

Appendix 6.3-A Traffic Study



Date: November 18, 2020

To: Village of Telkwa and Regional District of Bulkley-Nechako

From: Telkwa Coal Limited / Dan Farmer, COO

Re: Traffic Considerations

Overview

Telkwa Coal Limited (TCL) is proposing to develop the Tenas Project (the Project), a steelmaking coal mine located seven kilometers southwest of the Village of Telkwa. As part of this Project, TCL is planning to construct the Tenas Access Corridor which connects the existing Telkwa Coalmine Road to Lawson Road, and upgrades to the section of the existing forest service road on both sides of Goathorn Creek. During the construction phase, the Project will utilize existing roads such as Telkwa Coalmine Road, Lawson Road, and Forest Service Roads. The Tenas Access Corridor will be constructed during the first twelve to eighteen months of the Project, after obtaining regulatory approvals and the company's final investment decision. Following this, traffic will be directed to turnoff on Lawson Road to access the Tenas Access Corridor.

The purpose of this memo is to describe the baseline traffic study undertaken by TCL and to outline the specific directions provided by the BC Ministry of Transportation in relation to our Project and the results of the study. TCL contracted a third-party consultant, McElhanney, to conduct a traffic count to assess current traffic volumes at the following key intersections:

1. Telkwa Coalmine Road and Aveling Coalmine Road,
2. Telkwa Coalmine Road and Birch Ave (Lawson Road),
3. Highway 16 and Hankin Drive
4. Lawson Road at the proposed Tenas Access Corridor Crossing (driveway of private residence ~ six kilometers outside of town)

Figure 1 below illustrates the traffic count locations. **Appendix 1** attached is the McElhanney's traffic count study.

Summary of Traffic Study

The traffic count for Highway 16 completed for this study, was compared to data collected in previous years. Based on the data collected, the measured traffic values in 2020 were comparable to previous years which indicates that COVID-19 did not have a material effect on the traffic.

Key results of the traffic count includes:

- Peak traffic volumes occur in the afternoon for all four locations where counts were conducted
- Maximum peak hour traffic volumes over the existing Telkwa Bridge is approximately 162 vehicles per hour westbound and 132 vehicles per hour eastbound.
- Extremely low traffic volumes at the proposed Tenas Access Corridor crossing of the Lawson Road, located approximately six kilometers outside of the village of Telkwa.
 - o To be precise, only seven vehicles total travelled either east or westbound at the peak rate, per hour.
- Very low traffic volumes were counted at the intersection of Telkwa Coalmine Road and Aveling Coalmine Road, with a total of 23 vehicles using the Telkwa Coalmine Road portion at the peak rate, per hour.

