

### Section 4.5-1 - Transportation Narrative

BNI intends to haul coal from BNCR 1101 via a direct corridor passing through undisturbed areas and Permit BNCR 9401 to Minnkota's coal crushing facilities. As mining progresses haul roads within the mining disturbance boundary will be rerouted from ahead of the active pits to the reclamation side. The proposed haul roads and ramps are shown on [Plate 4.5-1] Transportation Plan Map. The final locations of the reclamation roads and ramps will be based on conditions in the field as the pits advance and will be designed and submitted for approval in subsequent revisions.

### General Construction Practices

Haul road grades are relatively flat and do not exceed 10%. Ditches are constructed on each side of the haul road. Haul road and access road construction consists of placing material in uniform layers about 6" thick. Earth moving equipment will be used to compact the layers to about 90% of the maximum dry density as determined by the methods described in ASTM D-698 (standard proctor method). Loaded coal trucks may be used to achieve fill compaction during the construction of haul road extensions. In these situations coal truck traffic will be routed through the haul road extension as part of the construction process. By constructing roads in this manner, the desired compaction can be achieved and confirmed as lifts of material are placed in the road fill. This method of road construction will in no way slow the construction of haul road extensions or the final engineering certification thereof. Fill material will be reasonably free of organic material, coal and other unsuitable materials. Toxic material will not be used as a fill or surfacing material. Typical haul road cross sections are shown on [Plate 4.5-2]. The road embankment will be sloped at about 4 feet horizontal to 1 foot vertical in fill areas and as steep as a 3:1 in cut areas. The ditch bottom will be from 12 ft to 15ft wide with a back slope not exceeding a 2 feet horizontal to 1 foot vertical. The road surface will be crowned at 2% and be about 80 feet in width, unless otherwise noted. The roadbed will be surfaced with gravel, scoria or other suitable material.

Culverts will be designed to safely pass a ten-year, six hour precipitation event, or greater as specified by the commission. Best management practices such as rock checks and silt fences will be utilized to prevent and control erosion at inlets and outlets of culverts. Where exit velocities will be greater than five feet per second as shown in [Appendix 4.5-2] Culvert Information Sheets, a plunge pool built from field stone will be constructed to prevent erosion. Mulch and bale dikes will be used as necessary to control erosion between the start of construction and the establishment of an effective vegetative cover. Following road construction, the ditches will be seeded with the same mixture that will be used for final reclamation. The seed mixture is shown in [Section 4.12]. Rock checks and silt fences will be utilized in areas where additional erosion control is needed. In the case of a culvert replacement when a county road is not closed, necessary approval documents will be submitted to the PSC before installation.

Prior to construction of haul roads and other ancillary facilities, erosion control measures will be implemented when necessary to protect contamination of SPGM and reduce the introduction of suspended solids to waters downstream of the impacted area. These measures may include mulching, rock riprap, erosion control fabric, straw bale dikes, silt fence or other appropriate measures.

After the haul roads and access roads are no longer needed, culverts will be removed and the natural drainage will be restored and the areas will be smoothed and graded to blend into the surrounding

ground. The surfacing material will be either buried or used on future roads. The topsoil will be respread to the depth of the topsoil surrounding the construction area and the area revegetated in accordance with the revegetation plan included in [Section 4.12]. As required by section 69-05.2-24-07, road beds will be ripped during the reclamation process.

### **Subsoil as a Road Building Material**

In BNCR-1101, BNI intends to construct certain sections of haulroad and walkway out of subsoil. This practice is typical in North Dakota lignite mining operations and has been utilized successfully in other permit areas of the Center Mine.

In situations where the haul road profile closely mirrors the existing topography, utilizing subsoil as a construction material minimizes the associated disturbance required for borrow areas and SPGM stockpiles. It also minimizes that disturbance necessary to reclaim the haulroads by reducing the amount of SPGM the needs to be brought in from stockpiles.

The drawback to utilizing subsoil as a haul road construction material is that a certain portion of subsoil is likely rendered unusable over the life of the haul road and will need to be discarded during final haul road reclamation. BNI recognizes this situation and will commit to the following safeguards to ensure that these losses are minimized and that an adequate amount of subsoil remains in inventory to reclaim all affected areas within BNCR-1101.

