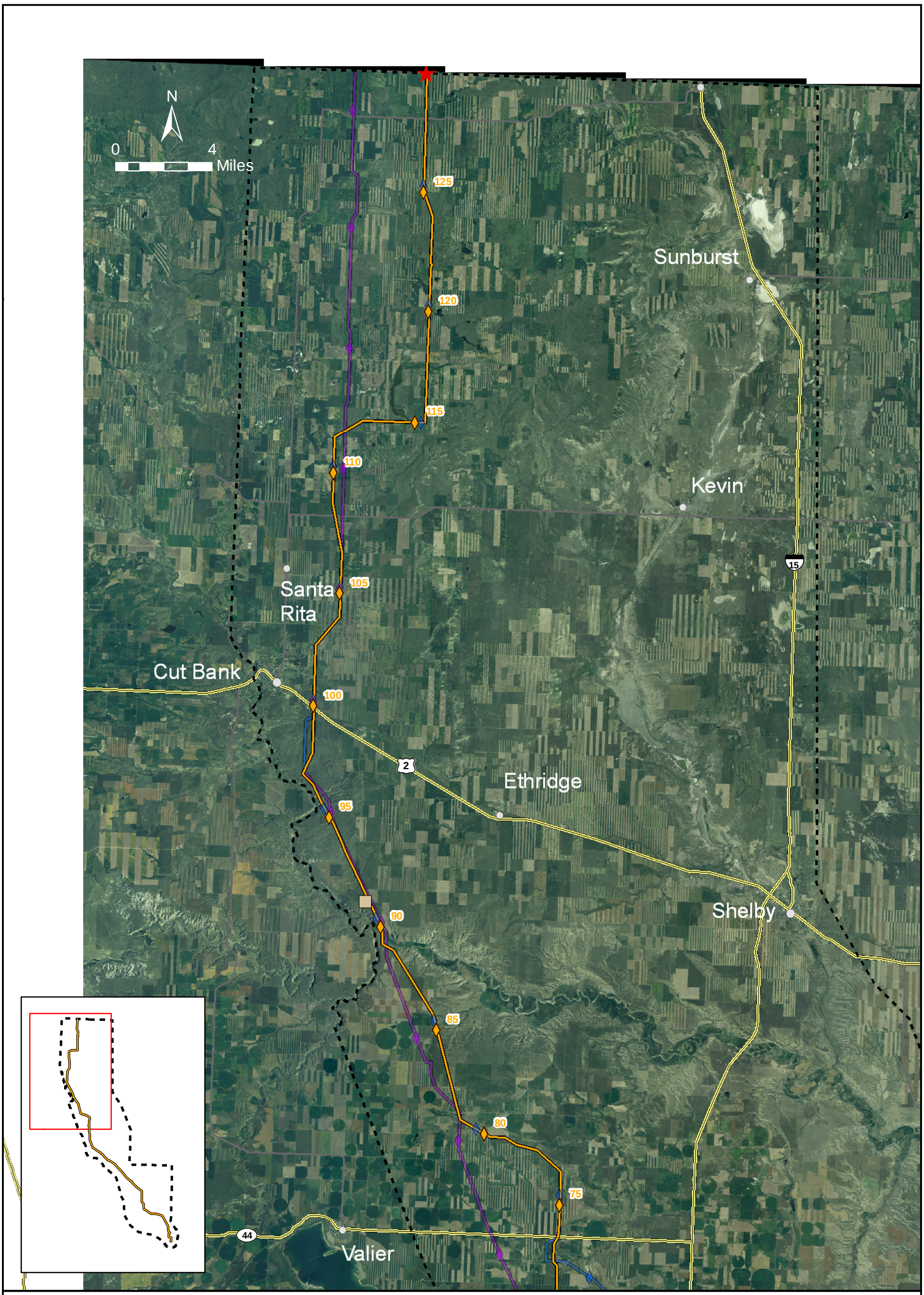

FIGURE 2.3-4
ALTERNATIVE 2 ALIGNMENT
NORTH

LEGEND

- ALT 2 - ALIGNMENT
- ALT 2 MILE MARKERS
- ALT 3 - ALIGNMENT
- ALT 3 MILE MARKERS
- ALT 4 - ALIGNMENT
- ALT 4 MILE MARKERS
- CITIES AND TOWNS
- ALIGNMENT END AND EXIT POINTS
- STUDY AREA BOUNDARY
- MAJOR HIGHWAYS
- SECONDARY ROADS
- MARIAS SUBSTATION

NOTE:
ALT = ALTERNATIVE

GIS map by Ed Madej -TTEMI-HE Fig2_3-4_MATL_ALT2_Alignment_North_111907.mxd

From the crossing of Hunt Coulee at approximately milepost 36, the alignment would traverse approximately 1 mile of cropland and rangeland to the Teton River.

The alignment would span the Teton River about 2.7 miles west of Kerr Bridge, on State of Montana land in a ¼-mile-wide gap in a riparian cottonwood stand avoiding an area of unstable slopes. From the river the alignment would go northwest and north across cultivated farmland until it intersects and crosses Interstate 15 about 2½ miles north of Brady about milepost 53. The alignment would continue northwest, crossing South Pondera Coulee and the Burlington Northern Santa Fe Railroad and Pondera Coulee, and continue northwest south of Conrad, passing approximately 3 miles west of Conrad.

At milepost 64 the alignment would turn generally north and would cross the eastern end of the Benton Bench. North of the Benton Bench the alignment would cross farmland to the Dry Fork of the Marias River. From milepost 69 north of the river the alignment would continue north about 12 miles over mostly cultivated farmland. From Belgian Hill along Highway 44 the line would go north to about the mid point of Trunk Butte. At milepost 77 the alignment would skirt the edge of farmland and pass through range and pasture land on the north side of Trunk Butte heading west-northwest toward Bullhead Creek. The alignment would follow the south side of Bullhead Creek until crossing the creek approximately 2 ½ miles east of Bullhead Lake. The alignment would traverse farmland and near milepost 81 head northwest. The alignment would cross Abbott Coulee about 2 ½ miles west of Willow Rounds and head northwest to the Marias River.

The alignment would cross the Marias River just west of the existing NWE 115-kV transmission line at milepost 90. The crossing would be approximately ½ mile east of the junction of the Two Medicine River and Cut Bank Creek on State of Montana and BLM land. North of the Marias River the alignment would extend approximately 8 miles northwest, running roughly parallel to Cut Bank Creek to a new Marias Substation south of Cut Bank. The exact location of this substation has not been determined. The alignment would turn north and cross Highway 2 at milepost 100 approximately 1½ miles east of Cut Bank crossing rangeland. From here north the alignment would cross cultivated farmland to cross Old Maids Coulee. North of Cut Bank, about 10½ miles, the alignment would turn east at milepost 112 for approximately 3 miles turning north near Hay Lake and passing the east side of Hay Lake. The alignment would continue north about 14½ miles from Hay Lake over mostly cultivated land to the Montana-Alberta border at a location that coincides with the proposed alignment in Canada. Along this stretch the alignment would pass the eastern edge of Grassy Lake near milepost 121. The border crossing would be at the western edge of the Red Creek Oil Field and would avoid existing oil and gas wells in this area.

Rights-of-Way

MATL proposes an operational right-of-way width of 105 feet for the proposed Project based on structure type, location, proven construction methods, and safety and operations zones. Transmission line easement requirements would depend on structure widths. The 105-foot-wide zone is to minimize the potential for encroachment and to ensure that if buildings are proposed near the line, the right-of-way width would be large enough to prevent them from encroaching near the line. The right-of-way width is based on safety considerations associated with line-to-ground clearances and access needs for line repairs and power line maintenance activities.

As discussed below under Transmission Line Structures, the Project would use a combination of H-frame structures with three-pole structures used at medium and heavy angles (**Appendix B**) and dead ends (**Glossary**) across cultivated ground at right angles as well as on range and pasture lands. Monopoles would be used on nearly all cultivated fields and fields enrolled in the CRP lands that are crossed diagonally (**Figure 2.3-5**). Where the line would turn a corner, angle-bracing guy wires would be used and additional easement space would be required (**Appendix B**).