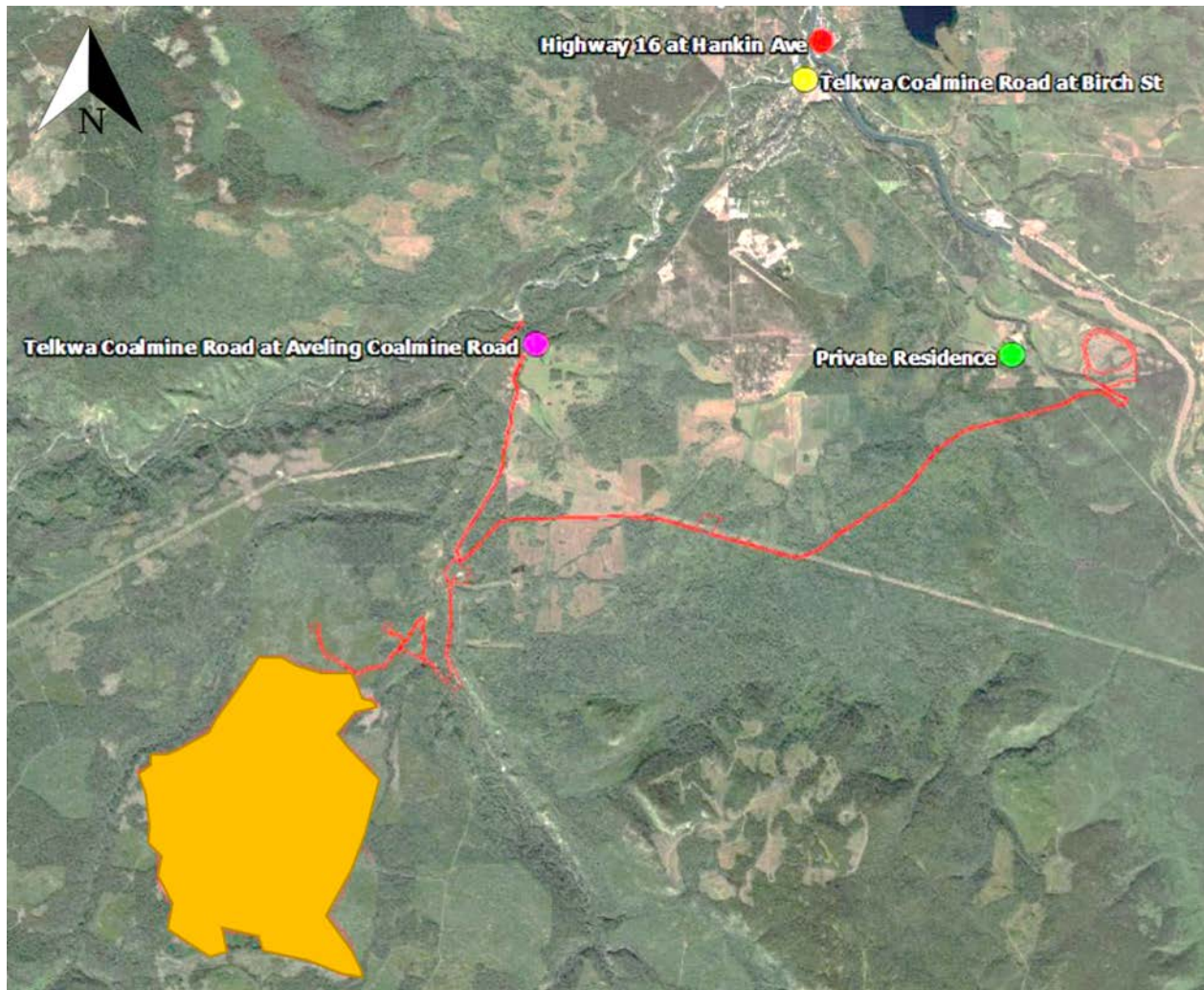


Figure 1 Traffic Count Locations

Expected Traffic during Operations

During operations, the Project is expected to add the following traffic volumes:

- Seven (7) round trips per day from Monday to Friday between the east side of the Bulkley River and the Project
 - o This route of this trip includes travel over the bridge, onto Telkwa Coalmine Road and turning onto Lawson Road, and then entering the Tenas Access Corridor and ending at the minesite.
- The majority of the seven (7) daily round trips Monday to Friday will likely be in the morning
- Eighteen (18) round trips per day, seven days of week between the east side of the Bulkley River and the Project
 - o This route of this trip includes travel over the bridge, onto Telkwa Coalmine Road and turning onto Lawson Road, entering the Tenas Access Corridor and ending at the minesite.
- Most of the 18 daily round trips will occur at the two designated shift change times, which are currently proposed to occur daily at 6:30am and 6:30pm

Conclusions

The data collected from the traffic count confirms that the existing roadways have a design capacity significantly greater than the existing traffic volumes and for the increased traffic volumes due to the Project. Given the small increase in traffic due to the Project provided above, there is not a measurable impact to local traffic.

Based on the above information, the local Ministry of Transportation (MOTI) Office provided the following directions:

1. An Access Permit will be required for the Tenas Access Corridor intersection with existing public Lawson Road,
2. MOTI asks for a review of the Parking Lot design/plan near Hudson Avenue in Telkwa, once finalized to ensure Highway 16 traffic is managed.
3. Request the addition of a 'Stop Ahead' sign for northbound traffic on Telkwa Coalmine Road, approaching the intersection of Aveling Coalmine Road, as well as refreshing/upsizing the current Stop Sign
4. Sight distance to the west of this junction could be improved due to angle of approach at the junction
5. Adherence to Seasonal Load restriction to be followed on public roads unless they are improved to meet the traffic requirements
6. Installation of crossing ahead sign on the Lawson Road on both sides of the Tenas Access Corridor crossing location to warn users of Lawson Road to be aware of a truck crossing ahead.

