



Post-Mining Reclamation Plan

Mountain Ash Limited Partnership Summit Pit

SLR Project No: 212.06650.00006

June 2021



Post Mining Reclamation Plan

Mountain Ash Limited Partnership

Rocky View County, Alberta

SLR Project No: 212.06650.00006

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Distribution: 1 copy (PDF) – Mountain Ash Limited Partnership
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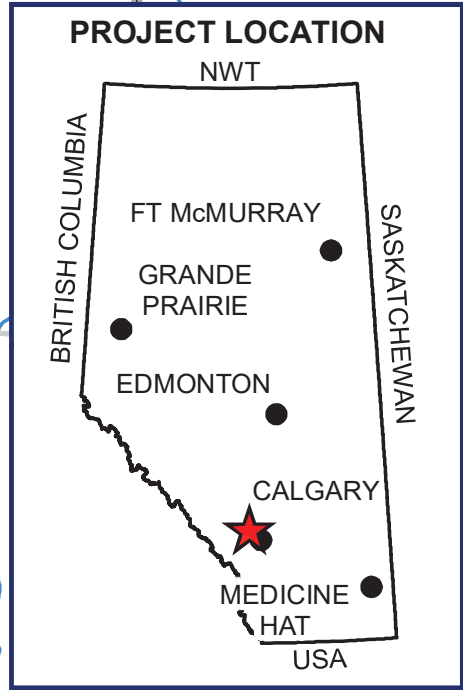
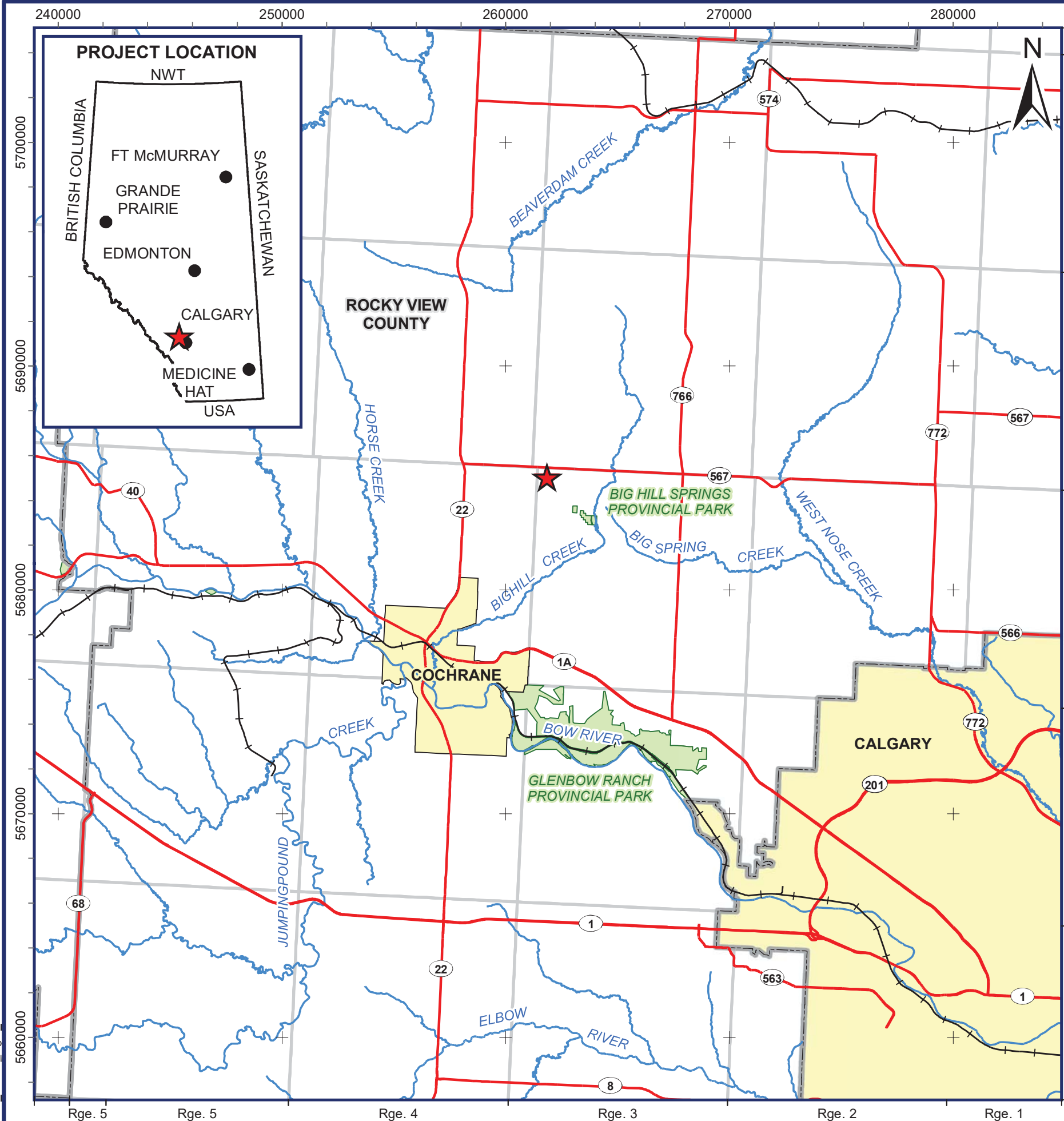
1.0 INTRODUCTION