There will be no co-mingling of subsoil and spoil within any given haul road cross-section. Haul road sections will be built entirely out of spoil or entirely out of subsoil. In reclaimed areas, subsoil will only be used as a construction material on areas that have been granted grade approval from the reclamation division. In the event that subsoil haul roads are built on undisturbed lands, subsoil will not be removed from fill sections prior to fill placement. All haul road sections built from subsoil will be assigned a subsoil stockpile number at the time of construction. These stockpiles will be delineated on the annual map. The volumes associated with these piles will be incorporated into the soils handling plan calculations conducted annually. The annual soils handling plan will assume that 80% of the volume contained within subsoil haulroads will be available for respread. We view this as a conservative estimate and in practice do not envision losses to be this great.

The annual soils handling plan is a legal requirement of BNI as the operator of the Center Mine. The development of this plan results in an updated topsoil and subsoil balance which is intended to demonstrate that sufficient amounts of topsoil and subsoil exist in stockpile to reclaim the disturbed areas of the mine. As mentioned above, BNI will incorporate all subsoil road stockpiles into the annual soils handling plan at 80% of their surveyed volumes. If this calculation results in a subsoil deficiency the practice of using subsoil as a road building material will be suspended.

In all instances where subsoil is used as a road construction material; the appropriate permit revisions will be submitted as expeditiously as is practical following final construction. The permit areas that will most likely be impacted include the soils handling plan, the transportation plan, and the bond calculations. Additional sections of the permit may also be revised if necessary.

Haulroads built out of subsoil and utilized by large mining equipment will be subject to compaction beyond what is typically desirable for reclaimed areas. In order to alleviate this condition, BNI will commit to incorporating an intense subsoil ripping program prior to resspreading topsoil. For subsoil roads that are intended to be reclaimed in place by cutting sections above grade and filling ditches,

the following steps will be taken. Any surfacing material that is not suitable for use as subsoil will be removed from the top of the road and either recycled or disposed of as spoil material. The remaining cut areas from the top of the road will be excavated and placed in the nearby road ditches. No specific treatment for compaction will be necessary for this cut material because the process of excavating and relocating material naturally fractures it sufficiently. The remaining roadbed will be ripped a minimum of 2 times in passes which are perpendicular to one another. The minimum depth of ripping will be 30". The minimum distance between ripper shank passes will be 5'. BNI currently has numerous pieces of equipment capable of meeting these requirements. The most likely of which will be the Caterpillar 854 Rubber Tired Dozer. After ripping is complete the entire area including the ditches will be disked and bladed in preparation for topsoil respread.

### **Haul Road Section A**

The proposed Haul Road Section A is to be constructed in 2014 prior to coal removal from BNCR 1101. The entire length will be constructed in undisturbed areas. The main trunk of the corridor between Station 62+35 and Station 120+00 has topographic features that are less than optimal for efficient and safe operation of a coal haulage fleet. These areas will require large cuts and fills to establish an acceptable profile which is shown in [Appendix 4.5-3]. This section of road will be constructed of spoil material following the removal of all SPGM. Approximately 60,000 CY of excess spoil material from the construction of the haul road in BNCR 9401 will be imported and used to construct this portion of the road. Haul Road Section A ends at Station 122+00 and leads into a temporary spoil road that will be built into a long term haul road shown as Haul Road Section E on Plate 4.5-1. Culvert Design Details for Section A are located in [Appendix 4.5-2]. The road from Station 62+35 to Station 120+00 will remain in use for the life of the mine estimated to be year 2042.

### **Haul Road Section B**

Haul Road Section B is to be constructed in 2014 prior to coal removal from the Page 736 dragline mining area in Section 7. The corridor has topographic features that are less than optimal for efficient and safe operation of a coal haulage fleet. These areas will require large cuts and fills to establish an acceptable profile which is shown in [Appendix 4.5-4]. The entire length will be constructed in undisturbed areas and will be constructed of spoil material from the road corridor and spoil borrow area within the mining boundary following the removal of all SPGM. SPGM will be removed from the corridor and stockpiled in an approved location. All cut overburden material will be utilized in fill areas. Additional spoil material from the initial box cut areas will be utilized in the corridor to make up the remainder of the material needed to establish acceptable grades. During reclamation of the road the excess spoil material will be hauled to a suitable disposal area or spoiled in a final pit location.

