside of wetland areas to the greatest extent possible. Where avoidance of wetland disturbance is not feasible, temporary roads and work areas will be removed and wetland restored following completion of construction.

F2.5.6.7 Cooling Tower Blowdown Pipelines

In the DEIS there were process water blowdown lines that would have resulted in the following type conversion impacts:

- Permanent
  - 0.09 acres of forested wetlands to emergent wetlands;
  - 2.95 acres of shrub-scrub wetlands to emergent wetlands;
- Temporary
  - 1.57 acres of shrub-scrub wetlands.

In the FEIS alternative, with the provision of ZLD, all of these potential impacts are avoided.

F2.5.6.8 Potable Water and Sanitary Sewer Pipelines

Potable water and sanitary sewer treatment will be provided from the City of Taconite. The water and sewer utilities will extend from the IGCC plant, along the plant access road, across Hwy 7, and along the west side of Hwy 7 to the City of Taconite as shown on Figure F2-16.

The utilities will be constructed below grade within a 40-foot permanent ROW. However, this ROW and the 100-foot construction ROW is located within the same impact corridor as Process Water Pipeline Segment 2 and the IGCC Power Station access road. Construction of the potable water and sanitary sewer utilities will not result in any additional wetland impacts beyond those described for those project elements.

F2.5.6.9 Summary of West Range Wetland Impacts

A summary of both temporary and permanent wetland impacts for the West Range IGCC Power Station, Buffer Land, and Associated Facilities is provided in Table F2-22 below.

Table F2-22. Summary of Wetland Impacts for the West Range IGCC Power Station, Buffer Land, and Associated Facilities

Project Element	Wetland Types													Total Wetland Impacts
	Type 1	Type 2		Type 3	Type 4	Type 5	Type 6			Type 7		Type 8		
	Floodplain Forest	Wet Meadow	Sedge Meadow	Shallow Marsh	Deep Marsh	Shallow Open Water	Alder Thicket	Shrub Swamp	Shrub Carr	Hardwood Swamp	Coniferous Swmap	Coniferous Bog	Open Bog	
Permanent Wetland Impacts														
IGCC Power Station - FEIS				0.04					7.31	24.01				31.36
Phase 1				0.04					7.31	6.27				13.62
Phase 2										17.74				17.74
Railroad – 3B							1.71		3.04	0.98				5.73
Access Road - FEIS				0.004			0.19							0.194
HVTL							0.0026		0.0006	0.0026		0.0039		0.01
Subtotal	**0.00**	**0.00**	**0.00**	**0.08**	**0.00**	**0.00**	**1.90**	**0.00**	**10.35**	**24.99**	**0.00**	**0.00**	**0.00**	**37.29**
Temporary Emergent Wetland Impacts														
Access Road				0.08										0.08
Gas Pipe Alt. 1	0.70	1.98		1.22										3.90
Process Water 1 - Lind Pit to Canisteo														0.00
Process Water 2 - Canisteo to IGCC site														0.00
Process Water 3 - Gross Marble to Canisteo					0.62	0.64								1.26
Potable Water and Sanitary Sewer														0.00
Subtotal	**0.70**	**1.98**	**0.00**	**1.30**	**0.62**	**0.64**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5.24**
Temporary Scrub-Shrub Wetland Impacts (TWS)														
Access Road							0.13							0.13
HVTL							2.33							2.33
Gas Pipe Alt. 1							0.83		0.01					0.84
Process Water 1 - Lind Pit to Canisteo														0.00
Process Water 2 - Canisteo to IGCC site							0.18							0.18
Process Water 3 - Gross Marble to Canisteo							1.15							1.15
Potable Water and Sanitary Sewer														0.00
Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**4.62**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**4.63**

Table F2-22. Summary of Wetland Impacts for the West Range IGCC Power Station, Buffer Land, and Associated Facilities

Project Element	Wetland Types													Total Wetland Impacts
	Type 1	Type 2		Type 3	Type 4	Type 5	Type 6			Type 7		Type 8		
	Floodplain Forest	Wet Meadow	Sedge Meadow	Shallow Marsh	Deep Marsh	Shallow Open Water	Alder Thicket	Shrub Swamp	Shrub Carr	Hardwood Swamp	Coniferous Swmap	Coniferous Bog	Open Bog	
Permanent Type Conversion (Scrub-Shrub and Forested)														
HVTL							9.40			6.84		19.92		36.16
Gas Pipe Alt. 1							3.00		1.50	9.16		2.72		16.38
Process Water 1 - Lind Pit to Canisteo														0.00
Process Water 2 - Canisteo to IGCC site							0.12			1.98				2.10
Process Water 3 - Gross Marble to Canisteo							1.23			0.46	0.05	0.63		2.37
Potable Water and Sanitary Sewer														0.00
Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**13.75**	**0.00**	**1.50**	**18.44**	**0.05**	**23.27**	**0.00**	**57.01**

F2.5.7 East Range Wetland Impacts

The following sections describe the wetland impacts that would result from the construction of each project element on the East Range Site. Wetland impacts are described as wetland fill, temporary wetland disturbance, and wetland type conversion resulting from vegetation removal. A summary of wetland impacts on the East Range Site is included on Table F2-35.

F2.5.7.1 IGCC Power Station Footprint

As positioned in Figures F2-17 and F2-33 the IGCC Power Station Footprint would impact 17.15 acres of wetland habitat. The impact area includes the Station Footprint and the 3:1 grading at its boundaries required to achieve the natural grade of the surrounding area. The Station Footprint is located on a hill that drops about 40 feet in elevation from northwest to southeast; therefore, site has been designed in a tiered fashion to minimize grading on the sloping topography. Such grading would require approximately 3,349,900 cubic yards of cut and 1,146,400 cubic yards of fill and result in a total of 2,203,500 cubic yards of excess material. Wetland impacts resulting from the placement, alignment, and grading of the Station Footprint, including areas within the grading limits, are summarized in Table F2-23. The mapping of the wetlands with the Eggerrs and Reed classifications is shown in Figure F2-33.

The IGCC Power Station would be constructed in two phases. Mesaba One is expected to be constructed between 2010 and 2014; construction of Mesaba Two is expected to begin in 2012. Mesaba One would be constructed in the northern portion of the Station Footprint because of the desire to provide the longest straight line approach to the railcar dumper and to minimize the length of conveyors needed for stockpiling feedstocks in this unit's active and passive storage areas.

Table F2-23. Wetland Fill for West Range IGCC Power Station

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions[2]		Wetland Fill (acres)		
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	Phase I	Phase II	Total
A	PEMC	Type 2	Sedge Meadow	High	Moderate	0.05	0.003	0.05
B	PFOC	Type 7	Coniferous Swamp	High	Moderate	5.53	0	5.53
C3	PFO2B	Type 7	Coniferous Swamp	High	Moderate	0.66	1.42	2.08
C4	PEMH	Type 4	Deep Marsh	High	Moderate	1.89	1.38	3.27
C5	PEMB	Type 2	Fresh Wet Meadow	High	Moderate	1.74	0.004	1.74
C6	PFO1B	Type 7	Hardwood Swamp	High	Moderate	3.38	0	3.38
C9	PSS1B	Type 6	Shrub Swamp	High	Moderate	0.19	0.90	1.09
					Total	**13.44 acres**	**3.71 acres**	**17.15 acres**

[1] Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classifications, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.

F2.5.7.2 Rail Alignment

The proposed rail spur to the East Range IGCC Power Station (Railroad Alternative 1) would intersect the southeastern margin of the Station Footprint and loop as shown on Figures F2-17 and F2-33. This rail loop would provide optimal rail yard operations because it allows the onsite rail sidings to be continuous and reconnect with the track without dead-end spurs. The spur would be 17,878 feet in total length with a rail loop of 9,836 feet at an elevation of 1,465 feet msl. The preferred rail alignment and loop would require 2.39 million cubic yards cut and 0.12 million cubic yards fill and would impact 13.38 acres of wetland. An additional 51.26 acres of two remnant wetlands would be enclosed within the rail loop. This wetland complex is supported by surface flow via a tributary to Colby Lake from offsite to the north. The preferred railroad alternative would cross this tributary in two locations. Culverts would be installed in these locations in order to maintain current volumes of flow. Culverts would be installed in other locations throughout the rail loop as well in order to ensure maintenance of hydrologic connectivity throughout the wetland.

The wetland impacts of this railroad alternative are summarized in Table F2-24 and include all wetlands within the construction limits of the proposed rail line, including a 3:1 slope along the railroad embankments.

Table F2-24. Wetland Fill for East Range Railroad Alternative 1

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions[2]		Permanent Impact Area (acres)
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	
C2	PFO2B	Type 8	Coniferous Bog	High	Moderate	0.91
C3	PFO2B	Type 7	Coniferous Swamp	High	Moderate	0.45
C4	PEMH	Type 4	Deep Marsh	High	Moderate	2.67
C6	PFO1B	Type 7	Hardwood Swamp	High	Moderate	0.44
C7	PSS1B	Type 6	Hardwood Swamp - Logged	High	Moderate	8.19
I	PSS1C	Type 6	Alder Thicket	Moderate	Moderate	0.67
J	PEMC	Type 2	Fresh Wet Meadow	Moderate	Moderate	0.05
					Total	**13.38 acres**

[1] Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classifications, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.