Mountain Ash Limited Partnership (Mountain Ash) is planning to develop the Summit Pit (the Project) along Highway 567 within NW and SW 31-026-03 W5M, northeast of the Town of Cochrane, in Rocky View County (RVC), Alberta (Figure 1). The Project will encompass approximately 208 acres (84 ha) excluding existing road rights-of-way. Mountain Ash is applying for Phase 1 of a six-phase mining plan. This land is currently owned by 1410266 Alberta Ltd. (a general partner of Mountain Ash). Summit Pit received land use and a master site development plan (MSDP) approval on March 2, 2021 (Land Use Bylaw C-8051-2020).

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 is also consistent with requirements of the land re-designation and MSDP.

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
- provide the endpoints for final reclamation of the Summit Pit and demonstrate how equivalent land capability will be achieved



LEGEND

- ★ PROJECT LOCATION
- HIGHWAY
- +— RAILWAY
- WATERCOURSE
- COUNTY BOUNDARY
- PROVINCIAL PARK
- URBAN

NOTES

This map is for conceptual purposes only and should not be used for navigational purposes.
Basedata: AltaLIS Government of Alberta under the Alberta Open Data License.

5 0 5
SCALE: 1:250,000 KILOMETRES
WHEN PLOTTED CORRECTLY AT 8-1/2 x11
NAD 1983 UTM Zone 12N

MOUNTAIN ASH LIMITED PARTNERSHIP
AGGREGATE OPERATION
NW & SW 31-26-03 W5M
ROCKY VIEW COUNTY, ALBERTA

Post-Mining and
Reclamation Plan

REGIONAL LOCATION

January 15, 2020	Rev 0.0	Figure No.
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2.0 PROJECT SETTING

The Project area settings are summarized from the Biophysical Impact Assessment (SLR 2020) completed as part of the MSDP application and based on literature review.

2.1 Landuse

The Project is located in the Parkland Natural Region and Foothills Parkland Natural Subregion (Natural Regions Committee 2006). The subregion has a relatively short growing season and correspondingly less intensive cultivation due to proximity to the mountains. Rolling to hilly native grasslands, aspen woodlands and willow shrublands are common in areas remaining under native vegetation. Haylands are typical for undulating to rolling terrain in the areas used for agriculture.

All soils in this area are mapped as Class 5 for agriculture, because of adverse climate (subclass C; Land Canada Inventory 2021). Such soils have severe limitations that restrict their capability in producing perennial forage crops. Since the main limitation for agriculture at the site is climate, this subclass cannot be improved (Environment Canada 1972).

Current land use at the site is hayland / tame pasture. In consultation with the landowner, the future landuse at the end of mine life cycle will be tame pasture.

2.2 Terrain and Soil

The site is in low relief – hummocky terrain with slope classes 3 – 4. (AGRASID 2021).

The AGRASID Alberta Soil Information Viewer (Alberta Agriculture and Forestry 2021) and the Alberta Soil Names File (Generation 4) User's Handbook (Alberta Soil Information Centre 2021) were accessed to determine soils expected to be present in the Project area.

It was determined that underlying parent material in the Project area is moderately to strongly calcareous, mixed Continental and Cordilleran till (Alberta Soil Information Centre 2021). Fertile loam to clay loam Orthic Black Chernozemic soils are extensive, with Gleysolic soils present in poorly drained and lower slope positions expected at the Project (Alberta Agriculture and Forestry 2021). The AGRASID information was consistent with SLR field assessment conducted on June 2019. The Dunvargan soil series, a fertile, well-drained Orthic Black Chernozem formed on glacial till parent material, was identified across the majority of the Project area, with the gleyed variant (Dunvargan-GL) identified in depressional areas. These soils have low wind erosion risk and moderate water erosion risk; no sensitive soils were observed within the Project area during the field investigation.

For Dunvargan soil series, Ap and Ah horizon (topsoil) depths are on average 25 cm and include well drained loam to clay loam soils and average subsoil thickness was 20 cm. SLR recorded average topsoil thickness in the wetland areas as 30 cm and average subsoil thickness as 20 cm.

