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March 5, 2001

Surface Transportation Board
Office of the Secretary
Case Control Unit
Att: STB FD#33407
1925 K St. NW
Washington DC 20423-0001



Re: Southern Bypass - M2, Mankato, MN - D M & E
STB Finance Docket No. 33407

Dear Ms. Rutson:

In compliance with the March 6, 2001, extended deadline for a response to the Southern Bypass, enclosed are the original and ten unbound copies of Mankato Township's Response. (Please note we have only enclosed two copies of the videotape and the CD attached as Appendix 4a and 4b to our response.)

If you have any questions or concerns, please do not hesitate to give me a call. Thank you for your consideration of our response.

Very truly yours,

Kenneth R. White

KRW/sam

Enclosures

cc: Mankato Township Board
U.S. Army Corps of Engineers

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Office of the Secretary

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Mankato Township

Comments on the Draft Environmental Impact Statement

Surface Transportation Board
Finance Docket No. 33407

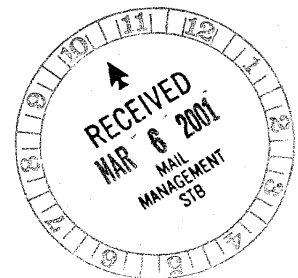
Prepared by: Farrish Johnson Law Office

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MANKATO TOWNSHIP COMMENTS
ON SURFACE TRANSPORTATION BOARD
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FINANCE DOCKET NO. 33407

March 2, 2001

I. Introduction.

Mankato Township is a political subdivision of the State of Minnesota located on the south and east sides of Mankato. Some of the existing DM&E track passes through the Township near its northeastern corner. Given its location, the Township will be affected whether the DM&E continues to use the existing track (the M-3 route) or the Southern Bypass (the M-2 route). (*See* Maps at Appendix 1, Appendix 2a and Appendix 2b). Despite this impact, the Township opposes M-2 for a variety of reasons ranging from the set of fundamental errors contained in the M-2 route, to the expressed desire of the DM&E to use the existing route through Mankato, to the geological, environmental and other issues raised by the M-2 route.

1. The M-2 route suffers from several fundamental errors that are fatal to any serious consideration of this alternative.

Careful examination of the Draft Environmental Impact Statement and its discussion of the M-2 route demonstrate that the M-2 route has not been subjected to anything approaching rigorous examination. In fact, the DEIS suffers from a number of errors so fundamental that the M-2 route should not be considered as a viable alternative to either the M-1 (no build) or M-3 (existing route) alternatives.

In its Order of April 20, 1999, the Surface Transportation Board directed that all alternative routes:

Be detailed enough for us to determine whether a specific bypass proposal constitutes a reasonable and feasible alternative to the applicant's proposal... To that end, any bypass proposal submitted by a community must, at a minimum, contain the following information:

1. detailed maps showing where the route will be located;
2. quantified impacts to wetlands;
3. cut and fill information to permit design and operation of a railroad;
4. roads that would be crossed and their average daily traffic levels;
5. proximity of the bypass to sensitive structures (for example, schools, libraries, hospitals, residences, retirement communities, and nursing homes); and
6. impacts to landowners and farmlands.

STB Order issued April 20, 1999. Although not necessarily governed by this Order, the M-2 route is governed by federal law, which requires similar detailed

information. *See Sierra Club v. Morton*, 510 F.2d 813 (5th Cir. 1975) (any alternative must avoid merely shifting adverse environmental impacts from one area to another). Without the kind of detailed information requested in the April 20, 1999, Order, no reasonable evaluation can occur over this fundamental issue – it is impossible to know all of the environmental impacts without a detailed analysis of a proposed route.

a. The DEIS contains conflicting information about the path of the M-2 route making serious evaluation impossible.

i. The DEIS describes multiple routes making evaluation impossible.

In the DEIS at least two different routes are described. In the narrative, the DEIS describes a route that would be west of the Blue Earth River, a quarter of a mile west of the City of Skyline. The maps in the DEIS show the route to the east of the Blue Earth River, cutting off a major portion of the Skyline bluff.

This fundamental error is then compounded throughout the evaluation of the environmental impacts. It is never clear which route is being considered in the narrative and discussion of impacts. Is the more western route under evaluation or the more eastern route? If it is the eastern route, why is Skyline not even mentioned in the DEIS? Why is Mount Kato, a major area business, listed as having no impact when the more eastern route takes a significant part of the ski runs on the back of the facility? Have the correct road crossings been considered?

Have correct agricultural impacts been evaluated? Have environmental impacts on the rivers and streams, forests, plants and animals been accurately assessed?

Certainly, the consideration of the M-2 route does not meet the requirements of the April 20, 1999, Order, given the failure to clearly define the route. Since the ultimate recommendation preferring the M-2 route is based upon such a fundamental flaw, the entire evaluation is suspect at best.

ii. The apparent route suffers from a lack of serious engineering work.

Interestingly, DM&E has also publicly acknowledged that little or no engineering work went into the M-2 route. (See "Report of Meeting of Local Officials and DM&E Railroad, January 19, 2001," Reference 12 to Response of the City of Mankato, attached as Appendix 3 to this response, page 3; City of Skline Response). Given the minimal engineering work performed, this alternative does not meet the requirements established by the STB for alternative routes. On this basis as well, M-2 should not be given serious consideration.

Unwillingly to simply challenge the DEIS on this basis, Blue Earth County, Mankato Township and area residents contacted the DM&E to try to find out the intended route. Those conversations revealed that DM&E intended to use the route east of the Blue Earth River, directly affecting the City of Skyline and several other major businesses and farms. Blue Earth County then prepared

detailed maps of the proposed route, including engineering drawings of the route and sample impacts at various points along the route. (See Blue Earth County's Response to the DEIS.)¹ DM&E has publicly stated that these maps show the intended route and are generally accurate.

This routing shows a massive engineering project. The DM&E has established significant engineering requirements for rail bed grade and curvature. To meet these requirements, numerous trestles will be necessary to cross rivers and roads. Other roads will travel over the railroad given the height differences. In places where significant grade difference exist between the railroad and a road, a major problem with snow removal will occur – snow removal equipment will have to move the snow out of the resulting underpass and on to some other location. Cuts and fills, all along the project, will dramatically alter the natural lay of the land. These structures will need to be maintained to ensure the structural integrity of the rail bed.

In its response, Blue Earth County points to a number of additional questions raised by the difference in maps and the other impacts of the M-2 route.

¹ The drawings submitted by Blue Earth County are based upon a 2:1 slope. Construction experience in the area and elsewhere around Mankato proves that at least a 3:1 slope will be necessary. Obviously, this will involve taking additional significant amounts of land. For example, in Skyline it will result in 8 houses being removed rather than the 2 shown in the maps.

Mankato Township adopts these same questions and suggests that all must be answered before any accurate evaluation of the M-2 route can proceed.

b. The M-2 alternative suffers from the lack of a field examination.

The DEIS fails to indicate whether a field examination of the actual proposed route was undertaken. Given the differences in the route, and the failure to consider some of the most major impacts, an accurate field examination presumably never occurred. If it did, how could the examiners have missed that part of the rail bed will require moving the Blue Earth River? How could they have missed the City of Skyline and the dire impacts on that community? How could they have missed the presence of the Mount Kato ski area and the impact on the chair lift bases and the bottom of several runs? How could they have missed the other physical features of the land and the impact on this rural landscape?

In an effort to help the STB better understand the environment of the M-2 route, Mankato Township prepared a video, in both tape and CD format, of the M-2 route and the existing route.² (Appendix 4a is the video. Appendix 4b is the CD.) The video can only provide an aerial overview of the topography in winter, given the timing of this process, but even in this format it demonstrates the

² The video is an aerial view of both routes taken by a volunteer from a coalition of citizens opposed to the M-2 route, locally known as the Southern By-pass.

challenges confronting the DM&E as it tries to meet its construction standards and the significant impacts on this rural area from the imposition of a new rail line.

Even with this video, a cursory review of the two environments shows the significantly greater impact caused by the M-2 route. No railroad currently bisects the area. The Blue Earth River valley is a natural and scenic area used for purposes **totally** inconsistent with a railroad – recreation, rural housing and agriculture. All future planning for the area maintains those uses and none that would benefit from a railroad. As the video, and a field examination would show, imposition of a railroad along the M-2 route would be totally inimical to the environment and uses of the M-2 area.

Before any final ruling establishing the M-2 route as the preferred alternative, the STB should undertake a field examination of the actual route proposed to fully understand the construction challenges and environmental impacts. To do anything less is to fail the citizens of Mankato Township in making an accurate evaluation of the M-2 route.

c. The DEIS proceeds from the inaccurate assumption that if the M-2 route is built, the M-3 route will not experience any increase in use.

The DEIS purports to examine the environmental impacts of each of the alternative routes. In doing so, it compares environmental, economic and social consequences of each route. The M-2 route, however, is not a complete

alternative to the M-3 route. If the M-2 route is built, traffic will increase on the M-3 route for a variety of reasons.

First, the DM&E justifies this project in large part on the increased ability to handle agricultural and other products besides Powder River Basin coal: “A second and equally compelling purpose of the project is to transform DM&E’s existing operation so that it can offer existing and prospective shippers of non-coal commodities vastly improved service, new marketing opportunities, and more efficient and safer operations.” (DM&E Application, page 22). Many of these products are delivered to Mankato sites, or delivered for transfer to other railroads for delivery from Mankato, principally the Union Pacific. If DM&E’s assessment of the results of this expansion is accurate, then use of the M-3 corridor will increase. DM&E will increase its deliveries to Mankato facilities and the transfer of products in the Mankato switching yards.

Second, Union Pacific owns the M-3 right-of-way. That railroad is in the process of a major expansion on both sides of Mankato. Ribbon rail has been installed as far as Lake Crystal, Minnesota, about 10 miles south of Mankato, with trains traveling through that town at 50 miles per hour. Similar improvements have occurred north of Mankato. In the near future, Union Pacific (UP) is sure to expand these improvements to Mankato, both in terms of the rail quality and the

switching yard. It simply makes no business sense for UP to leave the Mankato track and yard as a bottleneck within its system.

DM&E will, as far as we know, continue its rights to use the UP track through Mankato and the switching yard. DM&E proposes to use the M-3 route for coal shipments to new customers using Mankato as the interchange to UP track. (DM&E Application). That use will increase with the advent of better track and switching facilities. Additional increased use also will occur if the increase in non-coal traffic occurs. Thus, increased coal and non-coal shipments by DM&E will occur over the M-3 route, especially if better track is available.³

Third, the City of Mankato desires increased rail traffic by the DM&E through the City. In its Response, the City notes that numerous major businesses in Mankato rely upon the DM&E for rail service, for both inbound and outbound traffic. "In some cases, the major agricultural industries within the City receive 95 percent of their rail shipments from the DM&E... Each action alternative must contain provisions for continued rail access and future enhancements to meet industry needs." (Mankato Response to the DEIS, Corridor Enhancement Plan).

³ These improvements, and the increased use by DM&E will occur even if Mankato and DM&E fail to reach a new Community Partnership Agreement. DM&E has the usage rights and the need to use the M-3 tracks regardless of a new line over the M-2 alternative.

Even the City acknowledges the need for continued access for the DM&E to in-town locations, possible only on the existing M-3 route.⁴

Thus, even if the M-2 route is constructed, the M-3 route will see increased use.

Any accurate consideration of environmental, economic and social impacts, therefore, must include the impacts caused by **both** the increased use of the M-3 route and the new M-2 route. The M-2 route will have significant impacts. The increased use of the M-3 route will also have impacts. It is simply inaccurate to compare the effects of the M-2 route with the M-3 route as currently utilized, or the effects of the M-3 route as improved with the M-2 route, without considering the increased use of M-3. The cumulative effect of those impacts is the only way to accurately assess the comparative environmental impacts. Once that is done, the M-2 route becomes much less desirable.

The ultimate analysis in the DEIS suffers from this additional fatal flaw. It undertakes the analysis under an implicit assumption that DM&E will not use the M-3 route any longer if the M-2 route is built. Since that assumption is invalid, so

⁴ The City never explains the contradiction in its position. On the one hand, it opposes improvements to the rail system in the City, on the other it acknowledges that some improvements will occur and that those improvements are necessary to the continued growth of its business community.

is the analysis. A new analysis should be prepared considering the cumulative effect of the M-2 route and the increased use of M-3 that the DM&E project, and UP expansion, will cause. That analysis then should be compared to the consequences of implementation of just the M-3 route improvements.

d. The DEIS fails to consider the change in impact on an area rather than the level of impact under either proposal.

The DEIS addresses the relative impacts of the two routes under an additional implicit assumption: that no rail use currently exists for either the M-2 route or the M-3 route. Of course, the M-3 route has current rail traffic and the associated noise, pollution, vibration and other adverse impacts. The M-2 route, on the other hand, has no railroad present.

An accurate assessment of the consequences of the proposed alternatives, therefore, must proceed from an analysis of the change in impact. The value of a house along the M-3 route has already been impacted by the presence of the railroad; a house along the M-2 route has suffered no such impact. Many businesses were built along the M-3 route to take advantage of the railroad access; no such business exists along the M-2 route. The natural environment along the M-3 route already suffers some deleterious effects from railroad operations; the natural environment along the M-2 route suffers no such effects.

Thus, the DEIS should undertake an accurate analysis based upon the change in impact rather than merely on the new total effects. The failure to consider the change in impacts is another fatal flaw to the analysis.

2. The M-2 route should not be approved since DM&E has little interest in building on that route.

Another assumption implicit in the DEIS is that the M-2 route is a viable alternative. If the route is not one the DM&E would use, consideration serves no purpose. Put another way, a route DM&E does not intend to use cannot be considered a viable route.

On June 9, 1999, DM&E submitted the "Applicant Comments on Alternative Route Analysis" to the STB. (Appendix 6). In those comments, the DM&E notes the significant improvements to the UP line on either side of Mankato and projects that "the UP traffic level will increase significantly in the future." DM&E then goes on to note the advantages of the M-3 route, based upon additional engineering and suggests that improvements to the M-3 route be considered the preferred alternative and M-2 as an acceptable alternative. No subsequent filing with the STB shows that DM&E has varied from this preference for the M-3 route.

Since the DEIS was published, DM&E representatives have held a number of meetings with elected officials, DM&E employees and others to explain the

expansion and try to resolve concerns. At several of those meetings, Kevin Schieffer has publicly expressed that he has no intention of building on the M-2 route. For example, at a meeting of January 19, 2001, Schieffer stated that he would prefer not to build it. (Appendix 3, page 3). In a conversation after that meeting, Schieffer stated that he was going through Mankato, and would not build on the southern bypass (M-2) unless somebody "put a gun to his head." (See City of Skyline response).

The lack of serious interest in this route is also shown by the lack of engineering that has gone into that route. DM&E basically just drew a line on a map, and then drew a few others as it changed the proposed route. No serious examination of the geology, topography, or impacts of the route occurred. Even DM&E's chief engineer, Ray Geiger, admitted that they had done little work on the M-2 route. (Appendix 3, page 3).

Finally, the M-2 route creates a significant risk to Mankato Township in the future. Given the statements of DM&E officials of the desire to continue to use the Mankato route, M-3, it is likely that the efforts to maintain or improve the UP tracks and to provide DM&E access will continue. If those negotiations result in a successful agreement, after the M-2 route is constructed in whole or in part, DM&E may abandon that track. Mankato Township would then be left with the

significant eyesore of an abandoned railroad cutting through this scenic river valley.

Thus, the STB should also drop consideration of the M-2 route. If DM&E has no intention of building on that route, further consideration serves no purpose.

3. The DEIS fails to address a number of significant individual issues, beyond the fatal flaws and inaccurate assumptions.

Blue Earth County has submitted a detailed analysis of the DEIS which raises a number of questions and significant issues. In an effort to avoid repetition, Mankato Township will not address most of those issues. The Township agrees with the Blue Earth County analysis and adopts most of its recommended mitigation proposals. The Township does oppose the closing of **any** roads without the assurance of adequate replacements to maintain the Township's road system.

In terms of specific issues, the Township offers its comment on the DEIS.

a. The geology of the area precludes the M-2 route.

Knowing of the geology of the area in general, the Township retained the services of Bryce Hoppie to evaluate the geological features relevant to the M-2 route and the impacts of construction of a railroad in this area. His series of reports are attached as Appendix 7.

Hoppie finds that the area is unsuitable for construction of a railroad. The proposed route travels over several significant changes in geology that will require either significant mitigation efforts or cause the tracks and trestles to shift at different rates, causing twisting or other issues. The net result will be significant maintenance expense and a significant risk of accidents.

Hoppie also raises concerns about the stability of the hillsides and river fill upon which the tracks will be built. The Skyline hill, and other hills in the area, lacks the geological features necessary to support significant rail activity. In fact, according to his computer models, significant additional slumping of these hills is a virtual certainty. In addition to the computer models, Hoppie relied upon the similar slumping experienced around Mankato as the City and County attempted to build roads cutting into hillsides.

Hoppie further noted that the M-2 route includes significant involvement with the Blue Earth River. Noting problems in the Minneopa Park area with the stability of the rail bed, Hoppie suggests that similar difficulties will arise as the DM&E reroutes the Blue Earth River and changes the flow with trestle supports.

Some of these geological concerns can be avoided by the DM&E in constructing the rail bed. The additional time and expense of that mitigation must be considered and assured by the STB.

b. The M-2 route creates a significant pollution risk to the Blue Earth River and area water supplies.

In addition to Professor Hoppie, Mankato Township retained a chemist to evaluate the pollution risk presented by the imposition of a railroad into the M-2 route. James E. Rife undertook a study of the literature to evaluate the potential water and soil pollution risks given the M-2 route developed by Blue Earth County. (Appendix 5). His evaluation noted that the trains would be moving uphill, under heavy load, for a great distance. As a result, additional soot would be generated. Cancer causing agents, polycyclic aromatic hydrocarbons, would bind to the soot and fall in the immediate area of the rail corridor. He opines that these deposits would create an increased cancer risk for the residents of Skyline and others in close proximity to the tracks. The environment would change from a rural residential neighborhood to an urban center in terms of the PAH exposure risk.

Professor Rife further raised concerns about pollution to the Blue Earth River. He noted the risk to fish in that river, given the literature search.

In addition to the geological concerns, Hoppie has expressed concerns about the groundwater pollution risk presented by the M-2 route. Using the Blue Earth County drawings, Hoppie finds that the rail bed will cut into the bedrock at several locations, including breaching the Jordan Sandstone. The Jordan Sandstone

provides the water supply for several area residents (Appendix 7) and for one of the two Skyline wells. (Appendix 7). Surface spills, and other pollutants, have the potential to enter the groundwater through such breached bedrock.

Hoppie raises concerns about diesel fuel and other materials inadvertently spilled, as well as the results of a catastrophic accident. Since the DM&E carries various chemicals, and other potentially dangerous products, an accident resulting in a tank leak or similar catastrophic event, could create a significant risk to the water supply.

This risk is magnified by the risk created by the DM&E's own plans. According to the DEIS, DM&E will control weeds on the right-of-way through the use of sprayed herbicides. Application of these herbicides over the exposed bedrock and Jordan Sandstone will require extreme care to avoid damage to the water sources of these communities.⁵

As the STB considers the M-2 route, these pollution risks must be considered and adequate mitigation steps taken, such as a clay lining for the track bed, to assure the security of the area water supplies.

⁵ The City of Mankato makes use of a well dug near the Blue Earth River. Much of that water comes from the River. Any significant additional pollution of the Blue Earth River would thus put that water supply at risk.

c. The DM&E safety record must be more critically evaluated.

Accident records maintained by the Federal Railroad Administration, published on its website, reveal that the DM&E has a significant accident history. Two of the major causes are human error and poor maintenance by the railroad.

The human error does not involve financial limitations, but rather poor training and other problems. Given the inability of the DM&E to properly train and control its employees, the entire project should be stopped. If the DM&E cannot assure public safety with a small railroad operation, what confidence can we have that they can do so with a much larger operation?

The poor maintenance record raises another set of concerns. The proposed M-2 route presents a number of special challenges, both in design and construction. It faces the geological challenges detailed in Professor Hoppie's reports, all of which increase the need for active and aggressive monitoring and maintenance. The design by Blue Earth County shows numerous substantial structures, such as a trestle over the Blue Earth River some 50 feet high and a bridge over Highway 66 over 80 feet high, making it one of the tallest structures in the area. The geology under these structures must also be considered.

Given these significant challenges, the financial ability of the DM&E must be ensured. The DM&E has acknowledged that with current business it does not

have the financial resources to maintain and upgrade its track and other equipment. With the substantial debt anticipated to pay for this project, how will the DM&E ensure it has the financial resources to maintain the rail bed, especially in this challenging area? What contingency plans exist within the DM&E budgeting if the markets do not expand as it projects? What assurance does Mankato Township have that it will not end up with an unused, eyesore if the DM&E operation fails?

Absent significant proof of financial ability, and assurances of future financial security, the STB should adopt the M-1 alternative for this project.

4. A railroad is inconsistent with the current land use and road system.

In its Response, Blue Earth County details a number of inconsistencies between the M-2 route and current land use patterns. This area largely consists of three major land uses: agriculture, rural housing including high expense housing subdivisions, and recreation. A railroad is inconsistent with each of these uses. Mankato Township adopts the analysis by Blue Earth County of the land use pattern with four notable additions.

First, Blue Earth County suggests that mitigation might include the closure of some rural roads. In some cases, these roads provide the sole access to residences or agricultural facilities or fields. The Township opposes any road

closures unless adequate alternative access is ensured. The Township also supports a whistle-free zone to the maximum extent feasible.

Second, the expansion of the City of Mankato must be considered. The City, generally, is developing its commercial sites on the northeast corner of town, with additional development and road improvements in the area of the River Hills Mall. Additional commercial development, including a new medical facility, is planned for that area.

Residential development, on the other hand, is expanding more to the south and east, into Mankato Township. The two governments have entered into an orderly annexation agreement under Minnesota law. The development south of the City, in the area of the M-2 route largely consists of large, expensive residences in small, rural subdivisions. As the City expands south and east, this is the kind of development likely to occur – people will take advantage of the improved road service south of Mankato to live in a more rural setting and work in town. The large, expensive homes recently built and currently under construction simply will not occur adjacent to a railroad.⁶

⁶ It also seems unlikely that the City wants to be completely surrounded by rails. Presently, the City is bordered on the west by the Minnesota River and the M-3 route. Expansion north is limited by the existing tracks of the M-3 route north of town. It is only east and south where significant City expansion can occur without an adjacent railroad. To eliminate this growth, in light of the City's plans for expansion, seems short-sighted at best.

Nor will that kind of development occur if school bus service is difficult or non-existent. In its letter, Appendix 11, Yaeger Bus Service details the impacts on regular school bus service. Some rural routes will need to begin before 6:30 am, destined to spend over an hour on a school bus to start the day, and then repeat that long ride home. Parents looking for a satisfactory educational environment simply will not move into an area with such school transportation issues.

Third, a railroad is inconsistent with the overall nature of the area. As the video and drawings by Blue Earth County demonstrate, this is a rural area of much scenic beauty. A railroad will destroy that beauty. Unlike a road, which can generally follow the existing topography, the DM&E has rigid construction limitations. As a result massive amounts of earth will need to be moved, as cuts and fills are used to maintain the small slope and curve requirements. The railroad will necessarily become a major eyesore and source of noise and pollution in an otherwise largely undisturbed area.

In stark contrast, the M-3 route runs through largely industrial areas where service by rail is an important asset not a detriment. Residents already experience some disruption and chose to live in an area bounded by a rail line. The incremental change of expanded rail traffic in those areas is substantially less than the impact of a new railroad through this river valley.

Fourth, the railroad will damage or destroy the recreational value of this area. The parks and trails noted in the Blue Earth County Response exist because of the scenic beauty of the area. The trails and parks offer an opportunity to find recreation in the quiet and solitude of a rural setting. Imposing a railroad through this area, with dozens of trains per day, will destroy that scenic environment critical to the area. No matter the kind of buffers built to attempt to preserve the visual quality of the area, an impact will occur. And no amount of mitigation can protect the area from the noise of multiple diesel engines pulling a fully loaded coal train up a long grade.

In considering the preferred route, therefore, the STB should take into consideration existing land uses and future anticipated uses. It makes little sense, either in the short- or long-term, to destroy a valuable agricultural, recreational and residential resource when an existing route can accomplish the same goal with substantially less disruption. The M-2 route, on this basis alone, should not be considered a preferred alternative.

5. Significant public safety concerns are raised by the M-2 route.

As with land use, Blue Earth County's Response details a number of significant public safety concerns. In its Response, Blue Earth County detailed numerous problems raised by the M-2 route: the true risks of accidents, the emergency response delays with few, if any, alternative routes; and general travel

time delays, the County has more accurately detailed the problems M-2 presents. Mankato Township also calls upon the STB to undertake the necessary studies using GradeDeck 2000 to analyze all of the M-2 crossings.

The Minnesota Department of Public Safety website publishes accident records between motor vehicles and trains. Those records, Appendix 12, reveal that rural crossings pose a substantially greater risk of accidents than urban crossings. All of the crossings proposed for the M-2 route involve rural crossings.

Where the railroad will cross roads within the Township, all should have, at a minimum, the four-gate and center median protection system. All major roads – involving regular daily use – should be provided with separate grade crossings. As the Blue Earth County maps show, many roads are crossed at odd angles – only a very few actually have a 90 degree crossing. In many cases, the railroad track and road intersection abut a farm field where corn or other growing crops might obscure vision. Accumulations of removed snow may present a similar obstacle during the winter months. Adequate safety thus requires significant protections for traffic, either with grade separation or the four-gate system

In deciding the type of crossing to employ, adequate emergency response time must be ensured. In an urban area, such as the M-3 route, numerous alternative routes exist to provide emergency response. In a rural area, such as M-2, that is much less true - the roads tend to be further apart and less frequent. A

long train, even traveling at high speed, could so impact emergency response as to cause additional property damage, loss of life or other significant harm.⁷

6. The M-2 route will cause significant economic impacts, much greater than suggested in the DEIS.

In addition to the geological, environmental and other concerns discussed in the DEIS, the Report contains a discussion of the anticipated economic impacts. As with the other sections, this analysis appears to significantly underestimate the adverse impacts on LeHillier, an economic justice community, and on the economy of the area impacted by M-2.

a. The DEIS ignores the implications of the M-2 route for LeHillier.

Although not part of Mankato Township, LeHillier is an area just outside of the Township boundaries. Since no response is anticipated on behalf of that community, Mankato Township decided it was important to address the economic justice issues.

Under Executive Order No. 12898, all federal agencies must consider the impact of actions on communities of low-income and/or minority populations.

LeHillier meets that definition.

⁷ The Minnesota Court of Appeals recently affirmed a multi-million dollar verdict against an ambulance service for late response. The ambulance drivers became lost, losing a few minutes in responding. Blatz v. Allina Health System, ___ N.W.2d ___, No. C9-00-826 (Minn. Ct. App. Feb.6, 2001). Similar risks exist if an ambulance is delayed by a train with no reasonable alternative route available.

The DEIS, however, claims that no adverse impact will occur. Yet, even a casual view of the Blue Earth County map shows that LeHillier will suffer significant impacts. Numerous homes will be removed, generally housing low-income people. Their neighbors will be allowed to remain in their homes, only to confront the challenges of noise and vibration from regular rail traffic. These impacts, as will all M-2 impacts, occur in an area presently without any rail beds and the associated impacts.

The magnitude of these changes must be considered as part of the DEIS process and adequate mitigation efforts ensured.

b. The M-2 route will have significant impacts on several area businesses.

The DEIS did not address the impacts likely to occur to several area businesses, most significantly, the Hillcrest Nursing Home and Mount Kato. The evaluation of the best alternative must be considered with these impacts in mind.

The Blue Earth County plan shows that the M-2 route would pass within a few feet of the Hillcrest Nursing Home, taking much of the parking lot. At that point, it would be in a 25-foot cut. Nursing home residents would thus be subjected to frequent impacts of vibration and noise as the coal trains passed. If the DM&E succeeds in increasing its other business as well, additional trips over the M-2 route past the Home would serve to increase those impacts. Given the

frequency and significance of these disruptions, will the Nursing Home be able to attract new residents and stay open?

Mount Kato faces another set of challenges. The proposed route will require the removal of several of the lower lift supports on the back side of the ski area. The loss of these runs will, according to Mount Kato managers, likely result in the closure of the facility.

Even if adequate alternative locations for the lift supports could be found and supplied by DM&E, the resort faces significant challenges. The idea of recreational downhill skiing is to enjoy the exhilaration of the speed in a natural setting. The presence of a railroad at the bottom of the hill, on fill rising over 80 feet in the air, will destroy much of that attraction. The noise, smoke and vibration will further detract from the natural setting and the overall enjoyment. A significant risk exists that the ski area would lose so much business from this impact that it would be forced to close.

Finally, a number of other businesses, such as Associated Engineering, will be directly impacted. These impacts too must be considered.

It is interesting to note that some have suggested that new business development might occur along the rail route. Such development, of course, is inconsistent with current land use and planning. It is also difficult to conceive of a

business building in the river valley, with all of the associated challenges, when better sites exist at innumerable points along the route.

It is further interesting to contrast the current business activity along the M-2 route with the activity along the M-3 route. No current or planned business along M-2 requires or even desires rail access. Numerous businesses along M-3, on the other hand, desire better rail access. Many require rail access for their existence.

In considering economic impacts, therefore, the DEIS must be substantially revised. Considerations of the M-2 route, and its impacts on existing business, must be thoroughly evaluated. The inconsistent nature of M-2 with future likely development must also be considered. These negative impacts should then be evaluated in comparison to the needs of businesses along the M-3 route, a contrast that will be stark and absolute.

c. The M-2 route will destroy numerous agricultural uses.

Agriculture provides one of the major uses of the M-2 route today. Part of the area is notable for its vast farm fields, largely devoid of interruption by public transportation routes. These large fields create an ideal working environment, allowing farmers to plant long, straight rows, resulting in increased efficiency. In addition, many of the farms rely upon natural and man-made drainage systems to

maintain the land. These systems are critical to ensure the prompt removal of excess moisture from fields, allowing for higher crop yields.⁸

The DEIS notes some of these challenges, but they are not properly addressed due to the inadequate development of the M-2 route. Without a precise, or even approximate, route, no evaluation of impacts on farm fields and drainage can occur.

With the development of the Blue Earth County map, some of that evaluation can occur. Those maps show that many fields will be bisected by the proposed M-2 alternative. In some cases, this will result in fields so small that they are no longer economically viable. In other cases, point rows will occur, presenting great challenges for planting, harvesting and plowing. In some cases, access will be denied or made much more difficult.⁹ In all cases, the fields will become less economically advantageous because of the breaks in straight rows.

In addition, as the DEIS acknowledges, some fields will suffer adverse drainage impacts. Existing tile lines will be cut and streams rerouted. The damming effect of the rail bed must also be considered. Not only might this cut

⁸ The economic sensitivity of the rural economy need not be told here. All are familiar with the challenges confronting farmers, with crop prices far below the cost of production. Anything that increases those costs risks the loss of additional family farms through frustration, economic futility or bankruptcy.

⁹ DM&E's construction standards call for fencing along the entire route. Provision must be made to ensure farmers have access across the tracks for both equipment and farm animals.

off existing tile lines and streams, but new water issues will be raised by the change in existing water flow patterns. The DEIS makes no attempt to quantify this impact, a step that should be taken if this route is to be actively considered.

If the M-2 route is ultimately determined to be the preferred route, mitigation must address these issues. Farmers must be compensated not only for the pure loss of acreage, but also for the point rows and diminished field quality.¹⁰ Adequate plans to endure field access and maintain existing drainage, whether natural or man-made, must also be developed.

d. The recreational value of the area will be destroyed.

Recreation is the other major use of the proposed M-2 route, especially through the Blue Earth River valley. As the Blue Earth County Response notes, the route contains several parks and trails, all directly impacted by the proposed train tracks. These direct impacts must be considered and mitigated.

The indirect impacts must also be considered. The attraction of the river valley, and its streams, parks and trails, is largely from the unspoiled nature of the area. It remains a quiet, natural setting for walking, biking, and just sitting. Birds, wild flowers and other plants and numerous animal species flourish.

¹⁰ Minnesota recognizes the concept of inverse condemnation. This can include not only land taken but diminished market value caused by noise or other effects of a development. Alevizos v. Metropolitan Airports Comm'n, 317 N.W.2d 352 (Minn. 1982) Any action by the DM&E is likely to result in dozens of suits by those impacted by the construction of the railroad, even if their land is not actually taken.

