

OPERATIONS & MANAGEMENT PLAN



MOUNTAIN ASH
• LIMITED PARTNERSHIP •

SUMMIT PIT
PHASE 1 DEVELOPMENT PERMIT APPLICATION

APRIL 2021

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1.0 INTRODUCTION

Mountain Ash Limited Partnership (“MALP”), the owner and developer of the west half of Section 31, Township 26, Range 3, West of the 5th Meridian, known as the Summit Pit (“Summit”), is preparing this Operations and Management Plan in support of the operation, management, and development of an aggregate (sand and gravel) resource in Rocky View County (“RVC”), Alberta, in accordance with the approved Master Site Development Plan (“MSDP”) and RVC Bylaw 8051-2020, a.k.a. Direct Control District (“DC-170”).

MALP is responsible for obtaining for valid, approved development permit in accordance with the Summit Pit MSDP and DC-170. MALP will also be making a registration application to Alberta Environment and Parks (“AEP”), under the Code of Practice for Pits in Alberta (“COP”) which under the *Environment Protection and Enhancement Act* (“EPEA”) requires the developer to ensure the protection of the environment during all activity stages.

MALP has prepared the contents of this Operations Management Plan (“OMP”) in accordance with the adopted Summit Pit MSDP, DC-170 and the AEP COP registration requirements.

2.0 EXECUTIVE SUMMARY

MALP has committed to manage and operate the Summit in a respectful and responsible manner. Pursuant to the policy provisions of the adopted Summit Pit MSDP, and the land use requirements of DC-170, the following strategies will be implemented:

Project Consideration	Commitments to Address Concerns
1 Habitat & Wildlife	<ul style="list-style-type: none"> ▪ Restrict development disturbances within the valley feature situated within SW 31. ▪ Limit disturbance within the MSDP area during migratory bird nesting season, April 15th through August 15th. ▪ No wetlands will be disturbed within Phase 1 of the development permit. ▪ <i>Water Act</i> application will be made and submitted in conjunction with the Code of Practice.
2 Groundwater Wells	<ul style="list-style-type: none"> ▪ Limit excavation to minimum of 1 m above water table, implement ongoing groundwater monitoring and reporting monthly. ▪ Piezometers will be installed when excavation activities begin to encroach on the 1m of free-board gravel buffer and GWT. ▪ Landowners within 800 m of the Summit Pit are encouraged to participate in MALP's groundwater monitoring program. Also included is the community well located at the Big Hill Springs Estates sub-division. ▪ Big Hill Springs Provincial Park and creek will be included in our monitoring activities and monitored annually.
3 Dust Mitigation	<ul style="list-style-type: none"> ▪ Pave portion of Rge. Rd 40 (±. 200m) from Highway 567 to Summit Pit site access. ▪ Continued application of water and/or calcium chloride on internal access routes within the site.

		<ul style="list-style-type: none"> ▪ Implement ongoing air quality monitoring & reporting monthly which will be reported to inform subsequent development permit renewals. ▪ No crushing activities will occur within 190 m from the east property and 140 m from the north boundary.
4	Noise Mitigation	<ul style="list-style-type: none"> ▪ Reduce operating hours. ▪ Restrict crushing on Saturdays & no crushing on Sunday or statutory holidays. ▪ Implement ongoing noise monitoring & reporting monthly to inform subsequent development permit renewals.
5	Landscaping & Visual Screening	<ul style="list-style-type: none"> ▪ Install landscaped berms around perimeter of MSDP area as required. ▪ Implement dark sky lighting strategy (if required).
6	Respectful Aggregate Operations	<ul style="list-style-type: none"> ▪ Limit open disturbance to ± 40 ac per development permit. ▪ Reduce operating hours as prescribed by DC-170. ▪ Implement aggregate operations via a phased development permit process. ▪ Implement progressive reclamation throughout the lifespan of the Summit Pit as per the statutory Code of Practice registration and approved Activities or Mining and Excavation plan.
7	Ongoing Communications & Community Relations	<ul style="list-style-type: none"> ▪ Provide direct 24/7 contact of MALP representative to all landowners within ± 1.6 km of the MSDP area. ▪ Invite landowners within the stakeholder area to meet as may be required to share current information. ▪ Distribute a Summit Pit update via an annual newsletter to the landowners within the stakeholder area and post on a project website.

3.0 CRITICAL PATH

MALP will undertake the following activities regarding statutory requirements for Phases 1 prior to advancing entirely into Phase 2.

1. Complete and submit Development Permit ("DP") Application for Phase 1 and Code of Practice for Pits Registration ("COP"), for the Summit Pit, on or before May 3, 2021.
2. All conditions of DP Prior to Issuance completed before commencement of operations in Phase 1.
3. COP registration, or any other regulatory or statutory requirements to be obtained prior to commencing operations in Phase 1.
4. Depending on market demand, a possible renewal of the Phase 1 DP, beyond the initial five (5) years may be required to completed Phase 1 in its entirety.
5. The renewal DP for Phase 1 and Phase 2 would consider the reclamation of a portion of Phase 1, a Water Act Application because wetlands would be impacted in Phase 2, and the relocation of the Telus Fibre Optic Line would be included in the Phase 1/2 development permit renewal application.
6. As per the approved MSDP, a scale facility will be located adjacent to Range Road 40 to be situated ± 200 m south of the Highway 567/Range Road 40 intersection. It is anticipated that this scale area will include a scale house, an equipment "not-in-use" storage area, re-fuelling area, and a future possible natural gas plant location as contemplated in DC 170. The total area required for these uses is ± 150 m x ± 100 m, which is $\pm 15,000$ m², ± 1.5 ha or ± 3.7 ac.

NOTES:

- A *Water Act* Application is not required for Phase 1 because no wetlands will be removed or disturbed. The *Water Act* Application will be made, and approval obtained prior to moving into Phase 2 of operations.
- Topsoil and overburden from the north 1/3 of Phase 1 will be used to reclaim the south portion of Phase 1 where operations initially commenced.
- Product produced as part of the Phase 1 operations will occur at or near the Limit of Disturbance ("LOD") as defined or illustrated within the MSDP and COP.
- Reclamation materials, topsoil, and overburden will be stored from a portion of Phase 1 in accordance with the COP registration.

- If there is a surplus of reclamation materials, topsoil and overburden, these surplus materials will be placed along the east property line to provide for additional screening. These materials will be located within the 15 m land use bylaw development side yard setback and a minimum of 3 m from the surveyed property line.