The Railroad Alternative 1 corridor would require crossing approximately six linear feet of streams and bodies of water. See Table F2-25. The tributary to Colby Lake that flows through Wetland C is crossed twice by the center loop.

Table F2-25. Stream Crossings for Railroad Alternative 1

Water Crossing Location	MDNR PWI?	Length of Crossing (linear feet)
Tributary to Colby Lake (North Crossing)	Yes	3
Tributary to Colby Lake (South Crossing)	Yes	3
Total		**6**

F2.5.7.3 Plant Access Road

An access road would be constructed to provide access to the IGCC Power Station from the existing CR 666, as shown in Figures F2-17 and F2-33. CR 666 passes just to the east of the proposed site and is the only feasible option to serve the site via the public road system. The proposed road access is located to cross wetland areas at the intersection with CR 666 and near the Station Footprint at their narrowest point to minimize wetland fill.

Side slopes for the road bed would be graded to the maximum possible slope allowed by St. Louis County and Mn/DOT road construction specifications in order to minimize the footprint of the road and impacts to the environment, specifically to wetland habitat. Proper placement of culverts throughout the road alignment would mitigate potential indirect wetland impacts to nearby wetlands by maintaining existing hydrologic connectivity. Wetland impacts associated with the preferred access road are identified in Table F2-26.

Table F2-26. Wetland Fill for East Range Access Road

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions[2]		Permanent Impact Area (acres)
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	
C6	PFO1B	Type 7	Hardwood Swamp	High	Moderate	0.39
D	PSS1B	Type 6	Alder Thicket	High	Moderate	0.05
					Total	**0.44 acres**

[1] Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classifications, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3.

F2.5.7.4 Power Transmission Lines

Excelsior's preferred transmission plan for the East Range IGCC Power Station consists of constructing two new 345kV HVTLs within three existing ROWs to link the IGCC Power Station to the Forbes Substation POI as shown on Figure F2-23. Even though one 345kV HVTL would be sufficient to accommodate the combined full load output of Mesaba One and Mesaba Two, both new lines must be constructed concurrently with installation of Mesaba One to address the single failure criterion. Each line would follow existing routes now occupied by 115kV HVTLs owned by Minnesota Power that interconnect the Syl Laskin Energy Center with the Forbes and Virginia Substations (the 37L and 38L HVTL connect to the Forbes Substation; the 39L HVTL connects to the Virginia Substation).

As described in Final EIS Section 2.3.2.5 (Volume 1), to avoid the high cost and dangerous conditions associated with "hot" construction methods, Excelsior proposes to acquire an additional 30 feet of ROW along one of the routes between the Laskin and Forbes Substations. Based on a review of aerial photographs and video taken during overflights of the routes in September 2005, Excelsior identified the 39L/37L corridor as the preferred route along which to acquire the additional 30-foot ROW. For the alternative plan, Excelsior would acquire the additional ROW along the 38L corridor. In addition to the 30-foot ROW added to one corridor, either Excelsior's preferred or alternative plan would require the acquisition of two new segments of ROW. One of the two new ROW segments is about 2 miles in length and would extend alongside the existing MP 43L HVTL corridor connecting the Mesaba Generating Station with the initiation point of the 39L and 38L corridors. The second new ROW segment would be about 2 miles in length and would be required to link the 39L and 37L corridors near the City of Eveleth.

Wetland impacts along the HVTL alignment would include wetland fill for power pole placement, temporary impacts to scrub-shrub habitat in temporary work spaces (areas within the construction ROW but outside the permanent ROW), and conversion of scrub-shrub and forested habitat within the permanent ROW.

F2.5.7.4.1. Wetland Fill

Permanent wetland impacts would be limited to those areas where power poles are placed within wetlands. Each pole would require an estimated 28 square feet of fill. Wetland impacts are calculated for the HVTL alignment assuming that power poles would be placed every 800 feet along the alignment. Using this assumption, a total of 139 power poles (73 for Line 38 and 66 for Line 37/39) would be placed in wetland areas, resulting in 3,892 square feet (0.09) acres of permanent wetland impacts along the 68.42 mile alignment (33.58 miles for Line 38 and 34.84 for Line 37/39). Wetland impacts are summarized in Table F2-27, below.

The location of power poles would be more accurately specified during project design. Placement of the poles would consider avoidance of wetland habitat to the greatest extent feasible. In addition to avoiding wetland impact, location of the poles outside wetland habitat improves construction access and stability of the poles. However, the maximum distance between poles of approximately 1,000 feet would limit avoidance of long expanses of wetland habitat.

Temporary wetland disturbance during construction would be minimized by performing construction during winter months or through use of construction mats to minimize rutting by equipment and disturbance of wetland vegetation. Where construction within wetland habitat could not be avoided, best management practices would be employed to minimize disturbance. Extra workspace areas, access roads, and contractor staging areas would be located outside of wetland areas to the greatest extent possible. Where wetland disturbances cannot be avoided, temporary roads and work areas would be removed and the affected wetlands restored following completion of construction.

Table F2-27. Wetland Fill for East Range HVTL Alignments

Basin ID[1]	Wetland Classification[1]			Selected MnRAM Functions[2]		Wetland Fill	
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	# Poles	Area (acres)
38 Line							
NWI Basin	Various	Type 2	Assumed Wet Meadow	--	--	3	0.0019
NWI Basin	Various	Type 5	Assumed Shallow Open Water	--	--	1	0.0006
NWI Basin	Various	Type 6	Assumed Alder Thicket	--	--	33	0.0211
NWI Basin	Various	Type 7	Assumed Hardwood Swamp	--	--	5	0.0030
NWI Basin	Various	Type 8	Assumed Coniferous Bog	--	--	30	0.0189
NWI Basin	Riverine	Not Applicable	Not Applicable	--	--	1	0.0006
					Total	**73**	**0.0461**
37/39 Line							
NWI Basin	Various	Type 2	Assumed Wet Meadow	--	--	1	0.0006
NWI Basin	Various	Type 5	Assumed Shallow Open Water	--	--	3	0.0019
NWI Basin	Various	Type 6	Assumed Alder Thicket	--	--	19	0.0123
NWI Basin	Various	Type 7	Assumed Hardwood Swamp	--	--	13	0.0084
NWI Basin	Various	Type 8	Assumed Coniferous Bog	--	--	30	0.0194

Table F2-27. Wetland Fill for East Range HVTL Alignments

Basin ID[1]	Wetland Classification[1]			Selected MnRAM Functions[2]		Wetland Fill	
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality	# Poles	Area (acres)
					Total	66	0.0426

[1] NWI basins are those areas that have not been field investigated. Cowardin classifications are taken from the NWI. Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classifications, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3. MnRAM assessments were only completed for wetlands field delineated, and are not available for wetland impacts based off the NWI.

F2.5.7.4.2. Wetland Type Conversion (Tree and Shrub Clearing)

The majority of the East Range HVTL is proposed within an existing 100-foot power utility ROW which would avoid clearing of trees and shrubs. Tree clearing would be required on the additional 30-feet of new ROW and on the two new approximately two-mile sections of ROW to the Syl Laskin Substation and linking the 39L and 37L corridors. The proposed new 30-foot ROW would parallel the existing 100-foot ROW for the 37/39 Line (HVTL Alternative 2 – Excelsior's Preferred) and would alter wooded or shrub wetland habitat. Construction of the new 100-foot wide ROW between the East Range IGCC Power Station and the Syl Laskin Substation would require clearing of shrub swamp. HVTL Alternative 1 would add 30-feet of new ROW to the 38 Line.

Impacts to wetland vegetation would be of two types, temporary impacts and permanent conversion. Temporary impacts would include removal of scrub-shrub vegetation in the temporary construction ROW but outside the permanent ROW. These areas would be allowed to revegetate following construction. Permanent conversion would include removal of scrub-shrub vegetation within the permanent ROW and removal of forest vegetation within the construction ROW. The permanent ROW would be maintained free of woody vegetation, resulting in conversion of scrub-shrub and forested wetland to emergent wetland habitat. Although forested wetland cleared outside of the permanent ROW but within the construction ROW would still be allowed to revegetate, it is considered a permanent type conversion because of the length of time that regeneration would require. Table F2-28 provides a summary of wetland type conversion that would result from construction of the East Range HVTL.