2.3 Vegetation

Onsite vegetation consisted mostly of hayland / tame pasture species dominated by wheatgrass, brome species, alfalfa, and timothy. Treed areas, marsh areas and native pasture was also present (Figure 2). A detailed vegetation list is provided in Appendix C of the Biophysical Impact Assessment Report.

N:\Calgary\GIS\Projects_GIS\212_06650_MtnAsh\1.MXD\fig2_212_06650_00003_vegsoil.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



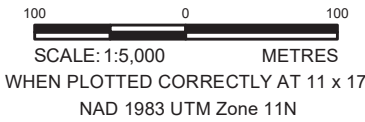
NOTES
1. Soil within the rest of the Project Area is classified as Orthic Black Chernozem of the Dunvargan soil series.
This map is for conceptual purposes only and should not be used for navigational purposes.
Basedata:

LEGEND

- AREA ASSESSED
- EXTRACTION PHASE BOUNDARY
- SITE LOCATION
- SOILS**
- GLEYED DUNVARGAN SOIL¹

VEGETATION

- HAY
- MARSH
- NATIVE PASTURE
- TAME PASTURE
- TREED



**MOUNTAIN ASH LIMITED PARTNERSHIP
AGGREGATE OPERATION
NW & SW 31-26-03 W5M
ROCKY VIEW COUNTY, ALBERTA**

Post Mining Reclamation
Plan

SOILS AND VEGETATION

January 15, 2020	Rev 0.0	Figure No.
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2.4 Wetlands

Ten wetlands ranging from class 1 to class 3 were identified (Figure 3). Detailed information on wetland assessment, including Classification and Species List is provided in Appendix C and D of the Biophysical Impact Assessment Report.

2.5 Rare Plants

No rare plants or rare ecological communities were documented in ACIMS or identified during the field investigation completed in 2019. Most of the habitat has low rare plant potential as it is tame pasture or hay land.

2.6 Wildlife

Active barn swallow (provincially ‘sensitive’ and federally ‘threatened’ species) nests were observed on two residences in the Project area; therefore, the potential exists to interact with or disturb species at risk. However, the Project area is heavily modified by existing land uses, with limited areas of native vegetation that provide limited habitat for wildlife species. The wetlands were dry during the 2019 surveys and therefore were determined to have limited value for wetland wildlife species.

3.0 POST-MINING RECLAMATION PLAN

3.1 Overall Reclamation Objectives

Reclamation objectives will be considered in all stages of mining in order 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
- 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.

3.2 Vegetation Clearing

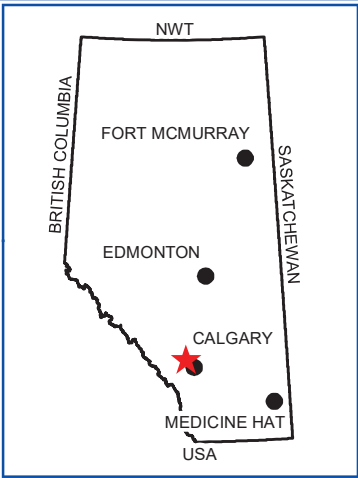
Development of the Summit Pit will require onsite vegetation to be stripped. Most of the vegetation onsite is hay, tame pasture or native pasture, where minimal vegetation clearing is required. As such, short vegetation can be salvaged with soil for future reclamation purposes.

3.3 Rare Plant Mitigation

Since no rare plants or rare ecological communities were identified (see Section 2.5.), no rare plant mitigation is required.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



NOTES

This map is for conceptual purposes only and should not be used for navigational purposes.

Basedata:

- LEGEND**
- AREA ASSESSED
 - EXTRACTION PHASE BOUNDARY
 - SITE LOCATION
 - WETLAND (# IDENTIFICATION)

100 0 100

SCALE: 1:5,000 METRES

WHEN PLOTTED CORRECTLY AT 11 x 17

NAD 1983 UTM Zone 11N

**MOUNTAIN ASH LIMITED PARTNERSHIP
AGGREGATE OPERATION
NW & SW 31-26-03 W5M
ROCKY VIEW COUNTY, ALBERTA**

Post Mining Reclamation
Plan

IDENTIFIED WETLANDS

January 15, 2020	Rev 0.0	Figure No.
Project No.	212.06650.00003	3



3.4 Wildlife Mitigation

Wildlife could be affected by activities including vegetation removal, removal of residences, topsoil stripping and salvage, excavation activities, and by vehicle and equipment traffic. Development will require the removal of habitat (treed areas and wetlands) and dwellings that may affect local wildlife use; although Project area was determined to have low wildlife use (Section 2.6.). 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). Similarly, care will be taken to demolish the residences or remove barn swallow nests from the residences outside the breeding season and prevent their renewed use; thereby avoiding interaction with a species at risk. Best management practices will be implemented (e.g., abiding by restricted activity periods; keeping garbage in wildlife-proof containers; being aware of the potential for wildlife at the Project access and on haul routes) to limit the likelihood of adversely interacting with wildlife.