Table 1: Anticipated Schedule of Operations for Phase 1 and/or Phase 1 & 2

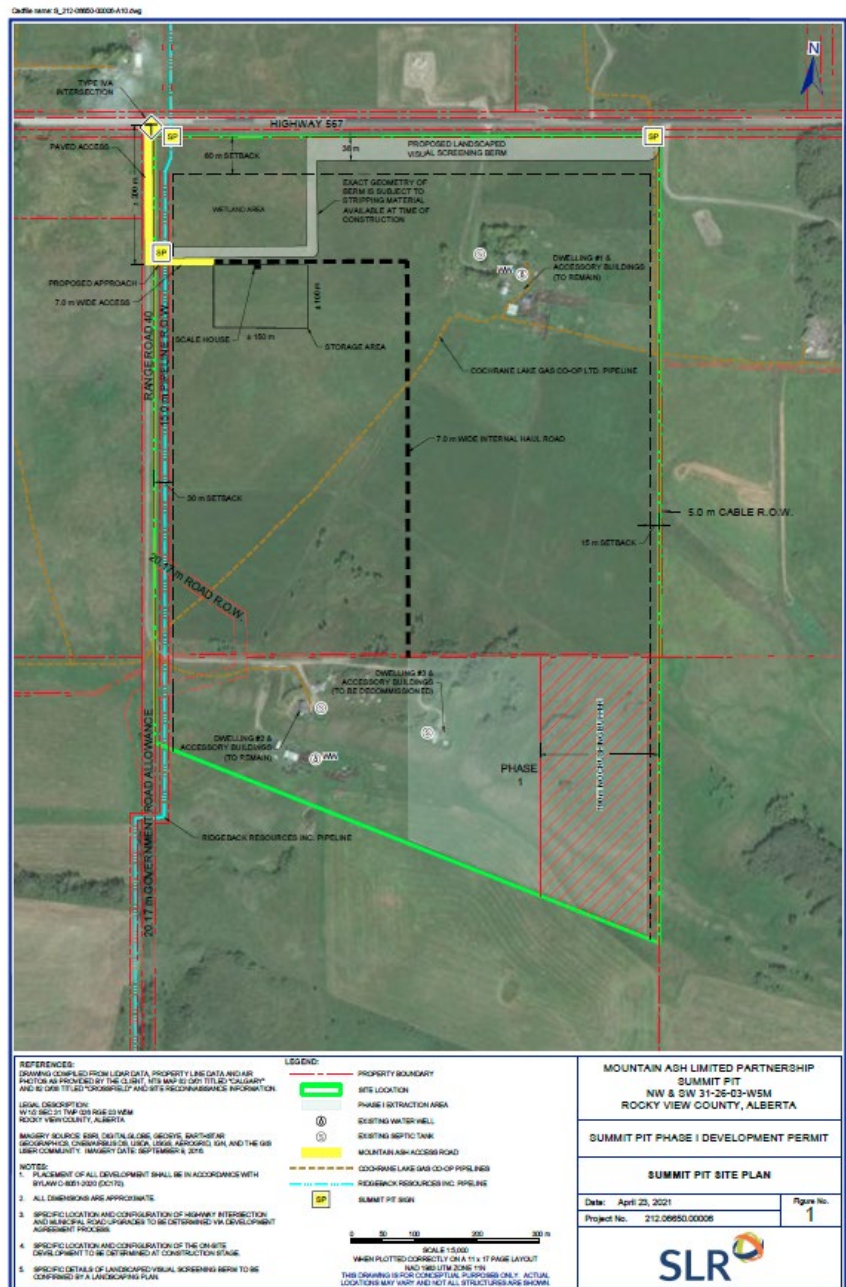
	Phase 1	Phase 1&2
Item	0-5 Years	5-7 Years
1) Development Permit Application	Initial - 2021	Possible Renewal - 2026
2) Code of Practice	Effective COP/AEP Registration - 2021	COP/AEP – 5 Year Update
3) Reclamation – Portion of Phase 1	NA	Reclamation of up to approx. 33% of Phase 1
4) <i>Water Act</i> Applications – Commence in Phase 2	NA	First <i>Water Act</i> Application Made prior to entering Phase 2 of Operations
5) Relocate Fibre Optic Line – Commence in Phase 2	NA	Relocate Telus Fibre Optic Line prior to Commencing Operation in Phase 2

4.0 OPERATIONS AND MANAGEMENT PLAN: PHASE 1

MALP has completed several operational and best practice plans to facilitate efficient aggregate operations and management within the Summit Pit.

The following plans have developed, to guide future operations and management activities. They are best practices and are intended to be dynamic and evolve over time. As such, they are expected to be subsequently improved upon at each development permit phase.

The following sections summarize the various operational commitments that have been designed to ensure MALP governs the operations and management of the Project in accordance with the provisions of the adopted Summit Pit Master Site Development Plan and RVC Bylaw C-8051-2020 (DC-170).

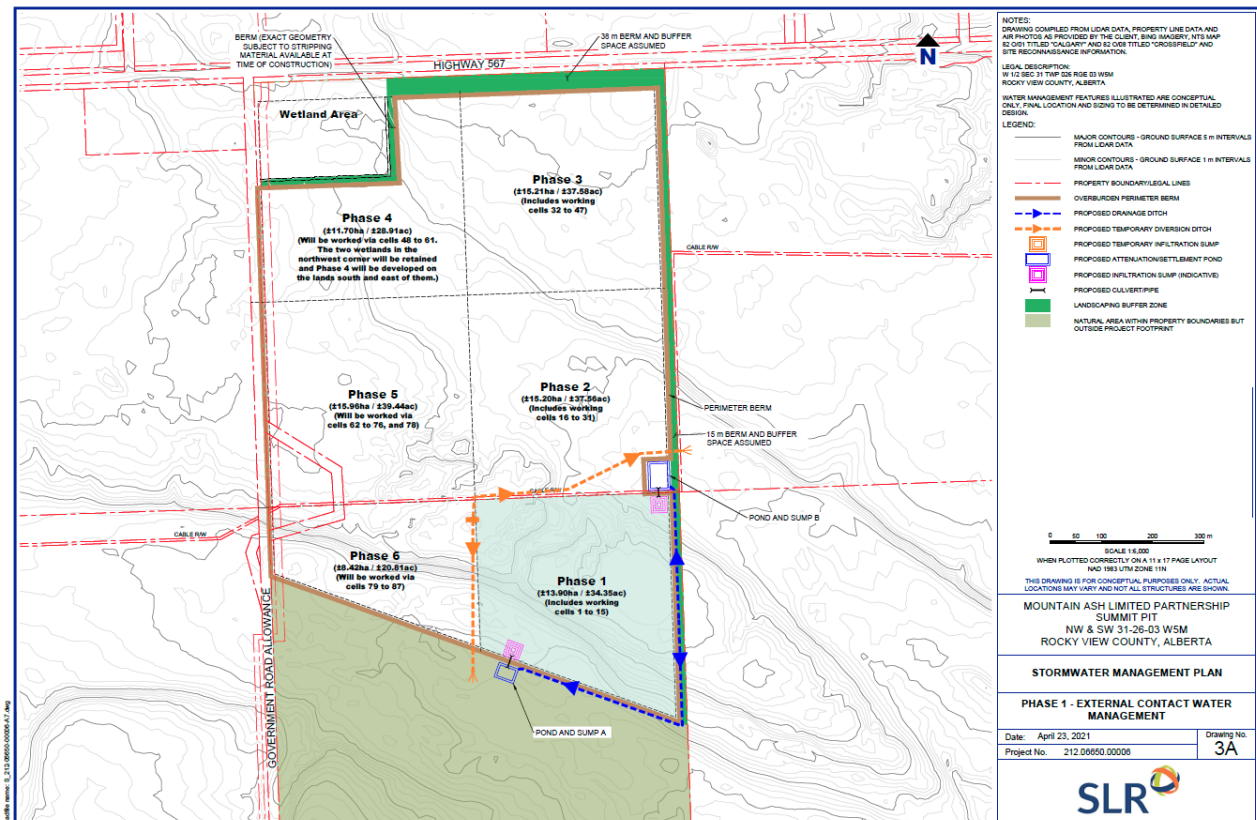


4.1 Stormwater Management

Stormwater Management will ensure that pre and post drainage patterns remain consistent through the operations and management of the Summit Pit.

Stormwater management facilities in Phase 1 will be constructed and maintained throughout the life of the operation. Surface water run-off will be separated by type offsite and onsite surface water. Offsite surface water will be directed via a swale to Pond A as indicated in the SWMP. Onsite surface water will be directed to a clay lined pond, then clean water will drain into a gravel lined pond which will eventually return clean, settled stormwater back to the sand and gravel aquifer. There will be no pumping or discharge of water outside of the limit of disturbance. All water return to the unconfined aquifer will be clean.

Stormwater management facilities will be constructed as per RVC's development permit approval and AEP's COP registration.



4.2 Transportation Infrastructure Improvements

Mountain Ash will ensure an appropriate access is provided to the Summit Pit in accordance with the requirements of Rocky View County and Alberta Transportation (“AT”).