Table F2-28. Wetland Conversion for East Range HVTL Alignments

Basin ID[1]	Dominant Wetland Classification[1]			Temporary Scrub-Shrub Impacts[3] (acres)	Permanent Scrub-Shrub and Forested Conversion[4] (acres)
	Cowardin	Circular 39	Eggers and Reed		
Alternative 1 – add 30' to the 38 Line					
NWI Basin	Various	Type 1	Assumed Floodplain Forest	0 (no shrubs)	0 (no trees/shrubs)
NWI Basin	Various	Type 2	Assumed Wet Meadow	0 (no shrubs)	0 (no trees/shrubs)
NWI Basin	Various	Type 5	Assumed Shallow Open Water	0 (no shrubs)	0 (no trees/shrubs)
NWI Basin	Various	Type 6	Assumed Alder Thicket	0 (no wetlands)	24.27
NWI Basin	Various	Type 7	Assumed Hardwood Swamp	0 (no shrubs)	9.15
NWI Basin	Various	Type 8	Assumed Coniferous Bog	0 (no shrubs)	29.03
NWI Basin	Riverine	Not	Not Applicable	0 (no shrubs)	0 (already cleared)

Table F2-28. Wetland Conversion for East Range HVTL Alignments

Basin ID[1]	Dominant Wetland Classification[1]			Temporary Scrub-Shrub Impacts[3] (acres)	Permanent Scrub-Shrub and Forested Conversion[4] (acres)
	Cowardin	Circular 39	Eggers and Reed		
		Applicable			
			Total	**0 acres**	**62.45 acres**
Alternative 2 (Preferred) - add 30' to 37/39 Line					
NWI Basin	Various	Type 1	Assumed Floodplain Forest	0 (no shrubs)	0 (no trees/shrubs)
NWI Basin	Various	Type 2	Assumed Wet Meadow	0 (no shrubs)	0 (no trees/shrubs)
NWI Basin	Various	Type 5	Assumed Shallow Open Water	0 (no shrubs)	0 (no trees/shrubs)
NWI Basin	Various	Type 6	Assumed Alder Thicket	0.20	19.21
NWI Basin	Various	Type 7	Assumed Hardwood Swamp	0 (no shrubs)	10.99
NWI Basin	Various	Type 8	Assumed Coniferous Bog	0 (no shrubs)	29.42
NWI Basin	Riverine	Not Applicable	Not Applicable	0 (no shrubs)	0 (no wetlands)
			Total	**0.20 acres**	**59.62 acres**

[1] NWI basins are those areas that have not been field investigated. Cowardin classifications are taken from the NWI. Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classifications, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.
[2] Complete MnRAM 3.1 Functions and Values Assessment data can be found in Appendix F3. MnRAM assessments were only completed for wetlands field delineated, and are not available for wetland impacts based off the NWI.
[3]Temporary removal of scrub-shrub vegetation outside the 100-foot permanent ROW. Natural revegetation would be allowed following completion of construction.
[4]Permanent conversion of scrub-shrub vegetation within 100-foot permanent ROW and scrub-shrub and forested vegetation within the 150-foot construction ROW.

F2.5.7.4.3. Water Crossings

There would be 21 crossings of streams or water bodies associated with the 38L corridor (HVTL Alternative 1) for a total length of water crossings estimated at 1,194 linear feet. There would be 20 water crossings in the 37L/39L corridors (HVTL Alternative 2) for a total length estimated at 1,760 linear feet. A summary of the length of each water body crossing is provided in Table F2-29.

Table F2-29. Water Crossings for East Range HVTL Alignments

Water Crossing Location	Milepost	MNDNR PWI	Length of Crossing (linear ft)
MP 38 Line Corridor			
Colby Lake	1+4670	Yes—249P	540
Partridge River	5+1190	Yes	110
Perennial Tributary to St. Louis River	6+3680	No	3
Perennial Tributary to St. Louis River	6+4590	Yes	3
Perennial Tributary to St. Louis River	8+1215	No	3
Perennial Tributary to St. Louis River	8+2420	No	3
Unnamed Pond	9+0480	Yes—430W	180

Table F2-29. Water Crossings for East Range HVTL Alignments

Water Crossing Location	Milepost	MNDNR PWI	Length of Crossing (linear ft)
Perennial Stream between North and South Cedar Island Lake	11+1780	Yes	60
Perennial Stream South of Forge Lake	13+1850	No	95
Perennial Tributary to Esquagama Lake	15+0670	Yes	3
Perennial Ditch to Esquagama Lake	15+3590	No	3
Perennial Tributary to Embarrass River	16+3900	No	60
Intermittent Stream to Embarrass River	16+4900	No	3
Ely Creek	22+0090	Yes	3
Perennial Stream south of Half Moon Lake	23+4750	No	3
Intermittent Stream north of Long Lake Creek	26+4020	No	3
Long Lake Creek	27+0360	Yes	3
Perennial Stream north of St. Louis River	29+3250	Yes	3
Elbow Creek	30+1230	Yes	15
Perennial Stream north of Elbow Creek	30+4100	No	3
Two River (in 3 places due to meander)	31+2840	Yes	95
		Total MP 38 Line	**1194**
MP 37/39 Line Corridor			
Colby Lake	1+4670	Yes—249P	540
Partridge River	5+3020	Yes	250
Perennial Tributary to St. Louis River	7+1110	Yes	80
Perennial Tributary to St. Louis River	8+2300	Yes	3
Perennial Tributary to St. Louis River	8+2980	No	3
Perennial Drainage Ditch to wetland	12+1410	No	6
Embarrass River	15+1140	No	3
Embarrass River	15+1490	Yes	70
Deep Lake	19+2260	Yes—666P	690
Perennial Stream west of Deep Lake (2 crossings in meander)	19+4840	No	6
Perennial Stream west of Deep Lake	20+1540	No	3
Unnamed Intermittent Stream	22+4080	Yes	3
Perennial Ditch to Mine Dump	25+0960	No	3
Perennial Stream to Mine Dump	25+1960	No	3
Elbow Creek	28+5130	Yes	15
Perennial Ditch to East Two River	30+2190	No	3
Perennial Stream to East Two River	31+1910	No	3
East Two River	32+0810	Yes	70
Unnamed Perennial Stream	33+0340	No	3
Perennial Ditch to Two River	34+4960	No	3
		Total MP 37/39 Line	**1760**

F2.5.7.5 Natural Gas Pipeline

For the East Range Site, the proposed natural gas pipeline would be constructed, owned and operated by Northern Natural Gas ("NNG"), and would be an extension of NNG's interstate pipeline system shown on Figure F2-24. NNG represents the only feasible option for supplying Mesaba One and Two with natural gas because it is the only pipeline company within the immediate vicinity of the East Range Site. NNG's existing pipeline serves Cliffs-Erie (and the former LTV mining operation) and abuts the IGCC Power Station Footprint on its eastern boundary. In order to provide natural gas in the quantity and at the pressure required to supply the Project's two phases, installation of approximately 28.8 miles of new, 16- to 24-inch pipe would be constructed adjacent to NNG's existing 32.5-mile pipeline. A new pipeline can be laid within the same ROW (i.e., without having to expand the ROW's width).

The natural gas pipeline would be constructed below grade within the existing ROW. Construction of the natural gas pipeline would result in temporary impacts to wetlands existing within the ROW from excavation and installation of the pipe. Permanent impacts to wetlands would be avoided by restoring wetland habitat after installation of the pipe. Material excavated from the trench would be sidecast to one side of the trench or the other. Preference would be given to sidecasting outside of wetland areas. Following pipe installation, soil would be returned to the trench in reverse of the removal (i.e. topsoil would be replaced on the surface). Disturbed wetland (and upland areas) would be reseeded with a native seed mix appropriate to the adjacent vegetative community. Indirect drainage effects to wetlands from groundwater conducted along the backfilled pipeline trench would be avoided by installing anti-seepage collars on the pipe in strategic locations.

Wetland impacts along the pipeline alignment would not include temporary disturbance of scrub-shrub habitat in temporary work spaces or permanent conversion of scrub-shrub and forested habitat within the permanent ROW because the existing ROW is maintained free of woody vegetation.

The location of the pipeline alignment would be determined during project design and would consider adjustments to avoid and minimize wetland habitat. Extra workspace areas, access roads, pipe storage yards, and contractor staging areas would be located outside of wetland areas to the greatest extent possible. Where avoidance of wetland disturbance is not possible, temporary roads and work areas would be removed and wetland restored in a manner similar to the pipeline trench following completion of construction.

F2.5.7.5.1. Temporary Emergent Wetland Impacts

Only the portion of the proposed gas pipeline where the alignment enters the East Range Site has been field delineated. The potential wetland impacts resulting from the construction of the gas pipeline have been estimated from NWI wetland boundaries, also shown on Figure F2-24. In an effort to improve the accuracy of estimation of wetland habitat along the inaccessible linear utility corridors, an exercise comparing aerial photography, hydric soils, and the NWI was performed along 15 miles of the gas pipeline corridor (*see* Section 4.3 of the Wetland Permit Application). This revised wetland information is used where available to calculate wetland impacts. The NWI classifies a majority of the wetlands within the existing ROW for the gas pipeline as scrub shrub, forested, or coniferous bog. However, because the existing ROW is maintained to be free of trees and shrubs, these wetland types are no longer accurate. For wetland impact calculations, scrub shrub and forested wetlands within the ROW are considered wet meadows and coniferous bogs are considered open bogs.

Construction and installation of the proposed natural gas pipeline would disturb an estimated total of 24.79 acres of wetland along the entire 28.8 miles of existing ROW, as shown in Table F2-30, below. This area assumes that open cut trenching is employed for construction, which would require use of the entire width of the ROW.