MATL would coordinate with the Real Estate Management Bureau of DNRC's Trust Land Management Division for rights-of-way and easements across state owned school trust lands and navigable waterways administered by the state. MATL also would coordinate with the BLM Lands and Realty office to seek approval following a compatibility assessment with the BLM's West HiLine Resource Management Plan and completion of the NEPA review process. In addition to fee-owned public lands, areas covered by conservation easements including the FWS wetland easements and the Farm Service Agency's CRP would require that MATL seek compatibility reviews by these agencies on specific parcels to ensure compliance with the terms of the easements.

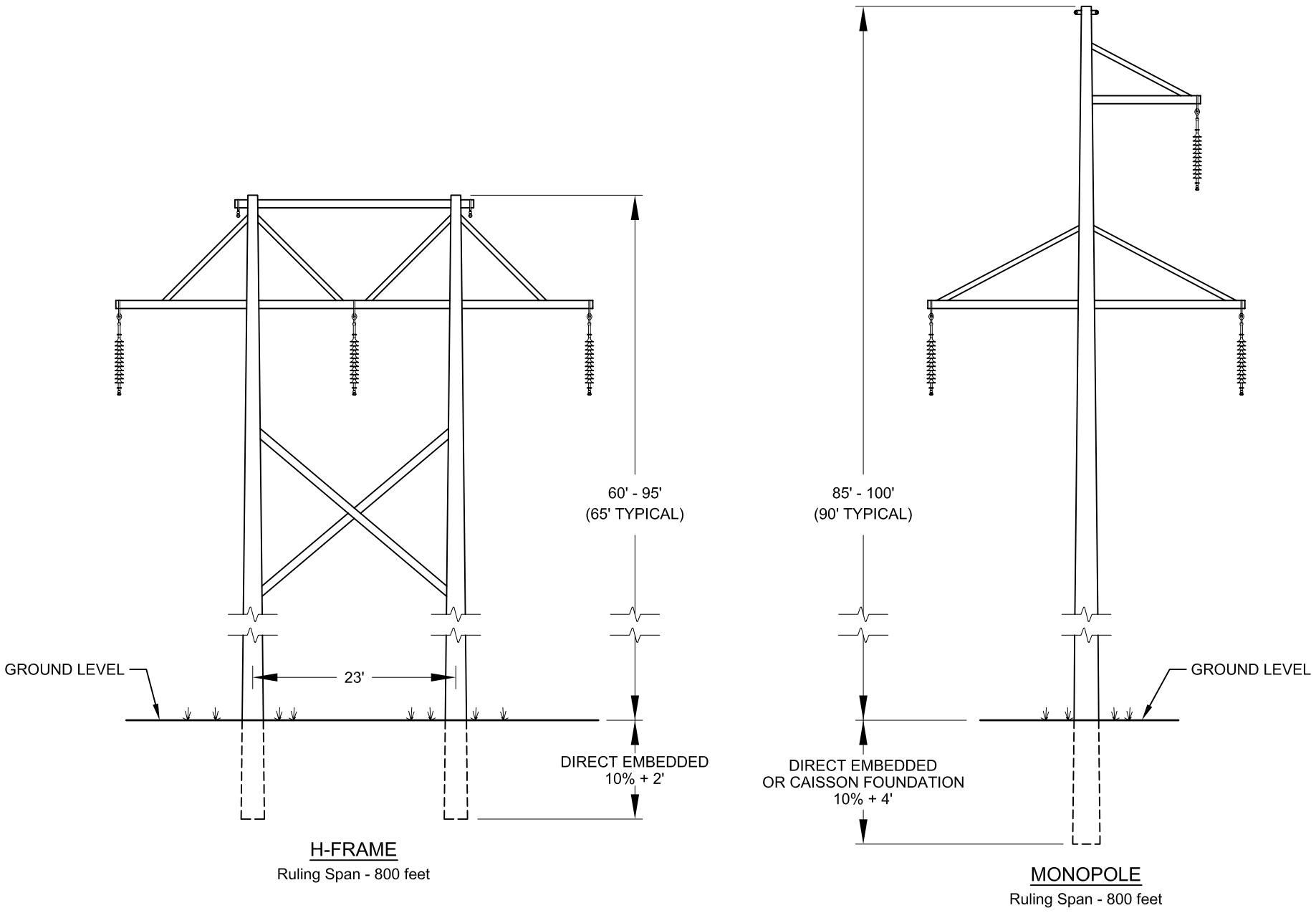

FIGURE 2.3-5
PROPOSED MATL POWERLINE
TYPICAL SUPPORT STRUCTURES

Figure 2.3-5_Typical Support Structures.dwg - DWH - 01/22/2008

Compensation to Landowners

MATL could acquire the necessary rights-of-way and easements to construct and operate the transmission line through negotiated agreements with landowners or through eminent domain. MATL would prefer to acquire rights-of-way by agreement and has committed to achieve mutual agreement before resorting to eminent domain. The eminent domain process is described in Chapter 1. MATL has proposed to implement an alternative dispute resolution process and provide compensation to landowners as described in the following excerpt from MATL's June 2008 MFSA application amendment.

> *Should DEQ approve the project, MATL has two options for acquiring the necessary rights-of-way and/or easements to construct and operate its transmission line. The first is through negotiated agreements with Landowners. The second is through the use of the power of eminent domain. MATL's position is that it is vastly preferable to acquire rights-of-way by agreement, and MATL will commit substantial efforts and resources to that end. In the end, eminent domain provides MATL with a clear path to acquiring the necessary rights-of-way, but MATL will make every reasonable effort to achieve an equitable solution by mutual agreement before resorting to that process.*
>
> *MATL is prepared to make several commitments regarding the efforts it will make to acquire rights-of-way by agreement before filing a complaint in eminent domain with respect to any particular parcel of land. In brief, and as described further below, MATL will offer greater opportunity for dialogue, greater routing flexibility (within the boundaries of the approved corridor), and different (and generally higher) levels of compensation in the context of a negotiated agreement than would be available in the context of an eminent domain proceeding.*
>
> *1. MATL will establish and utilize an alternative dispute resolution process prior to filing any complaint in condemnation.*
>
> *In order to reach agreement with Landowners, MATL believes it is necessary to engage the two parties in an appropriate process to clarify issues and help them work together to jointly resolve disputes. Accordingly, MATL commits that it will not initiate a condemnation proceeding with respect to a specific tract of land unless and until the involved Landowner has been provided an offer to participate in a Preliminary Alternative Dispute Resolution (ADR) meeting, as described below. This offer will be based on negotiation principles that are fair, consistent and uniformly applied to all Landowners.*
>
> *Where it is apparent that direct negotiations will not lead to an agreement between MATL and a Landowner, MATL will invite the Landowner to participate in a PADR meeting. A PADR meeting is a discussion facilitated by an independent 3rd party during which the parties attempt to reach an informed decision on the concerns that could be addressed through an ADR process and then select the appropriate resolution option(s) for those concerns. At this point, the Landowner may, by mutual agreement with MATL, choose to proceed with ADR to address some or all of those concerns.*

The PADR meeting can be a critical first stage to an effective mediation process, or any other form of Alternative Dispute Resolution (ADR), and can be used for any type of conflict and at any stage. The objective of the PADR meeting is to ensure that both parties clearly understand:

The issues to be resolved;
The impacts, needs and interests of both parties; and,
The alternative dispute resolution option for unresolved issues; which may include "interest-based" mediation and binding arbitration.

Other purposes of the PADR meeting include deciding on logistical matters such as: future meeting times; locations and contacts; the need, role, and use of advisors, lawyers and experts; the selection of mediators and arbitrators; and agreements on rules, timelines, and what important information needs to be exchanged. If, at the end of the PADR meeting, the two parties agree to continue into an ADR process, they would enter into a written agreement that codifies these matters and defines the steps going forward.

ADR is an additional option for the Landowner to resolve issues equitably. The PADR/ADR process has proven very effective in bringing parties together in agreement in similar projects in other jurisdictions. The process does not in any way displace or diminish any of the Landowner's or MATL's rights in law. All of the costs associated with the ADR process would be borne by MATL including all reasonable costs incurred by the Landowner.

2. In the context of negotiated agreements, MATL is prepared to provide mitigation measures and compensation components beyond those strictly required by law.