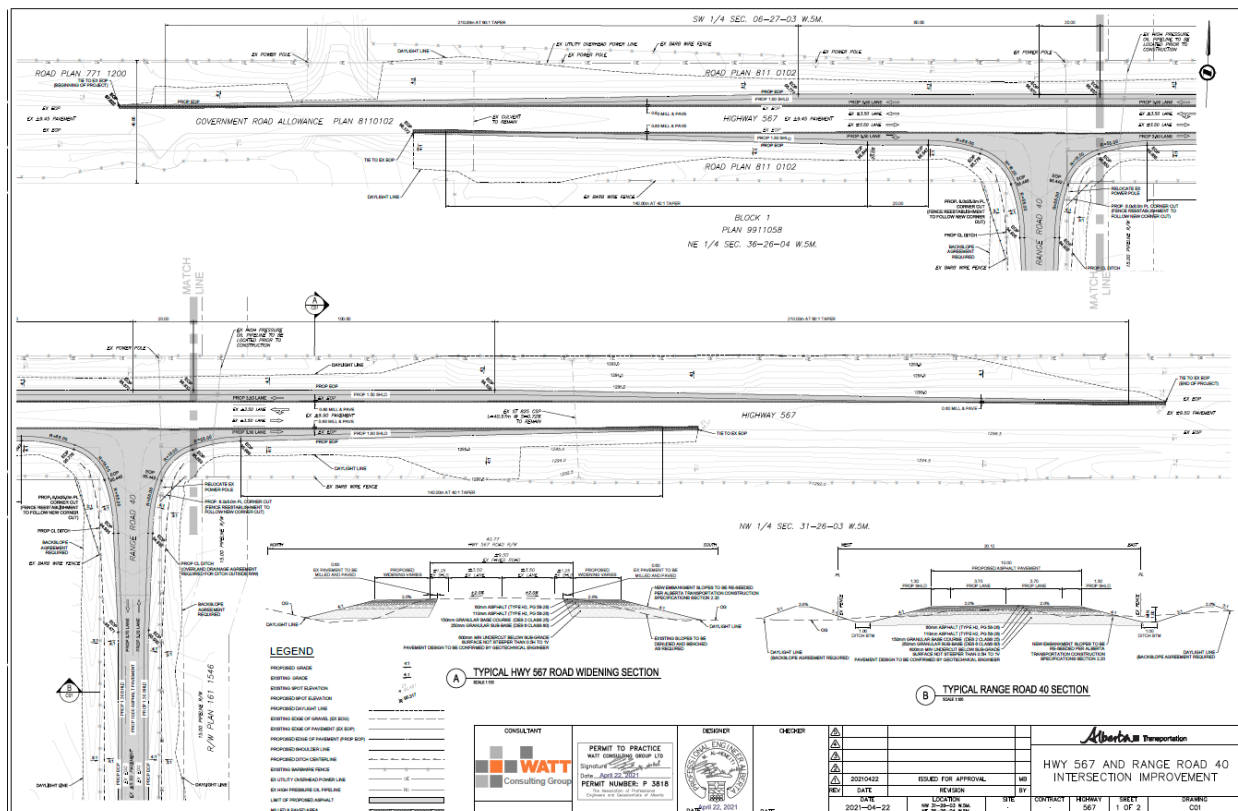
MALP will construct a Type IVA intersection and upgrade a ± 200 m portion of Range Road 41 in accordance with conditions set forth in the development permit prior to issuance, and prior to commencement of operations on opening day, as described in the Summit Pit MSDP.

Construction activities will be tendered and managed by MALP’s designated engineering consultant, WATT Consulting Group, which will work directly with Rocky View County and Alberta Transportation to ensure the required transportation improvements are constructed.

WATT Consulting Group has submitted the required plans on behalf of MALP to RVC and AT for approval.

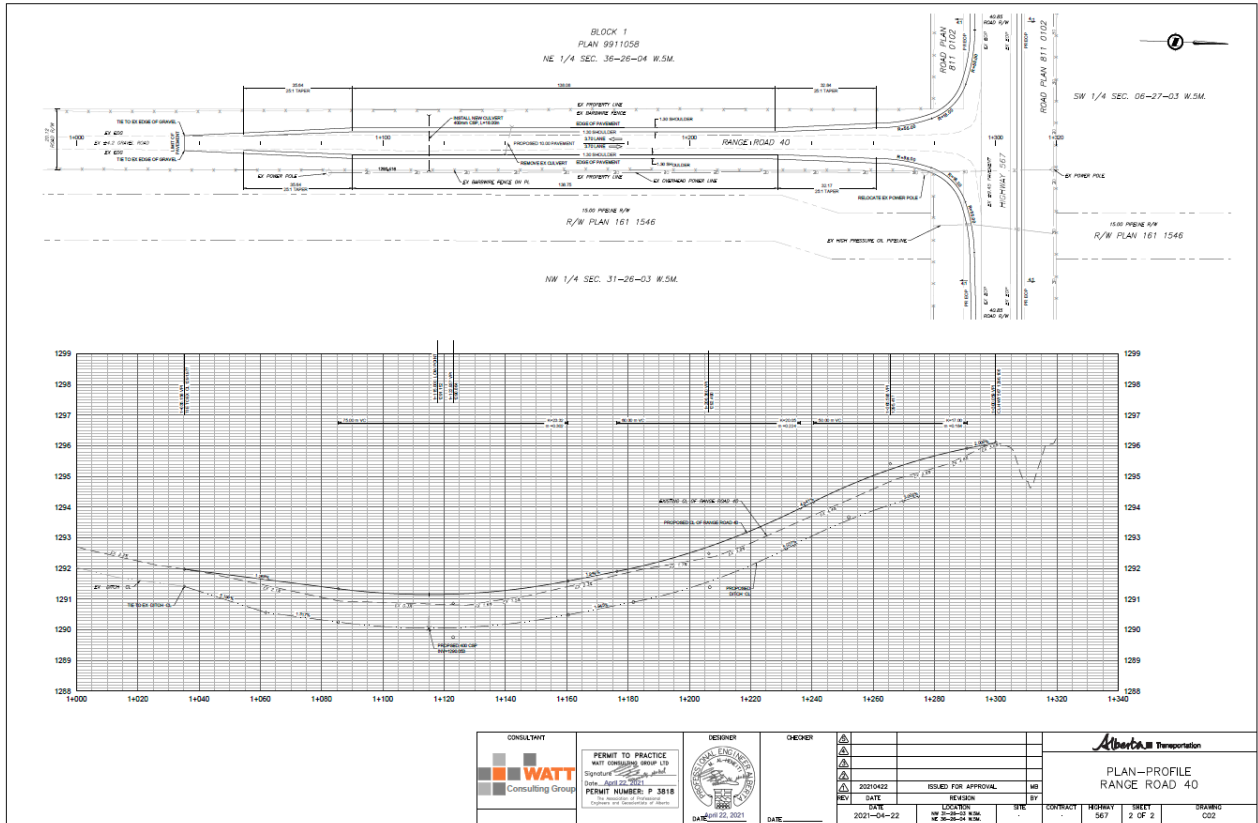
Type IVA Intersection @ Highway 567 and Range Road 40 South

Source: WATT Consulting Group



Plan Profile on Range Road 40 South

Source: WATT Consulting Group



4.3 Haul Routes

The HRP contains the anticipated haul routes as determined by market supply and demand. It has been determined that approximately 60% of the truck traffic will use Highway 567 to service the Airdrie, Balzac, and North Calgary market, while 30% will use Highway 766 (Lochend Road) to service areas in Northwest Calgary markets. It is estimated that only 10% of trips generated from the Summit Pit will service the markets located west of the Summit Pit.