Table F2-30. Wetland Impacts for East Range Natural Gas Pipeline

Basin ID	Dominant Wetland Classification			Selected MnRAM Functions[5]		Temporary Emergent Wetland Impacts[1]	Temporary Scrub-Shrub Wetland Impacts[2]	Permanent Wetland Type Conversion[3]
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality			
C2	PFO2B	Type 8	Coniferous Bog	High	Moderate	--	--	0.06
C4	PEMH	Type 4	Deep Marsh	High	Moderate	0.68	--	--
C6	PFO1B	Type 7	Hardwood Swamp	High	Moderate	--	--	0.41
C7	PSS1B	Type 6	Hardwood Swamp - Logged	High	Moderate	--	0.33	--
C8	PEMC	Type 3	Shallow Marsh	High	Moderate	0.003	--	--
NWI	Various	Type 2	Assumed Wet Meadow	--	--	1.81	--	--
NWI	Various	Type 5	Assumed Shallow Open Water	--	--	(0.34)[5]	--	--
NWI	Various	Type 6	Assumed Alder Thicket	--	--	8.71	Already clear	--
NWI	Various	Type 7	Assumed Hardwood Swamp	--	--	3.60	--	Already clear
NWI	Various	Type 8	Assumed Coniferous Bog	--	--	9.10	--	Already clear
NWI	Riverine	Not Applicable	Not Applicable	--	--	0.09	--	--
					Grand Total	**23.99 acres**	**0.33 acres**	**0.47 acres**

[1]Temporary disturbance of emergent wetland habitat within the 100-foot construction ROW. This includes impacts to previously cleared Type 6, 7, and 8 NWI wetlands.
[2]Temporary removal of scrub-shrub vegetation outside the 70-foot permanent ROW. Natural revegetation would be allowed following completion of construction.
[3]Permanent conversion of scrub-shrub vegetation within 70-foot permanent ROW and scrub-shrub and forested vegetation within the 100-foot construction ROW.
[4]MnRAM 3.1 Functional Assessments were completed only for wetlands field delineated.
[5] Impacts to open water would be avoided by directionally drilling pipeline under the water body.

F2.5.7.5.2. Water Crossings

The East Range Natural Gas Pipeline Alternative 1 would require crossing approximately 792 linear feet of streams and bodies of water, not including adjacent wetland habitat. Colby Lake (249P) and 12 streams and rivers impacted by Natural Gas Pipeline Alternative 1 are protected by the MDNR. Table F-31 below describes which impacted wetlands are protected.

Table F2-31. Water Crossings for East Range Natural Gas Pipeline Alternative 1

Water Crossing Location	Milepost	MDNR PWI?	Length of Crossing (linear feet)
Elbow Creek – West Side	1+3580	Yes	20
Elbow Creek – East Side			
Unnamed Perennial Stream- West Side	4+1010	No	3
Unnamed Perennial Stream – East Side			

Water	Milepost	MDNR	Length of
Perennial Stream from Mud to Horseshoe Lake – West Side	5+2840	Yes	3
Perennial Stream from Mud to Horseshoe Lake – East Side			
Perennial Ditch from Airport to Ely Creek – West Side	8+0550	No	3
Perennial Ditch from Airport to Ely Creek – East Side			
Perennial Ditch from Airport to Ely Creek – West Side	8+1030	No	3
Perennial Ditch from Airport to Ely Creek – East Side			
Ely Creek – West Side	9+3530	Yes	3
Ely Creek – East Side			
Perennial Ditch from Leaf Lake – West Side	12+2370	No	3
Perennial Ditch from Leaf Lake – East side			
Perennial Stream to Esquagama Lake – West Side	13+4720	Yes	15
Perennial Stream to Esquagama Lake – East Side			
Perennial Stream to Esquagama Lake – West Side	14+1790	Yes	15
Perennial Stream to Esquagama Lake – East Side			
Perennial Ditch to Esquagama Lake – West Side	15+0710	No	3
Perennial Ditch to Esquagama Lake – East Side			
Perennial Stream from Fourth Lake to Esquagama Lake – West Side	15+3620	Yes	90
Perennial Stream from Fourth Lake to Esquagama Lake – West Side			
Perennial Stream to St. Louis River – West Side	19+3500	No	3
Perennial Stream to St. Louis River – East Side			
Perennial Stream to St. Louis River – West Side	19+4350	Yes	3
Perennial Stream to St. Louis River – East Side			
Perennial Stream to St. Louis River – West Side	21+1880	Yes	15
Perennial Stream to St. Louis River – East Side			
Perennial Stream to St. Louis River – West Side	21+3380	No	15
Perennial Stream to St. Louis River – East Side			
Partridge River – West Side	24+0960	Yes	100
Partridge River – East Side			
Colby Lake – West Side	25+1490	Yes	430
Colby Lake – East Side			
Partridge River – West Side	27+3230	Yes	50
Partridge River – East Side			
Wyman Creek – West Side	28+0950	Yes	15
Wyman Creek – East Side			
		Total	**792 linear feet**

F2.5.7.6 Process Water Pipelines

The water supply system for the East Range site would consist of eight pipeline segments that would connect existing mine pits and provide process water to the IGCC plant as shown on Figure F2-25. As noted in Sections 1.1.1.3 and 3.1.2, plans are underway to resume mining in Mine Pit Nos. 6 and 2WX. In order to accomplish such activities, the pits and the immediate area surrounding them must be dewatered. Excelsior will work with the entities mining these pits to allow the IGCC Power Station to collect water resulting from such dewatering activities and ultimately use it as make up water to the cooling system. Given the status of the mining project's impending environmental review process (*see* Section 1.1.1.3), it is too early to project where and how such collection devices would be linked and subsequently piped to the IGCC Power Station. Until a mine permit application is submitted, Excelsior will continue to show the pipeline configurations between Mine Pits No. 6, 2WX, and the East Range Station Footprint as shown in Figures F2-17 and F2-25 as being conceptually indicative of its plans to use water directly obtained from the abandoned mine pits or derived from their dewatering. As shown in Table F2-32, the wetland impacts associated with these process water pipelines are small, as the pipelines would be primarily routed across lands previously disturbed by mining or other developments.

It is unlikely that the increased number of smaller pipelines required to collect water from numerous dewatering wells, route it to a common collection header, and then convey it via a larger pipeline to the IGCC Power Station would cause a significant increase in wetland impacts relative to those calculated using the assumptions provided in the three following paragraphs. Such collection pipelines would likely be installed assuming they would be moved as mining progresses and/or as their productivity decreased, i.e., they would be temporarily placed and cause minimal wetland impact. In any case, the land over which they would traverse would ultimately be excavated.

The impacts presented in Table F2-32 are calculated assuming the pipelines would be constructed below grade within a 150-foot construction ROW. Wetland impacts would be avoided by restoring wetland habitat after construction. Wetland impacts along the pipeline alignments would include temporary impacts to emergent wetlands within the construction corridor, temporary disturbance of scrub-shrub habitat in temporary work spaces (areas within the construction ROW but outside the permanent ROW) and permanent conversion of scrub-shrub and forested habitat within the permanent ROW where prior disturbance has not removed woody vegetation. Although vegetation outside of the permanent ROW would be allowed to revegetate, impacts to forested wetlands even outside the permanent ROW are considered permanent because of the length of time required for restoration of forested habitat. Only the Process Water Pipeline segments constructed from Area 2WX to the IGCC Station Footprint and Area 6 and Stephens Mine to Area 2WX contain shrub scrub or forested wetland habitat.

The location of each pipeline alignment would be determined during project design and would consider adjustments to avoid and minimize wetland habitat. The construction ROW would be located to minimize sidecasting in wetland habitat. Extra workspace areas, access roads, pipe storage yards, and contractor staging areas would be located outside of wetland areas to the greatest extent possible. Where avoidance of wetland disturbance is not possible, temporary roads and work areas would be removed and wetland restored in a manner similar to the pipeline trench following completion of construction.

Only a small portion of the proposed process water supply pipeline segments have been field delineated during the 2004 and 2005 field surveys. The potential wetland impacts resulting from the construction of the pipelines in the remainder of the proposed alignments have been estimated from NWI wetland boundaries.

Table F2-32. Wetland Impacts for Process Water System

Basin ID	Dominant Wetland Classification[1]			Selected MnRAM Functions[4]		Temporary Emergent Wetland Impacts[2]	Temporary Scrub-Shrub Wetland Impacts[3]	Permanent Wetland Type Conversion[4]
	Cowardin	Circular 39	Eggers and Reed	Vegetative Diversity	Wetland Water Quality			
Area 2WX to Station Footprint - Total Length: 2.18 miles								
NWI	Various	Type 3	Assumed Shallow Marsh	--	--	0.38	0	0
NWI	Various	Type 7	Assumed Hardwood Swamp	--	--	0	0	0.75
NWI	Various	Type 8	Assumed Coniferous Bog	--	--	0	0	0.32
					Segment Subtotal	**0.38**	**0**	**1.07**
Area 2WX to Area 2W - Total Length: 0.51 miles								
--	--	--	--	--	--	0	0	0
					Segment Subtotal	**0**	**0**	**0**
Area 2W to Area 2E - Total Length: 0.14 miles								
--	--	--	--	--	--	0	0	0
					Segment Subtotal	**0**	**0**	**0**
Area 3 to Area 2E - Total Length: 0.55 miles								
NWI	Various	Type 4	Assumed Deep Marsh	--	--	0.41	0	0
					Segment Subtotal	**0.41**	**0**	**0**
Knox Mine to Area 2WX - Total Length: 0.16 miles								
--	--	--	--	--	--	0	0	0
					Segment Subtotal	**0**	**0**	**0**
Area 6 and Stephens Mine to Area 2WX - Total Length: 2.15 miles								
NWI	Various	Type 6	Assumed Alder Thicket	--	--	0	0.19	0.26
					Segment Subtotal	**0**	**0.19**	**0.26**
Area 9 South to Area 6 - Total Length: 0.50 miles								
NWI	Various	Type 5	Assumed Shallow Open Water	--	--	(0.54)[6]	0	0
					Segment Subtotal	**0**	**0**	**0**
Area 9 North (Donora Mine) to Area 6 - Total Length: 0.95 miles								
--	--	--	--	--	--	0	0	0
					Segment Subtotal	**0**	**0**	**0**
					Grand Total	**0.79 acres**	**0.19 acres**	**1.33 acres**

