



Re: MSTI Supplemental Information Request – Mill Creek Substation

In response to your email dated Feb 6, 2009 NWE asking “why does NorthWestern need to route the transmission line to and from the Mill Creek substation area” NWE offers the following information.

The MFSA application states that the Mill Creek location provides a strategic opportunity for MSTI<sup>1</sup>. Routing through Mill Creek and development of strategic opportunities are premised on the following.

1. Mill Creek is consistent with regional plans,
2. Provides for strategic opportunities, and
3. Provides for a strategic placement of the phase-shifting transformer.

Following the discussion of these three items NWE provides a discussion of the timing of connecting to the Mill Creek station.

**Mill Creek is Consistent with Regional Plans:** Section 1.5 of the MFSA application provides a discussion of the need for MSTI and why MSTI development is needed to relieve congestion between Montana and Idaho. It also addresses how MSTI is consistent with regional plans for expansion of the appropriate grid of the utility system serving the state and interconnected utility system.

In addition, routing MSTI through Mill Creek is consistent with region plans for expansion of the region’s bulk electric system as needed because it affords NWE the opportunity to build MSTI in segments if necessary. The first segment could be from Mill Creek to Mid Point. While there is great interest in developing renewable generation in Montana, a 500 kV MSTI transmission system will be built only if potential MSTI shippers make sufficient transmission service requests to support that size of development. Executed transmission service provides the necessary shipper commitment and would result in a future revenue stream to support the MSTI development. Should a single line from Townsend to Mid Point not be supported by the results of MSTI’s open season, the Mill Creek to Mid Point alternative could serve to meet a lesser level of demand. Therefore, the routing of MSTI through Mill Creek allows for a more flexible plan. The plan could be to consider building MSTI as two line segments – segment one from Mill Creek to Mid Point and then later segment two from Mill Creek to Townsend.

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<sup>1</sup> “In addition to the strategic location of the MSTI northern terminus, the routing of MSTI past the existing Mill Creek Substation provides a strategic opportunity for MSTI to provide access to loads in the western part of Montana; access to Northwest loads through Path 8 (both the 500 kV and 230 kV); and will act as a collection point for future generation development in southwest Montana. The combination of a northern terminus at Townsend, and a substation near Mill Creek offer the greatest flexibility for future transmission needs.” MFSA, Chapter 1, page 1-25.

Until segment two is built the Mill Creek station is capable of serving as a northern terminal for this line with a reduced capacity. Eliminating the route to Mill Creek eliminates Mill Creek as a strategic location for MSTI development and guarantees an “all or nothing” development strategy.

**Provides for Strategic Opportunities:** The following discussion provides the reasons why a route through Mill Creek will provide for future strategic opportunities. None of these reasons individually would cause routing through Mill Creek, but collectively they provide the justification.

Connecting MSTI to the existing Mill Creek substation can provide local area voltage support and access to MSTI from NWE’s strongest 230 kV switching station in Western Montana with the addition of a transformer at that location. This would not be possible if MSTI is not routed through Mill Creek. Western Montana loads are susceptible to low voltage under certain load and generation dispatch conditions. The loss of the BPA 500/230 kV autotransformer at Garrison under certain conditions can result in low voltage throughout western Montana. Connecting MSTI to the Mill Creek 230 kV substation offers the possibility that with the new Mill Creek auto transformer addition NWE could minimize this reliability concern.

Mill Creek will provide increased access to the region through the bulk electric system for new generation resources and increased access to alternative generation sources for load serviced through the bulk electric system. This would not be possible if MSTI is not routed through Mill Creek. Access to regional load and generation markets to the south is extremely limited over the existing MT-ID through the existing Mill Creek 230 kV substation. Building a new 500 kV line opens up the strategic opportunities south of Montana. Should a new line be built from Mill Creek to the Garrison substation sometime in the future an expanded arbitrage opportunity between Idaho and the Northwest is created.

Finally, constructing a line from Mill Creek to Garrison sometime in the future (after both segments of MSTI are completed) would strengthen the bulk electric system in western Montana. The bulk electric transmission system would be strengthened because this line would provide for a second 500 kV route between Townsend and Garrison. The existing 500 kV lines are on common towers and offer no route diversity. This second geographic diverse route (i.e., MSTI) would reinforce this critical and vulnerable segment in the existing 500 kV transmission system across Montana.

**Proper placement of the Phase-Shifting Transformer:** The placement of the phase-shifting transformer (“PST”) is critically important. A PST is an electrical device that is used to control both the magnitude and the direction of the power flow on a power line. The MSTI PST is needed to control flows to inhibit inadvertent electrical flows between Idaho and the northwest through Montana. Physically the PST can be installed in MSTI anywhere along the route, but the PST location can either promote or eliminate strategic opportunities.

Placement of the PST at Townsend would greatly reduce the possibility to take advantage of the strategic opportunities that locating the PST at Mill Creek can provide. For example, suppose the PST was located at Townsend and MSTI was built directly to Mid Point and sometime in the future it was decided to tie MSTI to the Mill Creek substation

to take advantage of an opportunity. As soon this new tie to Mill Creek occurs, regardless where the new intermediate 500 kV MSTI substation is located, the Townsend PST would not be able to control inadvertent flows between the northwest and Idaho (NW-ID) unless the PST was moved and located in the MSTI line between the intermediate substation and Mid Point. Without also moving the PST, the Townsend PST would regulate only the flows from Townsend to the intermediate substation and not the flows between the intermediate substation and Mid Point. Inadvertent flows on MSTI from the new 500 kV intermediate substation to Mid Point section would exist and the effectiveness of the Townsend PST to regulate inadvertent flows on this section of MSTI to and from Idaho would cease. While moving the PST in the future is likely technically feasible, it is impractical and cost prohibitive. The estimated cost of the PST alone is \$60 to \$80 million and requires adequate proximity to rail service for delivery and installation. This large of a piece of equipment would likely take months to relocate (if technically possible) and render the transmission line out of service, or in service at a reduced capacity, placing the contractual rights to the energy shippers at risk Mill Creek does provide a good site for the PST substation, it has good rail capability to the site and would not affect land use. Developing an intermediate substation elsewhere may not have this same land characteristic.

Moving the intermediate substation and the PST further south on MSTI would be possible, but it would likely increase the length of the line from the intermediate substation to Mill Creek and its associated construction costs. The further south the PST is located on MSTI could also increase O&M cost of the PST due to travel costs. Placement of the PST further south on MSTI does not eliminate future interconnection at Mill Creek or the possibility to obtain future strategic opportunities, but it would require future construction, ROW concerns and increased costs. Locating the PST at Mid Point could be problematic due to land availability and O&M costs could be higher.

**Timing to the Mill Creek Substation:** While there are no immediate plans to connect MSTI to the Mill Creek 230 kV substation, connecting to the Mill Creek substation will be dictated by the need to do so. The outcome of MSTI open season transmission service requests and NWE transmission system needs will drive the time when MSTI is to be connected to Mill Creek 230 kV substation.