Truck configurations will vary. The largest configuration is truck and quad trailer which carries approximately 36 tonnes. Other configurations will include truck and pup (24 tonnes), truck and tri-pup (27 tonnes), tri-axle trailer/end-dump (29 tonnes), tandem trucks (14 tonnes), foundation slinger trucks (4 tonnes), and local pick-ups with 2 tonne dump trailers.

Hauling hours will be Monday through Friday from 7am to 7pm, Saturday from 7am to 5pm, and no hauling activities on Sunday's or Statutory Holidays.

All commercial vehicles hauling from the Summit Pit, for MALP, will be enrolled in the Alberta Sand and Gravel Association's truck registry program. All commercial vehicles hauling for MALP will be required to produce valid licence, registration, insurance, and a current/valid Commercial Vehicle Inspection Report.

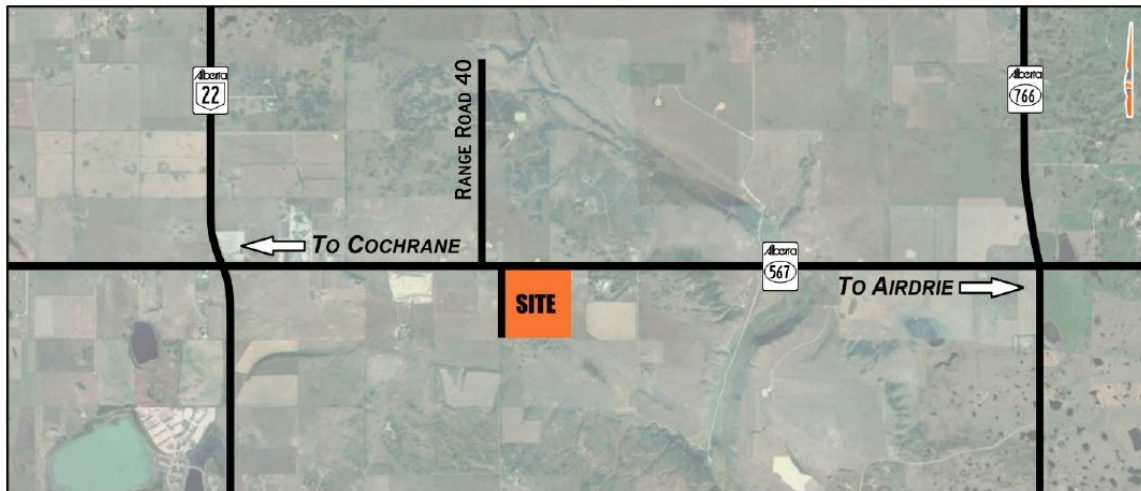
MALP will investigate all complaints regarding driver behaviors will be and deal with identified issues in an appropriate manner. Drivers/vehicles with more than two complaints will no longer be able to deliver aggregates from the Summit Pit. All complaints and supporting documentation regarding the driver and truck will be filed and stored for future reference.

Any incidence regarding school buses is cause for immediate suspension and has the potential for permanent termination, based on the findings of a subsequent investigation.

Any incident causing death will result in immediate termination.

There will be no staging of trucks on Highway 567, Range Road 40, or within the pit itself. Dispatch will ensure trucks are properly spaced apart to ensure staging does not occur. Trucks that arrive early will not be loaded and directed to leave immediately.

Prior to leaving the site, all truck drivers will ensure loose debris (sand and gravel) is removed from surfaces to prevent track out onto public roadways. Range Road 40 and the intersection will be routinely inspected for loose debris. Paved roadway surfaces containing loose debris will be cleaned/swept immediately using a skid steer equipped with a sweeping broom.



4.4 Mining and Excavation

The total area of disturbance in Phase 1 includes ± 15.78 ha (± 39 ac).

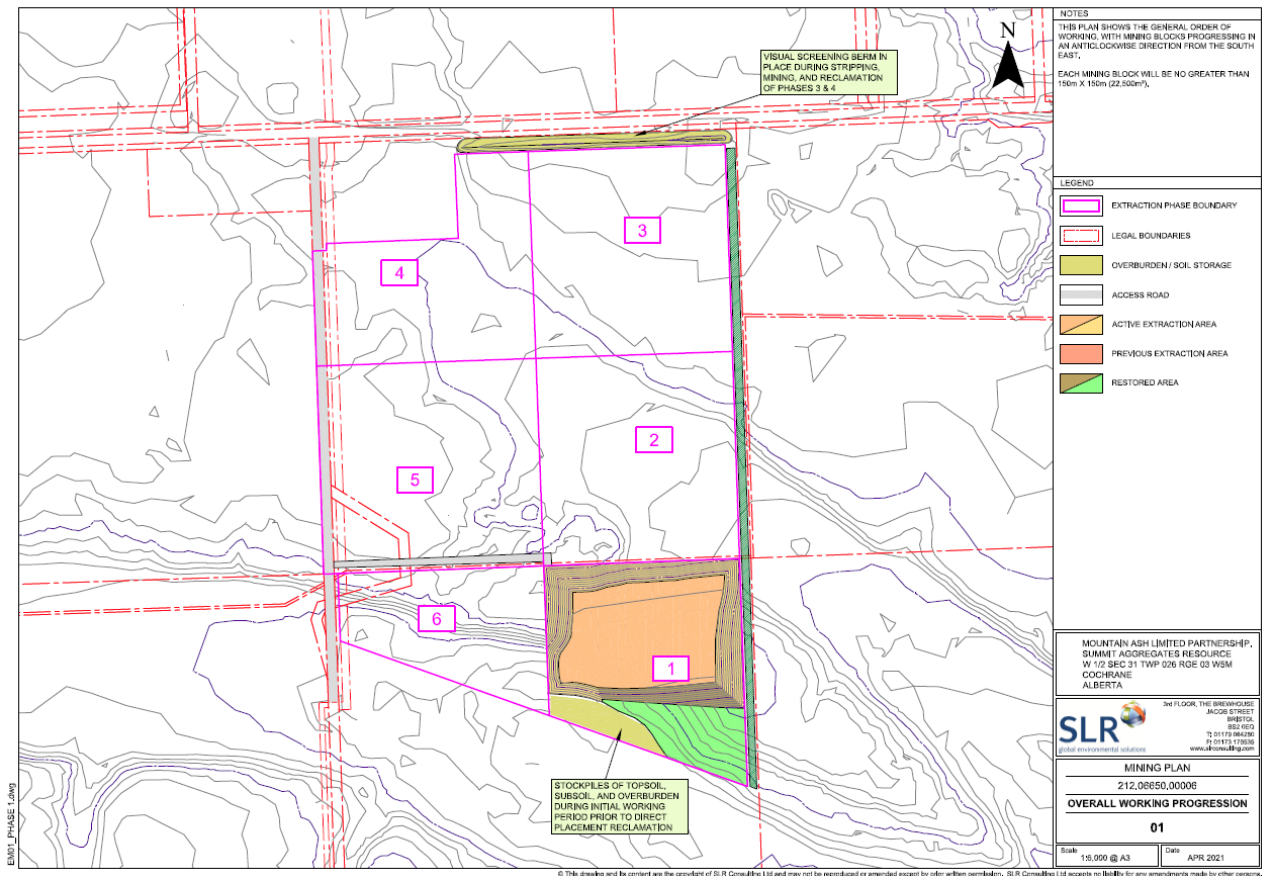
The internal haul/access road includes ± 0.10 ha (± 0.25 ac).

The scale house and mobile equipment storage/re-fuelling area includes ± 1.48 ha (± 3.7 ac).

The Phase 1 mining and excavation program will be implemented within a ± 14.16 ha (± 35 ac) area.

Mining and excavation will commence in the most southerly portion of Phase 1 and will progress in a northerly fashion.

The mining or excavation face will be removed as the face-of-gravel is depleted moving through the Phase 1 area towards Highway 567.