[1] NWI basins are those areas that have not been field investigated. Cowardin classifications are taken from the NWI. Circular 39 and Eggers and Reed classifications are assumed from the Cowardin classification, aerial photograph interpretations, and assumptions based on known characteristics of delineated wetlands.
[2]Temporary disturbance of emergent wetland habitat within the 150-foot construction ROW.
[3]Temporary removal of scrub-shrub vegetation outside the 100-foot permanent ROW. Natural revegetation would be allowed following completion of construction.
[4]Permanent conversion of scrub-shrub vegetation within 100-foot permanent ROW and scrub-shrub and forested vegetation within the 150-foot construction ROW.
[5]MnRAM 3.1 Functional Assessments were completed only for wetlands field delineated.
[6] Impacts to open water would be avoided by directionally drilling pipeline under the water body.

Several segments of the East Range Process Water Supply Pipeline system would cross streams. A summary of these crossings is provided in Table F2-33.

Table F2-33. Stream Crossings for Process Water Supply Pipeline

Stream Crossing Location	MDNR PWI?	Length of Crossing (linear feet)
Area 6 and Stephens Mine to Area 2WX		
Stephens Creek	Yes	3
Second Creek	Yes	30
Area 9 South to Area 6		
First Creek	Yes	3
Area 9 North to Area 6		
First Creek	Yes	3
	Total	**39 linear feet**

F2.5.7.7 Potable Water and Sanitary Sewer Pipelines

Potable water would be provided by constructing a 6-inch pipeline approximately 11,000 feet from the East Range IGCC Power Station to the 12-inch water main that serves Minnesota Power, as shown on Figure F2-26. The proposed 6-inch pipeline would provide the required flow and pressure to Mesaba One and Two without the need for a booster station. The City of Hoyt Lakes treatment plant has the capacity to provide the potable water needs of the facility.

Sanitary sewer would be provided through connection to the City of Hoyt Lakes' wastewater collection and treatment system. This would consist of constructing approximately 9,500 feet of 12-inch gravity sewer pipeline, a pump station, and about 2,500 feet of 4-inch force main as shown on Figure F2-26. The wastewater piping would parallel the existing high voltage power line easement along the west side of the proposed property boundary south to Colby Lake. A pump station would be located on the north side of Colby Lake. The force main would be directionally drilled beneath Colby Lake and then connected to the existing city gravity sewer near Minnesota Power on the north end of Colby Lake Road. The 12-inch sewer pipe would have ample capacity to convey the estimated wastewater flow of 30,000 gallons per day during construction. The existing Hoyt Lakes wastewater treatment facility has capacity available to treat the estimated flow from the proposed project.

The pipelines would be constructed below grade within a 100-foot construction ROW. Only a portion of the proposed corridor for the East Range Potable Water and Sewer Pipeline has been field delineated. The potential wetland impacts resulting from the construction of the pipelines in the remainder of the proposed alignments have been estimated from NWI wetland boundaries. According to the NWI, up to 1.12 acres of Colby Lake lie within the construction limit and would be impacted during construction. This segment of the pipelines would be directionally drilled to avoid impacts to the lake and lakeshore. No other NWI wetlands are identified within the 100-foot wide construction limit; however, field verification would be required for confirmation.

Construction of the Potable Water and Sewer Pipelines would require crossing approximately 460 linear feet of Colby Lake. The impacts due to crossing are shown in Table F2-34.

Table F2-34. Stream Crossings for Potable Water and Sewer Pipelines

Stream Crossing Location	Milepost	MDNR PWI?	Length of Crossing (linear feet)
Colby Lake	1+3720	Yes, 249 P	460
	Total	**460 linear feet**	

F2.5.7.8 Summary of East Range Wetland Impacts

A summary of both temporary and permanent wetland impacts for the East Range IGCC Power Station, Buffer Land, and Associated Facilities is provided in Table F2-35 below.

Table F2-35. Summary of Wetland Impacts for the East Range IGCC Power Station, Buffer Land, and Associated Facilities

Project Element	Wetland Types													Total Wetland Impacts
	Type 1	Type 2		Type 3	Type 4	Type 5	Type 6			Type 7		Type 8		
	Floodplain Forest	Wet Meadow	Sedge Meadow	Shallow Marsh	Deep Marsh	Shallow Open Water	Alder Thicket	Shrub Swamp	Shrub Carr	Hardwood Swamp	Coniferous Swamp	Coniferous Bog	Open Bog	
Permanent Wetland Impacts														
IGCC Power Station		1.74	0.05		3.27			1.09		3.38	7.61			17.15
Phase 1		1.74	0.05		1.89			0.19		3.38	6.19			13.44
Phase 2		0.004	0.003		1.38			0.90			1.42			3.71
Railroad		0.05			2.67		0.67	8.19		0.44	0.45	0.91		13.38
Access Road							0.05			0.39				0.44
HVTL	0.0006	0.0025				0.0025	0.0334			0.0114		0.0383		0.09
Subtotal	**0.00**	**1.80**	**0.05**	**0.00**	**5.94**	**0.00**	**0.75**	**9.28**	**0.00**	**4.22**	**8.06**	**0.95**	**0.00**	**31.06**
Temporary Emergent Wetland Impacts														
Gas Pipe Alt. 1	0.09	14.12		0.003	0.68	0.00							9.10	23.99
Area 2WX to Station Footprint				0.38										0.38
Area 2WX to Area 2W														0.00
Area 2W to Area 2E														0.00
Area 3 to Area 2E					0.41									0.41
Knox Mine to Area 2WX														0.00
Area 6 and Stephens Mine to Area 2WX														0.00
Area 9 South to Area 6						0								0.00
Area 9 North (Donora Mine) to Area 6														0.00
Potable Water and Sanitary Sewer						0								0.00
Subtotal	**0.09**	**14.12**	**0.00**	**0.38**	**1.09**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**9.10**	**24.78**

Table F2-35. Summary of Wetland Impacts for the East Range IGCC Power Station, Buffer Land, and Associated Facilities

Project Element	Wetland Types													Total Wetland Impacts
	Type 1	Type 2		Type 3	Type 4	Type 5	Type 6			Type 7		Type 8		
	Floodplain Forest	Wet Meadow	Sedge Meadow	Shallow Marsh	Deep Marsh	Shallow Open Water	Alder Thicket	Shrub Swamp	Shrub Carr	Hardwood Swamp	Coniferous Swamp	Coniferous Bog	Open Bog	
Temporary Scrub-Shrub Wetland Impacts (TWS)														
HVTL							0.20							0.20
Gas Pipe Alt. 1							0.33							0.33
Area 2WX to Station Footprint														0.00
Area 2WX to Area 2W														0.00
Area 2W to Area 2E														0.00
Area 3 to Area 2E														0.00
Knox Mine to Area 2WX														0.00
Area 6 and Stephens Mine to Area 2WX							0.19							0.19
Area 9 South to Area 6														0.00
Area 9 North (Donora Mine) to Area 6														0.00
Potable Water and Sanitary Sewer														0.00
Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.72**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.72**
Permanent Type Conversion (Scrub-Shrub and Forested)														
HVTL							19.21			10.99		29.42		59.62
Gas Pipe Alt. 1										0.41		0.06		0.47
Area 2WX to Station Footprint										0.75		0.32		1.07
Area 2WX to Area 2W														0.00
Area 2W to Area 2E														0.00
Area 3 to Area 2E														0.00
Knox Mine to Area 2WX														0.00
Area 6 and Stephens Mine to							0.26							0.26

Table F2-35. Summary of Wetland Impacts for the East Range IGCC Power Station, Buffer Land, and Associated Facilities

Project Element	Wetland Types													Total Wetland Impacts
	Type 1	Type 2		Type 3	Type 4	Type 5	Type 6			Type 7		Type 8		
	Floodplain Forest	Wet Meadow	Sedge Meadow	Shallow Marsh	Deep Marsh	Shallow Open Water	Alder Thicket	Shrub Swamp	Shrub Carr	Hardwood Swamp	Coniferous Swamp	Coniferous Bog	Open Bog	
Area 2WX														
Area 9 South to Area 6														0.00
Area 9 North (Donora Mine) to Area 6														0.00
Potable Water and Sanitary Sewer														0.00
Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**19.74**	**0.00**	**0.00**	**12.15**	**0.00**	**29.80**	**0.00**	**61.42**

Wetland impacts are first counted for the plant site, rail, road, HVTL, gas pipeline, process water lines, sanitary sewer, in that order.
Accurate Eggers and Reed classifications are only available for wetlands that have been field delineated. Eggers and Reed classifications for NWI wetlands are assumed to be the most common wetland types for this area of Minnesota. In instances where NWI and other data identify wetland complexes of multiple types, the information above uses the most predominant wetland type present.