In conclusion, based on the McElhanney study:

- Existing roads are underutilized and can accommodate small traffic increase due to the Project
- Key design and operational considerations have been provided by MOTI which has been incorporated into project planning.

For further questions and information please feel free to contact rmauer@allegiancecoal.com.au or dfarmer@allegiancecoal.com.au.

Thank you,



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Appendix I: McElhanney Traffic Count Study

TECHNICAL MEMO

To Dan Farmer, PEng Chief Operating Officer, Telkwa Coal Ltd.	From Katherine Clark, EIT Brendon Masson, PEng
Re Traffic Summary	Date August 12, 2020

The Tenas Project is currently in the pre-application phase of Environmental Assessment. The purpose of this memorandum is to proactively identify challenges and impacts with traffic in advance of permitting. The proposed coal mine would be accessed from the community of Telkwa, BC and will use rail to export coal.

1. Existing Traffic

1.1. DATA COLLECTION

Manual traffic counts were collected by personnel counting vehicles by classifications such as passenger cars, trucks, cyclists, and pedestrians over 15-minute intervals. This data was then assessed to determine the am and pm peak hours which are used to evaluate the intersection function conservatively during peak traffic. Traffic counts are typically conducted during peak hours and scaled based on permanent count station data. Manual traffic counts were conducted at the following intersections and dates:

- Monday April 6 at Telkwa Coalmine and Aveling Coalmine Telkwa Coalmine
- Tuesday April 7 at 14544 (Private Residence) Lawson Road
- Wednesday April 8 at Coalmine Road and Birch Street
- Thursday April 9 at Highway 16 and Hankin Avenue

The Figure shown below depicts the approximate location of the mine (orange), the possible routes for traffic (red), and the four general locations that traffic data was collected from (coloured bubbles).