Through consultation with the Landowner and the application of a high standard of engineering, MATL will undertake reasonable best efforts to mitigate all demonstrable adverse affects of its transmission line on property and existing agricultural operations. Where the effect cannot be mitigated through reasonable engineering design and structure placement, the Landowner will be compensated so that, at a minimum, he or she suffers no financial loss. MATL operates under the assumption that mitigation through impact avoidance, proper design and structure placement is more desirable than compensation. Accordingly, greater effort and emphasis will be given to mitigation even when, on a comparative basis, mitigation may be somewhat more costly than compensation without mitigation.

MATL's negotiated compensation package generally will consist of three components:

a. Easement Payment:

- *Rationale: This component includes three possible elements that closely align with the components of compensation that may be available in an eminent domain proceeding. The first compensates the Landowner for the use of the land across which the right-of-way passes. While the Landowner will continue to have the right to farm or graze this land, except for that which is physically occupied by structures and guy wires, MATL purchases the right to traverse it with its facilities and the Landowner may not engage in activities that interfere with the construction, operation and maintenance of the transmission line. The second is compensation for any specific tracts of land that are isolated or somehow rendered uneconomic due to the presence of the transmission line. Finally, this component may in some instances include compensation for any demonstrable reduction in the value of the Landowner's remaining parcel due to the presence of the transmission line.*

- *Timing: This is a one-time payment, and the funds are paid when the Easement is recorded. Alternatively, the Landowner may opt for up to five annual installments.*

- *Amount: The payment will be no less than the current fair market value of the interest in the property acquired for the Right-of-Way.*

b. Annual Payment:

• Rationale: This payment is intended to compensate the Landowner for reasonable, direct, ongoing impacts to his farming and/or ranching operations that may result from the presence of the transmission line. In most instances, this impact involves the additional cost of farming around the poles or associated structures combined with the lost production from those areas in which the structures are located.

• Timing: These payments are made annually.

• Amount: Annual payments have not traditionally been made to landowners by power line owners in Montana (generally rural co-ops, public utilities, and the federal government). As there is no precedent in Montana for MATL to draw upon, MATL will establish payment levels based on common agricultural practice and standard cost data.

• Adjustment: Annual payments will be reviewed and adjusted, if necessary, every five years. If a dispute arises upon future review of the annual compensation as to the amount of adjustment that is merited, the Landowner will again be made the offer to take advantage of the ADR Process described in 1) above.

c. Reimbursement for Damage to Crops and Improvements:

• Rationale: This compensates the Landowner for any damage to his property, crops, soil, livestock, improvements, or possessions should that damage be caused by MATL or its contractors as a result of the initial construction, ongoing maintenance, operation, or decommissioning of the MATL transmission line.

• Timing: Compensation is paid immediately. In many cases, MATL will undertake the repair work itself at its own expense. Where repair is not possible, for example in the case of crop damage, the Landowner will be financially compensated in full. Where possible and mutually agreed, the Landowner will be paid to undertake the repairs himself.

• Amount: All compensation for damage is in full.

Additional to all of the above, MATL will compensate the Landowner for the temporary use of any land off the Right-of-Way required for a Temporary Construction Easement associated with the initial construction of the transmission facilities. Such a temporary easement will be subject to the obligation of MATL to reclaim and revegetate the disturbed land.

Project Design and Implementation

MATL would design, construct, operate, and maintain the proposed transmission system in accordance with the National Electrical Safety Code (NESC), U.S. Department of Labor Occupational Safety and Health Act (OSHA) Standards, and other guidance as appropriate for safety and protection of property. The following sections describe the system components, general construction methods, and operation of the proposed transmission line.

Transmission Line Structures

Laminated wood or wood pole H-frames would be the primary support structures used to cross range and pasture lands. MATL committed in replacement pages to its MFSA application (June 19, 2008) to use metal monopoles on approximately 56 miles of diagonal alignment that crosses cultivated and CRP land. Additional steel H-frame structures may be used for special applications such as where extraordinarily tall structures are required. **Figure 2.3-5** illustrates the typical H-frame and monopole structures. Design characteristics of the laminated or round wood-pole H-frame support structures and metal monopole structures are summarized in **Table 2.3-1.** MATL has not specified the exact locations where the monopole structures would be used.

MATL would use different types of H-Frame structures to address the various angles that would be necessary to accommodate changes in terrain and land use. These structures are shown in **Appendix B**. The proposed laminated or round wood-pole H-frame structures would incorporate 230-kV design standard synthetic insulators, hardware, and ground wires to provide nearly corona-free operation, as well as reduce audible noise and radio and television interference. On the typical suspension structure, three insulator strings would be hung from each structure. Each string would have 12 individual insulators.

On H-frame structures, one overhead galvanized steel ground wire, about 3/8-inch in diameter, would be installed on one side of the top of the structure for lightning protection. A second ground wire carrying a fiber optic cable for communications would be installed on the other side. On monopoles only the fiber optic ground wire would be used. At this time the fiber optic capacity of the line would only be used for MATL communications and those of MATL customers. MATL would also use the communication capacity to connect MATL facilities and those of NWE and the Alberta Electric System Operator. No plans have been made to use the excess fiber capacity for commercial purposes.

For the H-frame structures, holes would be augered into the ground to accommodate the new structures. New poles are typically set in the ground 10 percent of the pole's length plus 2 feet (that is, an 80-foot pole would be buried 10 feet). Spacing between two poles of a proposed 230-kV H-frame structure would be about 23 feet. Typical ruling span length would be about 800 feet, but could range from 500 feet to 1,600 feet. Approximately six to seven (average of 6.6) structures per mile would be required for an 800-foot ruling span. Depending on terrain and type of structure, total disturbance at each structure location during construction would be about 44 square feet for H-frame and 28 square feet for monopole. Pentachlorophenol would be used as a preservative to treat the wood pole structures.

TABLE 2.3-1
TYPICAL DESIGN CHARACTERISTICS [a]

Design Element	H-frame	Monopole
Alternative 2 Length in Montana	129.9 miles	
Length of H-frame or Monopole used in Montana	Approximately 74 miles	Approximately 56 miles
Right-of-Way Width	105 feet	Same as H-frame
Thermal Capacity for 230-kV line	625 MVA @ 212° Fahrenheit	Same as H-frame
Nominal Voltage	230,000 volts (230 kV)	Same as H-frame
Conductor Size	1590 kcmil Falcon	Same as H-frame
Conductor Type	ACSR	Same as H-frame
Overhead Ground Wire	3/8-inch-diameter galvanized, plus optical ground wire	Incorporated into optical ground wire (diameter of < 0.433 inches)
Electric field at edge of right-of-way	1.67 kV/m	1-conductor side: 1.02 kV/m 2-conductor side: 0.98 kV/m
Magnetic field at edge of right-of-way	70.57 mG	1-conductor side: 97.89 mG 2-conductor side: 83.88 mG
Electrostatic short-circuit current limit	5 mA	Same as H-frame
Structure Height Above Ground (approximate)	65 feet average	90 feet average
Length of Span (approximate)	800-foot ruling span	800-foot ruling span
Minimum Ground Clearance of Conductor	21.2 feet at 212°F (27.2 feet for cultivated and CRP land)	Same as H-frame
Typical Structure Base Dimensions	2 poles, 1 foot x 2 foot	1 pole, 30-36 inch radius
Total land temporarily disturbed for conductor reel and pole storage yards	15-20 acres	Same as H-frame
Area required for each structure base during operations[b]	44 square feet	28 square feet
Approximate Transmission Line Cost per mile (U.S. $) (August 2008 Rates)	$323,02 (Unguyed structure)	$359,429 (Unguyed structure)

Notes:

ACSR	aluminum core steel reinforced	Kcmil	1,000 circular mils
kV	kilovolts	kV/m	kilovolts per meter
mA	milliampere	mG	milligauss
MVA	megavolt-amperes		

[a] MATL's MFSA replacement pages, June 19, 2008 (Revision g) and U.S./Canadian Exchange Rate – August 8, 2008.

[b] Additional space may be required for angle structures.