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Note: PHE prepared Figures F2-6, 22, 27 and 33. All other figures were prepared by SEH on behalf of Excelsior (Excelsior, 2009). They were prepared as color graphics and are in color on CDs of the document. They are also accessible on the web in color. They are reproduced in paper copies in black and white.

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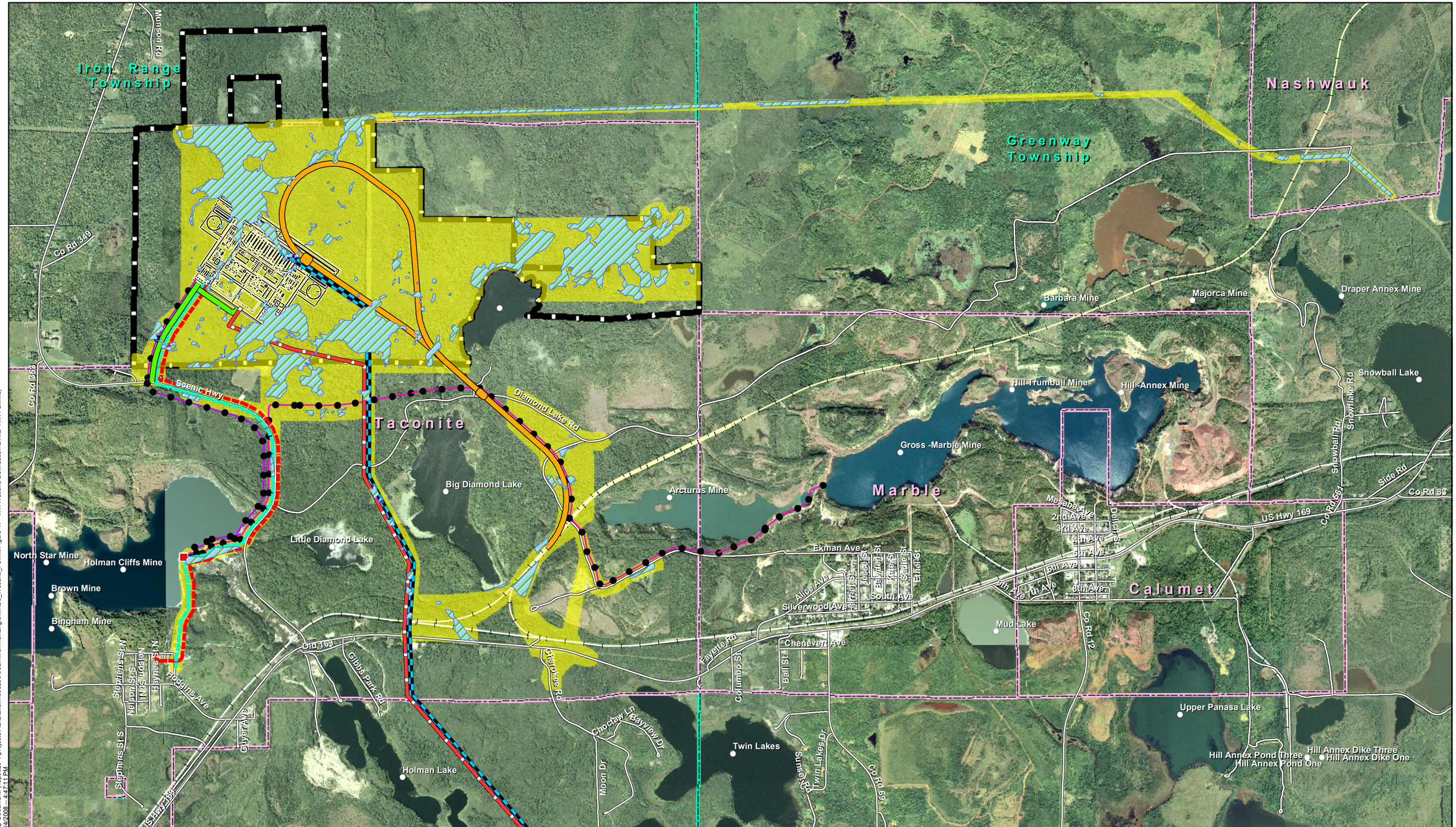

Map Document: (\\sp3020-1\projects\AE\E\Exen\050200\03\Environmental\gis\MXDs_Wetland_Permit\Figure 17 - WR Wetland Delineation Limits 11x17 L.mxd)
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West Range

November 2008

Legend

- Surveyed Wetlands
- Wetland Survey Area
- Plant Layout
- Footprint and Buffer Land
- Proposed Rail
- Proposed Access Road
- HVTL
- Gas Pipeline
- Potable Water
- Gravity Sewer
- Sanitary Pump Station
- Process Water Pipeline 1
- Process Water Pipeline 2
- Process Water Pipeline 3
- Geographic Names
- Municipal Boundaries
- Civil Township
- Existing Roads
- Existing Railroads
- Railroad in Development

Appendix F

Source: NAIP 2006, Itasca County, Mn/DNR, Mn/DOT, USGS, Fluor, Excelsior Energy, and SEH.
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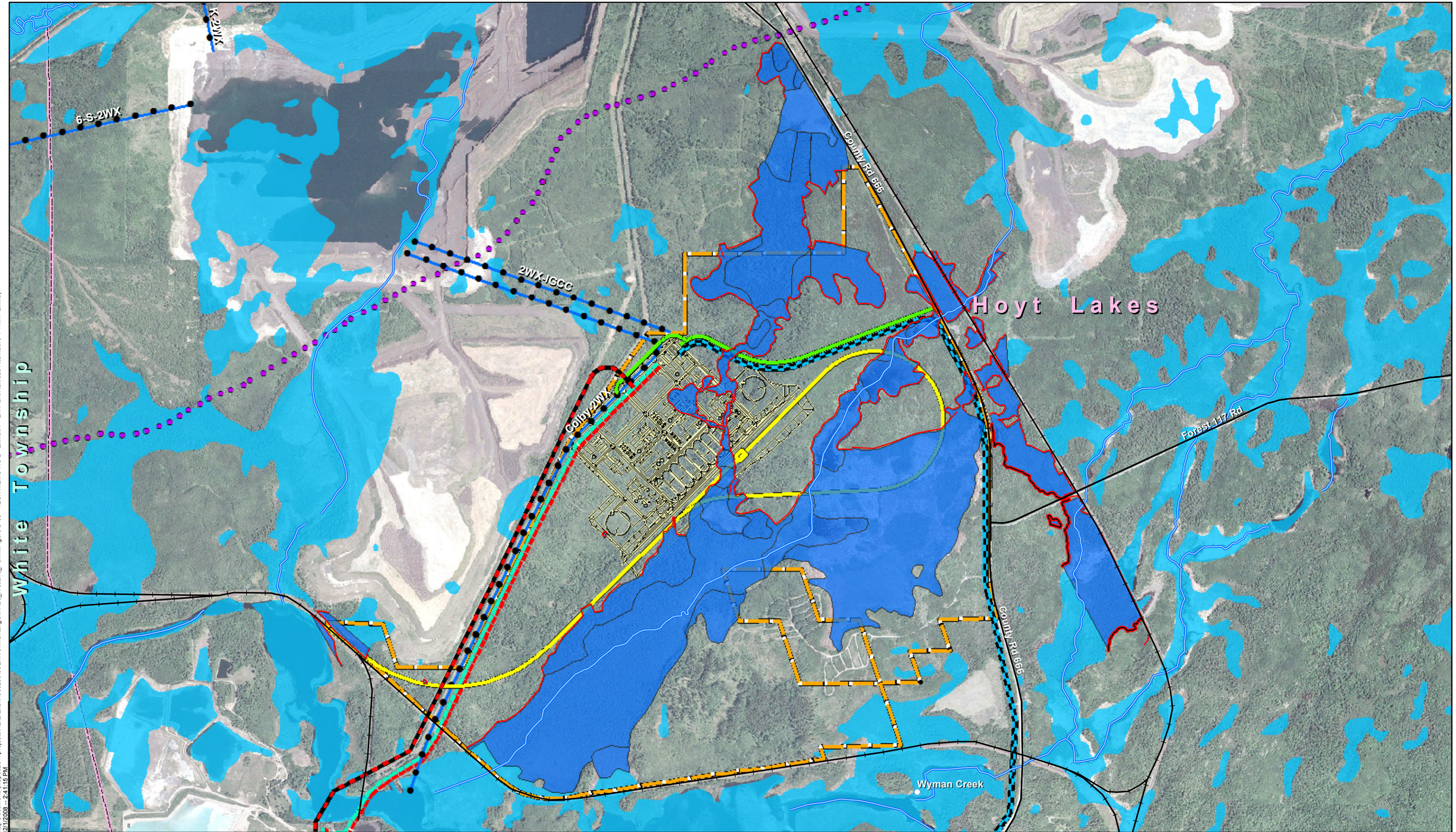
Figure F2-1