This natural splendor would be destroyed by the DM&E plan. The sounds of birds and flowing water would be replaced by the roar of diesel engines pulling up hill and the rattle of rail cars on the tracks. The scent of fresh air and wild flowers would be replaced by the stench of diesel fumes and coal dust.¹¹ The serenity of the surroundings would be interrupted by the vibration of fully loaded trains passing every few minutes. The beauty of natural flora and fauna would be replaced by the dominating feature of passing rail cars. No amount of mitigation will prevent these impacts.

Because of the time of year, an extensive survey of plants and animals was not possible. It is almost certain, however, that the significant environmental changes wrought by the imposition of a railroad in this area will impact plants and animals. Various species may be lost to this area as their habitat is destroyed or altered. Others may simply move to a more hospitable environment. It is known that challenged species such as the snow trillium, fox snake, maple and basswood forest remnants, burrowing owl and spotted skunk exist in the river valley. Bald eagles frequent the area, with some reports of nesting sites. The Minnesota Department of Natural Resources is expected to submit a response detailing these

¹¹ In addressing air quality issues, the DEIS assumes that fuel usage will be the same per mile. Such an assumption is almost certainly inaccurate. The M-2 route requires a long pull up a steady grade; the M-3 route is almost flat. These differences in fuel consumption should also be considered and the air quality impacts recalculated.

impacts. Its concerns should weigh heavily on the STB's consideration of environmental impacts.

These unavoidable impacts stand in stark contrast to the effects of the M-3 route. That route passes through a city, already experiencing train traffic, regular motor vehicle use and other urban sounds. The urban flora and fauna are consistent with that environment and have adapted to the presence of the railroad.

The STB should address these concerns, a subject largely ignored in the DEIS. These impacts alone justify rejection of the M-2 alternative given the inability to mitigate the harmful effects.

7. Given the inadequacies of the existing DEIS, from route description to impact consideration, the STB should order a preparation of a second DEIS to compel the DM&E to respond to the issues raised about the proposed M-2 route and to allow for public comment about that route.

The fundamental purpose of the DEIS process is to allow for consideration of environmental impacts of a proposed action. That purpose is defeated if the impacts cannot be evaluated due to inadequate project description and engineering. Sierra Club v. Morton, 510 F.3d 813 (5th Cir. 1975).

Here, the DM&E has acknowledged it has done little or no engineering of the M-2 route. Blue Earth County has attempted to fill the void, developing a plan well **after** the DEIS was published. The concerns raised by the M-2 route were then brought much more into focus, under the assumption that the Blue Earth

County route was an accurate plan. To the extent it is not, additional or new issues may be developed.

Given the lack of adequacy of the DEIS, in relation to the M-2 route, the only reasonable alternative is to require the process to begin anew for this alternative if it is to remain under active consideration. By requiring the DM&E to provide details of the route, and the engineering for that route, a complete and accurate analysis can occur.¹² Once that analysis is completed the new DEIS for the M-2 route can be published and open for a brief window of public comment – around 30 days. At that point the STB would have the information necessary to reach an informed, thoughtful decision about the preferred alternative in the Mankato area.

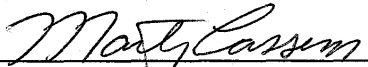
8. Conclusion.

Mankato Township opposes the M-2 route. The DEIS contains a number of fundamental errors fatal to the existing analysis – the lack of a defined route and the implicit assumptions, none of which are accurate, establish the inadequacy of

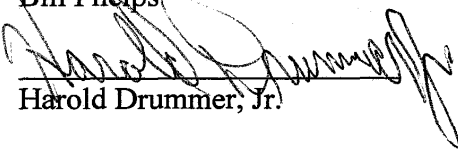
¹² No one is suggesting that actual construction plans be developed. However, the DM&E should be required to fix a route and the means it would use to build across that route, including all cuts and fills and trestles.

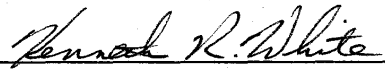
the existing analysis. The DEIS fails to consider the most important fact – the DM&E has no interest in building along this route. Utilizing the Blue Earth County map, the deficiencies in the DEIS become even more stark. The STB, therefore, should reject the M-2 route as an alternative. If it is to remain under active consideration, the STB should order a new DEIS for that proposal so that it and the affected communities, businesses and individuals can evaluate the project from an agreed upon route and design plans. If then ordered, the STB should direct the DM&E to work with the effected communities to ensure adequate mitigation of the impacts caused by the imposition of a railroad on this environmentally and economically sensitive area.

MANKATO TOWNSHIP
BOARD MEMBERS


Marty Cassen, Chairman


Bill Phelps


Harold Drummer, Jr.

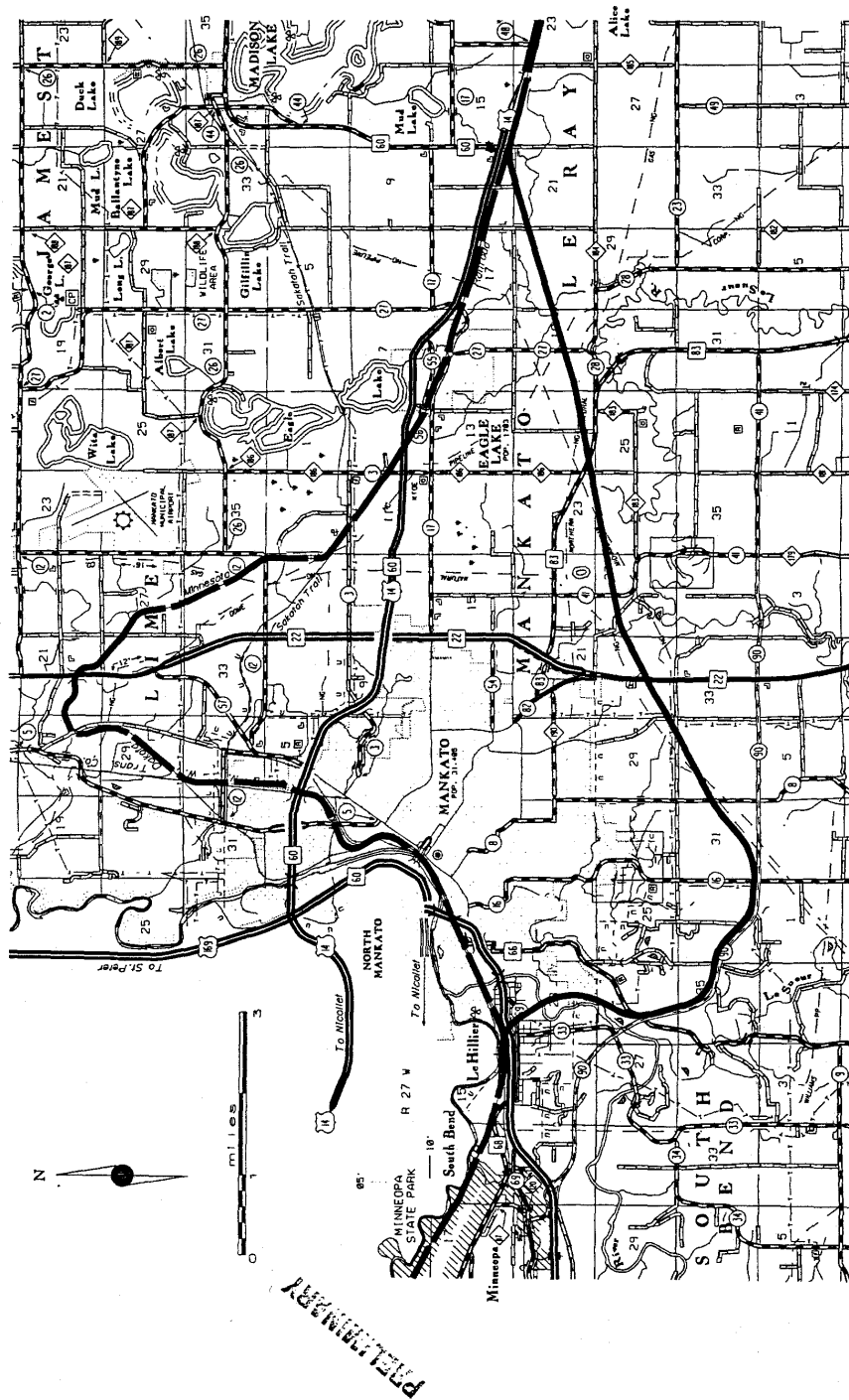

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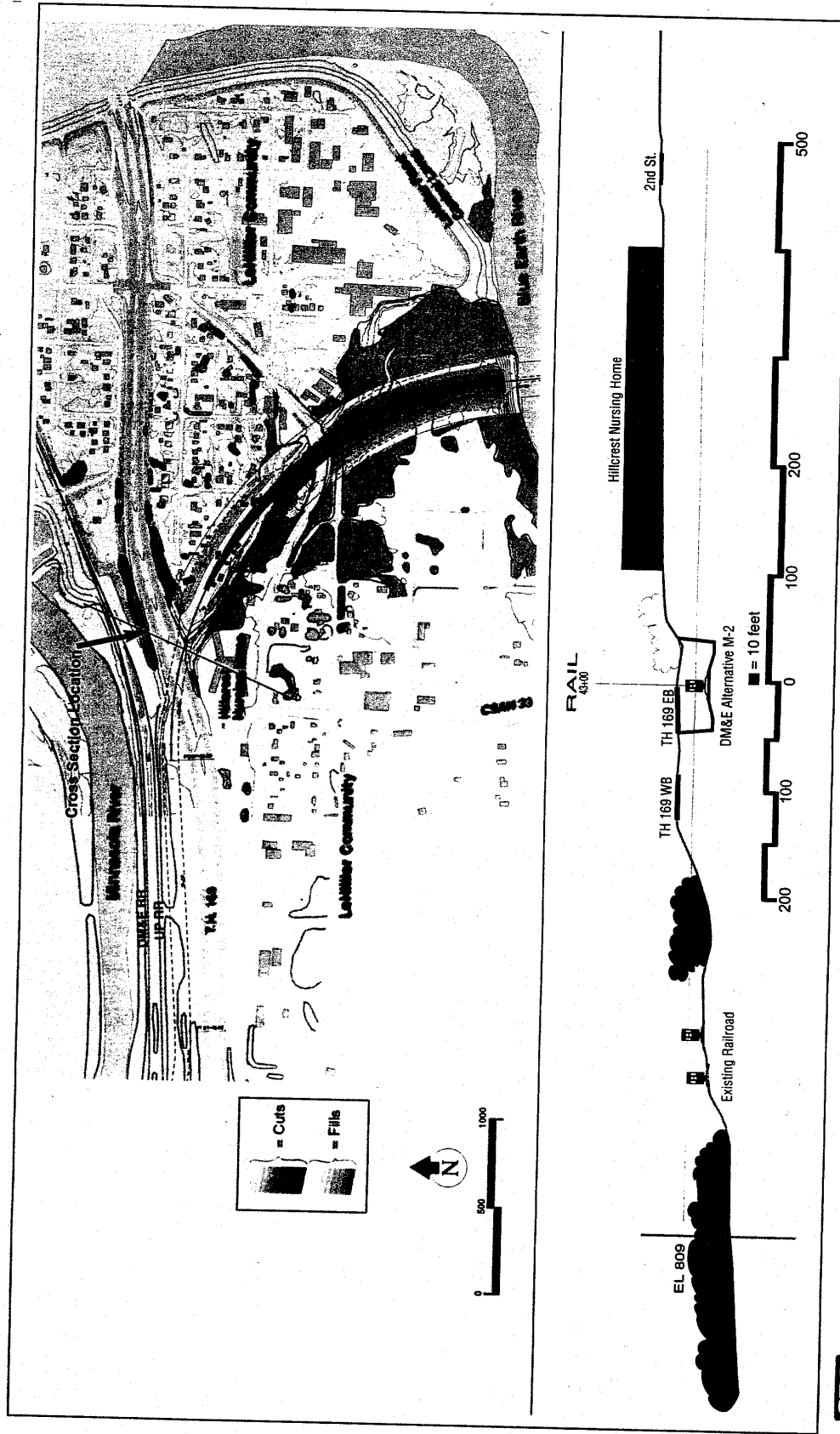


Blue Earth County Highway Department Estimated Plan & Profile with Cross Sections Of DM&E Railroad, Mankato South Route



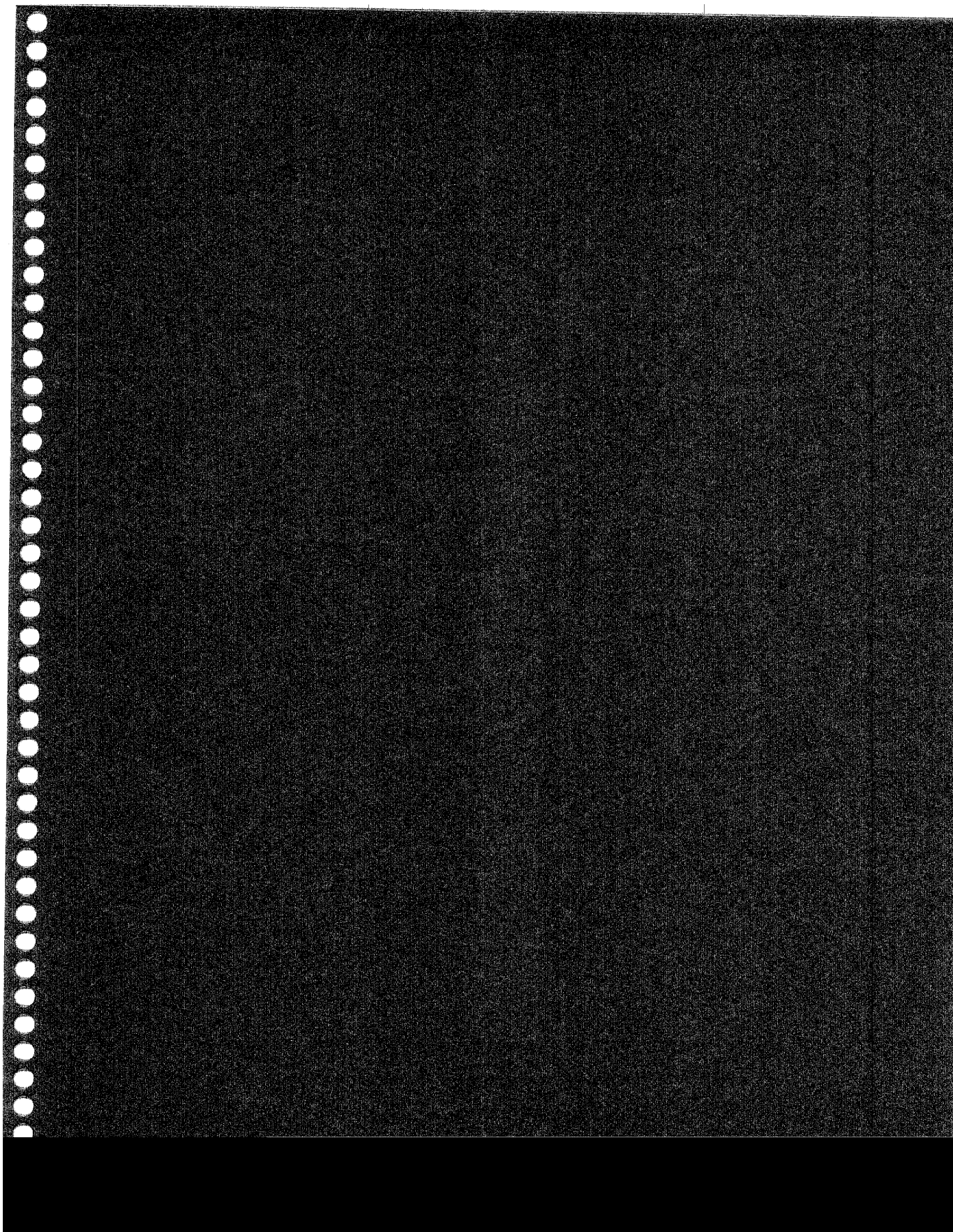
Powder River Basin Expansion Project
Alternative M-2 Mankato South Route

South Route Alternative M-2
Existing Rail Line Alternative M-3



Blue Earth County, Minnesota
Plan View of LeHillier Area and Cross Section at LeHillier (Station 43+00)
 DM&E DEIS Comments •• Figure B-1





Blue Earth County, Minnesota
 Planview of Skyline Area
 DM&E DEIS Comments •• Figure B-2



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Report of Meeting of Local Officials and the DM&E Railroad
January 19, 2001

In Attendance:

Pat Hentges, City of Mankato
Dennis McCoy, Blue Earth County
Jeff Kagermeier, Mayor, City of Mankato
Paul Vogel, City of Mankato
Bill Vetter, Former Mayor, City of Skyline
Ken White, Mayor, City of Skyline
Ray Gigear, DM&E Railroad
Kevin Schieffer, DM&E Railroad
Cyndy Story, City of Mankato

A meeting was held with the above named individuals in attendance in the office of Dennis McCoy, Blue Earth County Administrator, at 3:00 p.m. on Thursday, January 18, 2001. The purpose of the meeting was for the representatives from the DM&E to address any concerns or questions that the local officials have regarding the proposed expansion of the railroad and the effects it would have on the City of Mankato and the surrounding areas.

The meeting began with Mr. Schieffer explaining that he had received several letters from residents of the city of Skyline and Blue Earth County regarding the proposed expansion and the Draft Environmental Impact Statement that was released by the Surface Transportation Board (STB). He stated that he did not have an agenda for this meeting but that he simply wanted to meet with the various cities and towns along the proposed expansion corridor to address their concerns and to work with them wherever possible. He explained that the situation that the DM&E is facing in Mankato is "unique" because they do not own the trackage on the rail lines that go through Mankato. The way that he perceives the situation as it is now is that there are three alternatives with regard to the proposed expansion. There is: 1) the South Route, which would require the building of new tracks south of Mankato, close to Route 90; 2) an In Town route, which would necessitate the building of a second track line by the DM&E next to the existing Union Pacific line; and 3) the No- Build option, whereby the DM&E would have to use the existing Union Pacific line. He cited the importance of the project from both a regional as well as a national standpoint in terms of economics, energy and transportation needs and stated that he is trying to "get from point A to point B in the most direct way possible." He stated that his own expectation is that the STB will order a second track to be built through the City of Mankato, which is the alternative that he would prefer. While acknowledging that the expansion is a "complicated, cumbersome process" he assured everyone that the DM&E is trying to "develop it in the most responsible way possible."

Mr. Vetter then responded to Mr. Schieffer's remarks by noting that the City of Skyline has concerns for the community and cited the removal of seven homes in that area, should the south route be the one that is directed by the STB. He stated that the city has

already retained the services of an attorney experienced in the STB process and expressed concern for the cost of the litigation to the various communities that will result from this project. Mr. Schieffer suggested that Skyline could get in line with the other attorneys. Mr. Schieffer went on to say that the DM&E is more than willing to work with the City of Skyline, as far as their concerns for the homes that would be removed, as well as any legal concerns that would arise from the project.

Mr. Hentges then asked Mr. Schieffer if he could provide any insight into how the DM&E plans to "get from point A to point B" and expressed his concern that the STB is not going to order the surrender of trackage rights by Union Pacific (UP) in order for the DM&E to run more trains through the area on the UP line. If that were to be the case, then the only option is the No Build option, which Mr. Hentges stated is "not good environmentally" for the City of Mankato because the increased trains will have an impact on the city from a noise and vibration standpoint. Mr. Hentges also stated that he did not see how the STB could order the in-city route (without mitigation). Mr. Schieffer responded that the STB is not ordering an alignment between their railroad and Union Pacific at this time. He also stated that Union Pacific is not precluded from building a double line in Mankato and that they could do so if they wanted to without needing any regulatory approval from the STB. He stated that this "happens every day" in the railroad industry. If UP built a second line next to their existing line it would not be tied to the DM&E and therefore no filing with the STB would be required. He then mentioned the possibility of the South Route being chosen by the STB and stated that if that option is chosen, the DM&E will lose their interchange with UP and that the capital dollar cost to the DM&E would be higher. He also stated that if the South Route is the route that is ordered by the STB that the DM&E might not necessarily build it and that in fact they would prefer not to build it. With the No Action alternative, he said that both railroads would have rights over the single track line currently in place and that if the DM&E increased their frequency of trains in the area they would be considered "unit" trains (longer trains with more volume) and that the DM&E would then gain preference over the line because of that. Mr. Hentges then asked what would be the value to UP of keeping the DM&E on their route if UP built a dual track, which would result in the elimination of the Minneapolis switch. Mr. Schieffer responded by saying if that were the case then UP would lose the revenue that they would receive from DM&E and lose control over their operations, as well as lose an interchange opportunity for grain, clay and coal that would be shipped on the line. Mr. Schieffer said that UP would rather run coal themselves from Wyoming through Nebraska up to the Twin Cities than to take it from Mankato to Minneapolis after the DM&E had brought it here. He stated that it is better for UP to do long hauls because they are more profitable. Schieffer acknowledged that while the UP may be "capital poor" as a result of their merger, etc., he said that they are beginning to change their operations and use faster trains, but that Mankato is a "mess" operationally for them. If they require upgrades and signaling in Mankato UP would prefer to have the DM&E pay for it with a track upgrade that would come from the building of an additional line.

Mr. McCoy then inquired about the railroads servicing the companies located in Mankato such as Honeymead and ADM and what affect this would have on them. Mr. Schieffer

responded that UP "services whomever" and that they are "involved in all of it" so he did not foresee a problem for them. He also stated that the increased train traffic as a result of the DM&E expansion would result in a quadrupling of revenue for UP. Mr. Hentges then stated that with either alternative (the expanded in-town route or the southern bypass) the DM&E would have to spend millions of dollars and asked does it really make sense for the DM&E to spend all that money to build a new line in Mankato and still pay tipping fees to UP? Mr. Schieffer acknowledged that with the southern bypass route the DM&E would have an advantage as far as operating independence and they would not have to pay trackage rights fees to UP, but the money they would be saving from that would barely cover their maintenance costs on the southern route. He further stated that it is a question of capital versus operating independence and admitted that the DM&E does not have enough engineering information about the south route right now to know what the tradeoff between those two might be. He then stated that he would "cut a deal with UP" to either use their existing line or build a second line. Mr. Kagermeier then brought up the possibility of development opportunities along the south route for industries such as value added agricultural products, but the general consensus was that industries would be more likely to locate in cities already along the line.

Mr. Hentges then stated that the City of Mankato has prepared their filing for the STB and that they have already done a full mitigation plan that addresses the concerns regarding the expansion. He further stated that the city "has no say" in the outcome because the decision is up to the STB. He pointed out that while the city of Skyline has seven homes that would have to be removed if the southern bypass alternative was chosen, the City of Mankato has fourteen homes that will be similarly impacted if the in-town route is chosen, as well as up to forty other homes that will be affected by the noise and vibration from the increased train traffic. He stated that it is not dramatically cheaper for the DM&E to build in the City of Mankato than it would be if they had to build the southern route and that there would be less overall impact in the county with regard to the total project for not a lot more money. He stated that it is simply "less challenging" for the DM&E to go through the city. Mr. Schieffer responded that it would not be impossible for the DM&E to run more trains through the city with what they have now but that the DM&E has no authority or jurisdiction in the city with the present situation. He further stated that he expects lawsuits and litigation no matter what happens but that it just "makes sense" for them to operate where they are now. Mr. McCoy responded that with regards to the southern route that the 2:1 grade that was proposed will not work and emphasized that Blue Earth County has done more work on the engineering aspect of the proposal than the DM&E has. Mr. Giegar from DM&E agreed with Mr. McCoy and Mr. Schieffer admitted that they have not done a lot of work on that aspect of the project, primarily because they don't want to build the southern route. Mr. Giegar also responded that building railroad is different than building a highway.

Mr. Hentges then pointed out that there is "not a lot of support" among the citizens for 20-30 trains per day going through the area. Mr. Schieffer responded that it is "not their (DM&E) call" to make but that they are happy to work with the cities in the area as well as the county to address concerns that they have. He also stated that there is "no political happy solution" to the proposal. He emphasized that the DM&E is willing to develop

contingency agreements with mitigation with the cities involved and that he is making a "good faith commitment" to work towards that. He mentioned a four-way plan involving the City of Mankato, Blue Earth County, the DM&E and the other cities out there but did not elaborate on it. Mr. Kagermeier then stated that the will of the citizens is not there with regards to this project the way it stands now but that if there were provisions for full mitigation then it would be acceptable. Mr. Schieffer responded that he is not pushing one way or another and that the people in the area have been "led to believe" things that are incorrect because of false information. Mr. Hentges then stated that the City of Mankato will not agree to the building of a double line through the city without mitigation and that the proposal for a double line would in fact required mitigation under present law. Mr. Schieffer responded that he felt that Mr. Hentges "does not want a double line going through the City of Mankato" and that UP is fixing up the line and that it is "happening already". Mr. Vetter stated that the city of Skyline is willing to work with the DM&E with regards to their concerns about the project and he explained to Mr. Schieffer that their city had passed two ordinances regarding the proposed expansion: One stating that they are opposed to the project and another one that states that if the project is approved and the south route is chosen that the railroad will be required to build a three foot thick enclosure along the corridor through Skyline for noise abatement.

The meeting ended with Mr. Schieffer acknowledging that the DM&E and the those present had "agreed to disagree" about the proposal as it stands now and that as of right now there are no agreements in place (with the City of Mankato) or any provisions for mitigation. He thanked everyone for coming and for their continued efforts on the project.

Appendix 4a
See Video

Appendix 4b
See CD

Risk of Polycyclic Aromatic Hydrocarbon Contamination of the Skyline Neighborhood by Train Traffic along the Southern By-pass

The Southern By-pass proposed by the DM&E Railroad will expose the Skyline neighborhood to elevated levels of a class of cancer-causing agents known as the polycyclic aromatic hydrocarbons (PAHs). While these compounds are present at low concentrations in the environment, the diesel locomotive traffic will significantly increase their levels in a residential area that currently has nominal exposure.

Polycyclic Aromatic Hydrocarbons

PAHs are a class of compounds composed of carbon and hydrogen. The attached figure gives the names and structures of 16 PAHs that are commonly studied.

PAHs are produced as by-products of combustion processes. While cooking is a dominant indoor source of PAHs (1), traffic is the dominant outdoor source (1, 2, 3). Because of this contribution from auto exhaust, urban centers tend to have higher levels of PAHs than do residential areas. There is a correlation between traffic levels and indoor PAH concentrations (1). A seasonal cycle in PAH concentrations is related to domestic heating (2). Cigarette smoke contains PAHs and grilling a steak contaminates the steak with PAHs (4).

PAHs are also present in fossil fuels. For example, they are present in the crankcase oil that leaks in parking lots. Raw coal contains between 1.2 to 28.3 ppm PAHs (5).

Polycyclic Aromatic Hydrocarbons as Carcinogens

The earliest demonstration of an occupational risk of cancer was observed by Pott in 1775 (6). He noted the high incidence of cancer of the scrotum in chimney sweeps. Around 1915, the Japanese proved that soot tar could induce cancer (6). It is now recognized that PAHs present in the soot were the causative agents.

The carcinogenic activity of PAHs has been demonstrated in animal models. For example, closure of a coking plant near the Black River in Lorain County Ohio led to a decline in PAH levels in the river sediment and in fish. The decline in PAH levels correlated with a decrease in liver cancer in the fish (7).

Studies with laboratory animals have demonstrated that benzo(a)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene induce skin tumors in laboratory animals following intermediate dermal exposure. They are complete carcinogens. Benzo(a)pyrene is a potent melanocyte inducer in mice via dermal exposure. Anthracene, fluoranthene, fluorene phenanthrene and pyrene do not act as complete carcinogens. While not all PAHs are carcinogenic, they are formed as mixtures that contain both carcinogenic and noncarcinogenic PAHs (8).

It has been difficult to demonstrate correlation between PAH exposure and

cancer in humans. In a Canadian study (9), the incidence of 14 types of cancer were tested for a correlation with occupational exposure to PAHs. For most forms of cancer, there was no evidence of excessive risk in occupations where PAH exposure is prevalent. However; people in these occupations were at excessive risk for cancer of the esophagus, pancreas and prostate. The risk for lung cancer increased for nonsmokers. Studies from the US, indicate that occupational exposure is associated with increased incidence of lung, skin, gastrointestinal and genitourinary cancer (4).

The toxicity of PAHs is enhanced by photosensitization and photooxidation. In other words, as PAHs are exposed to sunlight in the environment, they actually become more toxic. In particular, Anthracene toxicity is greatly increased by photomodification to anthraquinone and hydroxyanthraquinones. 2-hydroxy-anthraquinone is the most toxic product of this photooxidation and this compound itself is not further photooxidized meaning it can persist in the environment (10). Likewise, when PAHs are absorbed in the human body, they are metabolized in the liver to polar compounds that are more easily transported to other organs where they can conjugate with DNA and initiate cancer than are the PAHs themselves (11).

Polycyclic Aromatic Hydrocarbon Pollution by the Southern By-Pass

The train traffic along the Southern By-pass will increase the PAH levels in the Skyline area. The PAHs will come from the diesel exhaust of the locomotives and the dust from the coal being transported by the trains. Outdoor PAH levels will be more like those found in an urban center rather than in a residential neighborhood. Indoor levels will follow the outdoor levels.

The exposure to PAH levels will be exacerbated by the form of the diesel exhaust that will be prevalent in the Skyline area. The diesels will be laboring up a steady incline. Under these conditions, the exhaust will be heavily polluted with soot. PAHs of environmental concern tend to adsorb to the surface of the soot particles. Whereas, PAHs in automobile exhaust tend to disperse into the atmosphere and be diluted, the PAHs in the diesel soot and the coal dust will settle in the lawns of the Skyline residents. Children playing in the lawns will have dermal exposure to these compounds. As the soot and dust lies on the yards and patio furniture and swing sets, the PAHs, they contain will be exposed to sunlight and will be photooxidized to more toxic compounds.

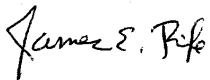
It has also been demonstrated that soot from diesel engines can absorb benzene from the diesel fuel (12). While benzene is not a PAH it is an established carcinogen. Consequently, the diesel soot also has the potential of concentrating benzene in residential lawns rather than allowing it to rapidly dissipate into the atmosphere.

While it is very difficult to predict the specific number of cancer cases the Southern By-pass will cause in the Skyline area over the next ten years, it is certain that it will increase the residents' risk of cancer.

Impact on the Blue Earth River

The PAHs in the soot produced by the trains and in the coal dust will undoubtedly also settle in the Blue Earth River. It is clearly established that these PAHs will adversely affect the fish and other organisms in the river.