For monopole structure installation, the holes would be 10 percent of the pole length plus 4 feet deep, but have a slightly larger diameter. After the pole is set in the hole, cement would be used, instead of soil, to backfill within approximately 1 foot of the soil surface. The salvaged topsoil material would be replaced on top of the cement and smoothed evenly around the pole. The excess soil from each hole would be evenly regraded around the structure, or hauled off site, depending on the landowner's preference. Additional design characteristics for the project are summarized in **Table 2.3-2**.

TABLE 2.3-2
ADDITIONAL DESIGN CHARACTERISTICS

Component Description	Alternative 2	Alternative 3	Alternative 4
Line Length in Montana (miles)	129.9	121.6	139.9
H-frame	507	803	337
Monopole	350	0	587
Pulling/tensioning sites (10,000 ft^2)	65	61	70
Staging areas (land temporarily disturbed for conductor reel and pole storage yards)	3 to 5 areas	3 to 5 areas	3 to 5 areas
Access road (14 feet wide)	3 miles	5 miles	7 miles
Road disturbance area (16.8 feet wide)[a]	6 acres	10 acres	14 acres

Notes:

NA = Not applicable

ft^2 = square feet

[a] Constructed access road estimates are based on minimal need in areas of steep terrain only. Construction disturbance for a road is assumed to be 20 percent greater than the actual roadbed area.

For construction near water bodies, no pole structures would be installed below the normal high-water mark or within a 100-year floodplain. MATL may use a helicopter for special locations such as major river crossings. If construction occurs during summer or fall months, it may be possible to use a boat to string the line across water bodies. If construction occurs during the winter months, clear-span bridges could be used when a stream is dry or frozen (MATL 2006b). Small watercourses could possibly be crossed if sufficiently frozen; where crossing isn't possible, other potential options include portable bridge placement or use of existing access roads. Construction across water bodies would be postponed if any excessive flows or flood conditions are present or anticipated. The use of a helicopter or boat would be the construction contractor's choice unless dictated to do otherwise.

Transmission Line Conductors

Electrical conductors provide the medium for flow of electrical energy. The proposed conductor configuration and size for H-frame and monopole support structures are shown in **Table 2.3-1**. The conductor consists of strands of reinforced steel cable encased by aluminum strands. The steel cable provides the tensile strength to support the conductor; the aluminum conducts most of the electrical current.

For safety reasons, where the transmission line crosses cultivated and CRP land, the height of the conductor for both types of support structures (H-frame and monopole) would be at least 7.2 feet above the highest currently-employed standard agricultural equipment (i.e., equipment 20 feet in height). Unless otherwise specified by the National Electrical Safety Code, the minimum conductor height on all other types of land would be 21.2 feet.

The electric and magnetic fields (EMF) are slightly different for H-frame and monopole structures due to the difference in configuration of the conductors (**Table 2.3-1** and **Figures 3.4-2** and **3.4-3**).

Bright Orange Disc Bird Flight Diverter

Markers and Warning Devices

In order to reduce bird collisions with the ground wire, MATL would install bird warning devices in high risk areas such as near Hay Lake, the Marias River, Dry Fork Marias River, and Teton River crossings, east of Benton Lake National Wildlife Refuge (NWR), and high ridge crossings such as the Benton Bench northwest of Conrad. For example, the "firefly" bird flapper/diverter would alert birds to the transmission line through light, motion, and reflectivity (Section 3.8). For daytime deterrence, this diverter uses highly reflective materials and fluorescent colors designed to be seen and avoided by birds. These markers glow in the dark for about 10 hours for night time deterrence. The "firefly" also rotates in 3- to 5-mile-per-hour wind conditions to increase visibility. MATL proposes to explore other technology and deploy it as needed for site-specific application.

Firefly Bird Flight Diverter Daytime

MATL would comply with appropriate regulations of the Federal Aviation Administration (FAA). MATL would install FAA-recommended colored aerial markers for aviation safety and these markers would be installed at major pipeline crossings as determined by consultation with pipeline companies. These ball markers are up to 36 inches in diameter (though 20-inch markers are permitted on approaches to airports where the lines are within 50 feet of the ground) and are available in international orange, white, and yellow (installed with alternating colors). Reflective tape can be installed on the markers to increase their nighttime visibility for aircraft.

New and Upgraded Substations

MATL proposes to construct a new substation, the Marias Substation, approximately 10 miles south of Cut Bank at a location next to the site where NaturEner USA has begun building the Glacier Wind Power Project (formerly known as the McCormick Ranch wind park). The approximate location of the substation would be in the southeast quarter of Sec. 27 T32N R5W. The potential disturbance area has not been determined. The Marias Substation and the expanded 230-kV Great Falls Switchyard would be located in farmland or range/pasture land, not in a residential or subdivided area.

North of Great Falls, across the river from Giant Springs State Park, MATL is proposing to interconnect with the NWE 230-kV Great Falls Switchyard, requiring NWE to enlarge the switchyard to accommodate the MATL tie line and other proposed lines. MATL has provided a copy of an executed interconnection agreement with NWE to the agencies as an addendum to the application (Appendix M).

Access Roads

As a result of relatively flat topography and associated agricultural land uses that predominate in the Project study area, MATL anticipates only minimum development of access roads to construct, operate, and maintain the proposed Project. The majority of the Project right-of-way would be easily accessed from public roads, existing two-track roads, and farm fields. MATL does not anticipate maintenance of these access points with the exception of gate installations at key locations, if necessary. MATL proposes that disturbances resulting from access requirements would be reclaimed to conditions similar to what existed pre-project or to those conditions specified by landowners during easement-lease negotiations. Obstacles to travel along the right-of-way would potentially include:

- Slopes greater than 5 percent forcing the contractor to construct temporary access roads,
- Coulees or intermittent stream channels,
- Flowing streams and rivers, or wetlands,
- Areas with highly erodible soils,
- Areas providing habitat for sensitive wildlife or plant species,
- Pipelines, railroad tracks, irrigation ditches, or other linear features, and
- Heritage or archaeological sites.

The Marias and Teton River valley crossings might be challenging access because of rugged topography. Grading and recontouring might be required in these potentially difficult construction sites to gain access to reinforced structures that would support conductor spans of these valleys. MATL would reclaim these areas per DEQ requirements in coordination with landowners and appropriate agencies. MATL expects that other specific sites would be identified and addressed in subsequent reclamation plans as system design and associated access planning proceeds.

Construction

Construction is anticipated to take 4 to 6 months to complete. **Table 2.3-3** provides a summary of construction tasks and required resources and equipment. Transmission line construction tasks would include the following:

- *Pre-Construction*: Environmental permitting, cultural resource clearance, final transmission structure siting, engineering design, land procurement, various utility studies, and major procurement.
- *Surveying:* Initial line survey work would consist of survey control, alignment centerline location, and profile surveys. Access surveys would occur before construction. Light Detection and Ranging (LIDAR) would be used to provide much of this information. LIDAR is an airborne laser mapping technology that directly measures the shape of the earth's surface under the aircraft. LIDAR generates wide-area elevation information that can be used to make models showing details such as buildings, trees, and power lines.
- *Geotechnical Survey:* Investigations would be completed at selected key locations (for example, medium and heavy angle deflection points) to establish foundation requirements. Geotechnical measurements would also be obtained at a frequency of one location for every two miles of line when crossing problem soils. The geotechnical information is used to reduce problems during erection of the structures and assist with the cost estimate and bidding process for the project.
- *Access Planning and Preparation:* Crews would gain access from public roads as well as within the transmission line right-of-way for constructing, operating, and maintaining the line. When possible, access to the right-of-way would be by existing trails and roads. Trails are generally two-track routes and are not maintained. Because access for line construction would be truck travel within the right-of-way, graded surface access roads are not planned except at the Teton River crossing. Trails would be located at right angles to streams and washes. Existing roads and trails would be left in comparable or better condition than before construction. The right-of-way width is designed to minimize the potential for encroachment and to ensure that if buildings are proposed near the line, the right-of-way width would be large enough to prevent them from encroaching near the line.

  Gates would be installed where fences cross the right-of-way. Locks would be installed at landowner's request. Gates not in use would be closed but not locked unless requested by the landowner.