For access and coal removal from the C1 addition, Section B haul road will be extended into the C1 mining area. Access to C1 area will require crossing Oliver County Road 37<sup>th</sup> Ave SW. Current plans include an at-grade crossing of the county road and a stream crossing over a Hagel Creek tributary. BNI will be working closely with Oliver County Commissioners to ensure a mutually beneficial design; subsequent revisions will include finalized designs. This haul road construction is shown on the Transportation Plan Map. Culvert design details for Section B are located in [Appendix 4.5-2].

### **Access Road Section C**

Access Road Section C is to be constructed in 2014. The primary use of this road will be for access to the mining area by equipment and support vehicles. BNI does not intend to use this road as a primary coal haulage road. Where the road crosses Hagel creek BNI will construct an H-Pile retaining wall on each side of the roadway. This will narrow the roadway to a 70 foot top width and utilize the existing culverts and county road fill material and provide minimal disturbance around Hagel Creek. The final road design is shown in [Appendix 4.5-6]. In sections where the final road grade is below the floor of the subsoil, subsoil will be removed and stockpiled and the design grade established out of overburden material. Culvert Design Details for Section C are located in [Appendix 4.5-2]. Best management practices will be used in the access road ditches to minimize erosion and capture sediment before it crosses topsoil or runs into Hagel Creek. These will include a combination of any or all of the best management practices implored at the Center Mine. Examples include applying mulch, seeding, bale dikes, silt fence, rock checks and sumps. Access Road Section C will remain in use for the life of the mine estimated to be 2042.

### **Haul Road Section D**

Haul Road Section D will be constructed of subsoil material and spoil material. The section of the road between stations 59+00 and 72+00 spoil grade has a slope that is not suitable to run haul trucks on during the construction phase. The spoil road that is in place will remain and documented as such. The proposed grade following reclamation is shown in [Appendix 4.5-7]. The road will remain in place and be used to haul coal from the 736 mining area which is proposed to begin in 2027 and end in 2029. Culvert design details for Section D are located in [Appendix 4.5-2].

### **Haul Road Section E**

Haul Road Section E will be constructed in 2023 which will allow safe coal haulage from West end of the 8200 Pit and adjoin to Haul Road Section A in Section 8. The proposed grade is shown in [Appendix 4.5-8]. This haul road will be constructed of spoil material and be built as the dragline pits advance. The haul road will be certified in sections as they are constructed. Construction will be completed in sections as the final spoil grade is achieved within and surrounding the road corridor. Culvert design details for Section E are located in [Appendix 4.5-2].

### **Haul Road Section F**

Haul Road Section F, will be constructed through undisturbed areas in Sections 8 and 9. The coal haulage road will constructed in 2022 and used as an access road to begin infrastructure buildouts in Section 9. The road will be built of spoil following all SPGM removal. Coal haulage is projected to begin in the 2<sup>nd</sup> half of 2023. The final grade and design details are shown in [Appendix 4.5-9].

**Table 4.5-1 Haul Road Construction and Reclamation Schedule**

Road Section	Completion Date	Appendix	Reclamation Date
Section A	2014	4.5-3	Life of Mine
Section B	2014, 2019	4.5-4	Life of Mine
Access Road Section C	2015	4.5-6	Life of Mine
Section D	2022/2023	4.5-7	2033

Section E	As pit advances 2023	4.5-8	Life of Mine 2042
Section F	2022/2023	4.5-9	2030

### **Road Closures**

In order to safely execute the proposed mine plan it is necessary to obtain several temporary and permanent section line closures. A number of the proposed closures contain actively used county roads that will need to be closed accordingly. All closures will be done only with the approval of the Oliver County Board of Commissioners. The process of obtaining these approvals will necessarily include a public notice procedure and, if required by the Board of Commissioners, a public hearing. [Appendix 4.5-1] contains a record of all of the formal County actions/approvals regarding road closings. This appendix will continue to be updated through the course of normal permit revisions as additional Commission actions are taken.

The majority of the section lines scheduled for temporary closure are subject solely to light local landowner traffic for the purposes of farming and ranching operations or recreation. In these cases the section line trails will be left open as long as it is safe to do so. Once a section line is closed, BNI will provide a suitable alternative route to support the remaining landowner activities impacted by the closure. All section line trails disturbed by mining and reclamation operations will be reconstructed to standards as good as or better than pre-mining conditions. All temporarily closed section line trails will be re-opened to the general public when it is safe to do so.