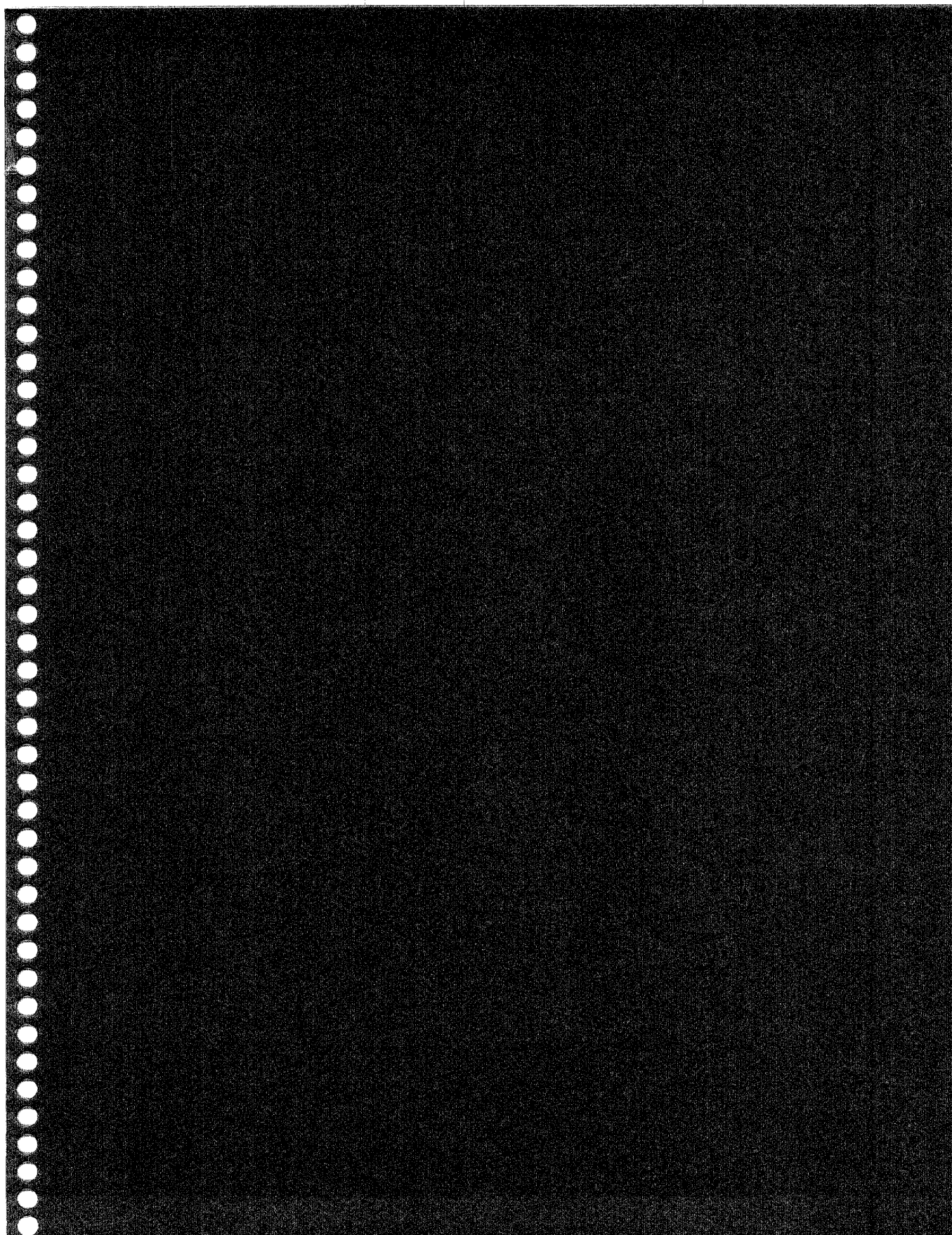
Respectfully submitted by,

A handwritten signature in cursive script that reads "James E. Rife".

James E. Rife

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Education

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Employment

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Project: Purification of Maize Phosphoenolpyruvate Carboxylase and Measurement of
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DAKOTA, MINNESOTA & EASTERN RAILROAD CORPORATION

June 9, 1999

Office of the Secretary
Case Control Unit
STB Finance Docket No. 33407
Surface Transportation Board
1925 K Street, N.W.
Washington DC 20423-0001

ATTENTION: Ms. Elaine K. Kaiser
Chief, Section of Environmental Analysis
Environmental Filing

RE: APPLICANT COMMENTS ON ALTERNATIVE ROUTES ANALYSIS

Dear Ms. Kaiser:

This is to provide additional comment pursuant to the STB Order decided April 14, 1999. That Order raises additional issues and extends the deadline for comment "regarding alternatives" to June 10, 1999. In addition, various agencies have requested further justification for Applicant DM&E's position that the various options listed in the Final Scope under Alternative D (i.e., Alternatives D1 through D5), and two new Alternatives (D6 and D7) that have surfaced since the publication of the Final Scope, are not feasible. Accordingly, we are taking the opportunity of this extended comment period to address that issue. We also will use the opportunity to provide additional comment relative to the Mankato, MN and Owatonna, MN alternatives listed in the Final Scope. In our April 9, 1999 submittal to STB SEA we commented on Final Scope Alternatives B and C, as well as the Rochester by-pass proposal. This letter will address the additional Final Scope Alternatives (A, D, M and O), explained in detail below but summarized as follows:

EXECUTIVE SUMMARY

- I. Alternatives A and D, relative to the South Dakota/Wyoming New Rail Line Extension (identified in the Final Scope ("FS") at pages 6-9), would lead to the same result. In essence, each of the proposed "D series" alternatives is in fact a "no build" alternative as it relates to the proposed project. Even if approved, they would not be built. None of them can realistically accomplish the purposes and meet the needs of the proposed project. Lost service opportunities, steep grades, sharp curves, and/or excessive circuitry dramatically increase cost or reduce project efficiencies to such an extent that the project cannot effectively meet its objectives. Simultaneously, the project would lose its practical appeal as a business venture for the same reasons.
- II. Alternative M4, relative to the UP Bypass at Mankato (FS, p. 9), is not feasible. M3 has undergone significant engineering analysis since the original application was submitted, and provides a unique opportunity to reduce current impacts on the existing UP corridor. Based on a more detailed examination of M4 (the "Northern Route") since the initial application was

filed, we have found that this is not a feasible or reasonable alternative. We know of no party who disagrees with this finding. Further community input and engineering since the initial application have developed a more detailed plan on the existing UP corridor route (M3). This alternative would require utilization of the existing UP corridor through Mankato. The southern route alternative (M2) appears to remain a reasonable alternative from an engineering standpoint. But the existing UP corridor appears superior from an environmental impact standpoint, and is currently the alignment upon which the planning is being based. Accordingly, Applicant proposes that (a) M3 be redesignated as the "Proposed Action", (b) M2 be redesignated as the Southern Alternative, and (c) M4 be eliminated from further consideration because it is not a reasonable alternative.

- III. A procedural alternative to the proposed construction of the I&M Connection at Owatonna (FS, p. 9) could effectively accomplish the purpose and needs of the project. This additional Owatonna alternative contemplates the utilization of the existing connection with the I&M Rail Link (IMRL) at Owatonna, which we would suggest adding as Alternative O4. This alternative raises legal and procedural issues discussed below, but it clearly is reasonable from an engineering and operating standpoint, and we believe would be less objectionable to the City than either O2 or O3. We understand that the City of Owatonna also will submit a by-pass proposal, which we will address separately in our comments on that issue (due July 10, 1999).

BACKGROUND

As a prerequisite to developing the EIS, the agencies are tasked with the responsibility of defining a reasonable range of alternatives in an effort to avoid or minimize adverse impacts or enhance the quality of human environment. (40 CFR 1502.1). The CEQ's often quoted reference to the "alternatives" section as the heart of the EIS emphasizes the importance of this aspect of the process. In determining what is "reasonable", the agencies are provided significant discretion. Common sense and the stated goals (or purposes and needs) of the project are primary factors to be considered. The "rule of reason governs both which alternatives the agency must discuss, and the extent to which it must discuss them." Citizens Against Burlington, Inc., et al. vs. Busey, et al. 938 F.2d 190, at 195 (1991). "The goals of an action delimit the universe of the action's reasonable alternatives." Id. at 195. Using an example of a proposal to license a nuclear reactor in a town called Vernon in an effort to expound on the relationship between project goals and the reasonableness test, the Burlington court noted that "the proposed alternative is reasonable only if it will bring about the ends of the action -- only if it will do what the licensing of a reactor in Vernon is meant to do." Id. (emphasis added). The court noted that if the purpose was simply to supply energy to the New England area, a reactor located in another New England city may very well provide a reasonable alternative. However, it also noted that "if licensing the Vernon reactor is meant as well to stimulate the Vernon job market" licensing a reactor elsewhere would be far less effective.

However, the articulation of the purpose and need statement itself must be reasonably tied to rational project goals, and should not be used either to avoid or to dictate alternatives.

[A]n agency may not define the objectives of its actions in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality. . . . Nor may an agency frame its goals in terms so unreasonably broad that an infinite number of alternatives would accomplish those goals and the project would collapse under the weight of the possibilities. Burlington at 196.

As implied by the language above quoted, this is particularly so when a federal agency is the project sponsor. Where the project is sponsored by a private enterprise, the agency's requirement to develop alternatives is significantly more limited. The Court noted that the agency's approach to alternatives was correctly more narrow in a private permitting action. In that case, the agency observed:

The scope of alternatives considered by the sponsoring Federal agency, where the Federal government acts as proprietor, is wide ranging and comprehensive. Where the Federal government acts, not as a proprietor, but to approve and support a project being sponsored by a local government or private applicant, the Federal agency is necessarily more limited. In the latter instance, the Federal government's consideration of alternatives may accord substantial weight to the preferences of the applicant and/or sponsor in the siting and design of the project. Burlington at 197.

After quoting the above agency analysis from the EIS in question in that case, the Burlington court found that the agency's "reasoning fully supports its decision to evaluate only the preferred and do nothing alternatives." Id.

Importantly, however, "[r]easonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant." CEQ 46 Fed. Reg. 18026, as amended by 51 Fed. Reg. 15618 (April 25, 1986).

It is with these principles in mind that we thought it best to begin the substantive portion of this "Alternatives Comment" with revisiting the fundamental objectives of this project as defined through its stated purpose and need.

PURPOSE AND NEED SUMMARY

A restatement of some of the relevant purposes and needs applicant seeks to fulfill with this project are summarized below:

1. To revitalize our existing railroad, which is in serious need of massive capital investment to ensure long term viability, thereby enhancing competitive access opportunities and improving overall service for our active customer base and improving the overall safety of rail operations.
2. To efficiently deliver PRB coal from identified mines to utility markets to the east. The primary focus of mining activity for originating traffic is on the southern cluster of those PRB mines, based on market demand. The primary focus for terminating traffic is on the identified target markets (i.e., Upper midwest, Great Lakes, Chicago gateway, Mississippi River). It is critical to focus efficiencies on those core segments.
3. To advance the SO₂ emission compliance provisions of the next phase of the Clean Air Act (scheduled to take effect in the year 2000), by providing cost incentives and service efficiencies sufficient to maximize use of low sulphur coal from the core target origination area as an alternative to higher sulphur coal being utilized in many of our target utilities today.
4. To advance national energy deregulation policies aimed at lowering delivered energy costs and passing that lower cost to the consumer through energy industry competition.
5. Significantly improving the national transportation infrastructure through added capacity, effective competition, and alternative service routes.
6. Modernizing key customer facilities.

7. Providing safe tourism excursion passenger service to and maximize project opportunities for communities along our existing line.

ALTERNATIVES' ABILITY TO MEET THE PURPOSE AND NEED

Our purpose in this project relative to coal transportation is not simply to build a technical connection from the PRB mines to our system. It is to build an efficient connection. If it does not result in greater efficiency and better service than exists for our target market today, it is doomed to failure before we begin. Without increased efficiencies and service opportunities, we stand little chance of achieving traffic levels sufficient to reach project viability. There are real and compelling service problems in delivering PRB coal today. Virtually all the "D" series alternatives drain the increased efficiencies and improved service opportunities out of this project. If we cannot substantially improve things, we should stay out of this project altogether. Customers in our target market are not clamoring for more of the same.

Draining the efficiency out of this project also will greatly diminish the efficiencies necessary to stimulate conversion from high sulphur to low sulphur burner tip technology throughout our target market. This would materially undercut our ability to achieve the Clean Air Act goals of the project, and by itself would significantly undermine the business plan.

Inevitably, the higher transportation costs which necessarily would result from the astronomically higher capital and operating costs of any "D" series alternative will be passed on to the ultimate consumer in a competitive marketplace. This fundamentally undermines the energy deregulation policy incentives driving this project, and makes it far more difficult for our target utility customers to be able to compete as effectively as they otherwise would be able to do in a deregulated environment.

While it would be wonderful to rebuild the existing DM&E portion of the "D" series alternatives to heavy haul standards, it makes little sense to do so if they cannot be utilized for that purpose. As a practical matter, rather than increasing the amount of DM&E trackage that will be rebuilt (e.g., our Black Hills subdivision south of Rapid City), the "D" series alternatives would simply mean that none of the DM&E system would be rebuilt, thereby totally frustrating that purpose. Customers at best would continue to experience 10 mph service, frequent delays, derailments, etc.

In particular, the D-7 alternative would significantly undermine our ability to enhance competitive options to our existing customers. Because this route would require us to build along the existing BNSF corridor and enter the PRB from the north (well beyond the UP's reach), it would effectively eliminate the ability (or even the realistic threat thereof) of DM&E to interchange west-bound traffic with UP. This would leave BNSF as the only potential west-bound connection, and would greatly diminish our effectiveness for westbound market opportunities for existing DM&E customers.

For our target market area, we have a clear direction from our target customer base that the southern PRB is the predominant target market. The D-7 route (and those going through Crawford, NE) in particular is problematic in this regard. Rather than force this circuitry, it would make far more sense from a business standpoint to develop a different market which might be more interested in utilizing the northern PRB mines. As explained in detail in Appendix 1 to our original STB application, this concept was studied carefully and rejected. That is a different project altogether than the one proposed here. That is not a project we intend to build, and have not been able to identify a market which could support such a redefined market.

The "D" series alternatives could theoretically be built and operated -- much like tunneling under Rochester or Brookings is theoretically possible. But like the tunnel, none of the "D" alternatives are practical or reasonable. They defy common sense.

None of the "D" series alternatives can meet the purposes and needs of this project. We cannot place at risk the extraordinary capital requirements to build such an inefficient system, and even if its construction costs were somehow magically reduced so that it could be built for the same capital cost levels as Alternative B, it could not be efficiently or safely operated, in our view. Any of those alignments would produce a dramatically less efficient route, and a dramatically less forgiving track structure. None of the alternatives in the "D" series is reasonable or practical. This conclusion was not made in haste. We have looked long and hard for other reasonable alternatives. In particular, we have made repeated attempts to utilize our existing line south of Rapid City. The routes identified in Alternative "B" and "C" are the only ones known. There is considerable flexibility and innumerable variations within each of those alternatives, but the basic corridors available are "B" and "C". It would be a waste of resources to go through an artificial exercise of permitting the project contingent on using one of the "D" alignments. There is no "D" alignment that would be built in the real world. Common sense, service demands and market realities have long since discarded those alternatives.

ALTERNATIVE C

DM&E already has commented on Alternative C in its submission to the STB dated April 9, 1999. But it may be useful to restate that the characterization of that route as a "Proposed Action", modified or not, is inaccurate. It is not a route the applicant seeks. It is in fact one we have developed in response to legitimate concerns raised, and one that we are prepared to accept. But it is not the preferred route nor is it a route that the applicant is proposing. It is an alternative that is reasonable and allows us to meet the purpose and needs of the project. It comes at significant cost, but we have accepted it in the spirit in which we have committed to developing this project. We are not trying to duck the difficult issues. We are working conscientiously to resolve them. From a business standpoint, we have determined to accept considerable compromises to efficiency and profitability in an attempt to solve problems and move the process forward in a responsible manner.

Although the reference chosen in the Final Scope to this alternative as a "Modified Proposed Action" is insignificant from a procedural or substantive standpoint, we raise it because of a concern that perhaps in the push to develop alternatives there does not appear to be a conscious acknowledgement that Alternative C is in fact an additional alternative to the Proposed Action. The Final Scope leaves the impression that there are two actions sought by the applicant, and that an alternative is needed. To the extent others are left with that impression, the record should be very clear that Alternative B, the "Proposed Action" is the preferred route. Alternative C is a reasonable alternative that is acceptable in accomplishing the project goals, but not preferable. The D routes are unreasonable and it would be a waste of agency time, public resources, and needless anxiety to potentially affected parties to consider them for permit action by the federal government. Issuing a permit will not build them. We have not found a way to build them and make them work to accomplish the objectives of the project. We enthusiastically embrace suggestions on how to improve upon a reasonable alternative without jeopardizing the project viability. But it would be irresponsible for us to allow the review of patently unworkable alignments to be considered as alternatives when we know at the outset we have no desire or ability to build them in a rational business world.

EXISTING TRANSPORTATION CORRIDORS ANALYSIS

General Considerations

It is worth noting at the outset that those who advocate using existing transportation corridors as a means of minimizing environmental impacts overlook many very problematic issues associated with placing two busy transportation corridors side-by-side. Some of the practical safety and operational problems associated with this approach are raised here and explained in more detail in the Verified Statement of Mr. Otter, and in particular Exhibit A thereto. Also, human impact issues would be considerably exacerbated in utilizing the Highway 450 or BNSF corridor.

The concept of attempting to utilize existing transportation corridors apparently stems from public scoping meetings where this concept was advocated by project opponents. There is no professional or literature support we know of that accepts this notional suggestion as having any basis in fact. In fact, it appears to be quite the opposite unless there are existing or foreseeable existing transportation corridor problems that can be solved by substantial upgrading and investment far above and beyond any normal industry standard, or unless the new construction proposed runs through a relatively highly populated and developed (or otherwise especially sensitive) area. This "existing transportation corridor" concept continues to be advanced by project opponents based on a claim that it would minimize adverse impacts. Based on our experience, that is not an accurate claim or assumption. In essence, the "existing transportation corridors" effort is in reality a "not in my back yard" approach to this project. There has been no objective justification to support an assertion that paralleling an existing corridor through a more developed area has less adverse impact affecting the quality of the human environment than one remote from developed areas.

The primary argument for using existing transportation corridors rests in large part on an assumed generality that, from an environmental and public policy perspective, constructing a new rail line next to an existing transportation corridor would result in less overall negative impact than the DM&E proposed preferred route or other alternative route(s) wherever they do not parallel an existing corridor. That is not accurate for a variety of reasons, some of which are summarized below:

- i. Land Acquisition. As noted from personal experience, the notion that land impacts to landowners who already border an existing railroad will be less problematic than for landowners whose land is divided by a new railroad is not accurate. I have met with landowners along that portion of the BNSF that our Proposed Action (Alternative B) and Alternative C parallels. Their problems are significant. The fact is that railroads create problems for landowners regardless of where they are at. As noted in Mr. Westergren's Verified Statement (Attachment C) and as witnessed by me personally, professional appraisers often note greater landowner impacts and damages for landowners who have an additional railroad right of way added adjacent to an existing railroad. Impacts to land valuation and related damages does not appear to be materially different than impacts to land not adjacent to an existing right of way. Additionally, since some of these routes pass through developed areas there will be serious space restrictions at urban locations along the existing corridors where the space does not exist for a second railroad to pass through the city or town, as explained in more detail in Mr. Westergren's Verified Statement (Attachment C).
- ii. Customer Service and Safety. It is impossible to build on either side of an existing rail transportation corridor for the distances required in any of the "D" alternatives without bisecting existing rail customers from the existing mainline. Each would require criss-crossing another railroad's mainline multiple times, and clearly would interfere with efficient operations of both affected railroads. A significant purpose of the project is to improve the efficiency and safety of the national rail transportation network. Utilization of any of these corridors would

involve a series of at-grade crossings of two busy mainlines, an increase in the number of highway at-grade crossings, interference with other rail operations, and cutting off rail customers from their current rail service provider.

- iii. Interference. Railroad junctions would become far more complicated for construction, maintenance and operation if trains of high-density heavy-haul railroads were in close proximity to each other. The train delays associated with conflicting routes of movement would result in higher operating costs and blocked public crossings or the need to construct rail-highway grade separations and/or rail grade separations. These impacts are costly and have the potential for substantial adverse environmental impacts upon communities, as well as imposing substantial additional cost burdens upon both the railroad and the governmental units involved.
- iv. Operations. In the case of parallel railroads, there would be many places along the corridors where at-grade crossings of the railroad would have to be built, as described above. Historically, the railroads that are in place first receive two major advantages. First, they do not have to pay for either the construction or maintenance of the "joint facility" and can charge whatever rate they wish to the "new" railroad which, in this case, would be the DM&E. This arrangement would continue for the life of the railroads. Second, the "first" railroad also retains control of the facility and may prioritize its trains whenever conflicts occur. This would result in the DM&E being placed at a competitive disadvantage. A conservative estimate of the direct costs combined with these less objective indirect costs and productivity for any of the "D" alternate alignments' annual operating costs would increase by a minimum of 20 percent.
- v. Crossing Safety. A significant increase to grade crossing safety hazards has been shown to exist where public roadways cross multiple railroads (not just multiple tracks) in close proximity to each other. Traffic stopped for lowered gates and/or a passing train on one railroad may not clear the tracks of a parallel railroad, resulting in grade crossing accidents with serious consequences.

Additionally, at many locations, highway intersection traffic control signals are interconnected with the grade crossing warning systems to avoid the backup of highway vehicles over railroad tracks in locations where highways which parallel the railroad intersect with other highways. This method of reducing the risk of rail grade crossing accidents would be rendered unworkable with two parallel railroads, especially if those railroads each had two or more main tracks.

The Verified Statements of Messrs. Otter and Westergren discuss the problems associated with parallel corridors in more detail. The point here is very simply that paralleling an existing transportation corridor often creates far more problems for the human environment than it solves.

EXISTING TRANSPORTATION CORRIDORS ANALYSIS

Specific Analysis

I. Alternative(s) D1 through D7. The seven variations of Alternative D are depicted at Attachment 1. For various reasons, these are not compatible with heavy haul rail operations contemplated by this project. These alternatives, even if approved, would not be built.

In submitting this comment, we are mindful of the difference between practical "feasibility" and simple "desirability". The alignment referred to in the Modified Proposed Actions (MPA), or Alternative C, is not a desirable alternative from the railroad's standpoint compared to the original applicant's Preferred Route as identified in the STB Application (i.e., Alternative B). It is not an alignment of our choosing, but rather one that reasonably and responsibly responded to the issues

raised by the agencies and public through the scoping process. While Alternative C is not desirable from the applicant's perspective, we acknowledge that it is feasible. We can build a railroad on this alignment and still accomplish the fundamental purposes and needs of the project -- albeit not as profitably, with significant added capital costs. (See Verified Statement of Kurt Feaster, Attachment A). This is distinguished from all seven of the D series alternatives in that each of those goes far beyond the realm of simply being undesirable. They are impractical and unfeasible. This is not simply the applicant's summary conclusion. It is the unanimous and unequivocal opinion of every engineering and operations expert who has reviewed the issue to date, each of whom were keenly aware of DM&E's strongest preference and instructions to them (issued long before and totally unrelated to this issue resurfacing in the EIS process) to find a way to make our existing line work. We cannot meet the project's goals on any "D" alignment.

A fundamental problem with Alternatives D1, D2, D3, D4, D6 and D7 is the combination of grade and curvature associated with each, resulting in extraordinary operating constraints and rendering each of those routes ineffective to achieve the goals of the project. One of the fundamental problems with Alternatives D1, D2 and D7 is circuitry, with its concomitant adverse impact on service improvements, market penetration, operating costs, and capital costs. Each of these six routes would deliver an alignment that could not effectively deliver low cost coal to allow this project to capitalize on the cost-driven energy deregulation policy initiatives throughout the country. Also, they would not result in the significant utility plant conversions (or the degree of "blend creep") from high-sulphur to low-sulphur coal sought to be achieved by this project. Both the Clean Air Act objectives and the energy industry deregulation goals are important purposes and needs of this project. If it is not able to achieve these to a significant degree, the project itself is jeopardized.

The fundamental problem with Alternative D5 is that it would defeat the goal of rebuilding much of our railroad. Rather than revitalizing the western half of DM&E's existing system, Alternative D5 would create a far greater likelihood of abandonment of the western half of our current system than exists even today.

These individual alternatives will be discussed in more detail in the individual sections below. As demonstrated in the collective works and Verified Statements of various rail operations experts attached to these comments, none of the D Alternatives are reasonable alternatives to meet the needs or achieve the purposes of this project. These alternatives are not feasible to finance or construct. As a practical matter, approval of any of the alignments analyzed in any of the D-series alternatives would be to DM&E the same as Alternative A, the "no build" option.

A. Alternatives D1, D2, D3, D4, D6, and D7. Utilization of Alternates D1, D2, D3, D4, D6, or D7 for the type of heavy haul operation necessary to accomplish the purposes of this project render alignments that literally pull trains apart or tear up the tracks, as illustrated by the CANAC modeling (See Verified Statement of Mr. Otter, Attachment B). Significant other problems include added circuitry and higher capital costs, as explained in the verified statements of Gary Westergren (Attachment C) and David Levy (Attachment D). It is best to address problematic segment characteristics of this alternative series individually:

i. Existing DM&E Line South and East of Rapid City (D1, D2, D3, D6, and D7). Looking at a railroad map, the existing DM&E line east and south of Rapid City "jumps out" at you. It appears as a logical alternative to the proposed route running north-easterly across South Dakota. The proposed route in some places runs near the Cheyenne River and other drainages, particularly in the Proposed Action (and to a significantly lesser degree in the Modified Proposed Action).

The initial reaction of virtually everyone who has looked at the rail map -- including us -- is that we would use our existing line to the east and south of Rapid City in building to the Powder River Basin (PRB). So why is this crazy railroad cutting out across new territory when it already has a route that gets from the same point A (Wall, SD) to the same point B (Smithwick, SD)? That is the first logical question from everyone studying the maps.

The answer to this very logical question is simple. In a nutshell, it is geography. The Black Hills are in the way. By definition, rail alignments in mountainous or particularly hilly terrain involve significant grades and curves. For the kind of heavy haul operation required to meet the driving the need behind this project, a modern heavy haul railroad will not work on this particular 100-year-old alignment. The grades are too steep. The curves are too sharp. The product(s) is too heavy.

The first opportunity to get out of the Black Hills is the Cheyenne River drainage, which itself found the closest route around those Hills many thousands of years ago. In this regard, heavy haul railroads are not unlike the forces of nature, also seeking out the most efficient route. It is the same reason the Union Pacific parallels the Platte river as it comes out of Wyoming and through Nebraska -- and why railroads throughout the United States and the world parallel river drainages. This is not unique to the DM&E.

The problems associated with the existing DM&E are not unique to modern railroading either. The grade and curvature problems on the DM&E south and east of Rapid city as it runs through the Black Hills helps explain why all the other railroads that used to flourish in the Black Hills one hundred years ago are gone today. Throughout the Black Hills (and other mountainous areas of the United States) there are dozens of old rail beds that used to support passenger and light freight operations of 10- and 20-car trains before the advent of trucks. As railroads have modernized and their traffic base has concentrated on the high volume, heavy commodities not conducive to efficient truck operations, these lines have dried up. Mountain grades simply will not support modern railroad operations.

The problems associated with the existing DM&E line segments within the Black Hills result not only from the fact that the existing alignment was built for a completely different purpose in a different era. The geographic complexity of this alignment for this project is further exacerbated by the fact the there are numerous west-east flowing drainages (e.g., Lame Johnny creek, Battle creek, Beaver creek, Cheyenne River, Billover creek, Dry creek, French Creek, Horsehead creek, Sand creek, and Spring creek) running perpendicular to the north-south segment of the railroad south of Rapid City. Between each of these low-lying drainage valleys there are significant crest ranges created from the surrounding Black Hills, each with its own extensive series of undulating hills in-between. These serve as localized drainage divides made up of very rough terrain. Additionally, the northern end of the existing DM&E line between Rapid City and Smithwick, SD is roughly 700 feet higher above sea level at Rapid City than the southern end of this line segment. Then again from Smithwick, SD to Chadron, NE, the elevation climbs in the opposite direction. The elevation change between Smithwick and Rapid City is particularly significant to the proposed project because today the operations from our existing railroad result in south-bound loads, with empties returning north-bound. While they still have to face the very significant grade and curvature problems, they are predominantly descending loads today (which themselves are limited to the lighter cars (263,000 lb) and shorter trains (50-car) (see Verified Statement of Mr. Colbert, Attachment E). The future coal traffic which would move over this line as proposed by this project is the exact opposite. Loads will move in the north-bound (or predominantly ascending) direction, while the empties would return in the south-bound (or predominantly descending) direction.

Attachment 2 is the actual track chart for this stretch of railroad (reference to mileposts numbering between M.P. 0.0 and 100.0 indicate existing DM&E track south of Rapid City, with M.P. 0.0 being Dakota Junction, NE and M.P. 99.15 being Rapid City, SD; reference to mileposts numbering between M.P. 590.0 and 650.0 indicate existing DM&E track east of Rapid City, with M.P. 591.0 being Wall, SD and M.P. 649.2 being Rapid City). All these negative attributes interact with each other to magnify their stand-alone impact. For example, the grade and curves often occur simultaneously on the same segment of track. The interaction between these two problematic features combines to create problems greater than the sum of their individual contributions to rail operating deficiencies (see verified statement of Mr. Otter, Attachment B). Further, the curves are often grouped close together as the track snakes around and up and down the Black Hills, producing reverse angles and reverse grades where the train is literally going up and down and right and left at the same time. In a 1- to 1.5-mile train, some cars are going uphill, some cars are going downhill, some cars are going uphill, curving to the east and some cars are going downhill curving to the east, and some cars are going uphill curving to the west and some are going downhill curving to the west. All these forces are interacting simultaneously, creating very significant forces within the train itself that are very detrimental to the track, the equipment, to safety, and to efficient operations. With modern computer simulation these forces can be documented, as they have been in this case by two independent rail operations experts: ALK Associates of Princeton, N.J. and CANAC Inc., of Montreal, Canada. Both came to the same conclusion. This track segment cannot rationally be utilized for the kind of heavy haul operations envisioned by this project in any economical manner. The results of this computer modelling are discussed in more detail in the Verified Statement of Mr. Otter (Attachment B). The features creating these countervailing forces within this segment of railroad are summarized in Exhibit B of the Verified Statement of Gary Westergren (Attachment C), which is summarized below:

CURVATURE PROBLEMS

Curves between 1 and <2 degrees = 20

Curves between 2 and <3 degrees = 61

Curves between 3 and <4 degrees = 21

Curves 4 degrees or greater = 15

Total number of curves violating project specifications = 117

Reverse curves (two curves in opposite directions within a single train length) = 19

Complex reverse curves (more than two curves in opposite directions within a single train length) = 8

Total number of reverse curves exceeding specifications = 27

GRADE PROBLEMS

Compensated grades between 1% and 1.2% = 16

Compensated grades between 1.2% and 1.4% = 10

Compensated grades in excess of 1.4% = 18

Total compensated grades exceeding 1% = 44

PROJECT STANDARDS

This all adds up to a very difficult piece of railroad -- even for today's relatively minor light-haul operations with predominantly downhill grades. It also helps explain the purpose and application of the project's technical standards (e.g., 1 percent grade; 1 degree curvature). The technical background of these standards are discussed in detail in the verified statements of Messrs. Levy, Giegear, Westergren, and Otter). Some background about how these standards relate to project policy decisions may be helpful as well.

As has been explained to me by the technical experts involved in establishing the project standards employed in this case, the project standards are considered aggressive (especially the 1% grade) for a modern heavy haul railroad. A 0.6% grade was the most frequently suggested criteria, but because of the terrain involved and other practical considerations, the more aggressive 1% was used. But even at that, these "standards" are not "maximums". There is not an absolute rule that no grade can exceed 1 percent, or that no curve can exceed 1 degree. These are benchmark. If there are reasonable benefits to be derived or negative impacts to be avoided by making exceptions to these standards in certain cases, that has been and will continue to be done so long as it does not jeopardize the overall project or become so unreasonably prevalent that the project ultimately fails.

By the same token, it should be emphasized that a 1% grade is a considerable obstacle. Even a 1% grade could make the project unfeasible if it is prevalent enough. For example, if there was no grade on the entire route that exceeded 1%, but that the grade was in fact 1% against the loads for the entire distance to market, this project would not be feasible. Alternatively, if in fact it even exceeds 1% in isolated cases that are not terribly lengthy or complicated with curves, that can be accommodated. In fact there are places throughout this project where the grade exceeds 1% or the curve exceeds 1 degree.

In essence, the standards analysis is a reasonableness test. This is an issue that is reviewed on a case-by-case basis, requiring reasonable judgments. In some cases they are close calls. In some they are not. In the case of the Rapid City alignment or the Highway 450 alignment, they are not close calls. We have analyzed hundreds of variations in determining the route selected. We have considered every alternative suggestion I know of. Many accommodations were made for individual ranchers, agencies, and the commenting public. The D series alternatives includes all of those that we know of that have been suggested by someone, but rejected as being unreasonable and incompatible with the goals of this project.

Where we have allowed project standards to be exceeded, that has been done for the same policy reasons as discussed above. In essence, establishing project standards really means that design accommodations in excess of those standards simply requires a conscious decision at a higher level. The issue is analyzed and decisions are made based on the available information. In the case of the Rapid City alignment, it was scrutinized repeatedly and intensely with a strong internal desire to make it work. It does not, in significant part because of the pervasive grade and curvature problems

summarized above. The Highway 450 alignment also has been carefully reviewed, as has the Donkey Creek northern access via the BNSF. For the reasons detailed at great length in the attached verified statements, they do not pass the threshold test of reasonableness.