TABLE 2.3-3
SUMMARY OF CONSTRUCTION TASKS AND REQUIRED RESOURCES AND EQUIPMENT

Task	Crew Size	Typical Wage Level ($/hour)[a]	Equipment
Access Fencing/Reclamation	2	$15 to $18	¾ –ton post pounder
Framing	6	$17 to $20	Teleking 5-ton crane, Bobcat, 1-ton crewcab pickup
Setting	8	$17 to $20	330 Texoma digger, 35-ton setting crane, gravel truck, concrete truck, air compressor w/ tamper, Bobcat, (2) 1-ton crewcab pickups
Anchoring	3	$20 to $22	radial arm digger or retrofitted trench hoe
Material Handling	2	$17 to $20	(2) trucks
Pole Hauling	3	$20 to $22	pole truck, pickup
Stringing	31	$20 to $26	Tensioner, puller, 30-ton crane and pickup, soft line winder and pickup, cat pulling sock line and pickup, crane and pickup, flat deck and small crane, rider pole crew digger, pole truck

Notes:
[a]Wage levels extrapolated from "Montana Prevailing Wage Rates – Heavy Construction" Rates Effective March 10, 2006

- *Delivery and Assembly:* Framing crews would deliver poles, X-braces, cross-arms, insulators, and hardware to structure sites on flatbed trucks, and then assemble individual structures. For H-frame structure installation, poles would be set directly in holes that are 10 percent of the pole length, plus 2 feet deep. Crews would backfill the holes and compact the native soil material to prevent structure movement or settling. Any excess soil from each hole would be evenly regraded around the structure, or hauled off site, depending on the landowner's preference. For H-frame structures located in problem soils that are difficult to compact to the required density, gravel would be used to backfill around the poles. At heavy angled and dead-end structures, cast-in-place concrete footings would be installed. Crews would assemble structures and place hardware using man-lift trucks. Guy wires would be screwed into the ground using standard construction practices.

  For monopole structure installation, the holes would be 10 percent of the pole length plus 4 feet deep, but have a slightly larger diameter. After the pole is set in the hole, cement would be used, instead of soil, to backfill within approximately 1 foot of the soil surface. The salvaged topsoil material would be replaced on top of the cement. Any excess soil from each hole would be evenly regraded around the structure, or hauled off site, depending on the landowner's preference.

- *Conductor Installation:* After erecting all structures, conductor and ground wires would be installed. Large reels of conductor and overhead ground wire would be delivered to pre-selected pulling and tensioning sites (about every 2 miles) along the transmission line alignment. About 10,000 to 16,000 feet of conductor and overhead ground wire would be installed for each pull. Methods used to install conductor and overhead ground wire would include using a small line (p-line) attached to the conductor or ground wire to pull the cable through pulleys attached to the insulator strings. Once the conductor/ground wire is pulled the necessary length, it would be tightened. Adjustments made during tensioning would prevent the cable from sagging too much (due to ambient temperature and heating caused by flow of electricity) and would comply with the NESC.
- *Reclamation*: All disturbed areas associated with transmission line construction would be reclaimed. These efforts typically include gate repair as necessary, regrading and revegetation, and waste material removal.

MATL proposes to commence construction as soon as all property rights are obtained and all necessary authorizations are issued by DEQ, DOE and the BLM. However, MATL may not commence any construction activities unless and until it obtains all required permits.

Construction Staging Areas

Construction staging areas (sometimes referred to as "lay-down areas") would be located in previously disturbed areas, such as rail yards, siding areas, construction yards, and fallow lots, whenever possible. Some construction staging areas may be on undisturbed land when disturbed sites are not available. In general, construction staging areas would either be located in communities near the right-of-way where rail and truck service are available, or in rural areas where equipment could be unloaded from tractor-trailers. In all cases, construction staging areas would be on private land and would be subject to landowner negotiations and agreements. Construction staging areas would likely be located near Cut Bank, Valier, Conrad, Brady, Dutton, or Great Falls. MATL expects that staging areas would be established in three of these six locations, with each staging area occupying about 5 acres. However, a few smaller areas (about 2.5 acres) might be used.

Operations

NWE and Alberta Electric System Operator system dispatchers located at power control centers would direct normal line operations, using MATL's facilities to operate circuit breakers, determine the amount of power required to serve the loads and configure the power system accordingly. Dispatchers also would schedule the proper generation amount, and monitor the power system to ensure reliable service. Circuit breakers would operate automatically to ensure safe transmission line operation. Normal farming and other activities would be permitted on transmission line rights-of-way, if

these activities do not interfere with line operation and maintenance or create safety problems. Grid reliability is discussed in Section 3.17.

Maintenance

Maintenance programs would include routine aerial and ground patrols. Aerial patrols would be conducted annually and as needed to check for damage to conductors, insulators, or structures after severe wind, ice, wild fires, or lightning storms. Ground patrols generally would occur every 5 years to detect equipment in need of repair or replacement. When possible, ground patrols and subsequent repair activities would be scheduled to minimize crop and property damage. Noxious weed control plans would help guide herbicide treatments (see **Appendix C** MATL Noxious Weed Control Plan). Vegetation clearing may also be required in certain areas to minimize fire hazards.

For emergencies, crews would respond promptly to repair or replace damaged equipment. MATL would meet with respective landowners to arrange compensation for any damages incurred during emergency repair operations.

Environmental Protection Measures

MATL proposes project-specific environmental protection measures, shown in **Table 2.3-4,** that may be used to avoid or reduce the intensity and/or duration of the impacts to resources. In addition, MATL has committed that:

- Care will be taken to ensure that the MATL line will not conflict with any existing infrastructure such as, but not limited to: electrical distribution and transmission lines; telephone and other communication lines; gas and oil pipelines; irrigation infrastructure; and communication and other linear facilities owned by the Department of Defense.
- MATL has offered to build double circuit structures near Great Falls so that more wires can be added to the poles later.
- Should it be demonstrated that any GPS system is adversely affected by the MATL transmission line, MATL will make good any such negative impact at its own expense.

TABLE 2.3-4
MATL PROPOSED
ENVIRONMENTAL PROTECTION MEASURES

Environmental Protection Measures and Monitoring	Intended Effectiveness	Locations (if known)	Timing
General			
Construction personnel would be instructed on the location and identification of sensitive resources within or adjacent to the Project right-of-way, as well as regulations pertaining to the protection of cultural and ecological resources.	Would help prevent damage to sensitive and/or protected resources.	Throughout Project area. Sensitive areas would be identified further during design phase.	Prior to construction
Erosion Control			
Erosion Control Plan identifying locations and specifications of measures to minimize erosion and sedimentation.	Re-establish vegetation and implement physical barriers to minimize soil movement on exposed slopes.	See MATL's draft Reclamation & Revegetation Plan in **Appendix D**. As the design phase continues, a SWPPP would be prepared as part of the MPDES permit.	Pre-construction
Construction contractor would implement erosion control measures (for example, water bars, drainage contours, straw bales, filter cloth, or similar). All off-site vegetative materials would be certified "weed free."	Implemented in areas with steep slopes to minimize soil movement.	See **Appendix D**. As the design phase continues, a SWPPP would be prepared as part of the MPDES permit.	During construction
Access			
Access would be limited to existing roads or two-track utility corridor, unless not feasible for transport of equipment/material.	Avoidance of new permanent vehicular access and long-term ground disturbance.	Potentially the Marias River and Teton River crossings may require some new access. This would be finalized and identified by milepost during design phase.	During construction
General engineering design plans would be developed for unforeseen temporary use areas.	Disturbance minimization and/or protection of natural resources.	Throughout Project area – This would be finalized and identified by milepost during design phase.	Pre- and during construction
All construction vehicle movement or temporary use areas outside the right-of-way would be coordinated with the authorizing agency and restricted to pre-designated access, contractor acquired access, or existing roads.	By limiting access to the Project area, unnecessary impacts to soils and vegetation would be avoided or minimized.	Throughout Project area – This would be finalized and identified by milepost during design phase.	During construction