4.5 Stripping and Grading

Stripping and grading will be implemented in accordance with the Mining and Excavation Plan.

A ± 150 m x ± 100 m area will be stripped to accommodate the scale and a miscellaneous storage/staging area located immediately south of the Pit's main access. Topsoil from this area will be removed and used to construct a visual screening berm along the south boundary of the retained wetland in the northwest corner of NW 31 as per the provisions of the adopted MSDP.

Topsoil will then be stripped from a ± 8 m x ± 650 m area to accommodate the internal access road. Some of this excavated topsoil will be used to construct the previously referenced visual screening berm adjacent to the retained wetland, with the remainder to be stockpiled within the Phase 1 area – to subsequently be used to reclaim portions of the Phase 5 and 6 areas.

All berms and/or stockpiles will be seeded with a grass mixture and maintained on regular basis.

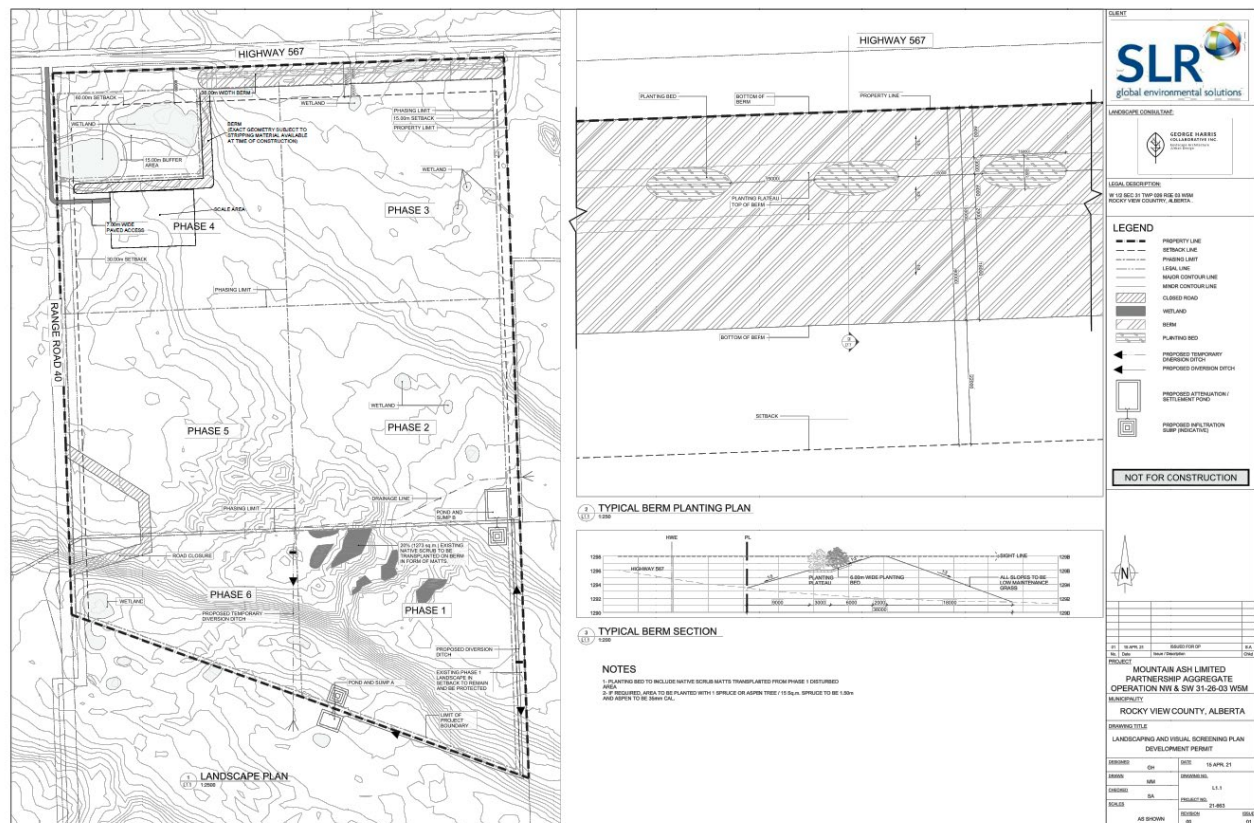
4.6 Landscape and Visual Screening

Topsoil stripped from the scale, miscellaneous storage/staging area, and the internal access road will be used to construct a visual screening berm with a 3:1 slope situated along the southern and eastern boundary of the retained wetland area in the northwest corner of NW 31 and along Highway 567.

All berms will be hydroseeded to ensure soil is conserved.

Several planting blocks will be placed along Highway 567 which will contain several species of trees and shrubs suitable for thriving in an Alberta temperate zone. Some species of trees include white spruce, lodgepole pine, trembling or Swedish columnar aspen.

A Landscaping Plan will be provided at each development permit stage to detail the specific type and configuration of the berm and associated landscape treatments.



4.7 Dust Control

An Air Quality Assessment, SLR was undertaken as part of the Summit Pit MSDP to assess the potential fugitive air emissions generated from the aggregate operations in relation to adjacent receptors.

The primary air emission associated with the Summit Pit operations is anticipated to be particulate matter (e.g., PM_{2.5} and TSP) released in the form of fugitive dust. Sources of fugitive dust can include traffic from on-site haul routes, aggregate processing, recycling, and handling, and natural releases occurring from exposed stockpiles and gravel faces.

As a requirement for the Code of Practice (COP) for Pits and Development Permit (DP) applications, a Dust Control Plan (DCP) for the operation of the Summit Pit will be implemented with the following key objectives:

- Provide an overview of the operations at the Summit Pit; identify potential sources of fugitive emissions; outline maintenance and inspection procedures.
- Provide a summary of control measures that are or shall be implemented.
- Provide an implementation schedule for the control measures.
- Illustrate how on-going compliance will be ensured using a monitoring and record keeping program (i.e., the Air Quality Monitoring Program); and
- Detail the employee training program for fugitive dust control procedures.

Once implemented, the DCP will be used to ensure MALP minimizes dust emissions from the Summit Pit, thereby minimizing or eliminating impacts to nearby receptors and the general local environment.

The Site Manager shall be responsible for ensuring that the control measures identified in this plan are implemented. To limit the transfer of dust to surrounding receptors, an operator must take reasonable actions to ensure that fugitive dust emissions are minimized using best management practices associated with the industry and any regulatory approvals.

Although several pits have been proposed for the area, no additional pits have been approved with a development permit that have the potential to add to the dust contributions from Summit Pit operations at adjacent receptors. There is an agreement between future operators to ensure that a cumulative impacts mitigation management agreement is in place to minimize the dust from their respective operations with respect to cumulative effects. Mountain Ash will participate with those operations to address cumulative effects/impacts in the area prior to submitting future development permit applications.

The DCP has been developed to manage the onsite and offsite emissions related to dust generated from the operations. MALP has established several controls to achieve air quality objectives related to the operations and management of the Summit Pit.

The following are mitigation measures which will be implemented, but are not limited to, the Summit Pit operations to ensure dust is managed at a minimum:

- Pave a \pm 200 m portion of Range Road 40 from Highway 567 south to the main site access.
- Continued application of water and/or calcium chloride on internal access routes within the site.
- Cessation of pit operations during high wind conditions.
- Implement ongoing air quality monitoring & reporting monthly which will be reported to support on-going subsequent development permit renewals.
- Install a minimum of two (2) dust monitors will be installed to gather real-time, continuous data.
- No crushing activities will occur within 190 m from the east property and 140 m from the north boundary.
- The crusher will be shrouded to reduce dust generated during operations.
- Annual reports will be supplied to RVC to ensure compliance.
- Process and procedures for addressing neighbor concerns or complaints will be established as part of the Good Neighbour Action Plan.