Illustrative of the problems with the Rapid City alignment is our current operating limitations on that track segment. As noted in the Verified Statement of Vernon Colbert (Attachment E), DM&E's Chief Transportation Officer, DM&E cannot move a light and relatively short 100-car, 263,000-pound-car grain train on that alignment today. We currently market to western destinations (e.g., Pacific Northwest) a very small number of 100-car grain trains from the middle of South Dakota. Those trains must be moved in 50-car blocks over this segment of railroad. These cars are far lighter than coal cars. What is very difficult on an extremely light density line moving very short trains with light loads becomes impractical for a heavy haul operation.

The purpose and needs of this project are fundamentally different than the purpose and needs of the original line built 100 years ago. We are not trying to move people and light general merchandise into the heart of the Black Hills to support a booming gold mining population as was the case 100 years ago. An important purpose of this project (especially in this section of the project) is to develop a heavy haul railroad that will support modern coal moving operations, effectively providing improved service for existing shippers and to help new shippers switch from the higher sulphur coal of the east to the more environmentally friendly coal of the west. For this to occur in any meaningful way, we have to provide more efficiencies than are available today. As explained in the Verified Statement of John Waltman (Attachment F), a significant amount of our market projections rely on converting high sulphur utilities into low sulphur burners because of the efficiencies we can bring to them.

The problematic issues discussed herein and in the attached verified statements do not "jump out" at you as does the line on a two-dimensional map. In fact, DM&E's acquisition of that line in 1996 generated a significant number of unsolicited calls from the utility industry and others who, looking at the same map, assumed it logical that DM&E should utilize this recent acquisition as a means to achieve the much sought after third PRB carrier. Our initial expectation in the early stages of project development was to utilize that line (either to the north or south of Rapid City) to aid in the penetration of the PRB. When I was first informed that was not feasible, I engaged another engineer for a second opinion. After the second engineering review produced the same conclusion, I persisted in engaging other engineers and operations experts in an attempt to find a workable utilization of the existing line based on a recognition that would simplify the application process. But as detailed in the Verified Statements of Mr. Levy, Mr. Westergren, Mr. Otter, Mr. Gigear (Attachment G), and others, the third and fourth and fifth review and all subsequent reviews of utilizing that alignment produced a consistent finding of non-feasibility. Fundamentally, the reason this line does not work is called the Black Hills. As detailed in the Verified Statement of William Otter (Attachment B), attempting heavy haul rail operations through the mountainous Black Hills pulls trains apart and/or pulls the track apart.

Theoretically, this alignment could be rendered operational on a limited basis through use of excessive "helper" units running for great distances and other modifications, but the physical plant and subsequent operational problems would make this a non-viable alternative to effectively access the target market. The Verified Statement of Mr. Feaster illustrates the cost implications of utilizing this 200-mile stretch of the existing DM&E, rendering the project unfeasible from a financing point of view (Attachment A). The Verified Statement of Mr. Waltman explains why this alignment would render the project ineffectual in penetrating the target markets to meet the objectives of the Clean Air Act (CAA), particularly as it relates to circuitry and service problems. Without a more efficient route

than is available today, the additional conversion from high sulphur to low sulphur coal is not likely. That is an important need arising from the CAA that this project is intended to fulfill. That cannot be done on this track segment, regardless of the alignment option with which it is associated.

From a personal and project standpoint, it would have been far easier to develop this alignment than have to acquire new right-of-way on the preferred route or Alternative C. The first time our Chief Engineer told me operating the project on this segment of railroad was not feasible, my reaction was similar to that of many others reading that map. It seemed difficult to accept. As a consequence, I sought out additional opinions as project development progressed, with a reasonably stubborn predisposition to make it work. The ultimate decision to place the alignment where it is was not made lightly, and was not made without careful review of the full range of alternatives. It would have been far easier to build this project on our existing right of way. It is not realistically in the cards. The number of attempts and the caliber of talent directed at accomplishing this goal over the past two years have convinced me that we have exhausted the issue fully.

ii. Highway 450 (D3 & D4). The problem with the Highway 450 alignment is simpler than the existing DM&E alignment, but no less implausible to overcome in a practical world. It can be summarized in a single word: "grade". Excessive grades alone (without complications of curvature, reverse curves, etc.) make this a non-viable alternative without regard for whether or not the existing DM&E alignment south of Rapid City is utilized. Without significant elaboration here, the verified Statements of Mr. Westergren (Attachment C) and Mr. Otter (Attachment B), make clear that the Highway 450 corridor is an unrealistic track segment for utilization with any heavy haul rail alternative.

More recently, the question has been raised as to the feasibility of generally following Highway 450, but meandering away from it. DM&E has not developed such a concept because of the problems referenced above in the discussion associated with its non-feasible right of way south and east of Rapid City. A line which "meanders" near the Highway 450 corridor would involve numerous crossings of Highway 450, multiple excessive and reverse curves, and would not render an alignment any more feasible than that which would parallel Highway 450. We have looked at developing such a concept, but have been unable to identify any feasible alignment within the area to quantify what is obvious from the most casual observation of the general terrain: no reasonable alignment exists, and we have been unable to identify any that could rationally be expected to meet the purpose and needs of this project.

B. Alternative D7. Alternative D7 has all the problematic features of the other Rapid City alignments, but is unfeasible for additional reasons beyond grade and curvature. With or without utilization of the Rapid City line, this alternative undermines project purposes in different ways relative to the other D alternatives.

- i. **Lost Connection/Competition.** An important purpose of this project is to increase competitive market alternatives for existing DM&E customers. One of the most important markets in this respect is our westbound connection, as discussed extensively in our original application. The D7 alternative would eliminate this opportunity on a competitive basis. It goes so far north as to effectively require that our staging facility on the west end must be paced to the far north, thus eliminating any interchange potential with the UP. This leaves only the BNSF as a potential westbound connection for our existing DM&E customers. BNSF already has a competing connection to the west on a single haul. This route would seriously undermine that purpose.

- ii. Unique BNSF Corridor problems. Even if this alignment could reasonably be built, it would serve no material purpose nor provide any material benefit to build it near an existing transportation corridor. There seems to be a theory, albeit and untested one, that building a railroad next to an existing rail corridor would automatically be environmentally superior to building it elsewhere. This is not necessarily true, and we believe in this part of the world would be a material operational, safety, and environmental detriment. There are no material improvements that can be made to the existing corridor. In fact, many new and more pronounced problems resulting from building next to an existing rail corridor would be created (e.g., customer service, highway traffic clearance restrictions, increased homeowner impacts, existing highway grade separation and other engineering design problems, etc.) (see Verified Statement of Mr. Westergren).
- iii. Circuity. The Edgemont-west portion of this route alone would add 152 miles to every round trip between the mines and the east end of our system. That is a fundamental and insurmountable obstacle relative to a significant portion of this project's target market, and is inherently incompatible with the purpose and needs of the project. The Alternative D7 route also would add an additional 76 miles of rail construction.

This route in particular would significantly increase annual fuel consumption, making it far more difficult to penetrate target markets effectively on a competitive basis (see Verified Statement of Messrs. Otter and Waltman). The service efficiencies (e.g., cycle times) would be lost. Id. In many markets, this additional distance would make this new route longer than existing service alternatives (e.g., Chicago market), compared to the relative distance advantage of the preferred and alternative shorter routes proposed for the project's target market. It also greatly increases capital costs. A key purpose of the project is to provide enhanced competition and to encourage target market area utilities to burn cleaner, low sulphur coal from the Powder River Basin. Any of the "D" series routes would undermine competition generally, and clearly restrict its ability to switch many customers to the lower sulphur coal.

- iv. Capital costs. The additional 76 miles of new construction Alternative D-7 adds to this limited portion of the route results base capital cost of over \$125 million in mileage related costs alone. See Westergren Verified Statement, Attachment C. In addition to this mileage-based capital cost increase, we have identified numerous route-specific structures and related capital cost issues that would have to be added because of the problematic nature of being required to parallel the BNSF, at a cost of over \$35 million. Id. Alternative D-7 also would require 7 more sidings, totaling approximately 25 miles of additional siding construction. This would add over \$20 million more to the capital costs. These are discussed in greater detail of the Verified Statement of Mr. Westergren (Attachment C), and summarized in Exhibit D to that statement. The additional identified capital costs of only that portion of D7 located west of Edgemont add a minimum of \$180 million to the capital cost solely for that portion of the line west of Edgemont. This cost does not include additional land costs, mitigation costs, and other contingencies which easily makes the Wyoming portion of D7 by itself to add over \$200 million-plus additional capital cost to this project over and above the Wyoming portion of Alternative C. It must be emphasized that this is a cursory review, and the cost delta is expected to increase significantly. In addition to these capital costs problems, tens of millions in annual operating costs would result from this alignment.
- v. Operating Costs. This alignment would increase dramatically project operating costs, as explained in the Verified Statements of Bill Otter (Attachment B) and Kurt Feaster

(Attachment A). Operating costs would increase by almost \$0.5 million per mile. Multiplied out by the 76 miles of additional circuitry this Alternative would bring to the project, that comes to tens of millions of dollars regardless of whether one limits the analysis to the Wyoming segment or includes the South Dakota circuitry associated with D7.

- vi. Service delays. This realignment would add 12.5 hours onto the cycle time compared to Alternative C. Perhaps more importantly from an operating standpoint, it completely eviscerates the advantages enjoyed by the placement of a yard that has three independent approaches to the target mines (as is the case with Alternatives B and C). With the yard placement requirements associated with D7 (i.e., the "Donkey Creek approach" from the north), a single operating problem on any portion of the line between the yard and the mines will bring to a halt operations for all mines beyond the problem point. Conversely, the "B" and "C" alternatives will allow DM&E the flexibility to continue serving 2/3 of the target mines regardless of where a rail- or mine-related operational problem arises.
- v. Market penetration. This alignment would eviscerate our market opportunities (see Verified Statement of John Waltman, Attachment F) for all the reasons mentioned above. Additionally, it would make be contrary to the Clean Air Act goals of this project.
- vi. Alternative project vs. Alternative route. Rather than utilizing the D7 alternative route, it would make more sense to attempt a different project altogether, whereby one would attempt to serve a different market based on a more efficient "northern corridor" alignment for this area. This concept was investigated at length and rejected two years ago, as discussed in my Verified Statement to our original STB application (which by reference we incorporate such application into these comments in its entirety).
- vii. Fundamental plant redesign. Injecting this new alignment as an alternative would require relocating not only all the siding placements, but would also require that major facilities be relocated and reconfigured. See Verified Statement of Mr. Otter (Attachment B).

A significant problem with all the circuitous D alternatives is the added construction costs and accompanying operating inefficiencies and costs. From an environmental standpoint, fuel consumption would increase, there would be far less opportunity to effectively meet the project purpose as it relates to the CAA, and more land and landowners would be impacted than necessary. Alternative D7 renders an alignment that is not sufficiently competitive to achieve the purpose and needs of this project, independent of the problems associated with the existing DM&E portion of this route.

The Verified Statement of Mr. Waltman (Attachment F) explains why any effort to build Alternative D7 would be futile for the target market of this project. The DM&E project market as envisioned in this Application is focused on the southern PRB coal. The D7 Alternative approaches the PRB from the north. If this alignment were used, we would have to revisit the market in an effort to determine whether or not it was feasible to move the northern PRB coal as a primary product -- an approach that was tested and rejected two years ago. Even if it is feasible today, that would result in an entirely different project, as was explained in the original DM&E application (see DM&E STB Application, Appendix 1, Verified Statement of Kevin V. Schieffer, February 20, 1998). If it was determined to build that project to serve that market, the original Northern Corridor (north from Gillette, through the Little Missouri River and connecting with our line north of Belle Fourche, SD) initially analyzed would be a more logical routing alignment. Id. For the target market we wish to serve with the current

proposed project, the northern PRB coal mines are not in significant demand today (see Verified Statement of Mr. Waltman, Attachment F). In short, for the market to be served by this project, they are interested in more efficient access to the southern PRB coal. Without that efficient access, this project will fail before it starts. The added inefficiency resulting from D7 makes it impractical to build from a financial point of view. See Verified Statements of Mr. Feaster (Attachment A) and Mr. Waltman (Attachment F). The underlying reasons behind this inefficiency in the greatly increased capital costs and the permanent additional operational costs that will result from this alignment.

There are no significant additional non-coal customers that would be served by this Alternative. As detailed below, there are various existing BNSF non-coal customers who actually would either lose BNSF service altogether or suffer a substantial degradation in service (as would DM&E customers whose shipments would also be delayed by the operational interference this Alternative would unnecessarily create with the BNSF) as a result of this Alternative (see Verified Statement of Mr. Otter (Attachment B)). Grade crossing and rail operations safety would be seriously compromised as well. Id. The impact on many other rail operating and environmental issues would be negative, as well, as discussed in more detail below. Also, see generally, Id.

C. Alternative D5. This corridor served the former Milwaukee Road, which is today owned by the state of South Dakota. It was listed in the original application as an alternative route for consideration (although since that time utilization of that corridor has been extended further east). Alternative D5 would involve approximately 40 to 50 miles of new construction not previously considered. This involves numerous farm operations and federal property and tribal trust lands between Draper, SD and Alto, SD (which is approximately 12 miles east of Pierre, SD).

The development of this alignment would be as an alternative to building on our existing DM&E line between Wall, SD and 15 miles east of Pierre, SD. That segment of track likely cannot provide a self sustaining operation in the long term. This alternative would also traverse the Badlands National Park, coming within a mile of a Class I airshed.

Alternative D5 is one that may work from a technical standpoint, but as it relates to that portion of the route east of the Cheyenne River, and only if we are willing to sacrifice service to our existing customers there and to do significant economic and social harm to existing DM&E communities to whom we are trying to target project benefits. Importantly, these communities and shippers have voiced strong concern about D5, and strongly support keeping the railroad in their communities.

Also of extreme importance to us is the fact that DM&E owes its very existence to many of these communities -- notably Midland, Philip and Wall, South Dakota. They fought hard to save this line 15 years ago when the Chicago & NorthWestern attempted to abandon it. It was in large part through their efforts and urging that this railroad was saved and today has the opportunity to revitalize itself into a major railroad. Having had 15 years of personal experience working with these communities and customers who banded together to help create us, it would be a tragic irony if the opportunity they made possible was the cause of their demise today. This Alternative was considered and rejected for policy reasons, and is incompatible with the goals of this project as it relates to existing customers and communities, and rebuilding our existing line where reasonably possible to do so.

BAD RIVER IMPROVEMENTS

Various landowners bordering our right of way between Ft. Pierre, SD and Wall, SD have contacted us to propose a land swap or other arrangements that would result in moving the alignment further

away from the Bad River in some areas. We have held meetings with the landowners and others, and have conducted site visits. Our preliminary analysis indicates that this suggestion may work in certain areas, and could further minimize Bad River crossings. It is premature to determine whether any such alignment changes will in fact be proposed. We expect to be able to respond to those proposals within the next 30 days. None of the proposed changes will be pursued unless there is significant consensus from the landowners, DM&E and the relevant agencies that such changes would be an overall improvement.

MANKATO ALTERNATIVES

The M3 alignment, which goes through the city, was proposed as one of three possible routes to connect a break in the DM&E mainline near Mankato. The preferred route set forth in the application proposed an alignment which ran south of the city (M2). One alternative to the preferred route was the UP corridor through town. A second alternative (which has since been discarded as unreasonable) proposed a route which ran north of town (M4). DM&E currently operates through Mankato via trackage rights over the UP mainline. Generally speaking, DM&E's traffic flow is east-west. UP's traffic flow in the region, generally speaking, is north-south. Both share a common single mainline through Mankato for approximately 10 miles. DM&E's application seeks authority to construct and operate a rail line to connect its mainline which today stops short of Mankato on either side of city limits. A single mainline is not reasonable for conflicting (east-west vs. north-south) traffic over that long of a distance. UP currently moves an estimated 7 to 10 trains per day on that alignment. But that traffic number is increasing significantly. Major track upgrade work being conducted both to the north and south of Mankato makes apparent that the UP traffic level will increase significantly in the future. DM&E currently moves approximately 2 to 3 trains per day over this same mainline, and already experiences major operational difficulties. With the additional traffic contemplated by this project, it would be unfeasible to meet the project's purpose and needs with the current infrastructure configuration, and would raise significant safety concerns.

Based on more detailed analysis and engineering conducted since the original application was submitted, we have concluded that restoring a former double track mainline where one previously existed could actually improve existing conditions -- which are problematic. This alignment is set forth in detail in Attachment 3 to this comment letter, and is submitted as a proposed action in lieu of M2 subject to the legal ability of the STB to grant such a request. While M2 is a reasonable alternative that would be acceptable (probably preferable) to DM&E, we have concluded that M3 is more responsive to the issues raised throughout the scoping process, and that they can be effectively addressed in this corridor. There are legal issues associated with this corridor that still need further research, but in the event the STB has the legal authority to grant a permit to construct on this alignment and that there are no other legal obstacles which prevent that construction, Applicant suggest redesignating Alternative M3 as the Proposed Action in Mankato, and suggests that M2 be redesignated as an alternative. M4 has proven to be non-viable from a construction and environmental standpoint, we believe is amply supported by the public scoping record, and as such applicant recommends that it be eliminated from further consideration.

A particularly significant feature of the UP corridor through Mankato is the fact that until several years ago it was operated with a double mainline railroad throughout the entire corridor length. Much of the second mainline remains utilized as a storage siding. In other sections, where the rail infrastructure was removed, the sub-grade remains in tact. There are no material interferences to restoring the second mainline. The corridor design which has emerged from local discussions provides a viable opportunity to close several existing at-grade crossings, construct one grade

separation for highway traffic, and another grade separation of DM&E and UP mainline rail traffic. It would provide significantly safer pedestrian access along (e.g., fencing, pedestrian walkways, public bridge crossings for pedestrians and bikes), pedestrian underpass to replace at-grade bike path crossings of streets and railroads. There would be no local industry which could not be effectively served by UP. In short, at least from an environmental standpoint, it is emerging in a manner that would significantly improve the existing rail corridor in many respects.

From an engineering and operating standpoint, the route through the city would involve slightly less distance. The overall cost is significant on either alignment, with the through-city route estimated to be slightly higher than the southern route. From an engineering and operational standpoint, however, based on the best information available today, it is a reasonably close call, with enough margin of error so that it is difficult to preference one route over the other from either an engineering or operations standpoint. It would be difficult to argue at this point that the designated "preferred" route indicated in the original application is superior to the existing corridor through Mankato, as now designed.

OWATONNA ALTERNATIVES

A procedural alternative to the proposed construction of the I&M Connection at Owatonna has been identified following an inquiry from the city of Owatonna. This would involve eliminating the rail "diamond" and replacing it with a "Y" connection, in a manner that would eliminate any material construction outside the existing rail right of way while still effectively accomplishing the purpose and needs of the project. This additional Owatonna alternative which may warrant consideration by the STB involves the utilization of the existing connection with the I&M at Owatonna, which we would suggest adding as Alternative O4. This alternative raises legal and procedural issues in that the line which intersects with the I&MRL is owned by the UP (although the UP does not and cannot operate on that segment). This unusual arrangement stems from the original acquisition of the DM&E from the C&NW in 1986. I&M was then part of the Soo line, and the C&NW retained ownership of this 3 mile "island" so as to prevent interchange with the Soo line. UP inherited that agreement as a result of its acquisition of the DM&E. This is a legal issue rather than an engineering concern. From DM&E's point of view, building the small connection proposed in the application or some variation thereof is sufficient. But we have agreed to work with the city in an attempt to reach a reasonable arrangement with UP or cooperate in a procedural effort to obviate the need for additional construction that is not necessary from an engineering standpoint. It clearly is reasonable from an engineering and operating standpoint, and we believe would be less objectionable to the City than either O2 or O3. Accordingly, we would suggest the addition of this "procedural alternative" for consideration as Alternative O4 in Owatonna.

We understand that the City of Owatonna also will submit a by-pass proposal, which we will address separately in our comment on that issue (due July 10, 1999).

CONCLUSION

A comprehensive analysis of existing transportation corridors (including most of the D series alternatives) was conducted long before it was required as part of the EIS process. It was the applicant's initial expectation and ongoing desire to develop the existing DM&E line south and east of Rapid City. That is not feasible, despite our repeated efforts to develop something that worked. The northern approach to the mines (Alternative D7) is not feasible independent of the track profile problems on the existing DM&E south of Rapid City. Serious examination of any of the D series

alternate routes demonstrates they are patently unreasonable to achieve the purpose and needs of the project.

The M2 alignment in Mankato is the alignment upon which we are now basing our operational planning, due primarily to our understanding that it would be a significantly superior alignment from an environmental standpoint than the original M1 "preferred" alternative (south bypass). The northern bypass alternative previously submitted for consideration in the Mankato area (M4) has proven to be non-viable based upon further engineering and public input.

In Owatonna, there exists another Alternative that would avoid altogether the need for additional construction, but requires further legal research to determine whether it is within the STB's authority to consider.

We hope these comments are helpful in your consideration of the alternatives issue. Should you have any questions concerning the above, do not hesitate to contact us.

Sincerely,

Kevin V. Schieffer
President and Chief Executive Officer

KVS:jeh

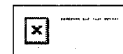
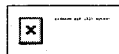
cc: U.S. Forest Service
U.S. Army Corps of Engineers
Bureau of Land Management

VERIFICATION

I, KEVIN V. SCHIEFFER, verify under penalty of perjury under the laws of the United States that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this Verified Statement. Executed on , 1999.

Kevin V. Schieffer

(seal) _____
Notary Public
My Commission Expires:



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Bryce Hoppie Geological Consulting
Applied Environmental Geology and Hydrogeology

December 5, 2000

Ms. Emily F. Anderson
Farrish Johnson Law Offices, P.L.L.P.
Union Square Business Center #107
201 North Broad Street
Mankato, Minnesota 56002

Subject: Geological and Related Aspects of the Proposed DM&E Expansion Through
Blue Earth County, Minnesota

Dear Emily,

I would like to thank you for drawing my attention to the Draft Environmental Impact Statement (DEIS) and latest maps regarding the expansion of the DM&E Railroad through Blue Earth County, Minnesota along proposed roadways M1-3.

This transmittal is intended to provide you with an overview of the geological and hydrogeological concerns I noted regarding DM&E proposed railway expansion for the portions of the M1-3 routes through western Mankato, Le Hillier and Skyline. I have not addressed any potential concerns regarding these routes through eastern Mankato, Mankato Township, or Blue Earth County. This overview is preliminary-- to date, my work includes reviewing pertinent components of the project's DEIS, analyzing maps of the routes through the greater Mankato area, and the available geographic and geological data for the area. I also briefly visited selected field sites along the proposed routes on November 27 and 29, 2000.

Although generated quickly, each concern outlined in this report is well justified. My interpretations are based on my basic training in Geological Engineering from the South Dakota School of Mines and Technology, five years experience as a practicing geological engineer, four years experience measuring physical properties and strengths of earthen materials during my graduate studies at the University of California, Santa Cruz, and three years studying local bedrock and glacial geology related to my research and teaching at Minnesota State University, Mankato. Consequently, I feel well qualified to comment on the geological viability of the proposed routes through the greater Mankato area.

The negative impacts I note in *Exhibit A* are comprehensive, but should not be taken as positions for or against the proposed expansion. The list contains, to the best of my ability, objective observations of the possible impacts the railroad expansion on the geological environment and vice-versa. Proposed routes M1 and M3 are treated equally. Comments regarding route M2 are referred to by its common name "southern bypass".

Exhibit B lists methods of further study or means of mitigating the impact of the railroad expansion on local geologic and hydrogeological features.

Exhibit C lists areas of additional concern to the Earth systems neighboring the existing railroad corridor through Mankato (routes M1 and M3) or the southern bypass (M2) and greater Minnesota. As an instructor of Earth Science, I am qualified to note the potential of concern for each

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Geological Aspects of the Proposed DM&E Railway Expansion

item in Exhibit C; however, I have no expertise in these areas and each concern should be addressed by more qualified scientists. A partial list of individuals qualified to comment on these concerns is included in *Exhibit C*.

In summary, my preliminary results indicate that expansion along the existing railroad corridor west of downtown Mankato (M1 and M3) or along the western end of the southern bypass (M2) have substantial negative impacts on the local environment. I believe the extent of the negative impacts I have identified herein may be as great as any found along the entire line of the expanded DM&E railway. The area around Mankato contains unique combinations of recent, glacial, and Paleozoic earth materials, large dynamic meandering rivers, and moderate relief developed upon poorly consolidated materials. Consequently, modifications to the route or extensive preventative engineering structures appear required to safeguard existing soils and water resources, terrain, and personal and public property. An expanded geological and hydrogeological investigation of these impacts appears warranted. Simply defining the goals and outcomes of that study and assembling the team of engineers and scientists would likely require at least one to two weeks; I cannot estimate the overall duration or cost of a thorough geological/geotechnical study at this time.

If you have any questions regarding the information contained herein, please feel free to contact me at the address listed below. If required, I look forward to providing your firm with a thorough study of the impact of the DM&E expansion through north-central Blue Earth County.

Sincerely,

Bryce Hoppie, Ph.D., P.G. (Minnesota AELSLAGID License No. 1342)

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Exhibit A

**GEOLOGIC CONCERNS REGARDING THE PROPOSED
DM&E ROUTE THROUGH MANKATO**

All observations included in this exhibit are based on the following data:

- A. Railroad route maps provided by Emily Anderson of Farrish Johnson, Inc.,
- B. Aerial photographs available at Minnesota State University, Mankato,
- C. U. S. G. S. topographic quadrangle maps,
- D. Various geological maps by the Minnesota Geological Survey, Minnesota State University Water Resources Center, and Minnesota Department of Natural Resources, and
- E. General field observations of local geology made on numerous dates since September 1996, as well as field studies between June 10 and 15, and November 27 and 29, 2000 made specifically regarding items mentioned below.

Items listed below apply to the existing roadway (M1) and proposed expansion (M3) through Mankato. They are listed from west to east along the route. The location of all sites is shown on Figure 1, a reference map of the area west of Mankato. At this time, I have insufficient information to assess their relative significance.

1. In the area immediately west and north of Minneopa State Park, the existing railway obliquely crosses substrates with differing compositional, textural, and hydrogeological attributes (see Figure 2). It rises from the modern Minnesota River floodplain to the edge of a Quaternary stream terrace. This section of the route has two principal geologic concerns. First, it passes from muddy, loosely consolidated sediments to unconsolidated sand and gravel on the approach to the stream terrace to moderately consolidated, interbedded sandy and muddy deposits on the terrace. Because subsidence and/or failure commonly occur at compositional and textural transitions, numerous opportunities exist for differential adjustments of the roadway. Thus, derailments resulting from uneven tracks are possible through this area. Second, any widening or expansion of the existing railway along the northern edge of Minneopa State Park (without adequate slope engineering) could induce widespread, small-volume slumping. The substrate in this area includes muddy floodplain deposits overlying Paleozoic bedrock, the Jordon Sandstone. Numerous, small-scale slumps are apparent along the existing roadway. Any widening or other landscaping work in this area could be expected to cause additional slumping. Although the size of the slumps will likely be small, any one could pile earthen material on the tracks or create instability in the underlying roadway.
2. The base, or footing, of the roadway appears within reach of historically significant floods. Increased water velocity with (relatively) lower bedloads during the early stage of flooding will cause expanded erosion in the Minnesota River channel and at numerous points along the floodplain—particularly at the edge of the floodplain. Cutbanks along the southern bank of the Minnesota River through Minneopa Park, the Williams Nature Center Park, and the area immediately west of Le Hillier are particularly susceptible to erosion. Riverbank erosion through this reach of the river will create negative impacts on the existing right-of-way (Figure 3). It should be noted that the existing roadway is

elevated above the southern edge of the floodplain and most future floods are unlikely to directly threaten the tracks. However, the base of roadway upon which the tracks are built will certainly be impacted by large floods. Resulting slope readjustments could cause the loss of roadway footings and significant instability in the overlying tracks (see Figure 4).

3. The existing roadway passes through two significant ground water discharge and recharge areas. The first of these areas includes the significant ground water discharge areas west of Minneopa State Park and the narrow, steep northern slopes of the river terrace occupied by Minneopa State Park. Disturbing the discharge areas could affect the overall regional water balances in the shallow unconfined aquifer. The viability of wetlands and water supply wells drawing from shallow sedimentary deposits would then be potentially impacted. Because soil saturation, an integral component of soil strength, will likely be affected by changes in the regional water balance, the roadway may require continuous monitoring and engineering to maintain its integrity. The second aquifer system potentially impacted by the proposed railway expansion includes the regional Paleozoic aquifer systems that provide some local drinking water. Specifically, the existing line cuts through bedrock Paleozoic bedrock formations east of Minneopa Park and North of Williams Nature Center and through the western and eastern reaches of Mankato. Track expansion could impact ground water recharge and quality in these regional aquifers.
4. Numerous community members question the effect of train traffic on the levees and floodwalls constructed by the Army Corps of Engineers. Preliminary analyses by the Corps show unlikely negative impacts on the floodwall system from neighboring train traffic. I have not seen the technical reports regarding the stability of these structures and cannot comment on any environmental impact of the expanded train traffic on their long-term stability and efficacy.
5. Through western Mankato, near Sibley Park, the existing right-of-way crosses through and over elements of the Oneota Dolomite. Recent excavations under the YMCA and close inspection of exposures of the Oneota along the Judson Bottom Road and in Le Hillier indicate the formation consists of large, jointed blocks of dolostone underlain by an extremely weak claystone, the Blue Earth Clay. The large blocks of dolostone are essentially foundering in the clay and are held in place by lateral confining pressure. Where the lateral confining pressure is removed, the blocks rotate, slip, and occasionally fall catastrophically (Figure 5). Increased train traffic could impact the geological environment two ways. First, increased vibrations resulting from large loads could cause continued slippage on the faults and joints in the Oneota Dolomite immediately adjacent to the roadway, and possibly in the more distant outcroppings of the Oneota that lack lateral confining forces. Differential subsidence in certain rigid structures overlying the formation would then be expected. Second, additional slippage and readjustments are particularly possible in areas where the roadway passes directly over the Oneota Dolomite. Possible negative impacts include rotation or differential subsidence on the railway bed and tracks and possible derailments.

Items listed below apply to the proposed route known as the southern bypass (DEIS route M2). The items are listed from northwest to southeast. Again, all sites are shown on the area reference map, Figure 1. The rank of the negative impact on the geological environment is not

stipulated. Further study is required to determine which of these conditions represents the largest negative impact.

1. Through Le Hillier, the roadway will pass over units of the Oneota Dolomite. Concerns regarding the stability of this formation and its impacts on the railroad tracks were discussed above (see #5).
2. The stability of the substrate across the Blue Earth River floodplain north of Le Hillier is unknown. By analogy to exposures along the current Blue Earth and the ancient course of the Le Sueur rivers in west Mankato, it is likely the substrate is very clay rich and is susceptible to substantial subsidence.
3. The construction of bridge over the Blue Earth River near Le Hillier will cause unpredictable morphologic changes in the river system. The angle of approach of the right-of-way to the Blue Earth River makes it likely new bridge footings will be placed in the channel. The footings in the Blue Earth River near Le Hillier will undoubtedly change the flow in the river and cause changes the depth and composition of the channel bed. Immediately downstream of the new bridge, undercutting of the eastern Blue Earth River valley wall is possible. Further downstream, a substantial portion of the reach is channelized and only structures in the existing channel are likely to be affected, i.e., the footings of the Highway 169 bridge in Le Hillier (see Figure 6).
4. Similar to the existing roadway west of Minneopa State Park, the proposed southern bypass will straddle substrates with variable compositional and textural attributes. Two compositional and textural contacts are noteworthy along the southern bypass. First, the contact between the Blue Earth River floodplain and weathered components of the New Ulm till is dramatic. These two materials differ in most compositional and textural qualities and are likely to experience differential rates of compaction and subsidence. Proper engineering, possibly including major excavations, driving deep piles into the floodplain or other typical geotechnical practices will be required to prevent uneven tracks and trestle or bridge footings across these contacts. The second contact of note is found at numerous locations along the proposed southern bypass. It exists between weathered and unweathered units of the New Ulm till. The difference in these materials is more subtle. Briefly, weathered till contains larger pores. Its overall compressive strength is less and it is prone to hold water in macroscopic pores. However, the potential scale of the negative impact on the roadway is possibly as large as the former contact.
5. Substantial evidence exists that large slumps formed on the eastern slopes of the Blue Earth River valley in the recent past (see Figure 7). The most-recent mega-slump apparently resulted from undercutting of the slope by the Blue Earth River. The proposed right-of-way will pass directly over the toe of the existing slump on an over-steepened slope in western section 26, T108N, R26W. Without extensive engineering of the slope, construction of a roadway on the slope will cause numerous injurious effects on the Blue Earth River, the eastern valley wall, and the community of Skyline. Creating stable slopes in this area will be complicated. It consists of highly jointed Oneota Dolomite underlying the eastern Blue Earth River valley walls and highly weathered glacial till lying on the hills' surfaces. As for the actual roadway, its development on the toe of the slump/slope will require excavations in the New Ulm till that exists over the slope (Figure 8). Similar excavations along Warren, Division, and Glenwood Drive in Mankato caused numerous, large-scale slumps to form. I would roughly estimate that the scale of the existing slump in western section 26 is at least three times larger than any

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recent slump in Mankato. Reactivation of the existing slump or development of new slumps on the over-steepened slope will likely be promoted by the additional load produced by the trains as well as the vibrations likely from their movement over the tracks. Reactivation of the slump could cause the following negative impacts: (A) continued slumping and slope retreat—the retreating slope will place numerous homes in the community of Skyline in harms way. Maps included with the DEIS indicate that homes on the western edge of Skyline may be slated for removal; however, establishing a stable slope may require the removal of many additional homes. (B) down slope transport of slump material could block the current Blue Earth River channel—temporary upstream flooding and development of a new downstream channel are likely. (C) lateral (down slope) shifting will likely move the rails on the rail bed and potentially lead to a derailment of cars into the Blue Earth River.