TABLE 2.3-4
MATL PROPOSED
ENVIRONMENTAL PROTECTION MEASURES

Environmental Protection Measures and Monitoring	Intended Effectiveness	Locations (if known)	Timing
At sites with soils that are sensitive to compaction, construction would be done with low bearing-pressure vehicles or compacted soil would be rehabilitated after construction by discing, plowing, or other means.	Weight limiting/distributing to reduce soil compaction and ground cover damage.	Croplands throughout Project area	During/post construction
Access road widening would be restricted unless essential for project implementation.	Minimizes damage to soils and vegetation.	Throughout Project area	During construction
Construction would be planned to avoid periods of intense farming (for example, grain harvest), as applicable.	Avoid impacting farming practices and implement crop damage compensation.	Croplands throughout Project area.	During construction
Fences, gates, and cattle guards would be repaired or replaced to their original condition if damaged during construction.	Replacement or repair as an effective resolution to property damage.	Cropland and range land as required throughout Project area.	Post-construction
MATL would work with the MDT in the design and construction of structures along or crossing any highway right-of-way.	Minimizes traffic disruption.	MDT maintained roads	Design and pre-construction
Existing roads would be properly maintained, and grading may be necessary.	Maintenance of proper drainage.	Throughout Project area	During and post construction
Access not required for operation/maintenance would be closed using the most effective method with landowner concurrence.	Prevention of permanent motorized vehicle use and resulting disturbance to soil/vegetation.	Throughout Project area	Post-construction
During project final design, structures and associated disturbances would be located to avoid or minimize impacts to known sensitive features such as water courses, residences, or cultural resource sites.	Avoid/minimize impact to sensitive features.	To be identified by milepost during final project design	Pre-construction
All construction vehicles would be restricted to the certificated construction right-of-way, associated facilities, and permitted access roads.	Avoid/minimize environmental impact	Throughout Project area	During construction

TABLE 2.3-4
MATL PROPOSED
ENVIRONMENTAL PROTECTION MEASURES

Environmental Protection Measures and Monitoring	Intended Effectiveness	Locations (if known)	Timing
Surface Water, Wetlands, and Floodplains			
Locations for new structures would be selected to avoid 100-year floodplains and, where practicable, to avoid the need for construction activity within 100-year floodplains.	Avoidance would prevent potential disturbance within 100-year floodplains.	Marias River, Teton River, and Old Maids Coulee crossings	Pre-/during construction
MATL would prepare an erosion control plan, whereby measures, locations of measures, and specification for measures would be used to minimize erosion and sedimentation. As a part of this a SWPPP would be submitted to DEQ.	Effective erosion control planning to reduce erosion.	See **Appendix D**. As the design phase continues, a SWPPP would be prepared as part of the MPDES permit.	Pre-construction
Unavoidable wetland impacts would require permits from U.S. Army Corps of Engineers to comply with Section 404 of the Clean Water Act.	Mitigate unavoidable impacts to wetlands and other waters of the U.S.	See **Appendix E** for a description of drainages and wetland areas that would be avoided, if possible. Any unavoidable areas would be identified by milepost during the final design phase.	During design and construction
If work in a 100-year floodplain is unavoidable, DNRC and county floodplain administrators would be consulted during the design phase and, if required, appropriate permit(s) would be obtained and implemented.	Permit stipulations would avoid or mitigate potential disturbance within floodplains.	Marias River, Old Maids Coulee, and Teton River crossings	Pre-/during construction
Wherever possible, placement of new structures and associated construction activities would occur out of wetland boundaries.	Avoidance of impacts to wetlands and other waters of the U.S.	See **Appendix E** for a description of wetland areas that would be avoided if possible. Any unavoidable areas would be identified by milepost during the final design phase.	Pre-/during construction
Reclamation & Revegetation			
Disturbed areas would be reclaimed by appropriate contouring and replanting with an approved seed mix. All seed mixtures would be certified "weed free."	Re-establishing desirable vegetation cover on disturbed sites to prevent soil loss and weed infestation.	Throughout Project area. Also see MATL's draft Noxious and Invasive Weed Plan and draft Reclamation and Revegetation Plan (**Appendices C** and **D**).	Post-construction

TABLE 2.3-4
MATL PROPOSED
ENVIRONMENTAL PROTECTION MEASURES

Environmental Protection Measures and Monitoring	Intended Effectiveness	Locations (if known)	Timing
If feasible, equipment would go around wooded areas. Tree removal would be kept to a minimum.	Avoiding or selectively cutting trees would protect limited forested habitats. Avoidance is preferred.	No forested areas have specifically been identified to date. Also see MATL's draft Reclamation and Revegetation Plan (**Appendix D**)	During construction
Noxious weeds would be controlled through implementation of noxious weed control plans approved by appropriate county agencies.	These efforts would reduce or eliminate introduction and spread of invasive, noxious plants.	Throughout Project area. Also see MATL's draft Noxious and Invasive Weed Plan and draft Reclamation and Revegetation Plan (**Appendices C** and **D**).	Pre-/during construction
Disturbed areas would be reclaimed to pre-construction condition or landowner requests as site work is completed.	Reduce or eliminate erosion, and weed invasion.	Throughout Project area. Also see MATL's draft Reclamation and Revegetation Plan (**Appendix D**).	During/post construction
Any reseeding would be done with an approved seed mixture.	Reduce or eliminate spread or invasion of noxious weeds.	Throughout project area. Also see MATL's draft Reclamation and Revegetation Plan (**Appendix D**).	Post construction
If necessary, vehicle wash stations would be located at appropriate locations and would be used to minimize the spread of noxious weeds along the right-of-way. All construction equipment would be thoroughly washed prior to first use on the Project.	Cleaning would remove mud, dirt, and plant parts from undercarriages, tires, grills, radiators etc. This would reduce potential of spreading noxious weeds.	Need and location of vehicle wash stations would be determined during final design stage.	During construction
All fill mixture brought into construction areas would be free of noxious weeds.	Borrow site should be inspected to minimize movement of noxious weeds.	Throughout Project area. Also see MATL's draft Reclamation and Revegetation Plan (**Appendix D**).	During construction
Health & Safety			
All on-site servicing or refueling of construction equipment would be performed using protective spill containment or absorption mats.	To prevent spills of pollutants, such as fuels and lubricants.	Throughout Project area	During construction
Storage of oil fluids or petroleum products on site would be prohibited. All petroleum products would be removed to a disposal facility authorized for disposal.	Reduces chances of spills and ensures proper storage and disposal of fuels and lubricants.	Throughout Project area	During construction

TABLE 2.3-4
MATL PROPOSED
ENVIRONMENTAL PROTECTION MEASURES

Environmental Protection Measures and Monitoring	Intended Effectiveness	Locations (if known)	Timing
All construction debris and trash would be contained and removed on a daily basis.	Daily containment and removal would prevent accumulation and windblown trash.	Throughout Project area	During construction
Traffic management and control of local roadways would be considered during construction.	Avoid unnecessary impacts to local traffic patterns.	State highway crossings and all county highway crossings. County crossings would be identified by milepost during final design and encroachment permits would be obtained, as required, from local county offices.	During construction
Human Health & Environment			
MATL would address individual complaints concerning radio and television interference as needed.	Alleviate individual impacts to radio and television users in vicinity of line.	As required, throughout Project area.	Pre/post-construction
Design would incorporate reduction or elimination of induced current and voltages.	Eliminate impacts associated with proximity and electric shock.	Throughout Project area	Pre-construction
Design and construction would be such to reduce electromagnetic field to the extent feasible.	Reduce potential for EMF effects.	Throughout Project area	Pre-construction
Land Use			
Construction would be planned to avoid periods of intense farming (for example, grain harvest) as applicable.	Avoid crop damage or compensate for damage.	Croplands throughout Project area.	Pre-/during construction
Fences, gates, and cattle guards would be repaired or replaced to their original condition if damaged during construction.	Resolution of potential property damage through replacement or repair.	Throughout Project area	Post-construction
MATL would secure encroachment permits from the MDT and counties for the design and construction of structures along or crossing any highway right-of-way.	Minimize impacts and safety concerns in the vicinity of roads and highways.	Final location of crossings would be determined during final design stage.	Pre-construction