West Range Wetland Delineation Area

Itasca County - South Coordinate System

N W E S

0 2,500 Feet



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East Range

December 2008

Legend

- Footprint and Buffer Land
- Preferred Rail Alt 1
- Proposed Roads
- National Wetlands Inventory (NWI) [Beyond Surveyed Wetlands Areas]
- Surveyed Wetlands
- Wetland Delineations
- Wetland Delineation Refinements
- Existing Roads
- Existing Railroads
- Geographic Names
- Municipal Boundaries
- Civil Township
- Streams
- Iron Formation

Appendix F

Source: NAIP 2003, Mn/DNR, Mn/DOT, USGS, USFWS, Fluor, Excelsior Energy, and SEH.
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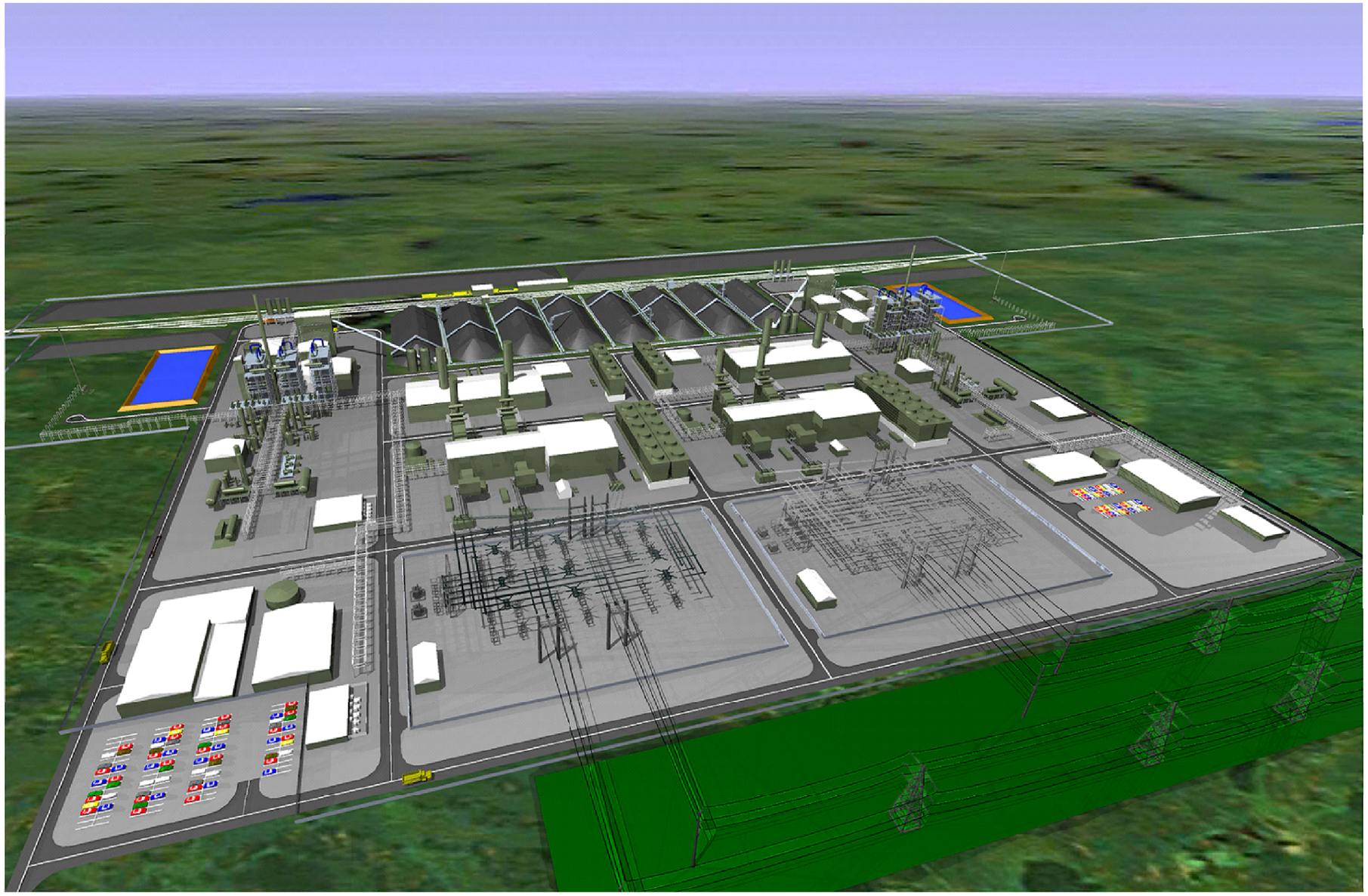
Figure F2-2

East Range Wetland Delineations

St. Louis County - Central Coordinate System

N W E S

0 1,500 Feet



FLUOR

PHASE 1 AND 2

ConocoPhillips

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West Range

August 2006

Appendix F

Source: Fluor, ConocoPhillips, and Excelsior Energy.
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Figure F2-3

Visual Rendering of Phase I and II

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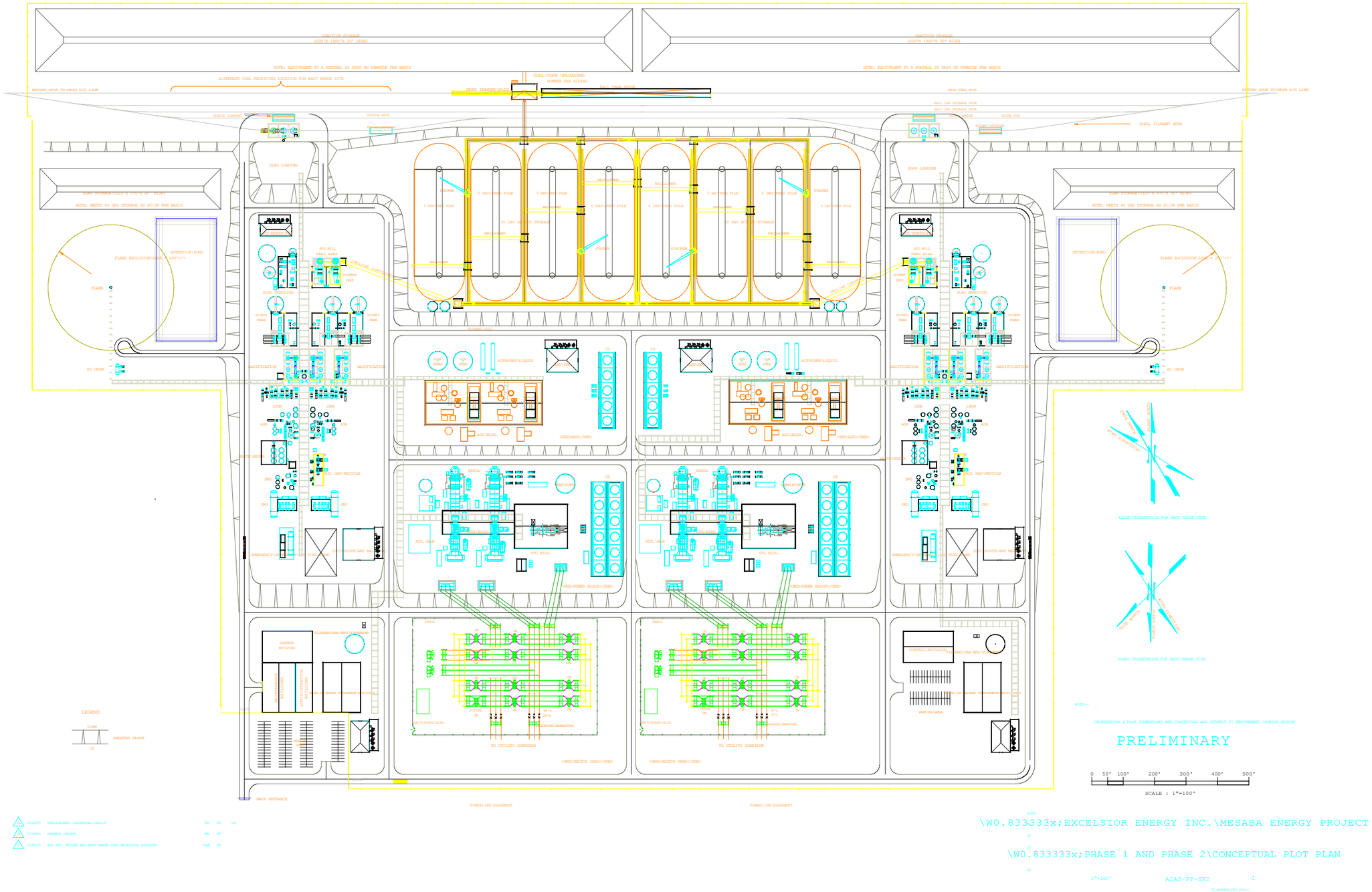