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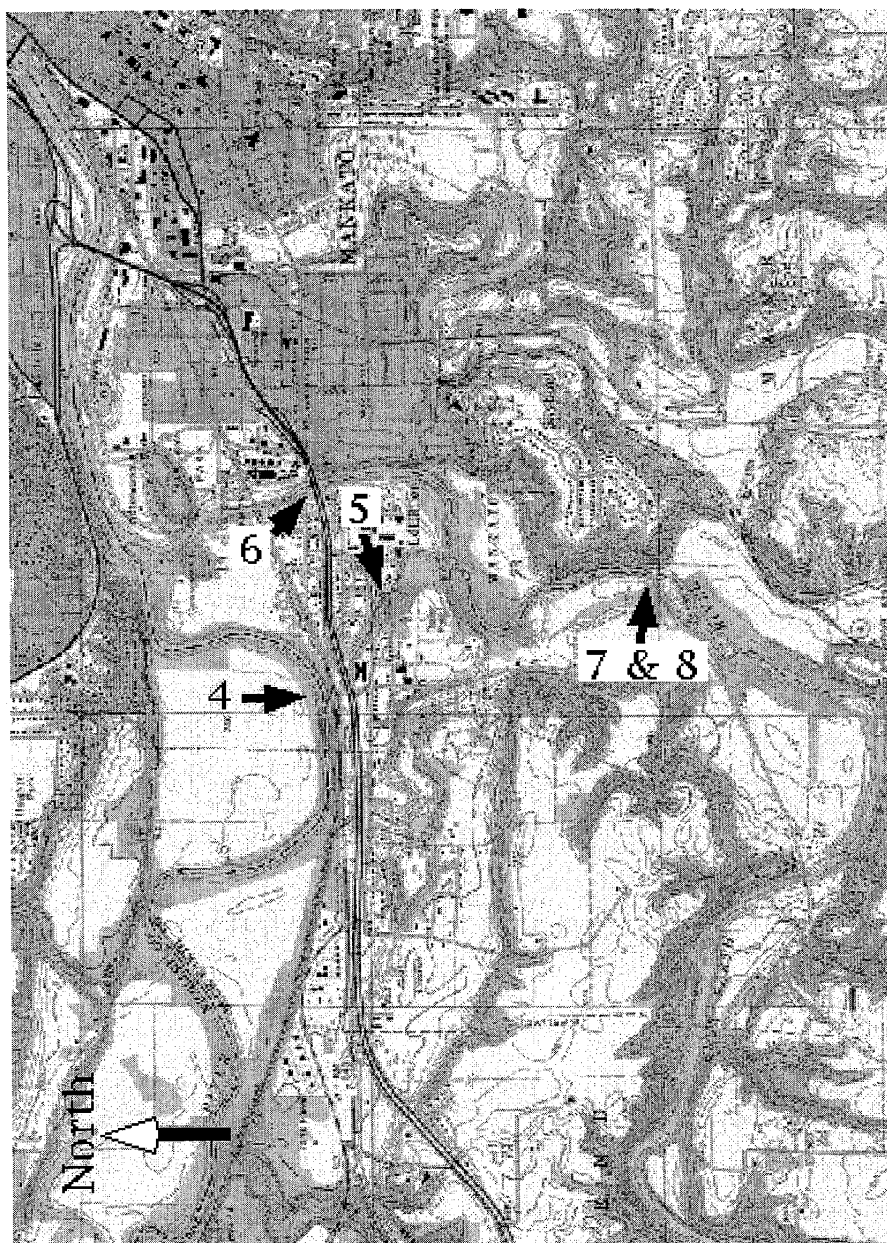


Figure 1. Reference map for sites discussed in this report. This map is presented in landscape view to maximize its size. Numbered arrows indicate the locations of figures included in this report.

Figure 2A



Figure 2B



Figure 2. Examples of variable soils along the existing right-of-way. Figure 1A: A thoroughly saturated soil along the north side of State Highway 68, two miles west of Minneopa State Park. The existing railway is the dark linear feature with occasional snow banks below its crest. All surfaces on the near and far side of the elevated railway grade are completely saturated and highly organic. Consequently, they are remarkable weak and prone to failure when loaded and shaken. Figure 1B: One-quarter mile east of Figure 1A. Here the soil is well drained and much more dense. The dramatic changes in soil composition and texture illustrated here are frequent along the entire right-of-way in the valleys of the Minnesota and Blue Earth rivers. Each soil type will likely react differently to imposed loads and vibrations; consequently, engineering properties of each must be estimated and appropriate subgrades must be constructed to serve the proposed expansion of rail service.

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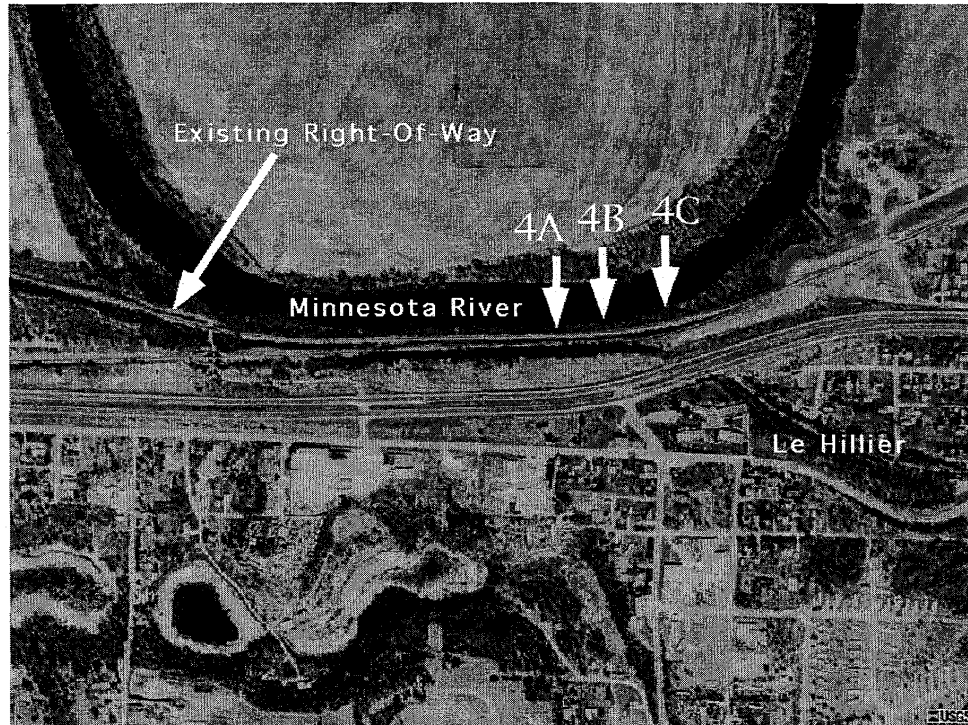


Figure 3. High-resolution satellite image (SPIN-2) of the area along the Minnesota River immediately west of Le Hillier. River flow is from left (west) to right (east). Note that the entire length of the [M1 and M3] railway right-of-way lies on the cutbank while the M3 right-of-way would also lie along a significant portion of the cutbank. The implication of this arrangement is that erosion is likely along this entire stretch of the right-of-way where it borders the river. Currently, the average distance between the river and the roadway is less than 50 feet. Annotated numbers refer to details shown in Figure 4.

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Figure 4A: Small slump immediately uphill of the existing tracks, 1/2 mile east of Le Hillier. The debris from the slump is removed. The scar of the slope failure is highlighted by the absence of snow on the nearly vertical surface. Small slumps of this nature could periodically cover the tracks with earthen and plant debris. Simple retaining walls or reshaping the slope will alleviate negative impacts on the existing rail corridor.



Figure 4B: Medium scale slump underlying the existing roadway, 1/2 mile east of Le Hillier. The slump exists as residual debris protruding into the Minnesota River beneath the highly arched trees. The flat appearance of the slump may be caused by the removal of the upper slump during subsequent high-water levels. The existing railway is in the middle right side of the image behind the trees. Slumps of this nature present significant danger to the stability of the current tracks. Methods of protecting the existing line are discussed in the text.



Figure 4C: An example of cutbank erosion impinging on the existing roadway. The track is located in the middle left side of this image. The upper level of the track is marked by a line of snow banks. In the foreground, extensive erosion of the riverbank is apparent. Exposed roots from standing trees indicate this erosion is recent. A chute, or channel of increased erosion exists along the path of snow through the middle of the image. Consequently, the existing track is being immediately threatened by erosive undercutting.

Figure 4. Potential negative impacts of the existing roadway west of Le Hillier, Minnesota.

Figure 5A:

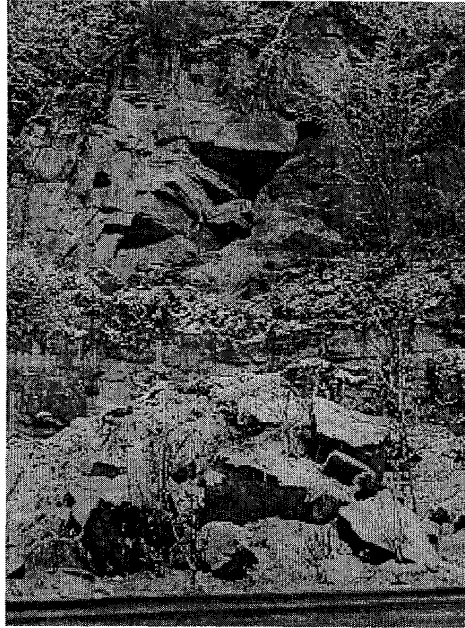


Figure 5B



Figure 5: Examples of jointed and foundering blocks of the Oneota Dolomite. Figure 3A: Fracturing and rockfall on the Judson Bottom Road in North Mankato. Lack of confining pressure at this location allows blocks to fall freely. Ground shaking could play a potentially significant role in causing additional rock falls in this and other locations in the greater Mankato area. Figure 3B: Fractured (faulted?) blocks of Oneota Dolomite in Le Hillier. This image represents a classic example of how the unsupported blocks are prone to rotation and differential settling. The application of new, substantial loads coupled with vibrations of passing trains could remobilize other unsupported blocks of the Oneota and lead to damage of nearby foundations and other rigid structures.

Geological Aspects of the Proposed DM&E Railway Expansion

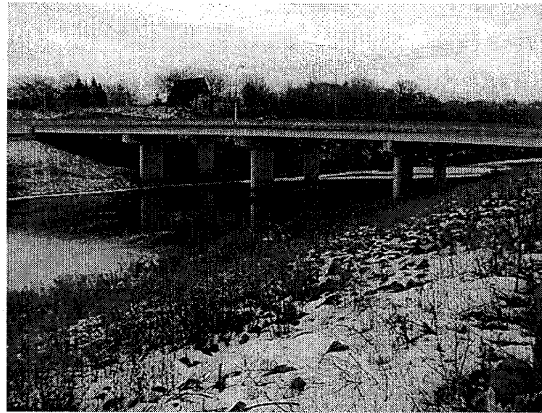


Figure 6: The Highway 169 Bridge over the Blue Earth River in Le Hillier, Minnesota. This view faces south from the east bank of the Blue Earth River. Both banks of the river are covered with rip-rap effectively channelizing the river through this reach. Consequently, any changes in upstream flow created by the proposed southern bypass will focus any downstream changes in the channel bed characteristics to the area shown here.

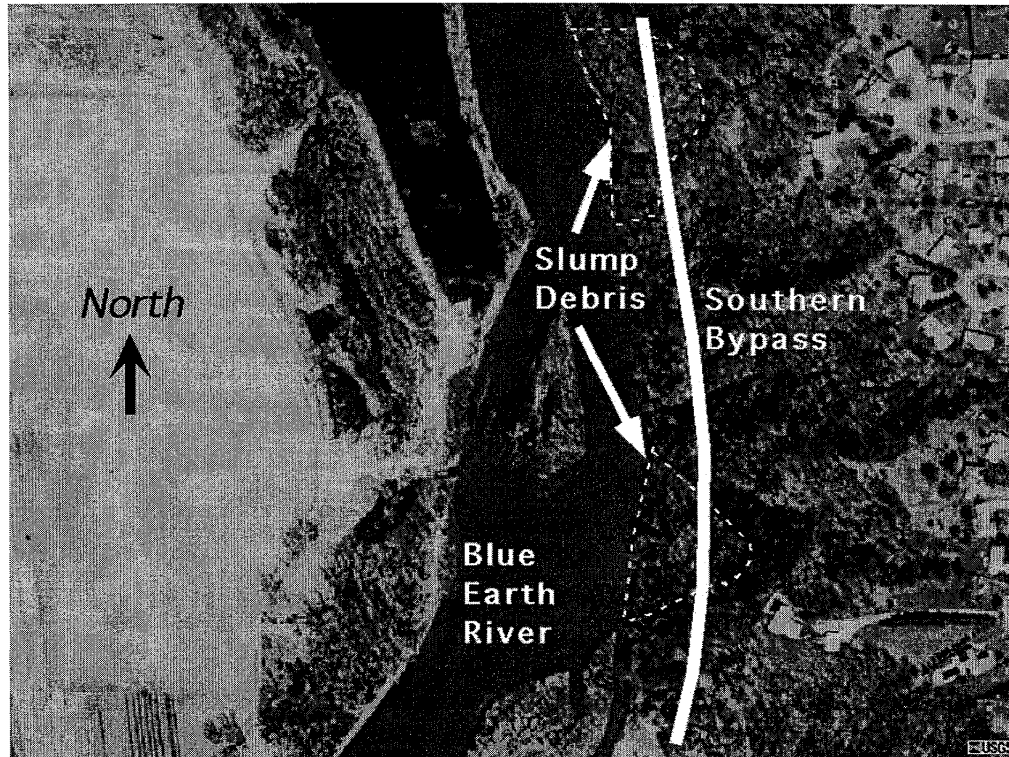


Figure 7. High resolution satellite image (SPIN-2) of the western edge of Skyline and the Blue Earth River. River flow is from bottom (south) to top (north). The eastern riverbank is the cutbank. The approximate location of the DM&E Southern Bypass, as taken from a large-scale topographic map accompanying the DEIS, is shown as a bold white line. Dashed outlines show the locations of two large slumps identified by aerial photography and confirmed by field observation (see Figure 8). The interpretation of these features is preliminary—additional field studies are required to confirm their number, size, shape, and propensity for sliding. The larger slump feature to the south of this image was briefly studied on November 27, 2000. Based on the size of trees growing on the slump scarps, it is very old; however, ongoing motion is indicated by fresh scarps in numerous locations within the debris field. The proximal location of the Blue Earth River virtually guarantees additional slumping. First, the continual saturation of the lower slump provides pore pressure to the toe of the slope promoting lower soil friction and higher potential for sliding. Second, ongoing erosion of the cutbank will further promote additional slumping by continually removing the toe of the slope. Finally, the loss of vegetative cover, additional loads, and potential ground shaking by heavily loaded trains will greatly increase the potential for catastrophic slumping in these areas. Negative impacts of construction of the Southern Bypass through this site as well as methods of possibly mitigating the impacts are discussed in the text.

Geological Aspects of the Proposed DM&E Railway Expansion

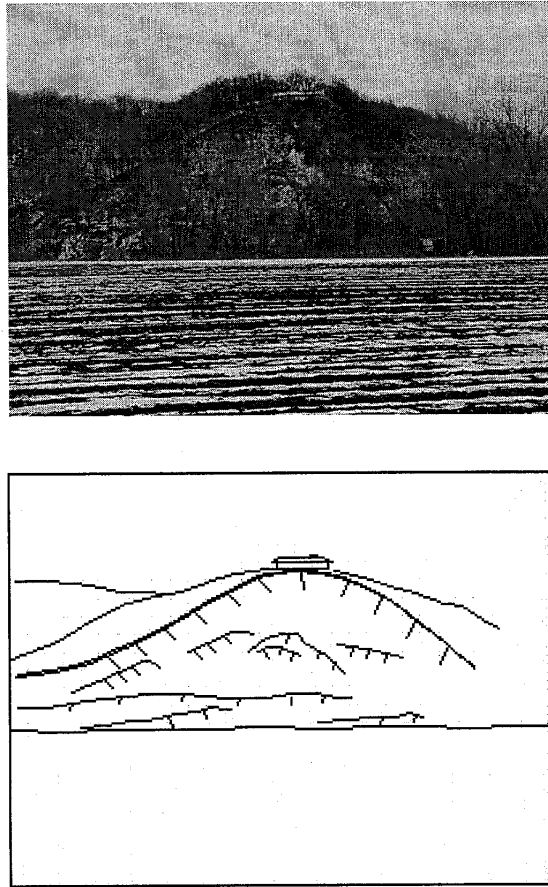


Figure 8. Facing east, this view of Skyline (on the top of the hill) illustrates the grand magnitude of slumping above the Blue Earth River. The lower line diagram shows the numerous slumps on the hill slope in solid lines with hachures. The numerous smaller slumps show continuing readjustment of hill to a newer, less steep slope and additional soil failures within the slump debris. The presence of the subordinate scarps clearly illustrates that the potential for continued slope failure is very high.

Geological Aspects of the Proposed DM&E Railway Expansion

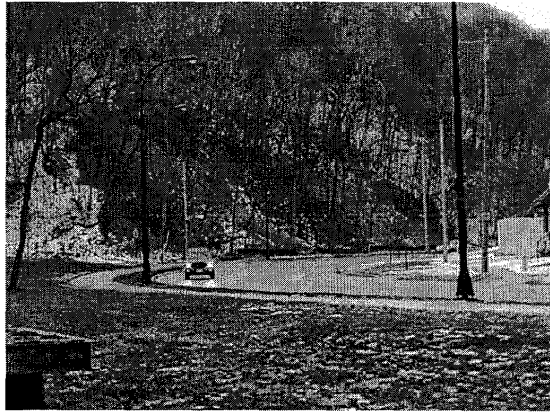


Figure 9. A slope with slumping analogous to the examples shown in Figures 7 and 8. These slumps along Glenwood Drive in Mankato followed partial removal of the toe of the slope. Failure on several other slopes in this area is repeated during the period from 1996 to 1999. Numerous retaining walls, slope grading, and large scale excavation were employed by the City to limit ongoing slope failures.

Exhibit B

**METHODS OF FURTHER STUDY OR MEANS OF MITIGATING THE IMPACT
OF THE RAILROAD EXPANSION ON LOCAL GEOLOGICAL FEATURES**

Along the existing right-of-way:

1. The developers of the expanded roadway should thoroughly characterize the engineering properties of the various surficial sediments and bedrock along all routes. Field observations indicate substantial differences will exist. Proper design of a railway subgrade capable of supporting the heavy and frequent loads of the expanded rail service will be necessary. In many cases, such data already exists. Most recent highway construction generates this type of data. A qualified engineer or scientist needs to assess this data and determine the strengths of the materials and design proper bases for the entire length of the railway through the greater Mankato area. Because further development could affect discharge in the local unconfined aquifer, a hydrogeologist will be needed to provide long term soil saturation estimates to the design engineers.
2. The reach and effects of flooding along the Minnesota, Blue Earth, and Le Sueur rivers must be defined. The close proximity (as little as 40 feet in some locations) of the existing roadway to cutbanks on the Minnesota River in the reach between Minneopa State Park and Le Hillier must be addressed. Evidence of continued southward erosion of these cutbanks, as well as small scale slumping of the riverbank, indicates the existing right-of-way may be in peril. Presently, I am unable to ascertain the rate of lateral migration of the river meanders and the potential for undercutting or slope failure of the existing roadway. A concerted study is needed because further construction on the existing right-of-way, heavier or more frequent loads, larger spring floods or increased annual discharge in the river could all produce negative impacts on the right-of-way and Minnesota River. I recommend that the study should address the effects of channelizing the river, armoring the cutbanks near the existing roadway, or moving the right-of-way further from the river.
3. The effect of train traffic on existing levees and floodwalls *during and following* spring floods must be ascertained. During floods, increased pore pressure in the earthen portions of the levee and floodwall systems will reduce their effectiveness. Following floods, hydrostatic loads on the wall will be reduced, but lingering pore water pressure may cause prolonged periods of susceptibility to vibrations. Washouts along the surface of the levee facing the river are also possible during the period following peak flooding, particularly if the material is being shaken. Along reaches of the Minnesota River through Mankato/North Mankato and along the Blue Earth River through Le Hillier and the Honeymead soybean processing factory, the affect of the elevated pore pressure on the tipping potential of the concrete floodwalls should be determined.
4. A regional ground water model must be developed that assess the impact of the expanded right-of-way on local unconfined (shallow) and regional (semi-confined) bedrock aquifers. The study must address the impact of construction on both discharge and recharge areas. Specific areas of study should include the sensitive wetlands along the Minnesota River west of Mankato, the shallow water supply wells between Le Hillier and Minneopa State Park, as well as the deliverability and quality of water in the regional Paleozoic aquifers.

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5. Subsurface mapping of the Oneota Dolomite is needed to determine its proximity to the roadway. Jointed bedrock near the new or expanded right-of-way is susceptible to settling, rotation, or rockfall. Boring will provide the best estimate of the bedrock composition and position. A subsidence risk map will need to be generated to characterize the potential damage to underground sewers, water mains, power and communication lines, structural foundations of bridges and buildings, as well as railway and highway grades.

Further studies and possible methods of mitigating negative impacts of constructing a southern bypass include the following items.

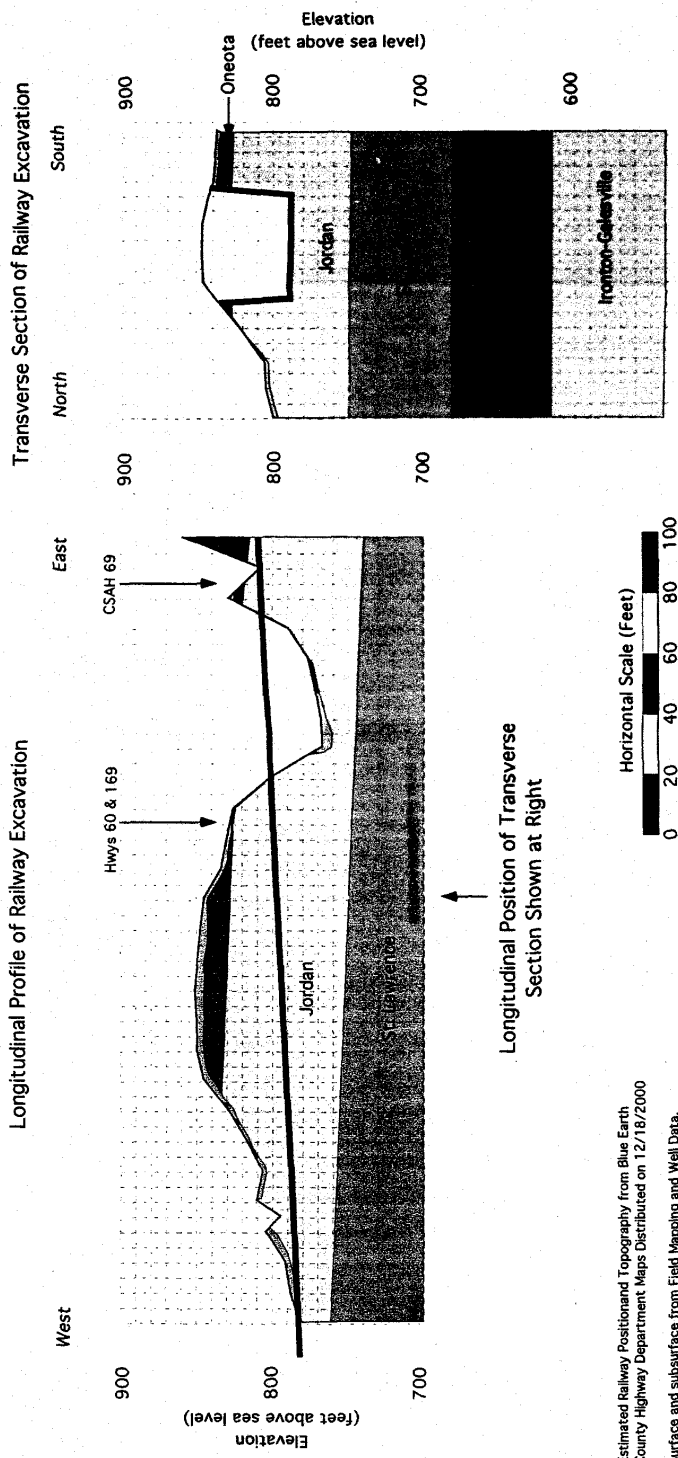
6. Similarly to the existing right-of-way, subsurface mapping is needed on the Oneota Dolomite to determine its proximity to the rail bed. Outcrops of the Dolomite in Le Hillier appear more highly disturbed than those in North Mankato or Mankato. Atypical for bedrock throughout southern Minnesota, these strata exhibit substantial inclination. This condition could indicate greater potential for additional adjustments and settling under increased loads or shaking caused by passing trains.
7. Because the entire length of the right-of-way along the southern bypass is new, engineering properties of substrate materials will be particularly important. Owing to recent construction on and related to Blue Earth County Road 90, some data may already exist. For areas or materials not previously assessed a coring program will be necessitated to quantify the engineering properties of the soils along the new route.
8. The potential for erosion by the Blue Earth and Le Sueur rivers on the right-of-way stipulated in the proposed southern bypass should be thoroughly studied. The route should be finalized only after its location is shown to be unaffected by flooding and normal stream evolution along these two rivers.
9. The impact of additional flow obstructions in the Blue Earth River upstream of the Highway 169 bridge in Le Hillier must be assessed. Possible impacts on the steep eastern (cutbank) of the Blue Earth River on homes in west Mankato as well as the footings to the Highway 169 bridge over the Blue Earth River in Le Hillier must be determined.
10. A complete study of the affect of rail bed on the over-steepened slope between Skyline and the Blue Earth River must be developed. The potentially disastrous effects on the people of Skyline or the environment of the Blue Earth River mandate a thorough evaluation of the proposed route through this area. I recommend evaluating the potential of (A) completely regrading the slope, (B) installing runoff and groundwater controls, (C) excavation and backfilling the existing slump with coarse sand, (D) constructing a massive retaining wall with supporting engineering structures, or (E) abandoning this proposed route between Skyline and the Blue Earth River.

Exhibit C

**AREAS OF ADDITIONAL CONCERN TO THE EARTH SYSTEMS NEIGHBORING
THE EXISTING RAILWAY CORRIDOR OR THE SOUTHERN BYPASS**

My areas of expertise are environmental /engineering geology and hydrogeology. Consequently, the accuracy of my interpretation is limited to the items listed in Exhibit A. However, my experience in the Earth Sciences also allows me to ask questions related to this project that a comprehensive EIS should address. The following list is in no way complete. It includes only thoughts regarding other environmental concerns posed by the proposed expansion of rail service along the existing corridor or the proposed southern bypass.

1. The additional diesel exhaust generated by the high volume of trains passing through Le Hillier, Skyline, and Mankato could potentially affect thousands of people. Diesel exhaust, and specifically the diesel fuel in it that is incompletely combusted, contains numerous poly-aromatic hydrocarbons (PAH's). PAH's are known carcinogens. This creates a particularly acute problem for people residing in the eastern end of Mankato and Skyline. In these locations, the trains will be experiencing increased loads as they accelerate out of the Mankato urban corridor or climb out of the Minnesota or Blue Earth river valleys. The thick piles of black exhaust expected during the trains' accelerations and ascents will surely drift over residential neighborhoods in both these areas. Since the PAH's are largely insoluble, they will persist in the air for some time and could be potentially inhaled or ingested by many people. The PAH's will also pose a substantial threat to water quality in the Minnesota and Blue Earth rivers where the existing or proposed right-of-way pass in close proximity. Dr. James Rife in the Department of Chemistry and Geology at Minnesota State has experience measuring PAH's in water environments. Dr. Beth Proctor of the Department of Biology and Water Resources Center at Minnesota State would also be an educated voice on this subject. The impact of air-borne PAH's area residents is probably an issue the Minnesota Pollution Control Agency or Minnesota Department of Health and Human Services could address.
2. Several concerned citizens at the recent DEIS public hearing in North Mankato expressed concern regarding impacts on regional air and water quality resulting directly from the coal transported on the expanded DM&E line. These negative impacts will result from increased coal-fired electrical production in Midwestern and eastern population and industrial centers using the coal transported, in part, by the DM&E railroad. The arguments of the concerned citizens focussed mainly on green house gases, sulfur dioxide, and mercury emissions. As an educator of Earth Science, I can confirm these concerns. I can also add that coal-fired power plants emit inordinate amounts of selenium (perhaps the most toxic naturally-occurring trace element). Some coals also contain appreciable concentrations of uranium or its daughter products (including radon). Consequently, it is my opinion that these additional negative impacts should be included in the DEIS.



Estimated Railway Position and Topography from Blue Earth County Highway Department Maps Distributed on 12/18/2000

Surface and subsurface from Field Mapping and Well Data.