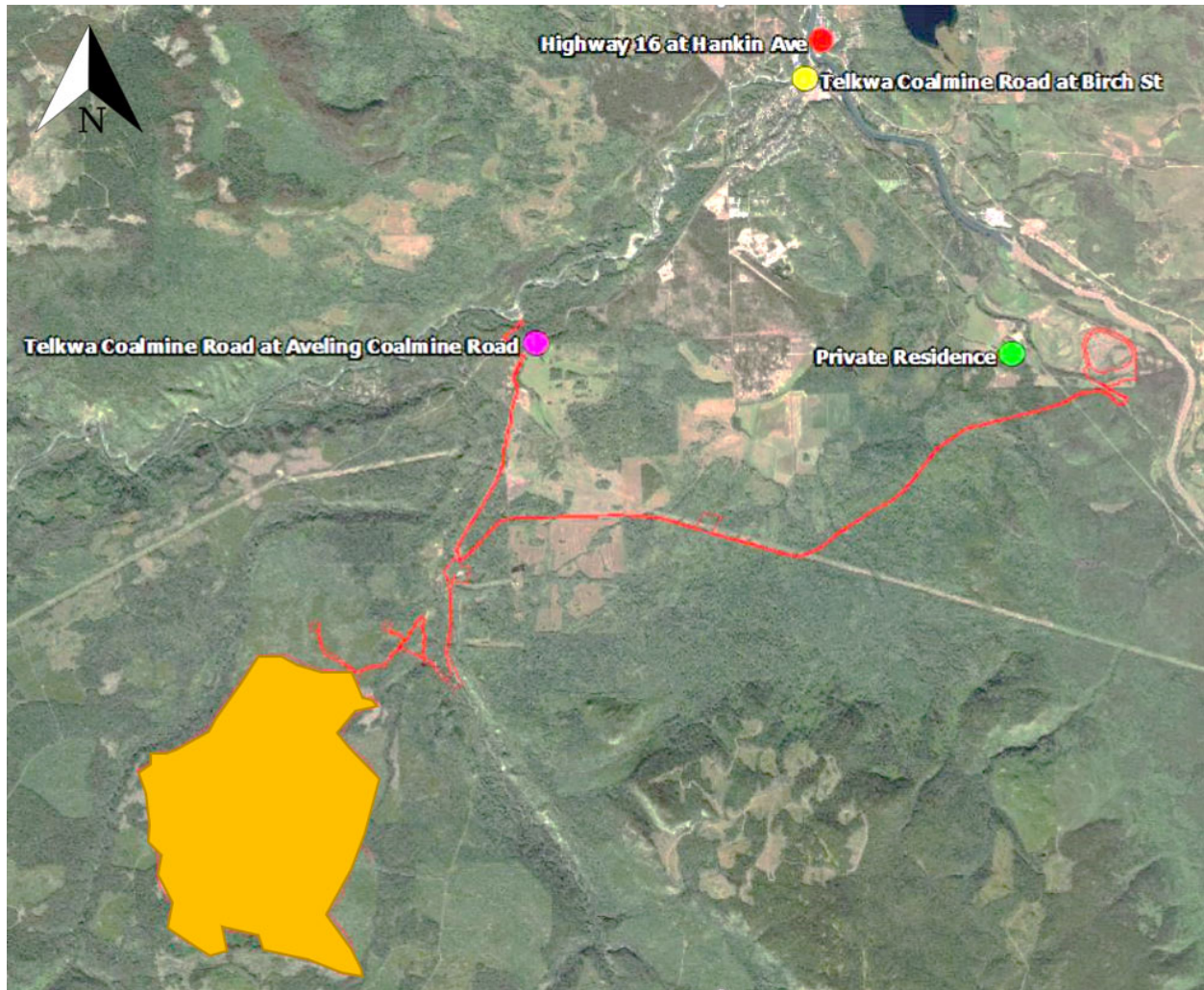


Figure 1: General project area and data collection locations.

1.2. PERMANENT COUNT STATIONS

Nearest permanent count station is P-45-1EW, located on Highway 16 approximately 200 km east of Telkwa. Permanent Count Station data was used to scale the raw data for the peak day of the week and seasonal variation. The most recent and relevant data was from 2017 and was used to scale traffic count data.

Traffic data was collected in the early stages of social distancing during Covid-19; it appears that Covid-19 had no measurable impact on the traffic data when compared to the permanent count station. Data collected on April 9th at Highway 16 and Hankin Avenue met or exceeded average traffic volumes as shown in the following table.



Data Type	Traffic Volume
Volume Counted at Highway 16 & Hankin Ave on April 9, 2020 (8 hr period)	2584
Average Daily Traffic for Thursdays (April 2017)	2939
Average Daily Traffic for Thursdays (April 2013)	2587
Monthly Average Daily Traffic (April 2017)	2534

1.3. TRAFFIC VOLUMES

Traffic volumes adjusted for day of the week, and seasonal variation have been shown in the Figures below for the four intersections. The peak hour observed at all sites was the PM peak hour, which varied slightly from site to site. The AM peak hour traffic volume is shown without brackets and the PM peak hour traffic volume is shown with brackets in the Figures below.



Figure 2: Telkwa Coalmine Rd at Birch St AM and PM Peak Hour Volumes

It is assumed that the through traffic volumes on Telkwa Coalmine Road, shown in Figure 2, can be attributed to residential commuter traffic. The traffic count conducted south of the residential area, shown in Figure 2, shows a significant reduction in traffic accessing the resource roads. Traffic on Lawson Road



was observed to be very low and was collected to capture a full snapshot of possible routes to access the proposed mine.