Map Document: (\\sp3020-1\projects\AE\IE\Exeni\050200\03Environmental\gis\MXDs_Wetland_Permit\Figure 06 - Surfacing Plan for Phase I & II Developments 11x17 L.mxd)
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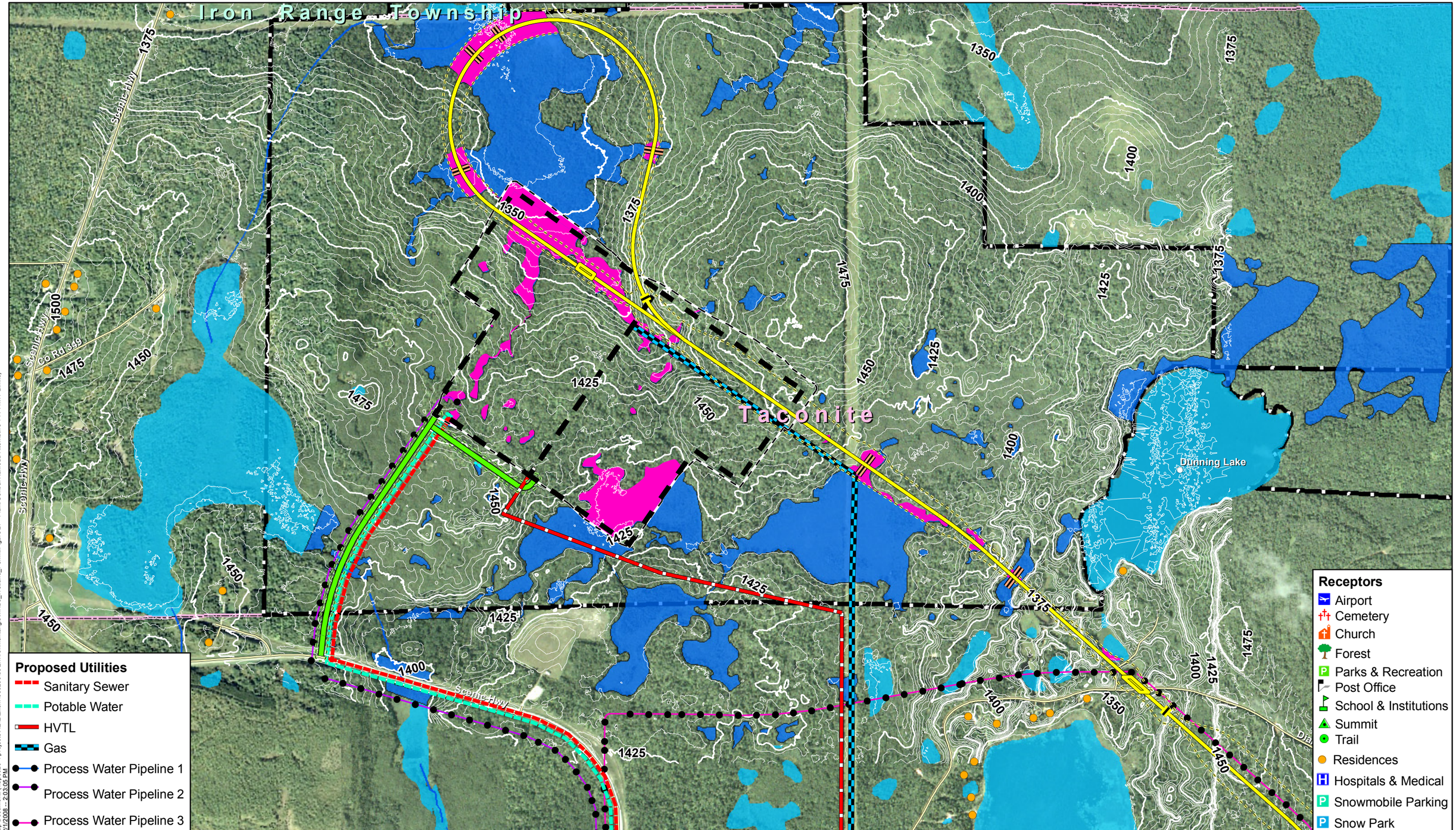
Excelsior Energy Inc. Mesaba Energy Project Energy, Innovation, and Economic Development for Minnesota 11100 Wayzata Boulevard Suite 305 Minnetonka, MN 55305 Phone 952.847.2360 Fax 952.847.2373	***West Range*** *November 2008*	Appendix F Source: Fluor and Excelsior Energy. © 2008 SEH	***Figure F2-4*** ***Surfacing Plan for Phase I & II Developments***



Map Document: (\\Sp3020-1\projects\AE\IE\exen\050200\03 Environmental\gis\MXDs_Wetland_Permit\Figure 27 - Plant Central Railroad Alternative 1-A 11x17 L.mxd)
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West Range

December 2008

Legend

- Footprint and Buffer Land
- Central Plant Layout
- Plant Layout Grading Limits
- Rail Alternative 1-A
- Rail Alternative 1-A Construction Limits
- Coal Train Limits
- Proposed Culverts
- Proposed Roads
- Proposed Road Permanent ROW Limits
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- Surveyed Wetlands
- National Wetlands Inventory (NWI) [Beyond Surveyed Wetlands Areas]
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- Existing Roads
- Existing Railroads
- Geographic Names
- Municipal Boundaries
- Civil Township

Appendix F

Source: NAIP 2006, Horizon's, Itasca County, Mn/DNR, Mn/DOT, USGS, USFWS, Fluor, Excelsior Energy, ESRI, and SEH, © 2008 SEH

Figure F2-5

Central Plant Layout Railroad Alternative 1-A

Itasca County - South Coordinate System

N W E S

0 1,000 Feet

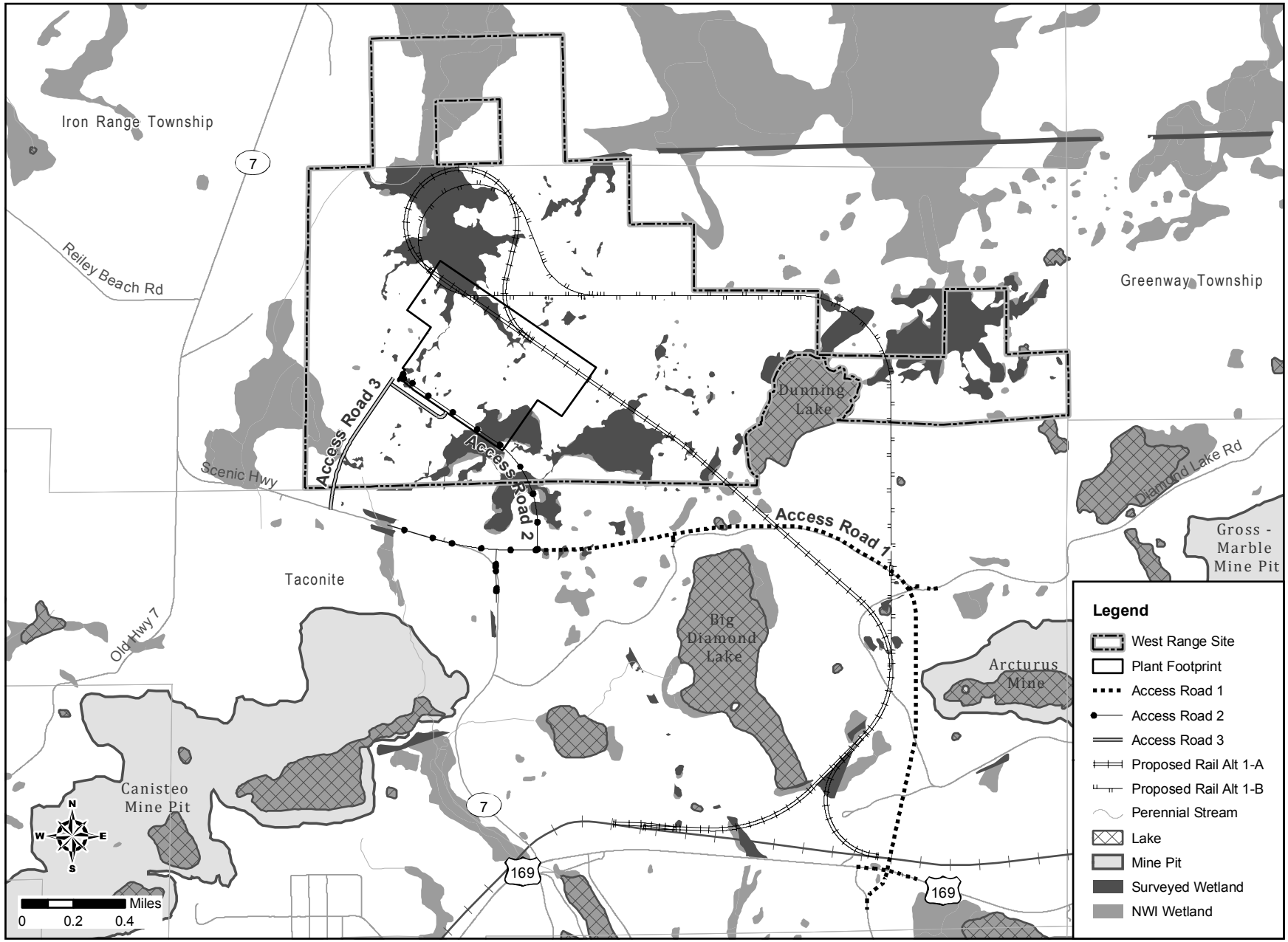

Figure F2-6.. West Range Central DEIS Plant with Rail and Road Alternatives

Appendix F