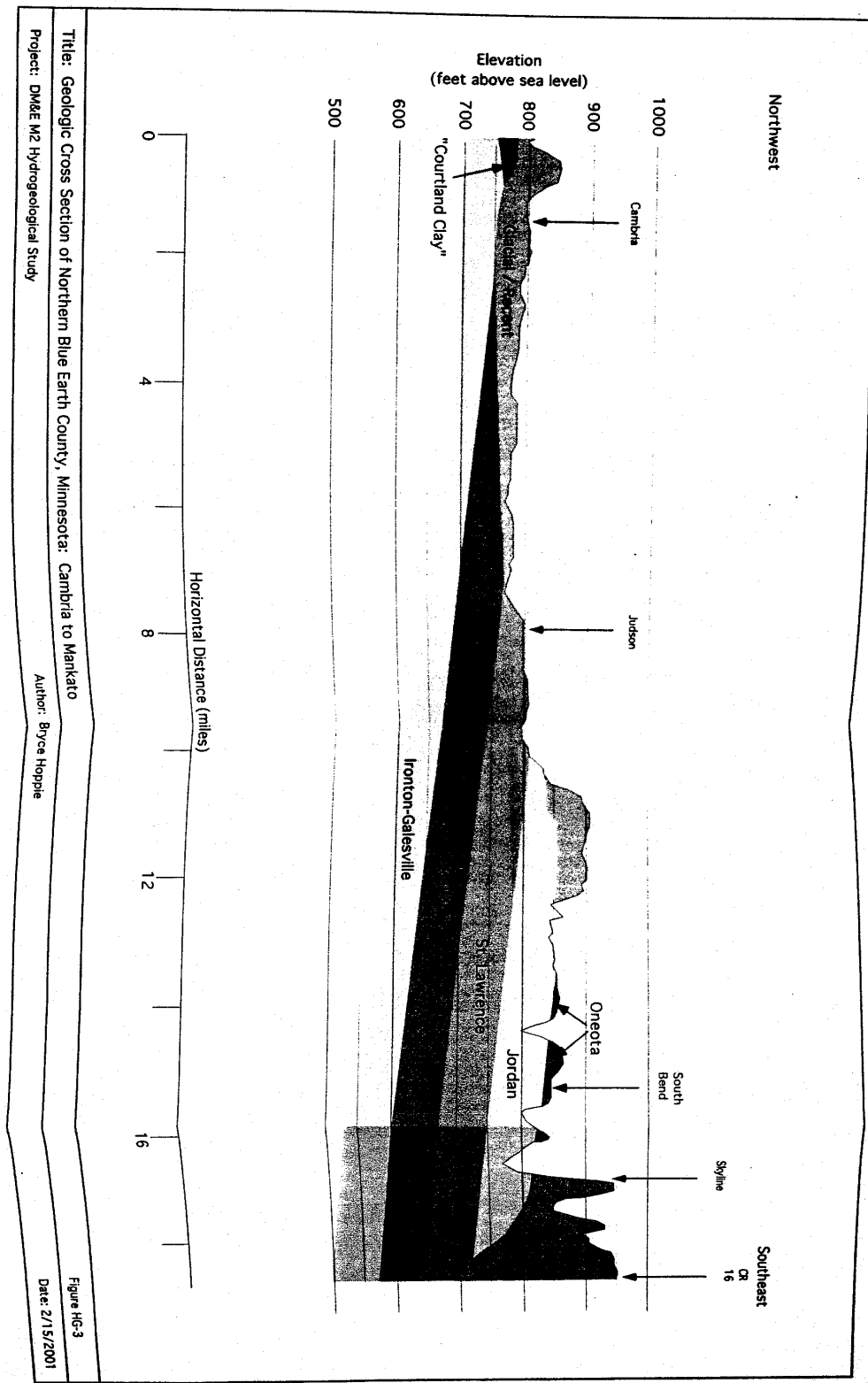
Title: Geologic Cross Sections of South Bend Township, Blue Earth County, Minnesota

Project: DM&E M2 Hydrogeological Study

Author: Bryce Hopple

Figure NO. HG-2

Date: 2/15/2001



Bryce Hoppie Geological Consulting
Applied Environmental Geology and Hydrogeology

**The Impact of DM&E Expansion Route M-2 on Ground Water Resources of
Northern Blue Earth County, Minnesota**

B.W. Hoppie, Ph.D., P.G.
February 14, 2001

The following report qualitatively describes hydrogeological aspects of the M-2 (Southern Bypass) route of the proposed DM&E expansion through north central Blue Earth County, Minnesota. Where appropriate, sensitivities and ambiguities are highlighted. All work was completed between December 20, 2000 and February 14, 2001. Snowfall retention during this period was above normal and limited my ability to perform field confirmations of my observations. Most data were acquired from the Water Resources Center at Minnesota State University, Mankato. A bibliography of other resources is included at the end of the report.

OVERVIEW

Construction of the M-2 route, and subsequent railway operations along this new line could negatively impact the ground water reserves of Mankato Township, Blue Earth County, Minnesota as well those of its neighboring communities and rural areas (Fig. HG-1).

The existing DM&E railway either avoids most bedrock or includes only limited contact with ground water recharge areas. The expanded railway proposed by the DM&E will disturb the hydrogeologic environment much more than its predecessor. The most obvious impact on the regional hydrogeologic system is the excavation of a portion of the bedrock aquifer system along the northern tier of South Bend Township (Fig. HG-2). Excavation of this area will provide a conduit for inadvertent spills of diesel fuel or other common pollutants to rapidly enter the regional ground water system near their points of extraction.

Other construction west of Minneopa State Park could compromise the integrity of the entire region's principal aquitard and aquifer. Both units are near the surface in this area. New construction either directly on them or upon the thin soils covering them may jeopardize the quality of water in the region's largest bedrock aquifer, the Franconia and Ironton-Galesville formations (Fig. HG-3).

ASSUMPTIONS

The DM&E Expansion will follow the route indicated by the Blue Earth County (Minnesota) Highway Department. These large and numerous maps are not included with this report. Copies will be made available upon request.

Estimated cuts and fills for the proposed railway will follow (approximately) the guidelines stipulated by the Blue Earth County Highway Department. These data are on the aforementioned Highway Department maps.

Soils and rocks along the M-2 route are typical of those found in northern Blue Earth and eastern Nicollet counties, Minnesota. (And consequently, previously assessed physical and hydrogeologic properties represent these materials accurately).

The proposed expansion includes no plans for protecting the quantity or quality of ground water from the regional bedrock aquifers in northwestern Blue Earth County.

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HYDROGEOLOGIC OBSERVATIONS

The proposed construction along the M-2 and M-3 routes will directly intersect the Jordan Sandstone, a regional bedrock aquifer. In South Bend and Mankato townships, an unknown (but likely small) number of wells are completed for water production from within the Jordan Sandstone. Additional ground water is produced from the Jordan Sandstone east of Mankato by rural communities (i.e., Eagle Lake, Minnesota), and private individuals.

Construction along the M-2 and M-3 routes will intersect two regional aquitards, the Oneota and St. Lawrence formations. Numerous exposures of the Oneota exist in west Mankato and the immediate vicinity; surface exposures of the St. Lawrence exist between the community of Judson and Minneopa State Park, Minnesota. Both formations contain numerous beds of dolomite and shale that limit ground water movement. Neither is completely effective as an aquiclude. The Oneota shows numerous effects of paleokarsting, including development of vuggy porosity, linear dissolution fractures, and foundering. Similar effects were not observed in the St. Lawrence, but numerous silt- and sandstone beds and fractures within this formation will likely permit considerable throughflow in this aquitard.

Skyline's water supply is drawn from the Franconia Formation (Fig. HG-3). Its contact with the overlying St. Lawrence Formation are gradational among adjoining sandstone units. Ground water cross-flow is also possible with the underlying sandstones of the Iron-ton-Galesville Formation, the region's largest bedrock aquifer. Ground water recharge in the Franconia is often attributed to an area west of Minneopa State Park where the formation rises to within 25 feet of the surface.

Recharge areas for these aquifers are not adequately delineated. Construction along the M-2 and M-3 routes west of Minneopa State Park are unclear. "Improvements," potentially including a switching yard were mentioned by Pat Hentges, Mankato City Manager, following discussions with DM&E.

RESULTS

New construction will not significantly affect the availability of water from regional aquifers. The area affected by construction constitutes a very small fraction of the total aquifer recharge areas.

The Jordan Sandstone may be used by a small number of rural residents of South Bend and Mankato townships as a source of potable water. Due to casual well drilling practices and the great antiquity of some water wells, the exact number of individuals using the Jordan as a source of potable water is not available. I identified at least five wells finished in this aquifer but cannot assess their current status or the disposition of any produced water.

The Jordan Sandstone has occasional surface exposures in South Bend Township. When complete, it is 75 feet thick and overlain by the Oneota Dolomite; it is coarse, very well sorted, and allows rapid ground water flow. Its dominant quartzose composition precludes significant cation-exchange capacity; consequently, the original chemical characteristics of the throughflow are maintained. In South Bend Township the overlying Oneota Dolomite is an ineffective aquitard and the sandstone is recharged directly from Recent till and soil (e.g., Fig. HG-3).

The M-2 route will excavate up to 40 vertical feet of the Jordan Sandstone through northern South Bend Township, west of Le Hillier. Along the length of the track, the trench created by excavation will be 300 feet; perpendicular to the railway, up to 40 feet Jordan Sandstone will be removed (Fig. HG-2).

Railway improvements west of Minneopa State Park may directly impact the St. Lawrence Formation. The St. Lawrence rises to the surface throughout the area between Minneopa State Park and Judson, Minnesota. The existing railway rests on thin surface soils throughout this area. Construction plans for this area are not available, and consequently the impact of the railroad on the St. Lawrence is speculative.

Although not validated by field tests (which are not possible during winter), recharge of the Franconia and Ironton-Galesville formations from within South Bend and Mankato townships is likely. Supporting evidence includes: (1) surface rocks in this area include the highly fractured Oneota Dolomite and the permeable Jordan Sandstone, (2) the Franconia Formation lies vertically within 100 feet of proposed surface excavations, and (3) the intervening aquitard (the St. Lawrence) exhibits numerous fractures and interbedded sandstones capable of rapidly (but locally) transmitting ground water to the lower aquifers.

DISCUSSION AND SUMMARY

"One gallon of gasoline renders ten thousand gallons of water unfit for human consumption"
Harvey Blatt, Our Geologic Environment, 1998

The potential impact of railway construction and operation on regional aquifers is not obvious. Furthermore, anticipated effects are constrained to ground water quality, not quantity. However, possible source of contamination to the region's bedrock aquifers must be treated with caution. Any degradation of water quality would impact virtually all residents of South Bend and Mankato townships as well as people in Skyline, Mankato, and North Mankato, Minnesota. The three principal areas of concern regarding railway construction and operation and ground water quality are summarized below.

Construction of the M-2 route through South Bend and Mankato townships will directly impact the Jordan Sandstone aquifer. Based on the existing plans, inadvertent discharges of diesel fuel or other pollutants from railroad operations will enter the aquifer directly. This contaminated water will move quickly. Because the aquifer lacks the lithological constituents needed to remove hydrocarbons or other reactive compounds from the throughflow the contamination will likely spread throughout the area.

Excavation of the Oneota Dolomite and Jordan Sandstone in South Bend Township could create proximal pollution point sources in the Franconia and Ironton-Galesville Formations. Construction will reduce the vertical distance between the railway and the Franconia to less than 100 feet. The intervening bedrock will consist of highly permeable Jordan Sandstone and St. Lawrence Formation. The lithology of the St. Lawrence beneath the site of excavation is unknown but could include fracture networks or sandstone beds limit its effectiveness as an aquitard. The proximity of this site to the water wells providing water for South Bend and Mankato townships are of concern. Pollution sources entering the aquifer at this proximal location would be less diluted than those originating from more distant recharge areas and reach the municipal water supplies quickly.

Construction of the M-2 and M-3 routes west of Minneopa State Park may affect the Franconia Formation, the regional aquifer that supplies the city of Skyline's municipal water. The development of any new route through Mankato will likely require railway improvements in the area where the St. Lawrence Formation surfaces west of Minneopa State Park. The St. Lawrence, while only partially effective as an aquiclude, includes numerous shale beds and a tortuous pore

network that causes water to move slowly. Within the formation, throughflow is drawn across clay-rich sediments that possess strong affinities for large or highly charged hydrocarbons or chemical compounds. Thus, the concentration of contaminants in the water passing downward into the Franconia Formation is lowered and quality is insured.

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**Slope Stability Analyses along the DM&E Expansion Route M-2:
South Bend Township, Blue Earth County, Minnesota**

B.W. Hoppie, Ph.D., P.G.
February 15, 2001

The following report describes the stability of the hillside along the southwestern margin of Skyline, Minnesota (Fig. SS-1). The hillside exists within Section 23, T108N, R27W. This slope represents one of several in South Bend and Mankato townships that will require significant modification before the M-2 (Southern Bypass) route can be utilized. The slope discussed herein was first identified as a pivotal portion of the M-2 route in my Preliminary Report of December 5, 2000. Please refer to that document for background information regarding origin and evolution of this slope.

This report will only address new work completed to assess the stability of the slope. Work completed since the preliminary report includes one additional field visit to confirm slope topography, acquisition and analysis of topographic information and expected soil properties, manual confirmation of key soil properties, and development and execution of numerous slope stability computer simulations.

OVERVIEW

The stability of the slope along the southwestern margin of Skyline, Minnesota is tenuous. Numerous small-scale slumps now exist on an overly steep slope formed by a previous mass wasting event of significant magnitude (Fig. SS-2).

Railway design will position the tracks below, upon, and above active slumps on the slope. "Three to one" excavation along the slope may remove the potential hazard of the slump uphill of the railway. The slope design will also increase the static, unloaded stability of the mid-slope slump upon which the railway will rest. However, the additional (static) load of a single diesel locomotive on the slump dramatically lowers its stability and increases the likelihood of a catastrophic slope failure.

These results do not account for dynamic loads, vibration (pseudoseismic events), over-pressure in pores of the slope or basal scarps, or the multitude of complexities arising from filling, partially filling, or rerouting the Blue Earth River. The marginally stable slopes would likely become highly unstable if any of these conditions develop during use of the railway.

ASSUMPTIONS

The DM&E Expansion will follow the route indicated by the Blue Earth County (Minnesota) Highway Department. These large maps are not included with this report. Copies will be made available upon request.

The design of the cut and fill along the proposed railway will follow (approximately) the guidelines stipulated by the Blue Earth County Highway Department. These data are on the aforementioned Highway Department maps. County maps presume slopes designed 3:1. Mr. Ken White of Farrish Johnson Law Offices, Dr. John Krenz, Skyline City Council member, and Mr. Ken Saffert, Mankato City Engineer reported DM&E may elect to use 2:1 slopes on hillside cut and fill. The computer simulations reported herein use the more stable (i.e., 3:1) slope for stability analyses.

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Both plans currently call for the filling or partial filling of the Blue Earth River to provide the base of the modified slopes. If the river is filled or partially filled, concrete, rock, or some unspecified structure will be required to resist the forces of erosion. If the river is rerouted, mechanical and physical properties of the river channel, levee and surrounding floodplain will undergo significant changes as they dry and become loaded for the first time. These changes are unlikely to occur evenly in space or time. Consequently, the affect of the river on any forward model of slope stability cannot be accurately estimated at this time. Therefore, my model assumes the Blue Earth River is not filled, partially filled or rerouted.

Soils and rocks along the M-2 route are typical of those found in northern Blue Earth and eastern Nicollet counties, Minnesota. (And consequently, previously assessed physical and hydrogeologic properties represent these materials accurately). Conservatively, the physical and mechanical properties of the soil and till are assumed to be homogeneous and isotropic.

My models assume all existing and proposed loads are static. Vibrations (pseudoseismic events) are considered negligible and all slopes are saturated but possess no excess hydrostatic pressure (i.e., geopressure). These assumptions are not true, but allow the evaluation of the slope stability (1) tractable, and (2) representative of conservative (or "best case") conditions.

To the best of my knowledge, the draft environmental impact statement includes no provisions for pilings, retaining walls, or other engineering structures commonly employed to stabilize slopes.

FIELD OBSERVATIONS, SOIL PROPERTIES, AND MODELING PARAMETERS

Considerable slump debris remains on the slope. Although large trees and lush vegetation exist on the slope, exposed roots of young saplings near the head scarps indicate some downhill movement of material in the recent past (i.e., < 8-10 years). The thickness of the average soil cover on the slope could not be measured due to snow conditions; however, the thickness exposed near the lower scarp was estimated visually to be approximately 40 cm.

Three scarps are present on slope (Fig. SS-2). Each is partially hidden by slump debris. Their location and inclination indicate they originated during three separate slumping events or, as three independent slope failures during a single, significant mass wasting event.

Field observations on hills southeast of Skyline indicate the water table lies near the surface. Seeps form near the bases of most slumps.

Soil testing at Minnesota State University on analogous till produced estimated soil densities of 2500 to 2650 kg/m³. Recorded porosity varies from 30% for sandy till to 60% for argillaceous samples. Estimates of the internal angle of friction were obtained from Mr. Ken Sieffert, Mankato City Engineer, and from modeling results of similar slumps in Mankato. The consensus of these estimates is an angle of approximately 18°, although some antidotal evidence suggests this value is slightly high. Soil cohesion was estimated from data in Rahn (1996). A value of 0.1 kg/cm² is reasonable for the soil where not saturated or sheared by mass wasting.

The estimated load of one diesel locomotive on the slope was obtained from the DM&E vibration study completed by Minneapolis engineering firm of David Braslau and Associates. The value used for modeling was 2,800 psf.

Computer simulations of slope stability were completed using GEOTEC B, by Interstudio, Inc. The Fellenius method of slices was utilized. Approximately fifty simulations were created to assess the stability of the slope using various soil properties and slope configurations. Representative results from six simulations are presented in Figure SS-3.

Two scarps along the lowest portion of the slope correlate to 10 and 25-year flooding recurrence intervals on the Blue Earth River (Fig. SS-2). The erosional features highlight the fact that this hillside acts as a cutbank.

RESULTS (PHYSIOGRAPHIC)

U.S.G.S. topographic maps were used to create an initial profile from the Blue Earth River to the western-most houses in Skyline. This profile was modified using field observations, stereoscopic aerial photographs, and satellite images. The final profile (Fig. SS-2) compares favorably with a similar profile created by the Blue Earth County Highway Department although the latter ignores recent fluvial erosion above the Blue Earth River and tends to smooth the abrupt change in slope associated with the contact of head scarps and slump debris.

The design of the fill west of the railway may be unstable. The 2:1 slope suggested by several sources as a possible design exceeds the internal angle of friction for the weathered till and will be unstable. Unloaded slopes designed at this angle are metastable and tend to fail when loaded or when confining pressure along their toes are removed. Annual flooding along the Blue Earth River will likely create excess hydrostatic pressures in the lower portions of any fill placed on the river's floodplain. 3:1 slopes in Mankato occasionally experience additional mass movements.

At least one significant slump lies above the proposed railway. If the position of the railway is accurately indicated on the Highway Department map of Mankato Township, the 3:1 slope will excavate the slump debris from this slump and possibly the basal scarp. More detailed study, possibly including trenching or coring, is needed to confirm this interpretation. It is clear that a slope design of 2:1 will leave the scarp and slump debris on the slope above the proposed railway.

The proposed railway itself will rest directly on slump debris. The head scarp for this slump is approximately 45 feet east of the track centerline. The toe of the slump is 25 feet west of the centerline. Both 3:1 and 2:1 designed slopes will increase the height of earthen material on the basal scarp by an average of 20 to 22 feet.

RESULTS (COMPUTER MODELING)

Model Parameters: Reasonable estimates for all modeling parameters were selected (Fig. SS-3).

Stability analyses tend to be insensitive to the chosen values of density, internal angle of friction, and porosity as well as the size, shape, and position of the slump. Model results are very sensitive to the value of cohesion. If the slope were composed entirely of sand, the sediments would possess no cohesion and all slopes were found to be unstable. If the slope was assumed to consist of firmly consolidated sedimentary material, the resulting cohesive strength of 1 kg/cm² would not permit any slope to fail under any load. Clearly, neither scenario is correct because the slope shows irrefutable evidence of failure yet persists as a steeply inclined hillside for many decades to centuries. Thus, some estimate between these end-members was warranted. Because frozen ground precludes sampling the slope and directly estimating cohesion, I referred to common tables of soil properties for cohesion in the soft, sandy till comprising most of the hillside. The value I chose was 0.1 kg/cm². This value is slightly lower than moist-soft clay, but significantly higher than unconsolidated sand. A value slightly lower than moist-soft clay also appears warranted given that the till is thoroughly weathered and probably contains macropores that decrease its cohesive strength.

Model Results:

Slope stability is presented in terms of its "Factor of Safety" (FS). Over fifty FS were determined

for various combinations of soil, slope, and load parameters. (FS below 1 are unstable and likely to experience mass wasting while those above 1 are generally stable). The minimum stability for the existing slope was estimated by creating slump forms in the model that mimic the size and location of known slumps on the hillside (Fig. SS-3A). All FS for the existing slumps are low but stable (i.e., $1 < FS < 2$). This result was expected. The average angle of inclination on the slope is currently 32.6° , or approximately 14° above the value generally accepted as stable. Small slumps tend to have slightly higher FS than larger slumps.

Slope stability remains low, but increases slightly when the slope is modified to 3:1 but otherwise unloaded (i.e., no trains). The additional overburden over the lower portion of the slope causes the FS of small and large slumps to increase by up to 35% (Fig. SS-3B).

Static loads representative of the stress induced by a single diesel locomotive (i.e., 2,800 psf) create differing results on the modified slope (Fig. SS-3C). Over the small slump in the mid-slope, the load applies directly to the uphill side of an underlying slump. Consequently, the (static) stress applies directly toward shearing the slump from the hillside; the resulting FS falls just below 1. For larger slumps, the FS is low but greater than 1. The cause of this condition is related to same effect as discussed earlier. That is, as long as the load is static and does not cause vibrations or excessive hydrostatic pressure in the sediment, the load adds additional weight to the toe of the slope and counteracts the downward force of the uphill sediments. The result is improved stability.

DISCUSSION AND SUMMARY

The modeling results discussed in this report treat scarps optimistically. First, strain softening of till near the scarps was neglected; the soil properties assigned to the scarp were similar to those in the underlying till. Second, excess pore-pressure in the scarp was not modeled. Two observations from slumps in Mankato indicate these modeling parameters will tend to overstate the stability of the slope. First, persistent seeps occur at the toes of slumps in Mankato. Thus, the scarps are probably saturated and the effect of hydrostatic pressure should be considered. Hydrostatic pressure, especially in clay-rich soils, tends to reduce the effective stress and promote failure by shearing or sliding along existing failure surfaces. Second, small-scale rotation is observed in the basal slumps. Because of till is clay-rich, this alignment will tend to reduce the internal angle of friction in the slump and promote continued downward sliding. Although both effects appear warranted in my models of slope stability, they were excluded because insufficient data exists to accurately assess their impact. Consequently, my modeling results are conservative.

My models use a 3:1 gradient of cut and fill. The additional overburden on the toe of the lower slumps stabilizes these features and reduces their tendency to slide. Cut and fill at 2:1 also tends to stabilize the lower slumps, but not to the same degree as 3:1 slopes. However, a 3:1 slope will cover the Blue Earth River with fill. Depending on how the slope is constructed and disposition of the River, the slope could experience any number of responses. Because the draft EIS fails to address the infilling of the river, I cannot create a single, reasonable model that simulates the stability of the slope. Consequently, my results assume the area at the toe of the slope is constructed of the same material as the entire upper slope and the river has been rerouted.

The impact of dynamic loads and vibrations (pseudoseismic events) were not incorporated into my model. Clearly, an applied load of 2,800 psf crossing the slump at 10-40 mph will cause dynamic loads and vibrations. Although software that incorporates these factors must be available for scientists in seismically active areas, my previous work in Minnesota has not required that degree of sophistication. The need for the sophisticated model, however, is unwarranted: Simple static

loads operating on homogeneous and isotropic material cause the slope to become unstable. Thus, while the dynamic load or vibrations might actually cause slope failure, their use in the model of slope stability is unnecessary.

Considering the deliberate exclusion of the aforementioned conditions, my estimate of the slope stability is conservative, erring toward more stable slopes. Thus, the FS values for the loaded slope must be considered significant. The FS values near and below 1 should be considered indicative a genuinely unstable slope.

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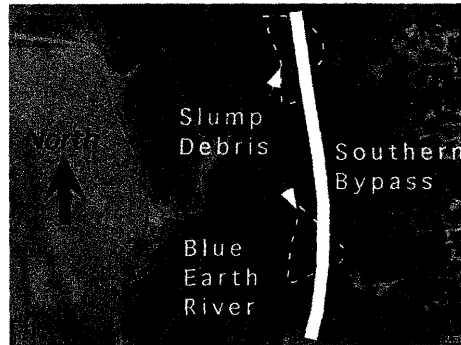
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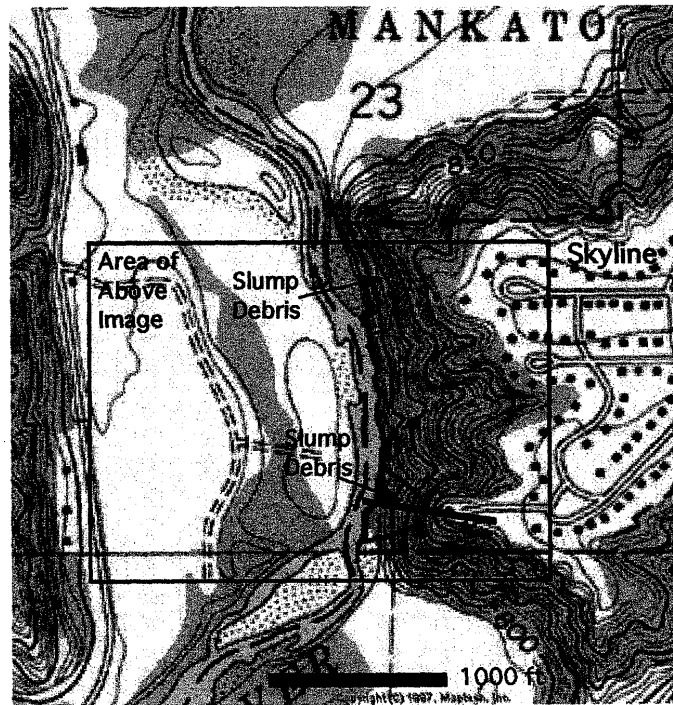
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Satellite image of the DM&E M2 Route west of Skyline, Minnesota



U.S.G.S. topographic quadrangle map for area shown above; The area of the southern slump is outlined in red; the line of a topographic profile is shown as the bold black line.

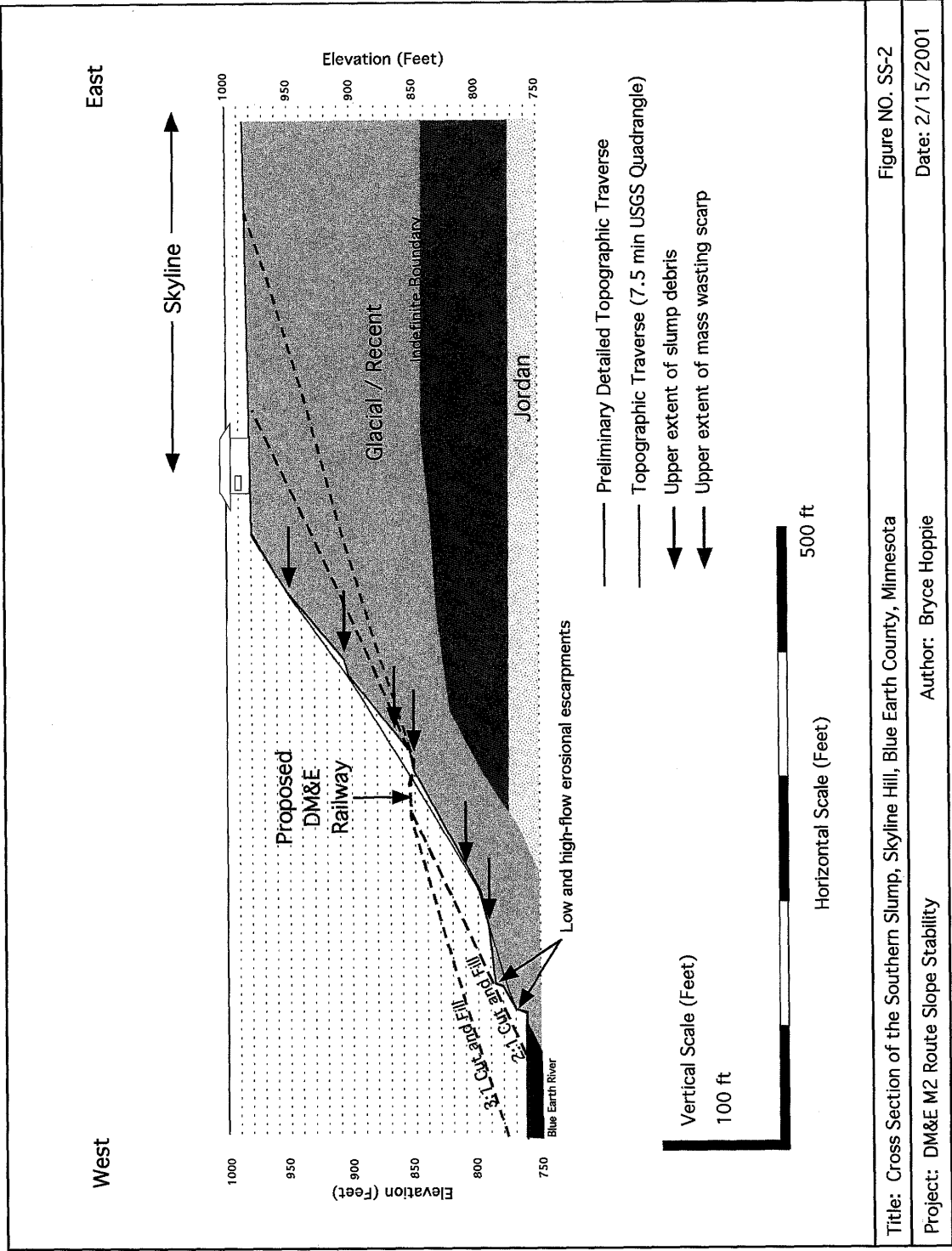
Title: Study Site, Blue Earth County, Minnesota

Figure NO. SS-1

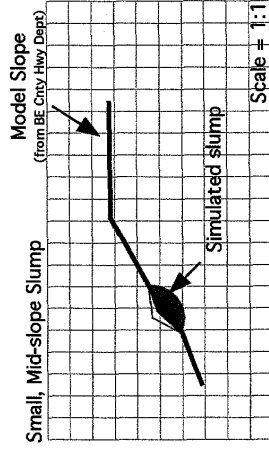
Project: DM&E M2 Route Slope Stability

Author: Bryce Hoppie

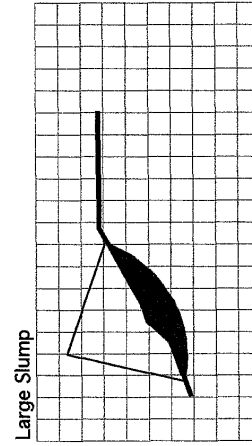
Date: 2/15/2001



A: Existing Slope

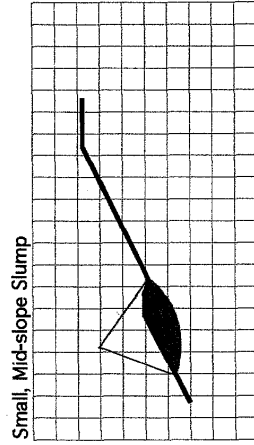


Factor of Safety (FS) = 1.88

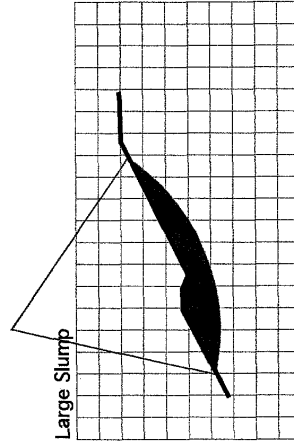


FS = 1.34

B: Modified, Unloaded Slope

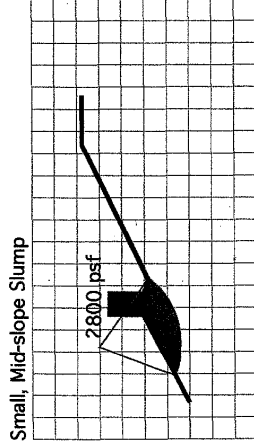


FS = 2.87

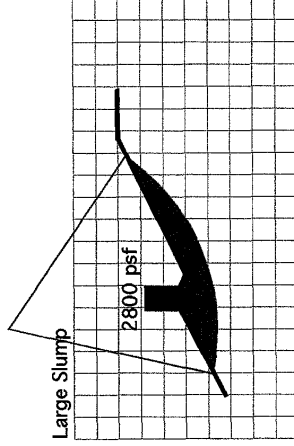


FS = 1.75

C: Modified, Loaded Slope



FS = 0.98



FS = 1.85

Analyses by Fellenius Method of Slices

Common Parameters: Density- 2500 kg/m³; Internal Angle of Friction- 18°; Cohesion- 0.1kg/cm²; Porosity- 50%

Computations by GEOTEC-B(TM); Simulations by B.W. Hoppie (2/14/2001)

Title: Computer Simulations of Slope Stability, Skyline Hill, Blue Earth County, Minnesota

Figure NO. SS--3

Project: DM&E M2 Route Slope Stability

Author: Bryce Hoppie

Date: 2/15/2001

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**Soil Classes and Properties along the DM&E Expansion Route M-2
Mankato Township, Blue Earth County, Minnesota**

B.W. Hoppie, Ph.D.
February 18, 2001

INTRODUCTION AND METHODS

The following report describes the soil classes as well as physical and mechanical properties of along the proposed route of the expanded DM&E railway. This broad soil classes and general characteristics were discussed in my Preliminary Report of December 5, 2000. Please refer to that document for background information regarding origin and evolution of this slope. This report supplies more detailed information and hard data regarding the soils and their properties along the route.

All work contained herein is assumed to follow the route indicated by the Blue Earth County (Minnesota) Highway Department. These large maps are not included with this report. Snow cover and frozen ground precluded first-hand examination and sampling of rocks and soils in this study. Consequently, preexisting maps, photographs, and rock and soil property data were used to augment the small number of field visits used to generate the conclusions of this report.

