

TO: Glen Van Treek
FROM: Thomas L. Dyer, P.E.
DATE: November 13, 2018
SUBJECT: Grassy Mountain Mine Traffic

1.0 INTRODUCTION

Mine Development Associates (“MDA”) was requested to estimate the amount of mine traffic that would use the access road from the town of Vale, Oregon to the mine site. This information is to be used in a traffic study to determine the design requirements for the access road. This memorandum is intended to document the estimated mine traffic along the access road. This excludes any mine traffic associated with the construction of the mine and does not include any public traffic not related to the mining activities.

2.0 Mine Personnel Traffic Requirements

A Pre-Feasibility Study (“PFS”) on the Grassy Mountain project was completed in July of 2018. The personnel requirements for this study are based on the PFS assumptions for processing, mining, and administration personnel. Table 2.1 shows the total estimated traffic that would use the access road.

Table 2.1 Total Mine Traffic Estimate

<i>Total Round Trips</i>	Round Trips per Day							Total/Wk
	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	
Process Personnel	4	5	5	5	5	5	4	33
Mining Personnel	-	10	10	10	10	-	-	40
Administrative Personnel	2	9	9	9	9	7	2	47
Consumables & Other	2	7	3	6	3	6	2	29
Total Round Trips	8	31	27	30	27	18	8	149
Total One-Way Trips	16	62	54	60	54	36	16	298
Average Weekday	53.2							
Average Weekend	16.0							
Average Week	42.6							

2.1 Processing Personnel

Processing is to be scheduled for 24 hours per day and 7 days per week. Workers involved directly with process production would be working either day or night shifts. The schedule rotation would be to have process production workers working 7 days on and 7 days off, thus there would be a total of 4 crews. Most of the personnel would commute in 12 to 15 person passenger vans.

The total number of process production personnel working per shift would include:

- Plant operators (3 per shift)
- Plant Electricians (2 per shift)
- Process Foreman (1 per shift)

It is anticipated that the shift foremen will have two pickup trucks (one for days and one for nights) and use them to commute back and forth to Vale or Ontario. This would allow the flexibility to arrive before the production crews if needed and to potentially haul parts as required.

The other production personnel would travel to and from the work site in a van. It would be possible to use a single van between days and nights, but preferably two vans would be procured for commuting to allow for some backup capacity as needed. Regardless, there would be two-round trips due to process production crew commute.

Other process production personnel will include:

- Gold Room Supervisor (1 per shift – dayshift only)
- Assay Lab Technicians (2 per shift –dayshift only)

These positions will commute with the process production day-shift vans.

Plant supervisory personnel will include the Process Superintendent, Metallurgical Engineer, and a Chief Assayer. These three positions are assumed to work day shift only, 5 days per week. The Superintendent would have a pickup available to allow flexibility in commuting to and from site depending on needs. For the purpose of this study it is assumed that the Metallurgist and the Chief Assayer would commute in one of the administration vans.

Table 2.2 shows the estimated daily access road traffic due to process personnel. A total of 4 round trips would be made during weekends and a total of 5 round trips during weekdays. This is an average of about 5 round trips per day or 9 one-way trips.

Table 2.2 Process Personnel Traffic

<i>Process Production Crews</i>	Round Trips per Day						
	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Process Operators (Vans)	2	2	2	2	2	2	2
Process Foremen (PU)	2	2	2	2	2	2	2
Process Superintendent (PU)		1	1	1	1	1	
Total Round Trips	4	5	5	5	5	5	4
Total One-Way Trips	8	10	10	10	10	10	8

2.2 Mining Personnel

Mining personnel can be divided into mine production, mining support, and mine supervision personnel. The work schedule for the mine production personnel is based on of 24 hours per day utilizing two shifts per day, each working 4 days on and 3 days off (Monday through Thursday). Mine production personnel would include two crews with:

- Miners that perform the tasks of drill, blast, load, haul, and rock support (25 per crew); and
- Mine foreman (1 per crew).

The mining crews would commute back and forth to the mine in 15 passenger vans. A total of six vans would be procured with three of them dedicated to day shift and three dedicated to night shift. The mine foremen would each commute in company provided pickup trucks allowing them the flexibility to arrive before the production crews in order to perform any required inspections prior to the start of production.

Mining support personnel will include Surveyors, Surveyor Helpers, Mining Engineer, Geologist, and Samplers. A surveying crew would be made up of one Surveyor and one Surveyor helper. Two crews would be used with one working night shift and one working day shift. These personnel would commute with the mine production personnel.

Four Samplers would work to support the mine by gathering samples from drilling, chip sampling, and grab samples. Two Samplers would work during day shift and the other two on night shift. These positions would also commute back and forth with in the production vans. All together the vans will transport 29 people (25 production, 4 support) for each shift.