Figure 3: Telkwa Coalmine Rd at Aveling Coalmine Rd AM and PM Peak Hour Volumes

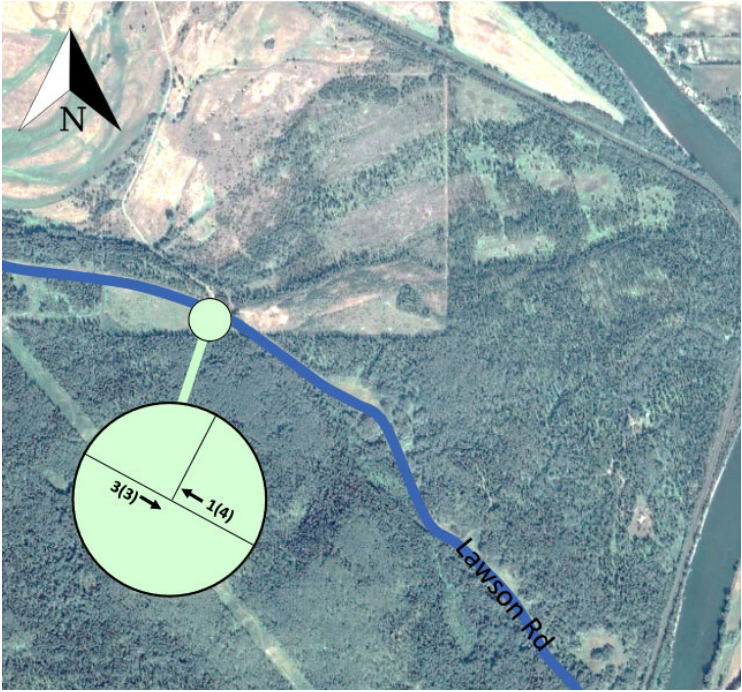


Figure 4: Lawson Rd at 14544 Private Access AM and PM Peak Hour Volumes



Figure 5: Hankin Rd at Highway 16 AM and PM Peak Hour Volumes

Volumes at Hankin Road and Highway 16 can largely be attributed to commuter traffic. Primary movements at this intersection were found to be through traffic on Highway 16 and turning movements onto Highway 16.



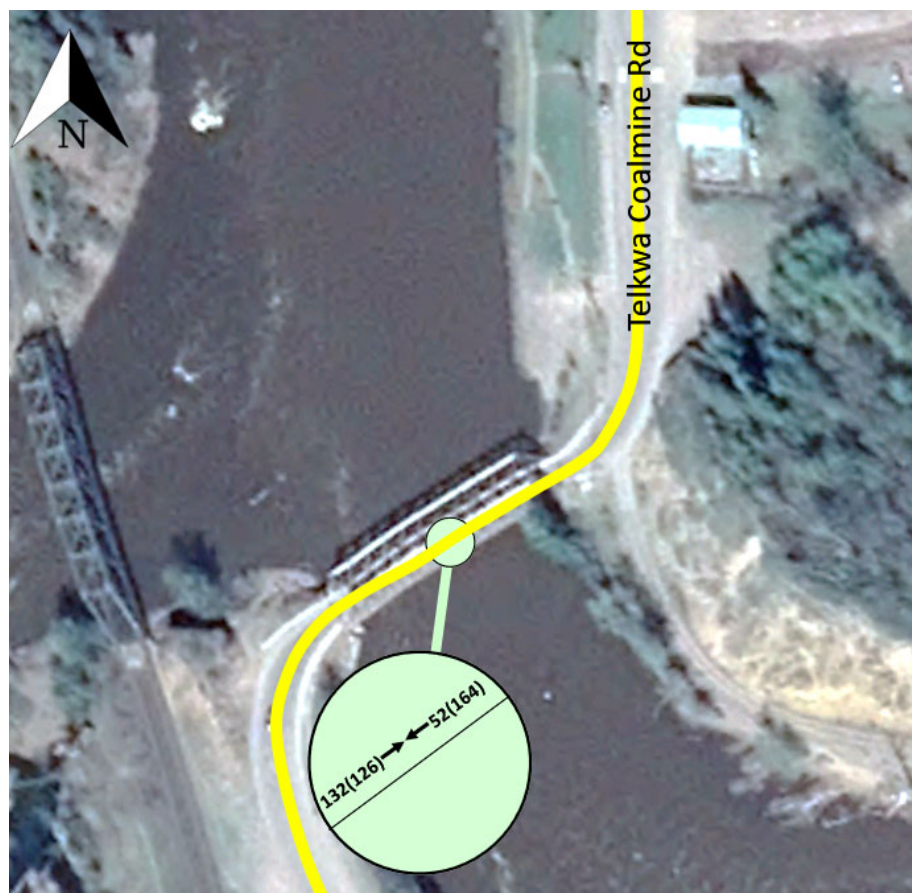


Figure 6: Bridge on Telkwa Coalmine Road – assumed traffic volumes

Traffic data was not collected for the bridge on Telkwa Coalmine Road. However, based on intersection data on either end of the bridge and limited opportunities for traffic loss it was assumed that existing traffic across the bridge would be as shown in Figure 6 above. This bridge is a narrow bridge which is used to support two-way traffic.

2. Trip Generation

Traffic expected to be generated by the proposed Tenas Mine is shown in the table below. Buses will be the primary method of transport for workers to and from the mine site. It is expected that there will be a day and a night shift, however the general deliveries are expected to occur during the day shift only. As a conservative approach, it has been assumed that all of the traffic entering or leaving the mine in the afternoon arrives at the intersection during the PM peak hour. The intent in assuming this approach is to demonstrate any challenges that could arise from the maximum contribution of vehicles to the peak hour. It is expected that the peak traffic flow entering and exiting the mine in the morning will occur well in advance of the AM peak hour.