FIELD OBSERVATIONS, SOIL CLASSES AND PROPERTIES

Table 1 contains a list of the soils found underlying the existing or proposed railway of the DM&E Railroad. The distribution of soils and rocks through the areas of investigation is presented in Figures SM-1 through SM-3.

RESULTS

Bedrocks

The M-2 route is underlain by bedrock through much of northern South Bend Township. The bedrock types include the St. Lawrence (mixed lithologies), Jordan (sandstone), and Oneota (dolostone) formations. Typically, "hard-rock" lithologies like these possess impressive compressive and shear strengths, do not possess a point of saturation above which they act as liquids, and are unaffected by frost action or saturation-dehydration cycles.

Soils: Overview

Soils along the M-2 routes are varied and possess a wide range of properties and sensitivities. Table 2 outlines the sensitivities. The impact of each sensitivity listed in Table 2 is

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discussed below in the context of its impact on construction and long-term viability of the M-2 route.

Flooding: flowing water easily erodes fine-grained materials. Although structures may be armored (e.g., reinforced with rip-rap), the armoring and overlying structure may become threatened when flowing water undermines its flooding.

Frost action: water-prone and argillaceous to hemic/sapric soils expand and contract seasonally. Expansion and contraction need not occur elastically. That is, the amount of expansion and contraction varies in vertical and lateral space. Overlying structures may lose their level and experience rotation.

Low strength: soils fail under light loads. Examples of low strength impacts include shearing on inclined surfaces and lateral displacement or collapse and loss of volume on horizontal surfaces.

Wetness: excess water increases pore-pressure and lowers effective stress. This effect lowers the soil strength. Liquefaction, or the sudden loss of soil strength often resulting from shock, is also of concern in soils with excessive wetness.

Excess humus: humus has very low shear and compressive strengths. Its filamentous to tabular internal structure holds excess water and promotes saturation-dehydration volumetric changes. Humus also degrades generating methane and causing significant volumetric reductions.

Assessment of Surficial Sediments' Sensitivities along the Proposed Route:

Minneopa State Park: This portion of the railway contains the route's greatest concentration of highly sensitive soils. Much of the route runs through the Caron Mucky Peat. A brief field visit during November, 2000 indicated this area is overlain by numerous cattails and boggy areas, and was fully saturated with free-standing water (i.e., it qualifies as a wetland). Contacts among various surface materials are abrupt and dramatic. In one case, the surface cover changes from mucky peat to bedrock within an estimated span of 30 yards (Fig. SM-1).

South Bend Township, west of Le Hillier: The railway is built near the contact of marsh, Chaska Loam, and bedrock (Fig. SM-2). The existing railway covers the contact in several locations. It is not possible to confirm the location of the contacts through much of this stretch.

Blue Earth River Valley: Two concerns present themselves from the available data. The first is significant and occurs where the proposed M-2 railway will pass over portions of the Storden Complex (Fig. SM-3). The Storden material is loosely consolidated, silty to clay-rich loam, and rests upon steeply inclined slopes on the eastern valley wall of the Blue Earth River. Of greatest concern is the diagonal slice the M-2 route strikes across the Storden. Field observations and computer modeling (see Report #2) indicate the Storden is currently metastable through this area and prone to numerous failures by slumping. The second concern exists where the M-2 route meets the southeastern wall of the Blue Earth River Valley. Although less oblique, the M-2 again cuts diagonally across a organic and clay-rich loam that is prone to slumping failure (i.e., the Terril Loam, see Fig. SM-3). Mitigating factors in this area include the more direct approach, shorter traverse, and less steeply inclined hill.

Correlation to AASHTO Soil Classes:

AASHTO classes assess soil properties and mechanics from the view of constructing highway subgrades. Mineral soils are classified in one of seven groups, A-1 through A-7 based on coarse-to fine-grained characteristics, respectively. Group A-8 is reserved for highly organic soils. When laboratory tests of grain-size distribution, liquid limits, and plasticity limits are made, groups A-1, A-2, and A-7 are refined further. Parenthetical index numbers are added to the group names to refine and indicate the desirability of the soil as subgrade material. Index numbers range from 0 for the best and 20 (or higher) for the poorest.

I was not able to determine if AASHTO classes exist for the soils located along the M2 route. Furthermore, winter precluded field sampling for producing my own analyses. To estimate AASHTO classes for the soils along the M-2 route, I correlated their textural and compositional attributes to those from 15 soil samples obtained from various locations in Blue Earth County and reported in the Soil Survey of Blue Earth County, Minnesota, 1978. Results are presented in Table 3.

DISCUSSION AND SUMMARY

The M-2 route cannot function without a portion of the M-1 route west of Minneopa State Park. The overall route will cross many areas composed of variable substrates ranging from Paleozoic bedrock to Recent muck. Bedrock includes dolostone, sandstone, and claystone. Loosely consolidated sediments include sand, silt, and mud. The soils along the route include a wide variety of loams, peat and muck. The contacts among these various materials are often abrupt. The physical and mechanical properties among these materials are often dramatic. Thus, the first concern regarding the surface materials along the M-2 route is their variable soil strength and settling where distinct materials meet. The condition appears particularly acute where highly organic materials (e.g., peat) meet bedrock. Careful design, construction, and maintenance are required to mitigate soil failure or uneven settling where distinct surface materials meet.

The M-2 route includes construction of new railway through bedrock in northern South Bend Township. Construction should present the designers and on-site construction crews with few challenges. The St. Lawrence, Jordan, and Oneota formations all possess considerable compressive strength, are not subject to liquefaction, and appear largely untouched by frost action or saturation-dehydration volume changes. The only significant concern involves locations where the railway will cut diagonally across the fractured Oneota dolostone. Foundering in the underlying claystone (i.e., the Blue Earth Clay) and lateral ground movements are possible impacts. Both effects were discussed in the Preliminary Report of December 5, 2000. As of this reporting, no new data has been obtained and the concerns expressed in the earlier report cannot be amplified.

Preliminary engineering design plans of the M-2 route created by the Blue Earth County Highway Department show the railway placed on sensitive soils near Minneopa State Park and in northern South Bend Township, west of Le Hillier. While loams and argillaceous sands are prone to frost action and saturation-dehydration volumetric changes, their impact on rail alignment and stability are subordinate to the effects associated with hemic, saproic, coprogenous soils occupying

wetlands along the M-2 route. The latter types present significant challenges to heavy construction in northern climates. They all have low strength, low liquid limits, high saturation, and significant reactions to frost action and saturation-dehydration cycles. They are also prone to long term volumetric changes due to ongoing biodegradation of subsurface organic matter. Soil failure and/or differential settling are among the concerns associated with placing heavy loads on this soils.

The M-2 route through the Blue Earth River Valley overlies soils with different expected responses to new construction. In the northern valley and again in the south-central portion of the valley, the M-2 will pass over sandy to silty alluvial to loamy sediments. Sensitivity to construction and loading in these areas should be slight. A different response, and one of significant concern, exists where the M-2 passes over the Storden Complex and Terril Loam (Fig. SM-3). These soils exist on are oranic to clay-rich and lie on steeply inclined slopes.. Soil failure and slumping in these areas indicate the material is unable to bear its current load—additional loads are likely to cause ongoing slope failures and will require engineering design to mitigate negative impacts.

REFERENCES

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Rahn, P., Engineering Geology: An Environmental Approach (Second Ed.). Upper Saddle River, New Jersey, Prentice-Hall Inc., 1996. 651p.

Soil Survey of Blue Earth County, Minnesota: United States Department of Agriculture, Soil Conservation Service, Washington, D.C, 1978. 212 p.

Soil Analyses of DM&E route M-2

Table 1: Soil Classes along the M1 & M2 DM&E expansion route

Area	Soil No.	Name	Unified Class.	LL %	PI %
BER	17	Minneopa Sandy Loam	SM		NP
	94B	Terril Loam (2-6% Slope)	OL, CL	25-40	8-15
	94C	Terril Loam (6-15% Slope)	OL, CL	25-40	8-15
	329	Chaska Loam	OL, CL, ML	30-40	5-15
	363	Minneopa Loamy Fine Sand	SM		NP
	451	Dorchester Loam	ML, CL-ML, CL	25-35	5-10
	961	Storden Complex, Very Steep	ML, CL, CL-ML	30-40	5-15
	961F	Storden Complex, (24-45% Slope)	ML, CL, CL-ML	30-40	5-15
	1001	Alluvium, Occasionally Flooded	None Available		
	1002	Alluvium, Frequently Flooded	None Available		
MSP	222B	Lasa Fine Sand	SM, SP-SM		NP
	329	Chaska Loam	OL, CL, ML	30-40	5-15
	539	Palms Muck	Pt		
	992	Bedrock			
	1800	Caron Mucky Peat	Pt	40-50	5-10
SBT	329	Chaska Loam	OL, CL, ML	30-40	5-15
	440	Copaston Loam	SM, ML	30-40	NP-10
	923	Copaston Rock	SM, ML	30-40	NP-10
	992	Bedrock			
	1002	Alluvium	None Available		
	1053	Marsh	s		

Notes to Table 1:

Areas: BER is the Blue Earth River area; MSP is the Minneopa State Park area; SBT is the area in South Bend Township west of Le Hillier.

All data from the Soil Survey of Blue Earth County, Minnesota, 1978. LL is liquid limit; PI is plasticity index).

Unified Soil Classification System is reported because those data are the most complete. American Association of State Highway and Transportation Officials (AASHTO) data are not complete and not reported here. See Results for a brief interpretation of likely AASHTO classification numbers for the soils in Table 1.

Soil Analyses of DM&E route M-2

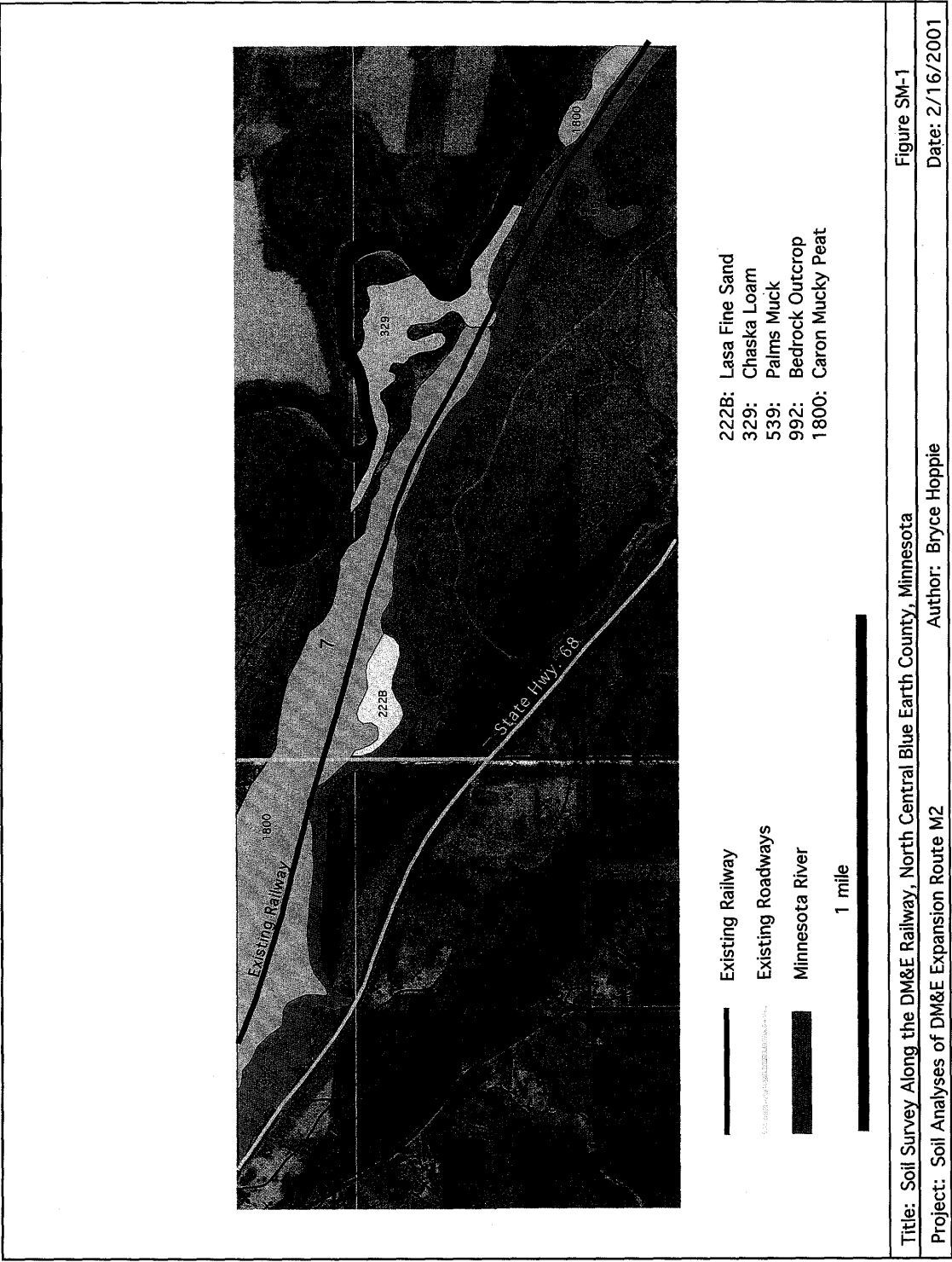
Table 2: Soil sensitivities along the M-2 route, by soil type.

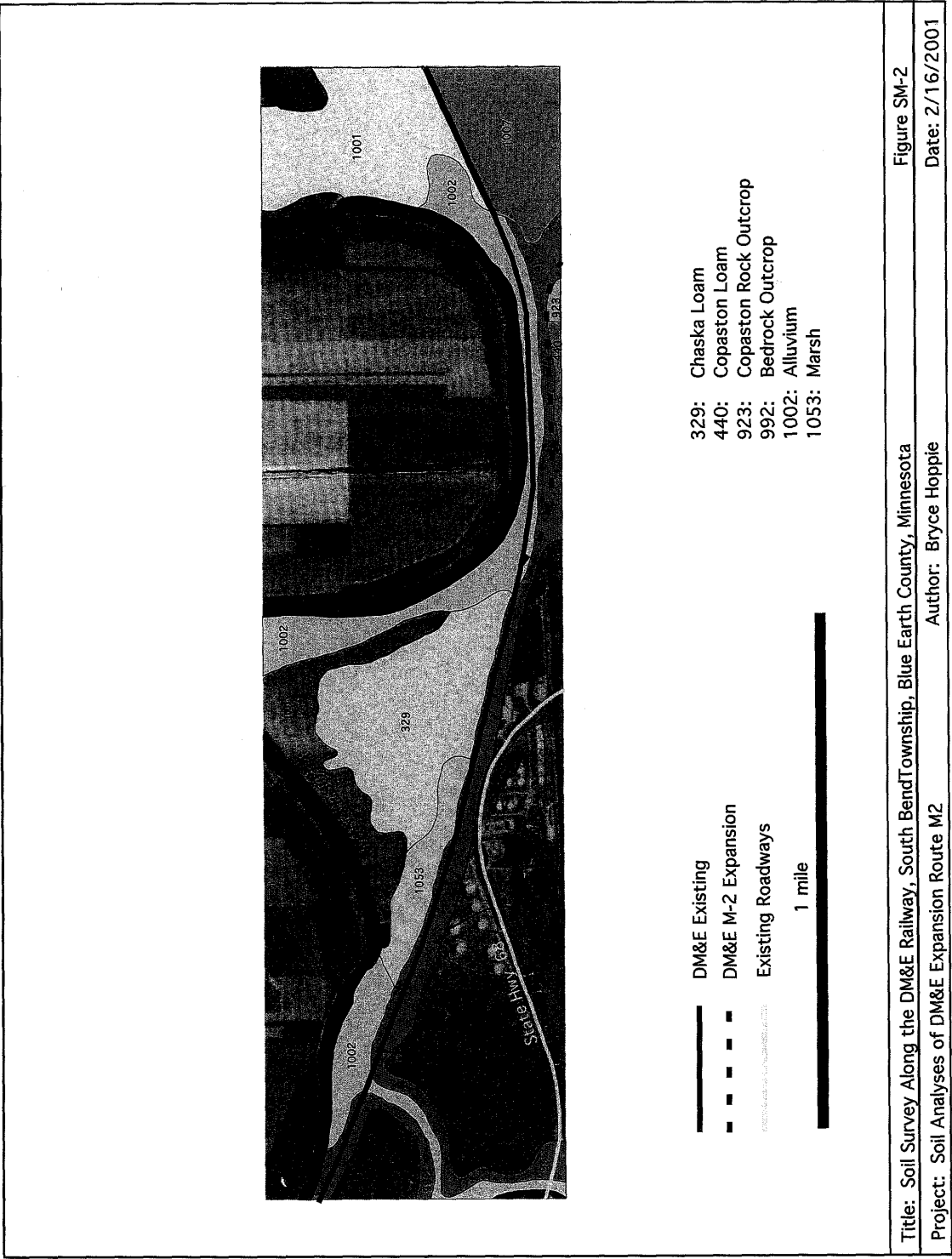
Soil No.	Name	Construction Sensitivity
17	Minneopa Sandy Loam	Moderate: flooding and frost action
94B&C	Terril Loam	Moderate: low strength and frost action
222B	Lasa Fine Sand	Slight: piping
329	Chaska Loam	Severe: wetness, floods, frost action
363	Minneopa Loamy Fine Sand	Severe: floods
440 & 923	Copaston Soils	Slight
451	Dorchester Loam	Severe: floods, low strength, frost action
539	Palms Muck	Severe: wetness, floods, low strength, excess humus
961, F	Storden Complexes	Severe: slope
992	Bedrock	Slight
1001, 2	Alluvium	Not rated
1053	Marsh	Severe: wetness, floods, low strength, excess humus
1800	Caron Mucky Peat	Severe: wetness, floods, low strength, excess humus

Soil Analyses of DM&E route M-2

Table 3: Approximate AASHTO classes for soils along the M2 route.

Soil No.	Name	AASHTO Class (Estimated)
17	Minneopa Sandy Loam	A-3 (5+)
94B&C	Terril Loam	A-7-6 (20) to A-8
222B	Lasa Fine Sand	A-2, A-3
329	Chaska Loam	A-4 (8-12) to A-7-6 (20)
363	Minneopa Loamy Fine Sand	A-2, A-4
440 & 923	Copaston Soils	A-4 (7) through A-7-5 (12)
451	Dorchester Loam	A-4 (7) through A-7-6 (16)
539	Palms Muck	A-8
961, F	Storden Complexes	A-4 (7) through A-7-6 (16)
992	Bedrock	Not rated
1001, 2	Alluvium	Not rated
1053	Marsh	A-8
1800	Caron Mucky Peat	A-8







 DM&E M-2 Expansion
 Existing Roadways
 Blue Earth River
 1 mile

17: Minneopa Sandy Loam
 94B: Terril Loam (2-6% Slope)
 94C: Terril Loam (6-15% Slope)
 329: Chaska Loam
 363: Minneopa Loamy Fine Sand
 451: Dorchester Loam
 961: Storden Complex, Very Steep
 961F: Storden Complex (24-45% Slope)
 1001: Alluvium, Occasionally Flooded
 1002: Alluvium, Frequently Flooded

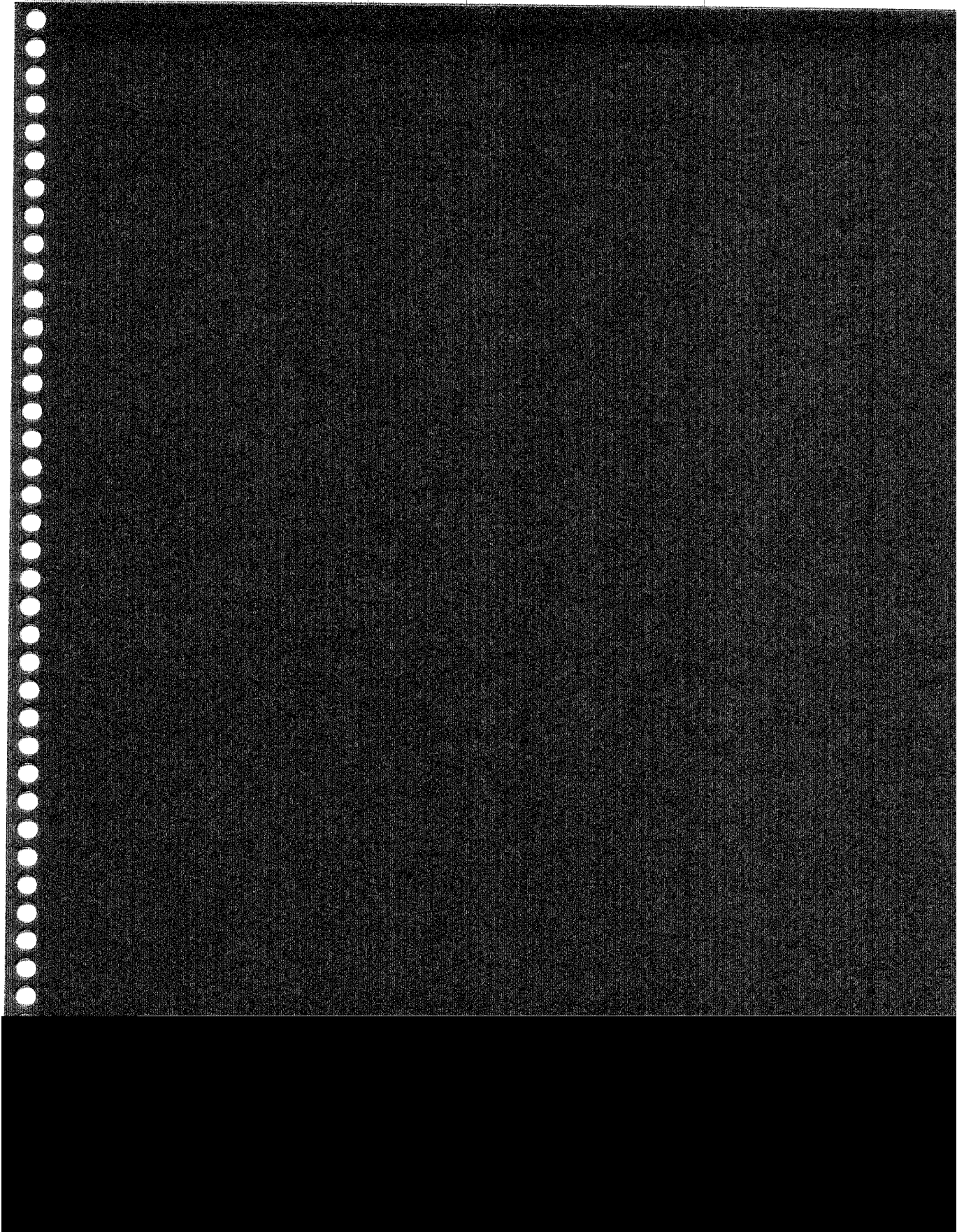
Title: Soil Survey Along the DM&E Railway,
Blue Earth River Valley, Blue Earth County, Minnesota

Figure SM-3

Project: Soil Analyses of DM&E Expansion Route M2

Author: Bryce Hoppie

Date: 2/16/2001



RESUME

1. **Name:** Bryce William Hoppie **Birth Date:** September 3, 1963
2. **Title / Address:** Assistant Professor of Geology
Department of Chemistry and Geology
Minnesota State University
Mankato, MN 56001
3. **Degrees:**

B.S.	Geological Engineering	South Dakota School of Mines and Technology	1986
		Rapid City, South Dakota	
Ph. D.	Earth Sciences	University of California, Santa Cruz, California	1996
4. **Years on this Faculty:** 4
5. **Other Related Experience:**
 - A) Academic

University of California, Santa Cruz	1991-1996	Teaching Assistant
University of California, Santa Cruz	1991-1996	Graduate Research Assistant
South Dakota Geological Survey	1984	Summer Intern
 - B) Industrial

Shell Western E&P Inc.	1988-1991	Geological Engineer
Shell Western E&P Inc.	1986-1988	Petrophysical Engineer
Shell California Production, Inc.	1985	Geological Engineer Intern
6. **Consulting, Patents, etc.:**

Bryce Hoppie Geological Consulting, Mankato, Minnesota
Consulting Geologist: Melland Engineering, Bakersfield, California
7. **Professional Registration:**

Professional Geologist (Minnesota) License No. 30541
8. **Publications:**

In Sub. Hoppie, B. W. and Garrison, R. E., Miocene Phosphate Accumulation in the Cuyama Basin, Southern California. Submitted to Marine Geology, June, 2000.

In Sub. Hoppie, B. W. and Garrison, R. E., Post-rifting stratigraphic development in a transform margin basin: The Miocene Cuyama Basin, California. Submitted to the Journal of Sedimentary Petrology, May, 2000.

1999 Fisher, A. T., Von Herzen, R., Blum, P., Hoppie, B., and Wang, K., Evidence may indicate recent warming of shallow slope bottom water off New Jersey shore: Eos, Transactions of the American Geophysical Union, Vol. 80, No. 15, p. 165, 172-173.

1998 Hoppie, B.W., The tectonic control on marginal environments of the Miocene Cuyama Basin, southern California, interpreted from phosphatic strata. Eos, Transactions of the American Geophysical Union, vol. 79, no. 45, p. F474.

1998 Hoppie, B. W., Syn- to Post-Rifting Transitional Sequences in a Transform Margin Basin: The Cuyama Basin, California. 1998 Annual AAPG/SEPM Conference, Salt Lake City, Utah.

Publications (Continued)

- 1996 Hoppie, B. W., High resolution lithological characterization of sequences on the New Jersey Margin slope: the inversion of ODP Leg 150 logging data for lithologies, *in* Miller, K. G., Mountain, G., et al., Proc. of the Ocean Drilling Program, Scientific Results Vol. 150, The New Jersey Continental Slope and Rise: Ocean Drilling Program, College Station, Texas. p. 385 - 410.
- 1996 Hoppie, B. W., Depth and density corrections for ODP Leg 150 shipboard GRAPE data, *in* Miller, K. G., Mountain, G. S., et al., Proceedings of the Ocean Drilling Program, Scientific Results Vol. 150, The New Jersey Continental Slope and Rise: Ocean Drilling Program, College Station, Texas. p. 461 - 470.
- 1996 Christensen, B. A., Hoppie, B. W., Thunell, R. C., Miller, K. G., and Burckle, L., Pleistocene Age Models, *in* Miller, K. G., Mountain, G. S., et al., Proceedings of the Ocean Drilling Program, Scientific Results Vol. 150, The New Jersey Continental Slope and Rise: Ocean Drilling Program, College Station, Texas. p. 115 - 128.
- 1996 Vecsei, A., and Hoppie, B. W., Sequence stratigraphy and diagenesis of the Miocene-Oligocene below New Jersey continental slope: implications of physical properties and mineralogical variations, *in* Miller, K. G., Mountain, G. S., et al., Proceedings of the Ocean Drilling Program, Scientific Results Vol. 150, The New Jersey Continental Slope and Rise: Ocean Drilling Program, College Station, Texas. p. 385 - 410.
- 1996 Miller, Kenneth G., et al., Drilling and dating New Jersey Oligocene-Miocene sequences; ice volume, global sea level, and Exxon records: Science, v. 271, p. 1092-1095.
- 1996 Hoppie, B. W., Nearshore facies of the Miocene Cuyama Basin, California, and implications to reservoir development in transtensional basins. Invited presentation to 1996 Annual AAPG/SEPM Conference, San Diego, California.
- 1995 Hoppie, B. W., Sea-level records from sequence stratigraphic data on continental slopes: use caution and multi-disciplinary data. Transcripts, 1st SEPM Sedimentary Congress.
- 1994 Hoppie, B. W., Blum, P., and the Shipboard Scientific Party, Natural gamma-ray measurements on ODP cores: introduction to procedures with examples from Leg 150, *in* Miller, K. G., Mountain, G. S., Blum, P. et al., Proceedings of the Ocean Drilling Program, Vol. 150 Initial Reports: The New Jersey Continental Slope and Rise: Ocean Drilling Program, College Station, Texas. p. 51-62.
- 1994 Miller, K. G., et al., Site Reports, *in* Miller, K. G., Mountain, G. S., Blum, P. et al., Proceedings of the Ocean Drilling Program, Vol. 150 Initial Reports: The New Jersey Continental Slope and Rise: Ocean Drilling Program, College Station, Texas. p. 63-360.
- 1994 Garrison, R. E., Hoppie, B. W., and Grimm, K. A., Phosphates and dolomites in coastal upwelling sediments of the Peru Margin and the Monterey Formation (Naples Beach section), California, *in* Hornafius, J. S., (ed.) Field Guide to the Monterey Formation Between Santa Barbara and Gaviota, California: Pacific Section, SEPM, Special Publication No. GB-72. p. 67-84.
- 1994 Christensen, B. A., Hoppie, B. W., Miller, K. G., Thunell, R. C., and Le, J. High resolution sediment changes on the Pleistocene NJ upper slope. Eos, Transactions of the American Geophysical Union, vol. 75, no. 44. p. 348.
- 1994 Greene, T. J., and Hoppie, B. W. Relationships between deformation and carbonate diagenesis in the Cuyama Depositional Basin, California. GSA 1994 Annual Convention Abstracts with Programs. p. 467.
- 1993 Hoppie, B. W., and Garrison, R. E., Sequence Stratigraphy of the Middle and Late Miocene Cuyama Basin, AAPG Bulletin, vol. 77, No. 4. p. 700-701.
- 1993 Hoppie, B. W., Shelfal sedimentary processes and cycles in a Miocene upwelling environment, The Log Analyst, SPWLA, Houston TX. February, 1993. p. 88.

9. Scientific and Professional Societies Memberships

American Geophysical Union (AGU), 1995-present
 Geological Society of America (GSA), 1991-present
 International Association of Sedimentologists (IAS), 1993-present
 Society of Economic Paleontologists and Mineralogists (SEPM), 1991-present

10. **Honors and Awards**

Alpha Chi Omega Nominee: Outstanding Teacher, MSUM, 1999
UC Santa Cruz Outstanding Teaching Assistant, 1996
Selected for Shipboard Scientific Parties, Ocean Drilling Program Legs 150 and 175, 1993 and 1997
Student Excellence and Development Award, Society of Economic Paleontologists and Mineralogists, 1992
Regents' Fellowship, University of California, Santa Cruz, 1991
Shell Western E&P Inc., Special Recognition Award, 1990
Outstanding Senior Geological Engineering Student Award, SDSM&T, 1986
Graduate with High Honors, SDSM&T, 1986
Registered Engineer-In-Training, 1986
Elected Tau Beta Pi National Engineering Academic Society, 1985
Elected Pi Mu Epsilon National Mathematics Society, 1985
Tenneco E&P, Twin City Alumni, and Melvin Haslem Academic Scholarships, 1983-86

11. **Courses Taught this Year**

Spring, 1999

Geol 122 Earth History	(3 Lect., 1 Lab., 4 Cr.) Day
Geol 350 Environmental Geology	(3 Lect., 1 Lab., 4 Cr.) Day

Fall, 2000

Geol 100 Our Geologic Environment	(2 Lect., 1 Lab., 3 Cr.) Night
Geol 121 Physical Geology	(3 Lect., 1 Lab., 4 Cr.) Day
Geol 201 Elements of Mineralogy	(3 Lect., 1 Lab., 4 Cr.) Day
Geol 490 Workshop: Geology of the Black Hills	(Extended Campus, 3 Cr.)

Spring, 2000

Geol 122 Earth History- Laboratory only	(1 Lab., 1 Cr.) Day
Geol 450 Hydrogeology	(2 Lect., 1 Lab., 3 Cr.) Day

12. **Other Assigned Duties**

Infusing Technology into the Earth Science Teaching Program (Research fund by U.S. Dept. of Education)	20 hrs./wk.
Chemistry and Geology Budget, Planning, & Curriculum Committee	1 hr./wk.
Student Advising	1 hr./wk.