BNI road closure plan takes place in two phases. Phase I allows mining to take place from 2014 through 2026 (approximately). All near term activities associated with road closures pertain to Phase I projects. As future mining progresses towards the necessary road closures in 2026, Phase II activities will begin to take place. Both Phases are described below. A drawing of all proposed and approved closures and corridors can be found on [Plate 4.5-3].

### **Approved (Phase I and Phase II) Road Closures**

In Phase I, BNI's mine plan calls for the closure of two significant sections of Oliver County Road. Before these roads are closed, acceptable detours or alternate routes will be identified and approved by the Oliver County Board of Commissioners. On 9/8/11 BNI addressed the Board of Commissioners at a normally scheduled public meeting and presented them with our mining plans. At that meeting several potential re-routes were discussed as possible means to address the transportation needs of Oliver County as mining progresses through BNCR 1101. BNI's position is that an acceptable detour for north-south traffic already exists. As such, we have no plans for constructing new roads or improving existing roads to facilitate north-south traffic due to the closure of a section of 35<sup>th</sup> Ave SW.

On 3/7/13 and 1/9/14 BNI appeared before the Oliver County Board of Commissioners. The primary topics addressed by BNI at those meetings were general mineplan updates, and the closure of 35<sup>th</sup> Ave SW. The published minutes of the 3/7/13 and 1/9/14 meetings can be found in [Appendix 4.5-1].

On 2/13/14 BNI again appeared before the Oliver County Board of Commissioners to discuss the topic of the closure of 35<sup>th</sup> Ave SW. Please refer to [Appendix 4.5-1] for additional documentation pertaining to this meeting.

The 12/9/13 petition to the Oliver County Commission for approval to temporarily close several section lines, permanently close a section line, and conduct mining operations within 100 feet of the outside right-of-way was approved on 4/3/14. This approval included the request to temporarily close 35<sup>th</sup> Ave SW. [Appendix 4.5-1] contains the minutes of this meeting as well as other relevant documents.

Prior to the April 3, 2014 approval of the December 9, 2013 petition, BNI appeared before the Oliver County Board of Commissioners to enter into an agreement by which the Commission may, at a future date, require BNI to construct a bypass route to alleviate any unforeseen problems that arise due to the closure of 35<sup>th</sup> Ave SW. Please refer to [Appendix 4.5-1] to view the executed agreement.

The closure of the section of 27<sup>th</sup> St SW [Appendix 4.5-1] will be necessary in 2018. The Oliver County Board of Commissioners was informed of this during the meeting on 1/9/14. A corridor around the south and east sides of the permit boundary are being built during the construction seasons of 2017 and 2018. A formal road closure application was presented to the Oliver County Board of Commissioners and approved by the Board on August 8, 2017. The public process is presented in [Appendix 4.5-1] of this section of BNCR-1101.

The Phase I section line roads and trails that BNI proposes to close temporarily or permanently in support of mining operations in BNCR-1101 can be found on [Plate 4.5-3]. Country road closures and possible replacement routes can be found on the same plate.

On September 9, 2015 BNI submitted a petition for Phase II Road Closures to temporarily close the remaining portion of the county road located on 35<sup>th</sup> Avenue SW and 3 other section lines necessary to continue mining operations. The Oliver County Board of Commissioners approved all of the temporary closures at the October 8, 2015 meeting. Please refer to [Appendix 4.5-1] for additional documentation for this petition.

Access to the farmstead located in the NE<sup>1</sup>/<sub>4</sub> of Section 18 (Larry & Virginia Schmidt) and the cemetery in the NE<sup>1</sup>/<sub>4</sub> of Section 18 will be available from the south on 35<sup>th</sup> Ave SW. This access will be available to local traffic only for the purposes of accessing those two locations.

In all cases discussed above, access from the north will have to be controlled by BNI due to MSHA regulations.

On July 17, 2017, BNI submitted a petition for Phase III Road Closures to temporarily close the main county road 27<sup>th</sup> Street SW and several other section lines necessary to continue mining operations. The Oliver County Board of Commissioners approved all of the temporary closures at the August 8, 2017 meeting. Please refer to [Appendix 4.5-1] for additional documentation for this petition.