TABLE 2.3-4
MATL PROPOSED
ENVIRONMENTAL PROTECTION MEASURES

Environmental Protection Measures and Monitoring	Intended Effectiveness	Locations (if known)	Timing
Cultural			
A project map would be provided to the contractor identifying all sensitive areas relative to the selected alternative. Prepare unanticipated discoveries plan.	Contractor awareness and mitigation implementation (notification and/or avoidance).	To be identified once cultural resources inventory and study are completed.	Pre-construction
Archeological monitors (including tribal) would be used when working in the vicinity of archeological sites.	Would monitor and work closely with MATL and contractor to ensure application of mitigation/avoidance measures.	The need for this would be assessed once the cultural resources inventory and study are completed.	During construction
Selective pole placement would be used to avoid impacts to cultural resource sites.	Cultural resource site protection.	To be identified once cultural resources inventory and study are completed.	Pre-construction
Access roads through cultural resource sites would be prohibited.	Cultural resource site protection.	To be identified once cultural resources inventory and study are completed.	Pre-construction
If any buried antiquities or remains are discovered, the contractor would notify DEQ and SHPO prior to continuing work.	Would allow for proper treatment of any undiscovered sites.	Unknown	During construction
Visual			
Structures would be placed to avoid or span visually sensitive features whenever possible.	Reduce potential visual quality impacts.	To be identified once visual resources analysis is completed during the EIS.	Pre-/during construction
No paint or permanent discoloring agents would be applied to rocks or vegetation. All flagging would be removed upon completion of the project.	Reduce potential visual quality impacts.	Throughout Project area.	Pre-/during construction
Wildlife			
Raptor safe power line construction practices (Edison Electric Institute, Avian Power Line Interaction Committee) would be employed during transmission line construction.	To reduce risk of electrocution to perching raptors.	Throughout Project area, as needed (Benton Lake NWR, and others).	Pre-/during construction
Approved line marking devices would be installed at appropriate intervals and appropriately staggered on each overhead ground wire across stream crossing and migratory bird flyways (for example, wetland crossings) within the right-of-way.	Minimization of potential bird strikes at stream crossings and other high use areas.	Installed at water body and drainage crossings and at wetland areas identified in **Appendix E**. This would be finalized during final design.	Pre-/during construction

TABLE 2.3-4
MATL PROPOSED
ENVIRONMENTAL PROTECTION MEASURES

Environmental Protection Measures and Monitoring	Intended Effectiveness	Locations (if known)	Timing
MATL would consult with FWP concerning construction activities (for example, timing) near sharp-tailed grouse leks.	Timing restrictions on construction near sharp-tailed grouse leks would reduce potential disturbance to grouse.	Leks were identified within 1 mile of the Marias River crossing and would be addressed.	Pre-/during construction
Air Quality			
Water would be sprayed on areas that are producing excessive airborne dust in proximity of residences and communities and as needed to ensure safety during construction.	Dust suppression during dry periods or near populated areas.	Throughout Project area, as required to address dry conditions during construction.	During construction

Notes:

DNRC	Department of Natural Resources and Conservation
EMF	Electric and magnetic field
EIS	Environmental Impact Statement
FWP	Montana Fish, Wildlife, and Parks
MATL	Montana Alberta Tie Line
MDT	Montana Department of Transportation
MPDES	Montana Pollutant Discharge Elimination System
NWR	National Wildlife Refuge
SHPO	State Historic Preservation Office
SWPPP	Storm Water Pollution Prevention Plan

Source: This table is from the MATL MFSA application, Revised submittal, August 2006.

MATL proposes to implement a worker education program and on-site monitors to ensure that site-specific environmental protection measures would be strictly followed. Other guidance MATL proposes to use includes WAPA's Construction Standard 13 (WAPA 2001), and Raptor-Safe Power Line Construction Practices (Edison Electric Institute [EEI] and Avian Power Line Interaction Committee [APLIC] 1996). Applicable standards from Standard 13 that MATL would adopt include:

- *Landscape Preservation (Section 13.3):* Includes guidance on preserving landscape features, constructing and restoring construction roads, and constructing and restoring construction facilities, such as offices and storage yards.
- *Preservation of Cultural Resources (Section 13.4):* Provides requirements for treatment and notification of known or discovered cultural sites or artifacts.
- *Noxious Weed Control (Section 13.5):* Requires a "clean vehicle policy" when entering and leaving construction areas to prevent transport of noxious weed plants and/or seed.
- *Disposal of Waste Material (Section 13.8):* Requires removing and disposing of all waste material generated during construction.
- *Pollutant Spill Prevention, Notification, and Cleanup (Section 13.10):* Requires measures to prevent spills of pollutants and appropriate response if a spill occurs. Includes any solvent, fuel, oil, paint, pesticide, engine coolant, or similar substance.
- *Prevention of Air Pollution (Section 13.13):* Ensures that construction activities and equipment operation reduce air pollutant emissions, and that nuisance dust is controlled.

Site-specific locations where these measures would be used would be finalized during the final design phase and would be identified by project milepost location when that information becomes available. Final mitigation measures required to address those site-specific measures (and all other finalized plans) would be submitted to the agencies before construction begins. In addition, MATL would work with the agencies to identify the extent of environmental monitoring that would be needed during and after construction.

The agencies would apply environmental specifications to the proposed Project. Revised draft DEQ Environmental Specifications (**Appendix F**) identify general environmental protection measures and sensitive areas for site-specific specifications; DOE and BLM might also provide some additional measures.

2.4 Alternative 3 — MATL B

Alternative 3 generally parallels the NWE 115-kV line along its entire distance from the line's tie-in to NWE's 230-kV switchyard north of Great Falls to a substation near Cut Bank.

This alternative is described in the MATL MFSA application as Alternative MATL B (MATL 2006b). Alternative 3 was designed based on a single application criterion listed in Circular MFSA-2, with specific intent to use or parallel the existing NWE 115-kV transmission line corridor. This alternative alignment was initially considered by MATL as its preferred option, but MATL has since changed its preference. This alternative is not intended to address potential land use issues or maintenance issues but is the shortest and potentially the least costly alternative under consideration.

Description of Alignment

The alignment for Alternative 3 would be 121.6 miles long (**Figure 2.4-1**) and would use H-frame design structures for its entire length. The south part of the alignment is shown in detail on **Figure 2.4-2**. The middle part is shown on **Figure 2.4-3**, and the north part is shown on **Figure 2.4-4**. The alignment would leave the Great Falls Switchyard in a northwesterly path then turning west for about ½ mile on private property north of existing lines. The alignment would turn north along a field boundary and travel on the west side of the Great Falls Shooting Sports Complex (Complex). The Alternative 3 alignment would rejoin and closely parallel the Alternative 2 alignment north of the Complex at approximately milepost 2.3, generally following the NWE 115-kV power line. Alternative 3 would diverge from Alternative 2 again around milepost 13. Alternative 3 would continue in a northwesterly direction, following the 115-kV power line, on the east end of Teton Ridge, while Alternative 2 would turn west then north.