The Mining Engineer and Geologist will typically commute with the Mine Superintendent, however there will be times where there may be conflicts creating the need to make an additional trip with company issued pickup trucks. For this reason this study assumes that the Mining Engineer and Geologist will commute in the Mine Support pickup truck.

Table 2.3 shows the estimated daily access road traffic due to mining personnel. A total of 10 round trips would be made Monday through Thursday. This is an average of about 6 round trips per day or 11 one-way trips per day on a seven day a week basis.

Table 2.3 Mine Personnel Traffic

<i>Mining Production Personnel</i>	Round Trips per Day						
	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Mining Crews (Vans)		6	6	6	6		
Mine Foremen (PU)		2	2	2	2		
Mine Support (PU)		1	1	1	1		
Mine Superintendent (PU)		1	1	1	1		
Total Round Trips	-	10	10	10	10	-	-
Total One-Way Trips	-	20	20	20	20	-	-

2.3 Administrative Personnel

Administrative personnel will work 5 days per week and will include:

- Human Resources Specialist (1)
- Warehouse and Purchasing (2)
- Environmental Technician (2)
- Security Personnel (2)
- Administrative Assistant (1)
- Safety Personnel (6)
- Mine General Manager (1)
- Administrative Superintendent (1)
- Health, Safety, Environmental, and Community (“HSEC”) Superintendent (1)
- HSEC Specialist (1)

The Human Resource, Warehouse and Purchasing, Environmental, Security, and Administrative Assistant would commute in a single van 5 days per week.

Safety personnel will include 4 people to work the same shifts as the process personnel and 2 people to work the same shifts as mining personnel. They would commute back and forth with a pickup allowing for flexibility to transport personnel off of the mine site in the occasion of minor emergencies or personnel issues.

The Mine General Manager would commute in a pickup or SUV and would typically commute 5 days per week. The Administrative Superintendent would also commute back and forth in a pickup or SUV, though may share rides with Human Resources or other weekly personnel working 5 days per week.

The HSEC Superintendent would commute in a pickup 5 days per week and may share the ride with the HSEC Specialist, but for the purpose of this study it is assumed they will each commute separately. This allows flexibility of travel based on the needs of their positions.

Table 2.4 shows the estimated daily access road traffic due to administrative personnel. A total of 9 round trips would be made Monday through Thursday reducing to 7 on Fridays and 2 on weekends. This is an average of about 4 round trips per day or 8 one-way trips per day on a seven day a week basis.

Table 2.4 Administrative Personnel Traffic

<i>Administrative Personnel</i>	Round Trips per Day						
	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Administrative Commuter (Van)		1	1	1	1	1	
Safety Personnel Process (PU)	2	2	2	2	2	2	2
Safety Personnel Mining (PU)		2	2	2	2		
Mine General Manager (PU)		1	1	1	1	1	
Administrative Superintendent (PU)		1	1	1	1	1	
HSEC Superintendent (PU)		1	1	1	1	1	
HSEC Specialist (PU)		1	1	1	1	1	
Total Round Trips	2	9	9	9	9	7	2
Total One-Way Trips	4	18	18	18	18	14	4

3.0 Consumables and Other Access Road Traffic

Additional access road traffic will be required for the delivery of consumables, visits by vendors, consultant and management visits, and others site requirements. Fuel will primarily be used for underground mining equipment. This study assumes that deliveries will be made three days per week.

The primary consumables for processing will be lime and cyanide, though some other reagents and media such as ball-mill media will also be required. This study assumes that delivers six deliveries per week will be made.

It is difficult to say with any certainty how many visits will be made to site by vendors or outside management. This study assumes up to one round trip per day will be made. As a contingency, an additional 2 round trips per day was added in.

Table 3.1 shows the estimated traffic on the Access road due to consumable deliveries and other travel. This travel averages about 4 round trips per day or 8 one-way trips per day on a seven day a week basis.

Table 3.1 Consumables and Other Traffic

<i>Consumables & Other</i>	Round Trips per Day						
	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Fuel		1		1		1	
Process Consumables		2		2		2	
Hazardous Waste		1					
Misc. Vendors		1	1	1	1	1	
Other - Contingency	2	2	2	2	2	2	2
Total Round Trips	2	7	3	6	3	6	2
Total One-Way Trips	4	14	6	12	6	12	4

4.0 Total Mine Access Road Travel

The total access road traffic due to the mine is shown in Table 2.1. The total mine traffic estimate is 149 round trips or 298 one-way trips per week. The average daily travel is estimated as 42.6 trips going past a single point along the access road.

As previously mentioned this does not include public travel along the road or traffic due to construction.