4.8 Air Quality Monitoring

An Air Quality Assessment was undertaken as part of the MSDP application to assess the potential air pollution from the Summit Pit operations in relation to surrounding receptors.

Operations will produce anthropogenic emissions and dust into the ambient air. Diesel combustion from engines on heavy trailer and haul trucks and other vehicles emit sulphur dioxide (SO_2), fine particulate matter with aerodynamic diameter below 2.5 micrometer ($\text{PM}_{2.5}$), carbon monoxide (CO), and oxides of nitrogen (NO_x). Additionally, fugitive dust emissions from wheel entrainment and pit operations produce suspended particulates (TSP). Since these emissions can pose potential negative effects at high ambient ground-level concentrations, they are regulated and should not exceed their prescribed Alberta Ambient Air Quality Objectives (AAQOs).

As a requirement for the Code of Practice (COP) for Pits and Development Permit (DP) applications, the Ambient Air Quality Monitoring Program (AQMP) in relation to the operation of the Summit Pit.

Following the Air Quality Modeling Guideline (AQMG), CALPUFF dispersion modeling was done to assess the effects of Summit Pit operations relative to the Alberta Ambient Air Quality Objectives (AAAQO). Modelling was completed for the three key pit operations defined as: overburden removal and backfill, aggregate mining/crushing, and hauling/trucking. Maximum Daily Emission and Annual Average Emission cases were estimated. The results at the Summit Pit boundary showed there were no predicted exceedances of AAQOs from any modelled compounds and any averaging period when the Dust Control Plan is executed appropriately (see Section 4.7). The predicted maximum concentrations at residence receptors are all less than the AAQOs for all modelling scenarios and all contaminants.

While Summit Pit operations are not expected to exceed ambient air quality objectives beyond the property boundary, Mountain Ash has committed to monitoring for a minimum $\text{PM}_{2.5}$ and TSP at the property boundary to ensure dust suppression techniques are working as previously modelled and predicted. All monitoring will be conducted real-time, and data will be stored on in cloud service. All monitoring data will be made available to the public, RVC, and other stakeholders via www.summitpit.com.

4.9 Noise Monitoring

An Acoustic Assessment was undertaken as part of the MSDP application to assess the potential sound egress from the Summit Pit operations in relation to the nearest noise receptors.

As a requirement for the Code of Practice (COP) for Pits and Development Permit (DP) applications, this report details the Noise Monitoring Program (NMP) in relation to the operation of the Summit Pit. The objective of the NMP is to monitor, continuously validate, and keep a record of sound from Summit Pit operations and from off-site sources. Ongoing monitoring and assessment of overall noise levels will be crucial for effective management of sound from operations.

Several noise receptors exist near the proposed Summit Pit area which have the potential to be impacted by sound from operations. The NMP has adequate consideration for these receptors and the influence from the existing acoustic environment. NMP provides a detailed description of:

- Current acoustic environment.
- Pertinent sound sources during operations.
- Monitoring objectives.
- Parameters that will be monitored.
- Sound monitoring procedure including locations, frequency, and duration.

A monthly monitoring report will be produced detailing the sound monitoring procedure, sound level results, weather conditions, site activities, subjective observations, comparison against monitoring criteria and applicable action items after each survey. The monthly report will also provide details of any complaints relating to sound and their state of resolution. An annual monitoring report will collate the findings of the previous monitoring reports. All noise monitoring data will be made available to the public, RVC and other stakeholders. Data will be stored using a cloud service and can be accessed via www.summitpit.com.

All complaints received regarding operational noise emissions from the Summit Pit will be responded to within 72 hours by appropriate personnel. Mountain Ash will keep a record of any complaint made in relation to operational noise from the site to include summary of the following:

- Date and time of complaint
- Method by which the complaint was made.
- Identification of the complainant (if provided).
- Nature of the complaint.
- Weather conditions corresponding to the time of the complaint.
- Action taken by Summit Pit Operatives and any follow up actions.
- If no action was taken, the reason why no action was taken.

In the event of a measured exceedance of the relevant sound monitoring criteria or an increase in the baseline sound emissions (as appropriate) the following actions will be undertaken:

- Identify the sound source responsible for the issue. This would be completed by reviewing sound monitoring data. Additional methods such as attended or near field monitoring may be used to investigate Summit Pit sound emissions, or to determine compliance with the criteria, where potential non-compliances have been measured but are difficult to attribute to the Summit Pit.
- Reassess the sound reduction techniques employed at the site and evaluate and implement reasonable and feasible additional controls to reduce impacts.
- Conduct follow-up monitoring, after sound control implementation, to evaluate the effectiveness of the mitigation strategy.
- Communicate details of any non-compliance, the results of sound monitoring/investigations and follow-up noise management activities to the County.

4.10 Groundwater Monitoring

A Hydrogeological Assessment was undertaken as part of the MSDP application to assess the potential for groundwater impacts from the Summit Pit operations in relation to nearby groundwater users.

The Hydrogeological Assessment concluded that there is little risk of impact to adjacent well users because aggregate extraction occurs above the water table, and the nearest wells residential wells are located more than 490m away when the operations are located at its nearest point to the off-site residential well.

As a requirement for the Code of Practice (COP) for Pits and Development Permit (DP) applications, details the Groundwater Monitoring Program (GWMP) in relation to the operation of the Summit Pit. The objective of this GWMP is to ensure the effects of site operations on groundwater resources in the vicinity of the site are monitored and negative impacts prevented wherever possible. This is also consistent with a condition required as part of the land re-designation and MSDP. Ongoing monitoring and assessment of groundwater levels and quality will be determined for effective monitoring of the lack of effect of operations on groundwater, and to plan and manage mitigation should un-anticipated impacts occur.

Several potential groundwater receptors including residential water wells and groundwater springs exist near the proposed Summit Pit area which the Hydrogeological Assessment (SLR, 2020) concluded would be unaffected by the Summit Pit.

4.10.1 Process for GWMP Participation and Monitoring

MALP has sent email correspondence to each resident/landowner within a \pm 800 m radius of the proposed Summit Pit with an offer to monitor private groundwater well as part of our Good Neighbour Action Plan, including the Big Hill Springs Estates Water Co-op (BHSE Co-op) located \pm 1,600 m from the MSDP area. The following process applies to the GWMP, providing residents and the BHSE Coop participate in the GWMP program. The period of this program is effective upon development permit approval and expires upon Phase 1 development permit expiration.

Proposed Baseline Monitoring Schedule (2021)

Parameter	Monitoring Point	Frequency
	<p>Residential Wells WW1, WW2, WW3, WW4, WW5**, WW6**, WW7**, WW8**, WW9**, WW10**, WW11**, WW12**, WW13**</p>	<p>Manual readings twice in the baseline period (June and November). Data loggers installed and recording normal usage and seasonal trends.</p>
<p>Field Parameters: Temperature, pH, specific conductance</p>	<p>Onsite Monitoring Wells MW14-101, MW14-102*, MW14-103, MW18-104, MW18-105, MW18-106, MW18-107, MW19-108, MW19-109, MW19-110</p> <p>Residential Wells WW1, WW2, WW3, WW4, WW5**, WW6**, WW7**, WW8**, WW9**, WW10**, WW11**, WW12**, WW13**</p> <p>Surface Water BHS1</p>	<p>Once before excavation commences</p>
<p>Routine Potability: alkalinity, bicarbonate (HCO₃), electrical conductivity (EC), ion balance, dissolved calcium (Ca), iron (Fe), potassium (K), manganese (Mn), magnesium (Mg), sodium (Na), chloride (Cl), sulphate (SO₄), nitrite (NO₂), nitrate (NO₃), pH, hardness, total dissolved solids</p>		
<p>Tier 1 dissolved metals: Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Se, Si, Sn, Sr, Ti, Tl, U, V, Zn</p>		
<p>Petroleum Hydrocarbons: Benzene, toluene, ethyl-benzene, xylenes, petroleum hydrocarbon fractions F1 & F2</p>		