During the summer of 2017 BNI began mine development work south of 27<sup>th</sup> Street SW prior to the approval of the Phase III Road Closure plan. This development work consisted of Sediment Pond Construction. Prior to beginning construction work BNI received verbal approval from the Oliver County Road Superintendent to cross the county road with mine equipment needed to perform the construction work. The county requested BNI only to cross the road for access and to maintain the crossing for public traffic along with utilizing traffic signage to mark the crossing during the construction process.

Construction of a the approved by-pass route to allow the closure of 27<sup>th</sup> Street SW along 29<sup>th</sup> St SW starting at 35<sup>th</sup> Ave SW and ending at the intersection of 29<sup>th</sup> St SW and 31<sup>st</sup> Ave SW began in the fall of 2017 and was completed in July of 2018.

BNI appeared before the Oliver County Commission on August 2, 2018 to petition for the temporary closure of 27<sup>th</sup> St. SW. The Commission approved the closure of the road. BNI closed the road on August 20<sup>th</sup>, 2018 following publication of a notice to the public in the Center Republican Newspaper.

### **Proposed Road Closures**

The Proposed portion of the road closure projects addresses the needs of the mine as mining progress towards the initial county road bypass corridor in 2026. At that time several temporary section line closures will be requested along with the construction of a second county road bypass between Sections 24 & 25 and Sections 19 & 30. The locations of the closures and corridors are shown on [Plate 4.5-3]. In addition to these activities, another bypass route will be necessary sometime near 2035. At that time traffic will either be routed south for 2 miles along existing roads, or likely redirected along re-constructed county roads through previously mined areas. Because the traffic needs of Oliver County are difficult to project this far out in time, the final configuration of this final bypass route is difficult to identify.

### **Oliver County Road Construction Standards**

During the initial permit review process the Reclamation Division requested that the design standards for Oliver County roads be included in the permit application. When the consulting engineer working on behalf of Oliver County was asked to provide these specifications, the following table was provided. This table is being included as a reference with the understanding that neither the Oliver County Commission nor BNI are bound by these standards; and that they may change in the future in accordance to the future actions of the Commission. As previously stated in the section, all closures will be done only with the approval of the Oliver County Board of Commissioners who has final authority on these matters.

# Oliver County Highway Department

## Minimum construction standards

### For All New Roadways

FAS

AVERAGE DAILY TRAFFIC	COUNTY ROADS	COLLECTORS		COLLECTORS		
		0 - 125		125 - 250		250 - 400
		MC	PC	MC	PC	MC & PC
<b>Minimum Design Speed mph</b>						
Level Terrain	40	40	55	50	55	55
Rolling Terrain	30	40	60	40	55	55
<b>Graded Roadway Section</b>						
<b>Graded Roadway</b>						
Gravel Surface: Width, Feet	24	26	28	26	28	28
Bituminous Surface: Width, Feet	24	28	32	28	32	36
Slopes	4:1	4:1	4:1	4:1	4:1	4:1
Right of Way	66-150	150	150	150	150	150
Ditch Depth Centerline to Ditch, Feet	3	3	5	3	5	5
Backslope	4:1	4:1	4:1	4:1	4:1	4:1
<b>Surfacing</b>						
Gravel: Width, Feet	20	24	24	24	24	24
Depth, Inches	3	3	4	4	4	4
Bituminous Base: Width, Feet	22	26	26	26	26	26
Depth, Inches	4	4	6	6	6	6
Bituminous Surface: Width, Feet	20	24	24	24	24	24
Depth, Inches	2-1/2	3	4	4	4	4
<b>Degree of Curve</b>						
Level	10	10	5.5	6.5	5.25	5.25
Rolling	10	10	5.5	8.0	5.25	5.25
<b>Drainage</b>						
<b>Bridges:</b>						
Clear Roadway Width Feet	28	28	28	28	28	28
Bridges & Culverts Capacity	HS15	HS20	HS25	HS25	HS25	HS25
Storm Frequency (Yrs) w/o Overflow	10	15	25	15	25	25
Storm Frequency (Yrs) w/ Overflow	10	10	15	10	15	15
Minimum Culvert Diameter Inches	18	18	24	24	24	24