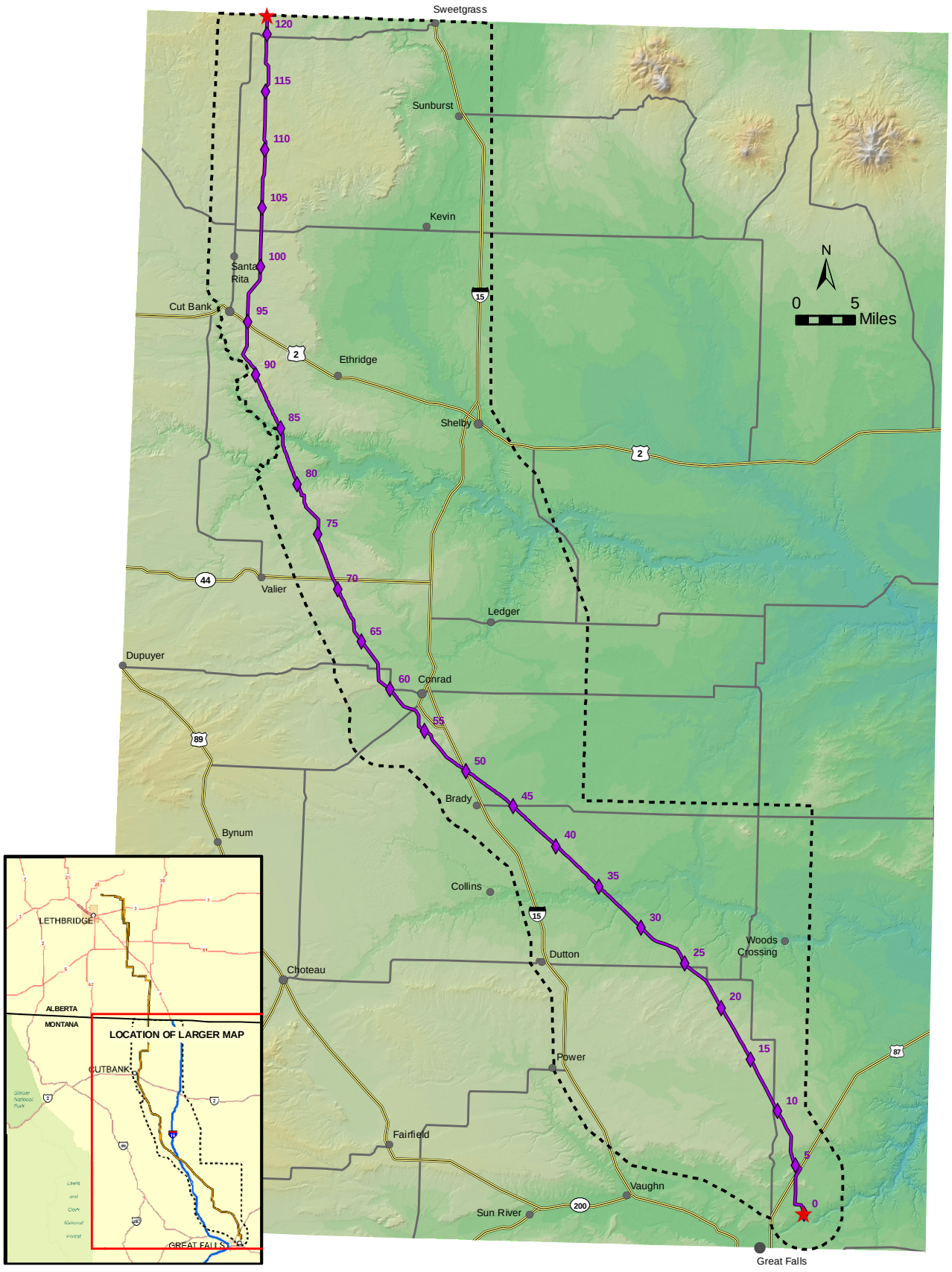

FIGURE 2.4-1
ALTERNATIVE 3 ALIGNMENT
(MATL B)

LEGEND

- ALT3 - ALIGNMENT
- MILE MARKERS
- CITIES AND TOWNS
- ALIGNMENT END AND EXIT POINTS
- STUDY AREA BOUNDARY
- MAJOR HIGHWAYS
- SECONDARY ROADS

NOTE:
ALT = ALTERNATIVE

GIS map by Ed Madej -TTEMI-HE Fig2_4-1_MATL_ALT3_Alignment All_111607.mxd

N

0 4 Miles

50
45
40
35
30
25
20
15
10
5
0

15
87
200

Dutton
Power
Vaughn
Woods Crossing
Great Falls

FIGURE 2.3-2
ALTERNATIVE 2 ALIGNMENT SOUTH

LEGEND

- ALT 2 - ALIGNMENT
- ALT 2 MILE MARKERS
- ALT 3 - ALIGNMENT
- ALT 3 MILE MARKERS
- ALT 4 - ALIGNMENT
- ALT 4 MILE MARKERS
- CITIES AND TOWNS
- ALIGNMENT END AND EXIT POINTS
- STUDY AREA BOUNDARY
- MAJOR HIGHWAYS
- SECONDARY ROADS

NOTE:
ALT = ALTERNATIVE

GIS map by Ed Madej -TTEMI-HE Fig2_3-2_MATL_ALT2_Alignment_South_111907.mxd

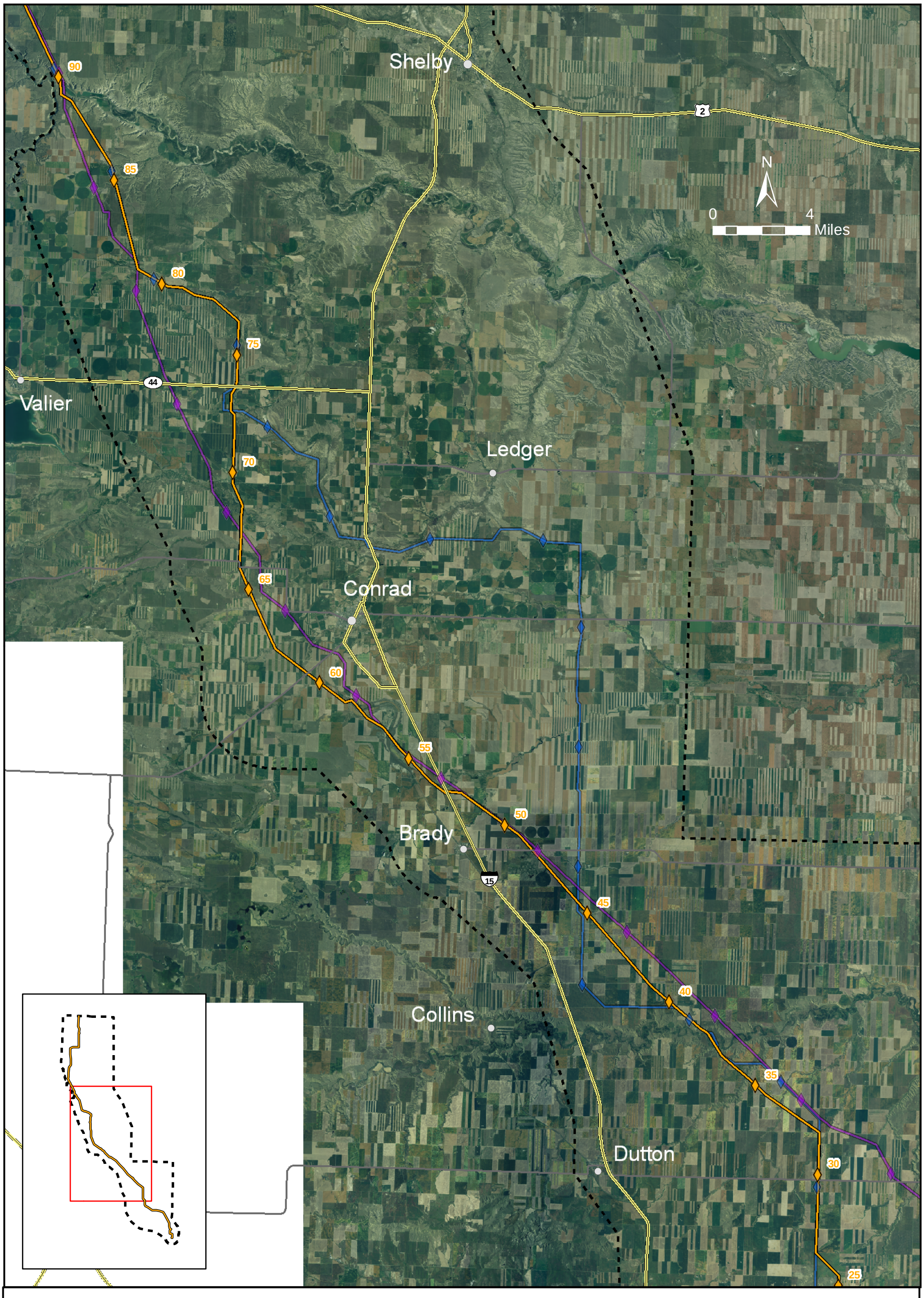

FIGURE 2.3-3
ALTERNATIVE 2 ALIGNMENT
MIDDLE

LEGEND

- ALT 2 - ALIGNMENT
- ALT 2 MILE MARKERS
- ALT 3 - ALIGNMENT
- ALT 3 MILE MARKERS
- ALT 4 - ALIGNMENT
- ALT 4 MILE MARKERS
- CITIES AND TOWNS
- ALIGNMENT END AND EXIT POINTS
- STUDY AREA BOUNDARY
- MAJOR HIGHWAYS
- SECONDARY ROADS

NOTE:
ALT = ALTERNATIVE

GIS map by Ed Madej -TTEMI-HE Fig2_3-3_MATL_ALT2_Alignment_Middle_111907.mxd