* MW14-102 only sampled should groundwater levels rise above the end of hole. **(MW14-102 is a dry well and has never contained water. In the event water becomes present during monitoring samples will be taken as per the schedule below. This monitoring well was installed in 2014.)**

** Pending well owner agreement for inclusion in the monitoring program.

Proposed Phase 1 Development Monitoring Schedule

Parameter	Monitoring Point	Frequency
Water Level	Onsite Monitoring Wells MW14-101, MW14-102*, MW14-103, MW18-104, MW18-105, MW18-106, MW18-107, MW19-108, MW19-109, MW19-110	Monthly during Operating Months (April - November)
	Residential Wells WW1, WW2, WW3, WW4, WW5**, WW6**, WW7**, WW8**, WW9**, WW10**, WW11**, WW12**, WW13**	Manual readings twice annually (April and November). Data loggers installed and recording daily usage.
Field Parameters: Temperature, pH, specific conductance	Onsite Monitoring Wells MW14-102*, MW19-108, MW19-109, MW19-110	Annually
Routine Potability: alkalinity, bicarbonate (HCO ₃), electrical conductivity (EC), ion balance, dissolved calcium (Ca), iron (Fe), potassium (K), manganese (Mn), magnesium (Mg), sodium (Na), chloride (Cl), sulphate (SO ₄), nitrite (NO ₂), nitrate (NO ₃), pH, hardness, total dissolved solids		
Tier 1 dissolved metals: Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Se, Si, Sn, Sr, Ti, Tl, U, V, Zn		
As Above	Residential Wells WW1, WW2, WW3, WW4, WW5**, WW6**, WW7**, WW8**, WW13**	Annually until Phase 1 DP expires
As above with the exception of water level	BHS1	Annually

Parameter	Monitoring Point	Frequency
Petroleum Hydrocarbons: Benzene, toluene, ethyl- benzene, xylenes, petroleum hydrocarbon fractions F1 & F2	Onsite Monitoring Wells MW14-102*, MW19-108, MW19-109, MW19-110	Annually

*MW14-102 - will be monitored as per the schedule and only sampled should groundwater levels rise above the end of hole. **(MW14-102 is a dry well and has never contained water. In the event water becomes present during monitoring samples will be taken as per the schedule below. This monitoring well was installed in 2014.)**

** Pending well owner agreement for inclusion in the monitoring program.

4.11 Construction Management

Construction management activities are broken down into two categories:

- Onsite construction, and
- Offsite construction.

Each of these construction activities may proceed once a conditional development permit has been issued. All onsite construction activities will be managed by MALP, while offsite construction related activities will be managed for MALP by others. All offsite related construction activities will be completed first, followed by onsite related construction and development.

It is expected that the County will require a detailed Construction Management Plan be provided by the contracting engineer as a condition of development permit approval at each phase of the Project. For the purposes of the Phase 1 development permit application, the following is a summary of how site improvements will be implemented.

4.11.1 Pre-Development: Offsite Construction Activities and Management Intersection Upgrade @ Range Road 40 and Secondary Highway 567 & Paving of Range Road 40

START: Upon receipt of a Development Permit with Conditions Prior to Issuance. One week's notice will be given to residents located within $\pm 1,600$ m of the development.

- Construction Manager: WATT Consulting Group, Transportation Engineer
- Tender Authority: WATT Consulting Group
- Owner: Alberta Transportation / Rocky View County
- Development Authority: Rocky View Council
- Duration: Day 0 to Day 12
- Critical Path: Start to Finish

4.11.2 Pre-Development: Onsite Construction Activities and Management All onsite construction management activities will be managed and tendered by MALP.

START: Once Offsite related development and construction activities have been completed and inspected by AT and RVC. Total duration of all onsite

construction activities from start to finish is estimated at ± 26 days. No gravel will be sold or removed from site until a final development approval is obtained.

Activity 1: Stripping and Grading of Scale Area/Refuelling Area – Berm Construction

- Topsoil will be stripped and placed along the south side of wetland area. Area to be stripped is 100 m x 150 m adjacent to Range Road 40. (± 1 day).

Activity 2: Stripping and Grading of Internal Access Road to Phase 1 – Berm Construction

- Topsoil will be stripped and placed along south and east side of wetland area.
- Internal road begins at the scale area and is stripped ± 8 m wide and ± 650 m long to provide access to the Phase 1 mining and excavation area. (± 3 Days)

Activity 3: Stripping of Phase 1 - Berm Construction

- Topsoil will be stripped and placed along south boundary of Phase 1, Phase 6 and possibly east property line if there is a surplus of material. (± 3 days)
- Overburden stripped and placed along Phase 1 and Phase 6 south boundary and possibly east property line if there is a surplus of material. (± 3 days)

Activity 4: Prepare Subgrade (Scale Area, and Internal Access Road)

- Compaction equipment will be used to prepare the clay subgrades for both scale area and internal haul road. (± 4 days).
- Run power, underground, from Range Road 40 power line to scale location. (± 2 days)

Activity 5: Place, compact and Grade Gravel Base (Scale Area and Access Road)

- Screen or import, place, grade, water and compact D6-80mm gravel subbase. Lift 350mm. (± 7 days)
- Crush or import, place, water and compact D2-40mm or D2-25mm gravel base. Lift 120mm. (± 7 days)
- Final Grade and apply Calcium Chloride to all gravel surfaces. (± 2 days).

Activity 6: Pave Scale Area and Install Scale Infrastructure

- Pave scale infrastructure area, 100m x 50m. Lift 125mm, City of Calgary Commercial B Mix or other mix specified by RVC. (± 1 day)
- Pour concrete footings, install Portable Scale (85ft) and Scale House/Shack. (± 14 days)

Activity 7: Hydroseed Berms and Landscaping

- Hydroseed berms and plant trees, shrubs, and perennials along Highway 567. (± 7 days)
- Install Summit Pit sign. (± 1 day)

4.11.3 On-Site Development Construction Activities and Management

Activities related to the development and construction of the Summit Pit include landscape maintenance including weed maintenance, infrastructure maintenance which includes removing tracked-out debris from paved surfaces, watering of internal haul routes, gravel crushing and stockpiling, aggregate loading, scaling of aggregate products for sale and delivery, and progressive reclamation of prior disturbances.



4.12 Erosion and Sediment Control

The primary objectives of Erosion and Sediment Control (ESC) are to prevent offsite sedimentation into adjacent vegetated lands and specifically into any adjacent permanent or ephemeral watercourses/wetlands.

Temporary ESC measures are necessary during construction and will be installed in specified work areas as required. In post-construction when areas are suitably stabilized, the temporary ESC measures will be removed.

Temporary ESC measures to be implemented in the Summit Pit are summarized below:

- Sediment control (perimeter silt fence) primarily along south and east boundaries of Phase 1.
- Sediment control (silt fence) along haul route adjacent to wetland preservation area.
- Sediment control (v-ditch/berm with check dams) to provide some runoff storage in unprotected areas.
- Run-on control (diversion ditch) along west and north boundaries to intercept drainage from upslope areas.
- Erosion control (scour matting) at exit points from diversion ditches into surrounding environment.
- Stormwater controls (conveyance ditches and settlement ponds) to convey runoff to ponds to allow sediments to settle.
- Erosion control (rolled erosion control product) in diversion and conveyance ditches to prevent erosion and reduce potential for downslope sedimentation.
- Sediment control (check dams) in diversion and conveyance ditches to reduce runoff velocity.
- Erosion control (hydro-mulch/tackifier) on all overburden areas and other disturbed areas that need to be stabilized beyond the short-term.
- Good housekeeping (gravel access pad) to reduce dirt/mud tracking onto adjacent paved roadways.
- Dust control applications, namely calcium chloride used on internal haul routes and potentially other gravel surfaces that accommodate common vehicle movements and traffic during operations.