3.5 Timber Management

There are limited treed areas onsite, consisting of small aspen stands and some planted trees surrounding the house sites. Non-merchantable timber and slash materials will be disposed of at landfill, local campsite(s) or burnt on site.

3.6 Soil Salvage and Soil Conservation

Based on available soil data (Section 2.2.), average topsoil depths onsite were approximately 25 cm in upland areas and 30 cm in wetland areas. Desktop information and field inspection indicates low variability in the topsoil thickness at the Project area.

Suitable upper subsoil was approximately 25 cm thick (Section 2.2); there are no unsuitable subsoil reported for this area. Color change between topsoil and upper subsoil is obvious and can be used to tell soil stripping depth in cases where the anticipated 25 cm or 30 cm does not seem reliable. Wetland and upland topsoil can be salvaged and stockpiled together, and wetland and upland suitable subsoil can be stockpiled together. For soil stripping and overburden volumes, please see the Stripping and Grading Plan (SLR 2021).

Topsoil will be stripped everywhere where soil disturbance occurs at the site, except for the areas under topsoil storage piles. Topsoil will be stripped at least 5 m ahead of the pit face to ensure there is no topsoil loss into the pit. The salvage distance will be increased if pit face is unstable or if it is rapidly advancing. Subsoil will be stripped everywhere where soil disturbance occurs at the site, and at least 3 m ahead of the pit face to reduce loss into the pit.

Topsoil and subsoil piles will not be located over merchantable aggregate, to prevent double handling of soils. Thin, vegetated topsoil piles tend to maintain topsoil quality better than thick piles; therefore, any topsoil piles will not exceed 2 m in depth (AEP 2004b); this will also allow better access for weed management. The surface of the stockpile will be smoothed and properly sloped to make a firm, well-drained base. A drainage channel around stockpiles will be constructed to prevent collection and blockage of surface run-off. Signs indicating topsoil and subsoil piles will be installed on each pile to be used for future reclamation purposes. Progressive reclamation and direct topsoil placement will occur as soon as practically possible to avoid deterioration of topsoil.

Native pasture is found in the south-east section in Phase 1 of the Project. Native prairie will be stripped and salvaged separately and the native prairie area will be reclaimed as soon as practical. This should reduce the future establishment of weeds and invasive species and increase the seed propagule viability upon reclamation of the area. Overall this will encourage the return of native species during final reclamation.

3.7 Erosion and Weed Mitigation

While the onsite soils were determined not to be susceptible to erosion (Section 2.2.) and no sensitive soils were identified during the biophysical assessment, 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; with the exception of 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.
- Reclaimed final slopes will have 3:1 configuration and will be hydroseeded within the first growing season of topsoil placement to avoid any topsoil loss or erosion. Furthermore, slope benching is recommended at this site to prevent erosion. The frequency of benches will be determined based on geotechnical properties of soil.

3.8 Reclamation and revegetation

As areas are no longer needed for operations, Mountain Ash will reclaim them in accordance with the best industry practices to ensure equivalent land capability can be achieved.

Subsoil will be de-compacted before topsoil placement. Subsoil will be recontoured to tie in with the surrounding landscape and create drainage patterns consistent with surrounding landuse. 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. Hydro seeders will be used for maximum germination and erosion control 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.

4.0 MONITORING RECLAMATION SUCCESS

Reclamation success will be determined by a landscape that does not require inputs and provides equivalent land capability as it did prior to disturbance.

Continuous monitoring of progressively reclaimed areas will guide further reclamation activities and help identify proper mitigation measures leading to a successful reclamation outcome.

In accordance with the current regulations, Mountain Ash will submit a report on disturbance and reclamation status to Alberta Environment and Parks, starting five years after registration and then every five years after that until the Final Reclamation Report is submitted and/or a reclamation certificate for the whole pit is received (AEP 2004a and 2004b).

5.0 REFERENCES

- Alberta Agriculture and Forestry. 2021. AGRASID Alberta Soil Information Viewer.
<https://soil.agric.gov.ab.ca/agrasidviewer/>
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- SLR Consulting (Canada) Ltd. 2020. *Biophysical Impact Assessment Report*, January 2020. Mountain Ash Limited Partnership, Rocky View County, Alberta.
- SLR Consulting (Canada) Ltd. 2021. *Stripping and Grading Plan*, April 2021. Mountain Ash Limited Partnership, Rocky View County, Alberta.

6.0 STATEMENT OF LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by SLR for Mountain Ash Limited Partnership., hereafter referred to as the "Client". The report has been prepared in accordance with the Scope of Work and agreement between SLR and the Client. It is intended for the sole and exclusive use of the Client. Other than by the Client and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of SLR.

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