13. **Professional Development**

GSA National Convention, Reno, Nevada, November, 2000
St. Croix Watershed Rendezvous, October, 2000
Minnesota Ground Water Association Spring Convention, May, 2000
AGU Fall National Convention, San Francisco, California, December 1998
AAPG National Convention, Salt Lake City, Utah, May, 1998
Classroom Assessment Techniques Workshop, Mankato, Minnesota, February, 1997
AAPG National Convention, San Diego, California, May 1996
AGU National Convention, San Francisco, California, December, 1995
SEPM Sedimentary Congress, St. Petersburg, Florida, August, 1995
GSA National Convention, Seattle, Washington, October, 1994

14. **Other Duties**

Contributing Content Area Specialist, Minnesota Minerals Education Workshop
Instructor, Blue Earth County Environmental Day Camp

Unique No. 00147952 County Name Blue Earth		MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING RECORD Minnesota Statutes Chapter 1031			Update Date 1997/07/09 Entry Date 1997/06/17																				
Township Name Township Range Dir Section Subsection 108 27 W 23 DACADD		Well Depth Depth Completed Date Well Completed 501 ft. 501 ft. 1977/08/15																							
Well Name SKYLINE		Drilling Method Cable Tool																							
Contact's Name SKYLINE MANKATO MN 56001		Drilling Fluid		Well Hydrofractured? ☐ Yes ☐ No From ft. to ft.																					
Contact's Name MANKATO MN 56001		Use Community Supply (municipal)																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">GEOLOGICAL MATERIAL</th> <th style="width: 20%;">COLOR</th> <th style="width: 20%;">HARDNESS</th> <th style="width: 10%;">FROM</th> <th style="width: 10%;">TO</th> </tr> </thead> <tbody> <tr> <td>DRIFT</td> <td>BROW</td> <td></td> <td>0</td> <td>261</td> </tr> <tr> <td>SHALE, LIME ROCK</td> <td>GRAY</td> <td></td> <td>261</td> <td>480</td> </tr> <tr> <td>JORDON SANDSTONE</td> <td>WHITE</td> <td></td> <td>480</td> <td>501</td> </tr> </tbody> </table>		GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO	DRIFT	BROW		0	261	SHALE, LIME ROCK	GRAY		261	480	JORDON SANDSTONE	WHITE		480	501	Casing Drive Shoe? ☒ Yes ☐ N		Hole Diameter	
		GEOLOGICAL MATERIAL	COLOR	HARDNESS	FROM	TO																			
		DRIFT	BROW		0	261																			
		SHALE, LIME ROCK	GRAY		261	480																			
JORDON SANDSTONE	WHITE		480	501																					
Casing Diameter Weight(lbs/ft) 12 in. to 263 ft 8 in. to 297 ft																									
		Screen N		Open Hole From 263 ft. to 501 ft. Make Type																					
		Static Water Level 220 ft. from Land surface Date 1977/08/15																							
		PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.																							
		Well Head Completion Pitless adapter mfr Model Casing Protection ☐ 12 in. above grade ☐ At-grade(Environmental Wells and Borings ONLY)																							
		Grouting Information Well grouted? ☒ Yes ☐ No <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Material</th> <th style="width: 10%;">From</th> <th style="width: 10%;">To (ft.)</th> <th style="width: 10%;">Amount(yds/bags)</th> </tr> </thead> <tbody> <tr> <td>G</td> <td>0</td> <td>297</td> <td>5 Y</td> </tr> </tbody> </table>					Material	From	To (ft.)	Amount(yds/bags)	G	0	297	5 Y											
Material	From	To (ft.)	Amount(yds/bags)																						
G	0	297	5 Y																						
		Nearest Known Source of Contamination ft. direction type Well disinfected upon completion? ☐ Yes ☐ No																							
		Pump ☐ Not Installed Date Installed Y Mfr name FLOWAY Model 6JKL HP 25 Volts 220 Drop Pipe Length 275 ft. Capacity 150 g.p.m. Type S																							
		Any not in use and not sealed well(s) on property? ☐ Yes ☐ No																							
		Was a variance granted from the MDH for this Well? ☐ Yes ☐ No																							
USGS Quad: Mankato West Elevation 985 Aquifer: MTPL Alt Id:		Well CONTRACTOR CERTIFICATION Lic. Or Reg. No. 27022 License Business Name Mccarthy Well Co. Name of Driller																							

Report Copy

Unique No. 00147952		MINNESOTA DEPARTMENT OF HEALTH WELL AND BORING RECORD <i>Minnesota Statutes Chapter 1031</i>						Update Date 1997/07/09			
County Name Blue Earth								Entry Date 1997/06/17			
Township Name	Township	Range	Dir	Section	Subsection	Well Depth		Depth Completed	Date Well Completed		
	108	27	W	23	DACADD	501 ft.		501 ft.	1977/08/15		
Well Name SKYLINE				Lic. Or Reg. No. 27022		Name of Driller					
USGS Quad Mankato W		Elevation	985	Aquifer		MTPL		Alternative Id			
GEOLOGICAL MATERIAL				COLOR	HARDNESS	FROM	TO	STRAT	LITH PRIM	LITH SEC LITH MINOR	
DRIFT				BROWN		0	261	QUUB	DRFT		
				DRFT = Drift							
SHALE, LIME ROCK				GRAY		261	480	CSLF	SLSN	DLMT SNDS	
CSLF = St.Lawrence-Franconia				SLSN = Siltstone		DLMT = Dolomite			SNDS = Sandstone		
JORDON SANDSTONE				WHITE		480	501	CIGL	SNDS		
CIGL = Ironton-Galesville				SNDS = Sandstone							



Ken White**From:** Kelly P. Coleman [kcoleman@teltech.com]**Sent:** Tuesday, February 27, 2001 3:31 PM**To:** kwhite@mctcnet.net**Subject:** DM&E's Safety Record 1986-2000**TRAIN ACCIDENTS BY CAUSE FROM FORM FRA F 6180.54**

Selections: Railroad - Dakota, Minnesota & Eastern Railroad
 State - ALL, County - ALL
 ALL ACCIDENT TYPES / ALL TRACK TYPES / ALL CAUSES
 Time Frame: Jan 1986 To Nov 2000

MAJOR CAUSE= Equipment

Specific causes:	Total		Type of Accident		Reportable Damage	
	Cnt	%	Der	Othr	Amount	
E05C- Brk valve malf. (undesired emergency)	1	0.3	1	-	17,200	
E07C- Rigging down or dragging	3	0.8	3	-	55,017	
E21C- Center sill broken or bent	1	0.3	1	-	30,400	
E23C- Center plate broken or defective	1	0.3	1	-	239,821	
E24C- Ctr plate disengaged from truck	5	1.4	5	-	453,951	
E25C- Center pin broken or missing	1	0.3	1	-	81,500	
E29C- Other body defects, (CAR)	1	0.3	1	-	13,750	
E34C- Draft gear/mechanism broke/defective	1	0.3	-	1	29,150	
E39C- Oth coupler/draft system defects-car	1	0.3	1	-	8,700	
E40C- Side bearing clearance insufficient	1	0.3	1	-	36,726	
E42C- Side bearing(s) broken	1	0.3	1	-	185,786	
E44C- Truck bolster broken	1	0.3	1	-	128,300	
E47C- Defective snubbing	1	0.3	1	-	118,037	
E49C- Other truck component defects, (CAR)	2	0.6	2	-	106,384	
E52C- Journal (plain) failure from overheat	4	1.1	4	-	80,420	
E53C- Journal (roller bearing) overheating	6	1.7	6	-	603,704	
E59C- Oth axle/journal bearing defect-car	1	0.3	1	-	45,000	
E64C- Worn Flange	1	0.3	1	-	85,000	
E69C- Other wheel defects (CAR)	1	0.3	1	-	8,975	
E83C- Box car door, other than plug, open	1	0.3	1	-	7,700	
-- Total	35	9.9	34	1	2,335,521	

MAJOR CAUSE= Highway-rail

Specific causes:	Total		Type of Accident	Reportable Damage	
	Cnt	%		Amount	%
M302- Highway user inattentiveness	1	0.3	1	326,500	1.3

2/27/01

M399- Other causes (highway-rail collisions)	2	0.6	2	230,000	0.9
-- Total	3	0.8	3	556,500	2.3

MAJOR CAUSE= Human

Specific causes:	Total		Type of Accident			Reportable
	Cnt	%	Coll	Der	Othr	Amount
H017- Failure to secure engine- rr empl	1	0.3	-	1	-	52,5
H018- Fail to secure car hnd brk -rr emp	3	0.8	1	2	-	69,5
H021- Fail to apply car hnd brks -rr emp	2	0.6	-	2	-	52,4
H022- Fail to secure equip - not rr emp	1	0.3	-	1	-	34,0
H301- Car(s) shoved out & left out of clear	1	0.3	-	1	-	19,2
H302- Cars left foul	3	0.8	-	2	1	62,7
H303- Derail, failure to apply or remove	1	0.3	-	1	-	8,2
H306- Shoving movement, absence of man	4	1.1	-	4	-	79,9
H312- Passed couplers	2	0.6	-	2	-	20,3
H399- Other general switching rules	1	0.3	-	-	1	25,2
H501- Improper train make-up at init term	1	0.3	-	1	-	3,5
H503- Buff/slack action excess, trn handling	2	0.6	-	2	-	64,7
H504- Buff/slack action excess, trn make-up	1	0.3	-	1	-	120,6
H505- Lat DB force on curve xcess trn hndng	2	0.6	-	2	-	111,7
H513- Automatic brake, other improper use	1	0.3	-	1	-	276,5
H525- Independent brake, improper use	1	0.3	-	1	-	62,1
H526- Failure to actuate off independent brk	2	0.6	-	1	1	44,1
H599- Other train handling/makeup	1	0.3	-	1	-	57,7
H603- Train inside yard limits, excess speed	1	0.3	-	1	-	198,9
H604- Train outside yd limits, excess speed	3	0.8	-	3	-	171,8
H699- Speed, other	2	0.6	-	2	-	247,4
H702- Switch improperly lined	11	3.1	-	11	-	163,1
H999- Other train operation/human factors	1	0.3	-	1	-	11,5
-- Total	48	13.6	1	44	3	1,958,3

MAJOR CAUSE= Miscellaneous

Specific causes:	Total		Type of Accident		Reportable Dama
	Cnt	%	Der	Othr	Amount
M101- Snow,ice,mud,gravel,coal,etc. on trk	2	0.6	2	-	16,150
M203- Overloaded car	1	0.3	1	-	262,700
M404- Obj/equip on/fouling track, other	1	0.3	1	-	17,030
M405- Harmonic rock off, etc.	10	2.8	10	-	490,829
M501- Interference(not vandals)with RR op.	3	0.8	2	1	57,995
M502- Vandalism of on-track equipment	2	0.6	1	1	44,874
M503- Vandalism of track or track appliances	3	0.8	2	1	912,581
M504- Fail by non-rr empto control spd of car	1	0.3	1	-	25,350
M599- Other miscellaneous causes	1	0.3	1	-	35,390

-- Total	24	6.8	21	3	1,862,899
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MAJOR CAUSE= Track

Specific causes:	Total		Type of Accident		Reportable Dam Amount
	Cnt	%	Der	Othr	
T001- Roadbed settled or soft	9	2.5	9	-	437,852
T002- Washout/rain/slide/etc. dmg -track	1	0.3	1	-	595,300
T101- Cross level of track irregular(joints)	21	5.9	21	-	1,020,265
T102- Cross level track irreg.(not at joints)	66	18.7	66	-	2,943,083
T103- Deviate frm uniform top of rail profile	2	0.6	2	-	44,190
T106- Superelevation improper, excessive,etc.	2	0.6	2	-	153,850
T107- Superelevation runoff improper	1	0.3	1	-	65,380
T108- Trk alignmnt irreg-not buckled/sunkink	5	1.4	5	-	277,963
T109- Track alignment irreg(buckled/sunkink)	20	5.7	20	-	1,263,510
T110- Wide gage(defective/missing crossties)	28	7.9	28	-	636,296
T111- Wide gage(spikes/other rail fasteners)	1	0.3	1	-	40,751
T199- Other track geometry defects	1	0.3	1	-	5,500
T201- Bolt hole crack or break	2	0.6	2	-	268,650
T202- Broken base of rail	4	1.1	4	-	362,189
T204- Broken weld (field)	1	0.3	1	-	87,400
T205- Defective or missing crossties	1	0.3	1	-	57,600
T207- Detail fracture - shelling/head check	8	2.3	8	-	2,738,137
T210- Head and web sep(outside jt bar limit)	5	1.4	5	-	417,084
T211- Head & web separation-in jt bar limit	1	0.3	1	-	299,651
T212- Horizontal split head	1	0.3	1	-	144,947
T213- Joint bar broken (compromise)	1	0.3	1	-	453,672
T215- Joint bar broken (noninsulated)	2	0.6	2	-	151,800
T218- Piped rail	1	0.3	1	-	300
T220- Transverse/compound fissure	16	4.5	16	-	2,135,587
T221- Vertical split head	19	5.4	19	-	2,200,212
T299- Other rail and joint bar defects	1	0.3	1	-	313,485
T308- Stock rail worn, broken, disconnected	1	0.3	1	-	51,283
T311- Switch damaged or out of adjustment	4	1.1	4	-	71,157
T314- Switch point worn or broken	14	4.0	14	-	303,159
T315- Switch rod worn, bent, broken, etc.	1	0.3	1	-	194,951
T399- Oth frog, switch, trk appliance defect	2	0.6	2	-	12,810
T401- Bridge misalignment or failure	1	0.3	-	1	34,500
-- Total	243	68.8	242	1	17,782,514

Ken White

From: Kelly P. Coleman [kcoleman@teltech.com]

Sent: Tuesday, February 27, 2001 3:31 PM

To: kwhite@mctcnet.net

Subject: DM&E's Safety Record 1996-2000

TRAIN ACCIDENTS BY CAUSE FROM FORM FRA F 6180.54

Selections: Railroad - Dakota, Minnesota & Eastern Railroad
 State - ALL, County - ALL
 ALL ACCIDENT TYPES / ALL TRACK TYPES / ALL CAUSES
 Time Frame: Jan 1996 To Nov 2000

MAJOR CAUSE= Equipment

Specific causes:	Total		Type of Accident	Reportable Damage		Ca
	Cnt	%		Amount	%	Kld
E21C- Center sill broken or bent	1	1.0	1	30,400	0.3	0
E23C- Center plate broken or defective	1	1.0	1	239,821	2.3	0
E24C- Ctr plate disengaged from truck	1	1.0	1	262,250	2.5	0
E39C- Oth coupler/draft system defects-car	1	1.0	1	8,700	0.1	0
E53C- Journal (roller bearing) overheating	3	2.9	3	279,600	2.6	0
-- Total	7	6.7	7	820,771	7.7	0

MAJOR CAUSE= Human

Specific causes:	Total		Type of Accident		Reportable Damage	
	Cnt	%	Der	Othr	Amount	%
H021- Fail to apply car hnd brks -rr emp	2	1.9	2	-	52,456	0.5
H022- Fail to secure equip - not rr emp	1	1.0	1	-	34,000	0.3
H302- Cars left foul	2	1.9	1	1	41,269	0.4
H306- Shoving movement, absence of man	2	1.9	2	-	57,500	0.5
H399- Other general switching rules	1	1.0	-	1	25,249	0.2
H501- Improper train make-up at init term	1	1.0	1	-	3,520	0.0
H505- Lat DB force on curve xcess trn hndlng	1	1.0	1	-	56,850	0.5
H525- Independent brake, improper use	1	1.0	1	-	62,100	0.6
H526- Failure to actuate off independent brk	2	1.9	1	1	44,150	0.4
H603- Train inside yard limits, excess speed	1	1.0	1	-	198,952	1.9
H604- Train outside yd limits, excess speed	1	1.0	1	-	139,050	1.3
H699- Speed, other	1	1.0	1	-	48,500	0.5
H702- Switch improperly lined	3	2.9	3	-	25,535	0.2
-- Total	19	18.3	16	3	789,131	7.4

2/27/01

MAJOR CAUSE= Miscellaneous

Specific causes:	Total		Type of Accident		Reportable Damage	
	Cnt	%	Der	Othr	Amount	%
M101- Snow,ice,mud,gravel,coal,etc. on trk	1	1.0	1	-	8,150	0.1
M203- Overloaded car	1	1.0	1	-	262,700	2.5
M404- Obj/equip on/fouling track, other	1	1.0	1	-	17,030	0.2
M405- Harmonic rock off, etc.	2	1.9	2	-	37,890	0.4
M501- Interference(not vandals)with RR op.	1	1.0	-	1	10,270	0.1
M502- Vandalism of on-track equipment	2	1.9	1	1	44,874	0.4
M503- Vandalism of track or track appliances	3	2.9	2	1	912,581	8.6
M504- Fail by non-rr empto control spd of car	1	1.0	1	-	25,350	0.2
-- Total	12	11.5	9	3	1,318,845	12.4

MAJOR CAUSE= Track

Specific causes:	Total		Type of Accident		Reportable Damage	
	Cnt	%	Der	Othr	Amount	%
T001- Roadbed settled or soft	2	1.9	2	-	107,181	1.0
T002- Washout/rain/slide/etc. dmg -track	1	1.0	1	-	595,300	5.6
T101- Cross level of track irregular(joints)	4	3.8	4	-	334,034	3.1
T102- Cross level track irreg.(not at joints)	12	11.5	12	-	632,219	6.0
T106- Superelevation improper, excessive,etc.	1	1.0	1	-	90,000	0.8
T108- Trk alignmnt irreg-not buckled/sunkink	3	2.9	3	-	233,944	2.2
T109- Track alignment irreg(buckled/sunkink)	6	5.8	6	-	268,688	2.5
T110- Wide gage(defective/missing crossties)	9	8.7	9	-	155,751	1.5
T111- Wide gage(spikes/other rail fasteners)	1	1.0	1	-	40,751	0.4
T199- Other track geometry defects	1	1.0	1	-	5,500	0.1
T205- Defective or missing crossties	1	1.0	1	-	57,600	0.5
T207- Detail fracture - shelling/head check	8	7.7	8	-	2,738,137	25.8
T213- Joint bar broken (compromise)	1	1.0	1	-	453,672	4.3
T220- Transverse/compound fissure	5	4.8	5	-	642,707	6.1
T221- Vertical split head	4	3.8	4	-	1,162,093	11.0
T308- Stock rail worn, broken, disconnected	1	1.0	1	-	51,283	0.5
T311- Switch damaged or out of adjustment	1	1.0	1	-	11,000	0.1
T314- Switch point worn or broken	3	2.9	3	-	54,977	0.5
T399- Oth frog, switch, trk appliance defect	1	1.0	1	-	9,410	0.1
T401- Bridge misalignment or failure	1	1.0	-	1	34,500	0.3
-- Total	66	63.5	65	1	7,678,747	72.4

Ken White

From: Kelly P. Coleman [kcoleman@teltech.com]

Sent: Tuesday, February 27, 2001 3:32 PM

To: kwhite@mctcnet.net

Subject: DM&E's Safety Record 1998-2001

TRAIN ACCIDENTS BY CAUSE FROM FORM FRA F 6180.54

Selections: Railroad - Dakota, Minnesota & Eastern Railroad
State - ALL, County - ALL
ALL ACCIDENT TYPES / ALL TRACK TYPES / ALL CAUSES
Time Frame: Jan 1998 To Nov 2000

MAJOR CAUSE= Equipment

Specific causes:	Total		Type of Accident	Reportable Damage		Casualties	
	Cnt	%		Amount	%	Kld	N
E23C- Center plate broken or defective	1	2.0	1	239,821	4.3	0	
-- Total	1	2.0	1	239,821	4.3	0	

MAJOR CAUSE= Human

Specific causes:	Total		Type of Accident		Reportable Damage	
	Cnt	%	Der	Othr	Amount	%
H021- Fail to apply car hnd brks -rr emp	2	3.9	2	-	52,456	0.9
H302- Cars left foul	2	3.9	1	1	41,269	0.7
H306- Shoving movement, absence of man	1	2.0	1	-	11,000	0.2
H399- Other general switching rules	1	2.0	-	1	25,249	0.4
H501- Improper train make-up at init term	1	2.0	1	-	3,520	0.1
H505- Lat DB force on curve xcess trn hnding	1	2.0	1	-	56,850	1.0
H526- Failure to actuate off independent brk	1	2.0	-	1	7,750	0.1
H702- Switch improperly lined	3	5.9	3	-	25,535	0.5
-- Total	12	23.5	9	3	223,629	4.0

MAJOR CAUSE= Miscellaneous

Specific causes:	Total		Type of Accident		Reportable Damage	
	Cnt	%	Der	Othr	Amount	%
M405- Harmonic rock off, etc.	2	3.9	2	-	37,890	0.7
M501- Interference(not vandals)with RR op.	1	2.0	-	1	10,270	0.2
M502- Vandalism of on-track equipment	1	2.0	-	1	35,921	0.6
M503- Vandalism of track or track appliances	1	2.0	-	1	854,881	15.2
-- Total	5	9.8	2	3	938,962	16.7

2/27/01

MAJOR CAUSE= Track

Specific causes:	Total		Type of Accident	Reportable Damage		C
	Cnt	%		Amount	%	KI
T001- Roadbed settled or soft	1	2.0	1	64,562	1.1	
T101- Cross level of track irregular(joints)	2	3.9	2	129,384	2.3	
T102- Cross level track irreg.(not at joints)	5	9.8	5	247,977	4.4	
T108- Trk alignmnt irreg-not buckled/sunkink	1	2.0	1	175,004	3.1	
T109- Track alignment irreg(buckled/sunkink)	4	7.8	4	139,388	2.5	
T110- Wide gage(defective/missing crossties)	5	9.8	5	114,441	2.0	
T199- Other track geometry defects	1	2.0	1	5,500	0.1	
T207- Detail fracture - shelling/head check	5	9.8	5	1,944,707	34.6	
T213- Joint bar broken (compromise)	1	2.0	1	453,672	8.1	
T220- Transverse/compound fissure	3	5.9	3	177,583	3.2	
T221- Vertical split head	2	3.9	2	713,543	12.7	
T314- Switch point worn or broken	3	5.9	3	54,977	1.0	
-- Total	33	64.7	33	4,220,738	75.1	

2/27/01

Ken White**From:** Kelly P. Coleman [kcoleman@teltech.com]**Sent:** Tuesday, February 27, 2001 3:32 PM**To:** kwhite@mctcnet.net**Subject:** DM&E's Safety Record 2000-2001**TRAIN ACCIDENTS BY CAUSE FROM FORM FRA F 6180.54**

Selections: Railroad - Dakota, Minnesota & Eastern Railroad
 State - ALL, County - ALL
 ALL ACCIDENT TYPES / ALL TRACK TYPES / ALL CAUSES
 Time Frame: Jan 2000 To Nov 2000

MAJOR CAUSE= Equipment

Specific causes:	Total		Type of Accident	Reportable Damage		Casualties		
	Cnt	%		Der	Amount	%	Kld	N
E23C- Center plate broken or defective	1	4.3	1	239,821	8.7	0		
– Total	1	4.3	1	239,821	8.7	0		

MAJOR CAUSE= Human

Specific causes:	Total		Type of Accident		Reportable Damage		Causes
	Cnt	%	Der	Othr	Amount	%	
H021- Fail to apply car hnd brks -rr emp	1	4.3	1	-	31,536	1.1	
H302- Cars left foul	2	8.7	1	1	41,269	1.5	
H399- Other general switching rules	1	4.3	-	1	25,249	0.9	
H501- Improper train make-up at init term	1	4.3	1	-	3,520	0.1	
H702- Switch improperly lined	1	4.3	1	-	7,345	0.3	
-- Total	6	26.1	4	2	108,919	3.9	

MAJOR CAUSE= Miscellaneous

Specific causes:	Total		Type of Accident		Reportable Damage	
	Cnt	%	Der	Othr	Amount	%
M405- Harmonic rock off, etc.	2	8.7	2	-	37,890	1.4
M501- Interference(not vandals)with RR op.	1	4.3	-	1	10,270	0.4
M502- Vandalism of on-track equipment	1	4.3	-	1	35,921	1.3
M503- Vandalism of track or track appliances	1	4.3	-	1	854,881	30.8
-- Total	5	21.7	2	3	938,962	33.9

2/27/01

MAJOR CAUSE= Track

Specific causes:	Total		Type of Acci- dent	Reportable Damage		C KI
	Cnt	%		Amount	%	
T001- Roadbed settled or soft	1	4.3	1	64,562	2.3	
T101- Cross level of track irregular(joints)	1	4.3	1	102,833	3.7	
T108- Trk alignmnt irreg-not buckled/sunkink	1	4.3	1	175,004	6.3	
T109- Track alignment irreg(buckled/sunkink)	1	4.3	1	7,658	0.3	
T110- Wide gage(defective/missing crossties)	2	8.7	2	50,193	1.8	
T207- Detail fracture - shelling/head check	1	4.3	1	484,880	17.5	
T213- Joint bar broken (compromise)	1	4.3	1	453,672	16.4	
T220- Transverse/compound fissure	2	8.7	2	141,459	5.1	
T314- Switch point worn or broken	1	4.3	1	3,350	0.1	
-- Total	11	47.8	11	1,483,611	53.5	

2/27/01

MINNESOTA DEPARTMENT OF PUBLIC SAFETY**Traffic Safety***Kathy Swanson, Director*[Crash Facts Home Page](#) | [Index](#)[Department Home Page](#)

IX: MOTOR VEHICLE/TRAIN CRASHES

Each crash reported in this section involves a motor vehicle and a train. Train collisions with pedestrian bicyclists are not counted as traffic crashes for the purpose of this publication.

Statewide, about one-half of one percent of all motor vehicle crashes result in a fatality. In 1997, almost motor-vehicle/train crashes were fatal. That's more than ten times the rate for all crashes. Motor vehicle crashes may be few in number, but they are more likely to be serious and, thus, are a cause for concern.

Number of train crashes is lowest ever

Over the years, the number of motor-vehicle/train crashes has been declining. There were 107 motor-vehicle/train crashes in 1997. This represents the lowest yearly total ever recorded in Minnesota. total of 107 also represents a 14% decline from 1996 when there were 124 train crashes.

Number of fatalities and injuries also decline

The number of deaths related to motor-vehicle/train crashes in 1997 was also the lowest ever recorded in Minnesota. Six crashes were fatal, resulting in 6 deaths. The number of non-fatal injury crashes declined the previous year, as there were 36 injury crashes compared to 45 in 1996. The number of people injured in motor-vehicle/train crashes declined from 50 in 1996 to 46 in 1997.

Colder months

In 1997, motor vehicle/train crashes were most numerous in January, February, March, and December, four months accounted for over half (53%) of the crashes. Four out of the 6 fatalities also occurred in those months.

Railroad crossbuck sites remain dangerous

Thirty-five of the 107 train crashes, including 27 of the 46 injuries, occurred at a crossing signed by a railroad crossbuck. An additional 11 crashes, including one fatal, occurred at a railroad crossing stop sign. Combining those two types of traffic control devices were present for 43% of the total number of train crashes. By contrast, only 4 property damage only crashes occurred at a crossing equipped with overhead flashing lights and

15-to-19-year-olds injured most often

In 1997, persons from the 15-19 age-group accounted for 28% of all persons injured in motor-vehicle/train crashes. Also, 2 out of the 6 fatalities came from this age-group.

Rural Areas at Greatest Risk

Motor vehicle crashes involving a train are predominantly rural. (Defined as an area with less than 5,000

population). In 1997, 56% of the total crashes, 83% of the fatal crashes, 67% of the injury crashes, and 6 all injuries occurred in rural areas.

Contributing Factors

For the motor vehicles involved in train crashes, driver inattention or distraction, disregard for traffic co device, and failure to yield the right of way, were the three most often cited contributing factors listed b at the scene. These three accounted for 64% of all contributing factors cited.

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TABLE 9.04

**1997 MOTOR VEHICLE / TRAIN CRASHES
BY TRAFFIC CONTROL DEVICE**

Traffic Control Device	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes
RR Crossbuck	0	19	16	35
RR Crossing Stop Sign	1	6	4	11
RR Flashing Lights	0	5	14	19
RR Overhead Flashers Plus Gate	0	0	4	4
RR Overhead Flashers	0	0	1	1
RR Crossing Gate	2	1	7	10
Stop Sign	2	1	5	8
Other	1	3	5	9
Unknown	0	0	2	2
Not Applicable	0	1	7	8
Total	6	36	65	107

TABLE 9.06

1997 MOTOR VEHICLE / TRAIN CRASHES BY POPULATION OF ARE

Population of City or Township	Fatal Crashes	Injury Crashes	Property Damage Crashes	Total Crashes
100,000 and Over	0	4	6	10
50,000 - 99,999	0	3	3	6
25,000 - 49,999	0	1	11	12
10,000 - 24,999	0	4	13	17
5,000 - 9,999	1	0	1	2
2,500 - 4,999	1	1	2	4
1,000 - 2,499	0	1	2	3
Under 1,000	4	22	27	53
Total	6	36	65	107

TABLE 9.07
CONTRIBUTING FACTORS
IN 1997 MOTOR VEHICLE / TRAIN CRASHES

Contributing Factor	Number	Percent
Human Factors		
Driver Inattention / Distraction	44	28.0%
Disregard for Traffic Control Device	31	19.7
Failure to Yield Right of Way	25	15.9
Illegal or Unsafe Speed	10	6.4
Vision Obscured	9	5.7
Improper Parking/Stopping/Starting	5	3.2
Physical Impairment	5	3.2
Driver Inexperience	3	1.9
Other Human Factor	2	1.3
Vehicular Factors		
Skidding	9	5.7
Other Vehicular Factor	1	0.6
Miscellaneous Factors		
Other	7	4.5
Weather Conditions	6	3.8
Total	157	100.0%
Vehicles for Which There Was "No Clear Contributing Factor"	6	
Number of Drivers	110	

Zero, one, or two contributing factors may be attributed to a single driver. This may cause the sum of the factors cited to differ from the number of drivers. Percentages are based on all contributing factors cited. They may not sum to 100 due to rounding. No contributing factors are cited for train operators.

TABLE 9.01

MOTOR VEHICLE / TRAIN CRASH SUMMARY, 1988 - 1997

	1988	1989	1990	1991	1992	1993	1994
Total Crashes	168	142	116	147	111	128	144
Fatal Crashes	9	11	13	10	7	11	14
Persons Killed	12	15	17	10	9	15	17
Injury Crashes	56	48	35	49	39	45	51
Persons Injured	70	75	67	70	54	63	75
Property Damage							
Crashes	103	83	68	88	65	72	79



**Yaeger Bus Service Inc.**

56548 Doc Jones Road
Mankato, MN 56001
Phone (507) 345-5470
Fax (507) 345-5118

December 1, 2000

Dear Mr. Forsberg:

The proposed DM&E project Southern Alternative M-2 will have many negative impacts on busing.

We would have to cross the Rail Road tracks approximately 53 times a day or 9540 times a year. We have eight buses transporting Kindergarden-12th grade that would have to cross the tracks daily, should the proposed M-2 alternative be adopted. I have marked on the enclosed map where my buses would have to cross the proposed Rail Line Alternative M-2. This number of crossings does not include the number of times that we would have to cross the tracks when transporting athletics to and from their destinations. Nor does this include any summer transportation programs which include Lancers Marching Band, Lincoln Community Center activities, and summer school programs.

Train Delays: With up to 37 trains per day, it would be impossible to maintain a constant and timely daily bus schedule. In the event of train delays—a virtual certainty, children waiting for the bus would have to wait longer; out in the rain, snow, and cold weather before being driven to school. Additionally, when one bus route is delayed, it affects all of my routes due to the complexity of the routing system we have here in the Mankato School District. Mankato has 29 schools in the district. This means we have several bus transfers at several schools which must be synchronized to ensure that all the students make it to their school, and make it on time.

Safety: We all know what happens when a train is involved in an accident; the train destroys everything in its path. I should like to think that all of my drivers are well trained to the extent that we won't have any accidents. But, we're all human, and can all make mistakes. The thought of a bus full of children in a wreck with a train is absolutely unbearable for the children, the parents, and myself. Most of the dangerous crossings could be eliminated if DM&E uses the pre-existing rail running through Mankato. Most of the crossings have either over or under-passes so rail-traffic does not affect automobile traffic.

I have heard that possibly some of the township roads would be closed as a result of the rail-line. This would force my buses to reroute and would have to pick up children much earlier in the morning. Which means children would have to get on the bus before 6:30 a.m. Right now the earliest anyone is picked up is 7:00 a.m. The after school routes would also return children home later, as late as 4:30 p.m.

I hope after all the safety issues are evaluated, the best, safest, and most convenient railway will be the existing Rail Line; Alternative M-3.

Sincerely,

Dwight Yaeger
President
Yaeger Bus Service