4.13 Soil and Weed Management

A biophysical impact assessment was undertaken as part of the MSDP application to assess baseline conditions for soils, vegetation, and wildlife, and to provide an impact and cumulative effects assessment on these resources. As a requirement for the Code of Practice (COP) for Pits and Development Permit (DP) applications, this report details the Soil Management Plan (SMP) and Weed Management Plan (WMP) in relation to the operation of the Summit Pit.

During construction, best practices for erosion and sedimentation control will need to occur to prevent soil erosion once the vegetation is removed. Topsoil and upper subsoil will be salvaged and stockpiled separately for reclamation purposes. These soils are not susceptible to wind erosion; however, water erosion during spring melt or heavy rainfall events is a concern. Soil stockpiles will be vegetated with an appropriate seed mix to prevent water erosion.

Average topsoil onsite for upland areas is ± 25 cm and ± 30 cm in wetland areas. Approximately 20 cm of suitable subsoil is present. Soil series and subsoil will be further characterized onsite during stripping and grading. Soils will be appropriately managed under the direction of a qualified professional onsite. Unique or problem soils, if present, will be handled separately.

A weed survey was conducted as part of the biophysical assessment in June 2019 and no weeds were identified. Professionals supporting the site through construction will assess and monitor stockpiles for noxious and invasive weed species. This includes the list of invasive species provided by RVC and species listed under the *Weed Control Act*.

Since no specific species of weeds have been identified onsite, general weed control methods are presented in this section. Mountain Ash will implement weed control as part of their regular operating practices that will cover construction, operation, and reclamation.

Weed control methods may include a combination of or any one of the following:

- Chemical (e.g., herbicides).
- Mechanical (e.g., mowing prior to flowering).
- Manual (e.g., hand pulling prior to seed set).
- Grazing and/or cultivation (may be limited due to land use).

Herbicide spraying is conducted in early spring, late fall or throughout the growing season depending on weeds treated. For example, late fall application

is effective on Canada thistle, but early spring application is effective for downy brome. Mechanical weed control may include mowing scentless chamomile prior to flowering to reduce seed spread. Manual methods would be hand pulling weeds prior to seed set for species such as nodding thistle, scentless chamomile, and purple loosestrife. Weed management should optimize control methods with timing of construction.

Onsite staff during the initial stripping and grading phases will identify different types of weeds and develop a map indicating weed species, no spray zones (i.e., water including a buffer area) and different control methods.

4.14 Post-Mining Reclamation

A biophysical impact assessment was undertaken as part of the MSDP application to assess baseline conditions for soils, vegetation, and wildlife and to provide an impact and cumulative effects assessment on these resources (SLR 2020). As a requirement for the Code of Practice (COP) for Pits and Development Permit (DP) applications, this report details the Post-Mining Reclamation Plan (AEP 2004a and 2004b).

This Post-Mining Reclamation Plan has been developed based on the information obtained in the biophysical impact assessment, literature review as well as best industry practices and in accordance with recommendations in a User's Guide to Pits and Quarry Reclamation in Alberta (Alberta Land Conservation and Reclamation Council 1992).

The objectives of the Post-Mining Reclamation plan are to:

- Provide information about the planning process for the phased reclamation and the ultimate closure of the Summit Pit; and
- Provide the endpoints for final reclamation of the Summit Pit and demonstrate how equivalent land capability will be achieved.

Reclamation objectives will be considered in all stages of mining to:

- Minimize the footprint of the development.
- Maximize resource extraction.
- Prevent double handling of materials.
- Consider sequencing of pit development in reclamation planning and incorporate direct soil placement and progressive reclamation in all stages of mining, whenever feasible; and
- Optimize the efficiency of soil handling equipment and reduce noise, dust, and equipment emissions.

The goal of reclamation is to achieve equivalent land capability and obtain reclamation certificate as required under the *Environmental Protection and Enhancement Act* and *Conservation and Reclamation Regulation* (GoA 2021). The sections below describe how these objectives can be achieved.

Development of the Summit Pit will require on-site vegetation to be stripped and salvaged for future reclamation purposes. As due diligence to avoid contravening the *Migratory Birds Convention Act*, and to reduce the potential for impacting active migratory nesting birds which may nest between mid-April and late August, clearing of wetlands and vegetation will occur outside of this period (GoC 2019).

The following mitigation measures for erosion will be implemented:

- Soil will not be salvaged during extremely windy periods, when wind velocity creates a potential for loss of topsoil or subsoil.
- Soils will not be handled when wet conditions are present, such as during spring melt or heavy rain events.
- Salvage or replacement of topsoil and subsoil will only restart when conditions specified above no longer exist.
- Soil stockpiles will be promptly revegetated using suitable seed mix to limit erosion and weed establishment. Proposed species include oats, barley, or rye – except for the native pasture topsoil pile that will be allowed to naturally re-vegetate.
- Soil stockpiles will be continuously monitored for weeds and erosion issues and further mitigation measures will be developed based on these observations.

As areas are no longer needed for operations, they will be reclaimed in accordance with the best industry practices to ensure equivalent land capability can be achieved. Subsoil will be de-compacted before topsoil placement and recontoured to tie in with the surrounding landscape and create drainage patterns consistent with surrounding land use. Experienced reclamation specialist will supervise machinery to avoid final contours that may cause water ponding or any erosion issues. Revegetation will occur within the same growing season when topsoil placement is completed to avoid any soil loss via erosion. Seed drill machine or standard farming equipment will be used for maximum germination success. Species mix, seeding rates and composition will be determined by assessing the surrounding lands during the time of reclamation and will be supported by the approval received in writing from the landowner. Currently, the land is used for native pasture, tame pasture, and hay. Seed will be sourced from the reputable supplier and professional agrologist will review seed germination tests, impurities, and presence of weed species in the seed mix. Seed certificates will be reviewed and kept on file.

4.15 Good Neighbour Action Plan

Mountain Ash Limited Partnership (MALP) is a progressive aggregate extraction company that is sensitive to concerns from neighbouring residents and businesses regarding the potential for operations within the Summit Pit that could generate noise, dust, traffic, groundwater, and visual impacts.

As such, Mountain Ash have developed the following goals for the Summit Pit:

- Operate respectfully.
- Address neighbour concerns in a timely and transparent manner.
- Effectively mitigate cumulative effects that may arise during operations.
- Do more than the minimum of what is required.

To implement these goals, Mountain Ash has created a Good Neighbour Action Plan to:

- 1) Provide a summary of the type and scale of aggregate operations within the Summit Pit.
- 2) Establish readily accessible mechanisms for ongoing communication between MALP and the surrounding residents and businesses situated within ± 1.6 km radius of the Project site.
- 3) Provide a means to resolve expressed complaints or disputes that may arise from aggregate operations within the Summit Pit.
- 4) Build and maintain trust between the Summit Pit aggregate operator and surrounding residents and businesses.

MALP is committed to open and transparent communication with surrounding neighbours and businesses throughout the life of the project. Communication is intended to be frequent and ongoing with direct lines of communication maintained between the operator and neighbours, especially those within ± 1.6 km radius of the Project site. MALP will provide residents with a main point of contact who is actively engaged in the operations and is available at any time. This contact person will be part of the community and enable neighbouring residents to feel that their concerns will be investigated, addressed, and resolved in a reasonable time frame should any arise.

MALP is prepared to work with adjacent residents to ensure their concerns are mitigated before, during, and after operations have ceased. Aggregate operations within the Project site have incorporated numerous protocols to ensure the Summit Pit is the best neighbour possible.