Trips on Dayshift Only (Monday to Friday)		Trips on Day and Nightshift (7 Days/week)
• 1 delivery flat bed • 1 fuel b-train • 1 explosives truck • 1 recycling transport	• 1 general delivery vehicle • 1 hazardous waste transport • 1 visitor van	• 5 buses • 4 pick-ups

During the day on weekdays it can be expected that Tenas Mine would generate:

- 7 return trips for general deliveries (fuel, recycle etc.)
- 10 return trips for busses (dayshift and nightshift start and end)
- 8 return trips for passenger vehicles (dayshift and nightshift start and end)

Of the above trips the following trips could occur during the PM peak hour at the critical intersection the as a result of the mine:



Figure 7: Possible PM Peak Hour Trips Generated by the Tenas Mine (background traffic removed)

The traffic shown at the highway intersection could increase traffic across the bridge on Telkwa Coalmine Road by 11 vehicles eastbound and 12 vehicles westbound in the PM peak hour. For comparison, currently



it is estimated that 126 vehicles move eastbound and 162 vehicles move westbound across the bridge during the PM peak hour.

The capacity of Telkwa Coalmine Road can be compared to that of a Class II two-lane highway, with ~3 m lanes, ~0.5 m shoulders with several access points along the roadway (defined in the *Highway Capacity Manual 2010*). It is likely that during peak hours this road currently operates at 30km/hr for the 1.5 km that approach the bridge on the west side. The most critical piece of this road was assessed independently of the entire route to the proposed mine to determine if there would be any challenges that would affect local residential traffic. Traffic beyond the residential area on Telkwa Coalmine Road is significantly reduced as shown in the traffic counts, indicating that the focus of assessment should be placed on the 1.5 km residential area.

Level of Service

Percent Time Spent Following (PTSF) is an estimate of the amount of time that will be spent in platoons following a vehicle due to the inability to pass. Level of Service is a measurement of the quality of traffic and generally corresponds to the amount of time spent waiting to complete a desired movement and is ranked from Level of Service (LOS) A to E. LOS A is preferred and represents reasonably free flow and LOS E represents operation at capacity and driver discomfort. LOS A, B, and C are considered acceptable.

Performing an assessment of the PTSF during the peak hour shows that the level of service (LOS) for this roadway is currently LOS A. Regular traffic on Telkwa Coalmine Road would have to double in order to achieve a LOS C when assessing using PTSF.

Road Capacity

Increasing the volume of traffic on Telkwa Coalmine Road by including the trips generated by the project still produced a LOS A, showing no noticeable change to Telkwa Coalmine Road from existing. Assessing the capacity of this road would be difficult to complete accurately due to the low volumes observed. Typically, LOS for driver comfort is the driver for upgrades on two lane highways long before the capacity becomes a challenge. Unfactored base capacity for a two-lane highway based on a 2 second headway between vehicles is approximately 1800 passenger cars per hour each direction which is an order of magnitude higher than existing traffic volumes. Adjusting for road geometrics and cross section results in a reduction of this capacity but is still significantly higher than the traffic volumes observed. Therefore, the roadway has significant excess capacity.

3. Safety

Based on our review of the intersections and anticipated traffic volumes we can anticipate that the nominal number of vehicle incidents will increase along the transportation corridor. However, the incident and severity rates are not anticipated to change as the composition of traffic will not change enough to be a concern. At a minimum, additional project signage, advisory signage (stop sign ahead / truck turning) and additional brushing to improve sight distance should be considered during detailed design.



4. Summary

Traffic expected to be generated by the proposed Tenas Coal Mine in Telkwa, BC is low and is not expected to have a significant impact to the existing traffic flow at the intersection of Hankin Road and Highway 16. The trips generated coincide with the primary movements at the existing intersection. Based on the known traffic volumes at the intersections, the level of service for all movements will be acceptable.

5. Closure

This intersection study has been prepared by McElhanney Ltd. for Telkwa Coal Ltd. The information and data contained herein represent McElhanney's best professional judgment considering the knowledge and information available to McElhanney at the time of preparation.

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Yours truly,

McElhanney Ltd.



Brendon Masson PEng

Project Engineer

