



global environmental solutions

**Mountain Ash Limited Partnership Aggregate Operation
NW and SW 31-026-03 W5M
Rocky View County, Alberta**

Wetland Assessment and Impact Report



MOUNTAIN ASH
• LIMITED PARTNERSHIP •

**February 2020
SLR Project No.: 212.06650.00003**



WETLAND ASSESSMENT AND IMPACT REPORT

NW AND SW 31-026-3 W5M

ROCKY VIEW COUNTY, ALBERTA

SLR Project No.: 212.06650.00003

Prepared by
SLR Consulting (Canada) Ltd.
#1185 – 10201 Southport Road SW
Calgary, AB T2W 4X9

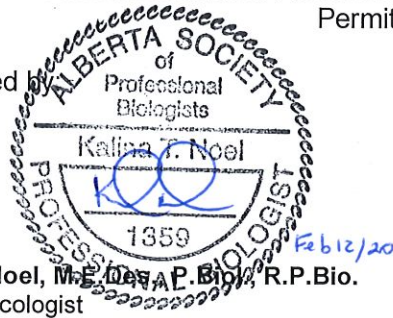
for

Mountain Ash Limited Partnership
1945 Briar Crescent NW
Calgary, AB T2N 3V6

February 12, 2020

The Association of Professional Engineers and Geoscientists of Alberta
Permit to Practice P05449

Prepared by



Kalina Noel, M.Biol., P.Biol., R.P.Bio.
Senior Ecologist

Reviewed by:

Rick Lauzon, P.Biol., R.P.Bio.
Principal Environmental Consultant

CONFIDENTIAL

Distribution: 1 copy – Mountain Ash Limited Partnership
1 copy – Alberta Environment and Parks
1 copy – SLR Consulting (Canada) Ltd.

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	DATA REVIEW AND BIOPHYSICAL FINDINGS IN THE FIELD.....	1
2.1	Natural Subregion.....	1
2.2	Soils.....	1
2.3	Vegetation	1
	2.3.1 <i>Rare Plants</i>	2
	2.3.2 <i>Parks and Protected Areas</i>	2
2.4	Wildlife and Wildlife Habitat	2
2.5	Watercourses	3
3.0	WETLAND ASSESSMENT	3
3.1	Wetland Field Identification, Delineation and Assessment	3
	3.1.1 <i>Qualification of Assessors</i>	3
	3.1.2 <i>Identified Wetlands</i>	3
	3.1.3 <i>Alberta Wetland Rapid Evaluation Tool – Actual (ABWRET-A)</i>	4
3.2	Additional Wetland Parameters	5
	3.2.1 <i>Soils</i>	5
	3.2.2 <i>Chemical Gradients</i>	5
	3.2.3 <i>Water Regime and Catchment Area</i>	5
	3.2.4 <i>Use of Wetlands by Wildlife</i>	5
	3.2.5 <i>Wetland Vegetation</i>	5
	3.2.6 <i>Wetland Delineation and Classification</i>	8
3.3	Wetland Permanence.....	10
4.0	WETLAND MITIGATION	10
4.1	Impacts to wetlands.....	10
4.2	Wetland Valuation.....	11
4.3	Crown Claimability.....	11
5.0	STATEMENT OF LIMITATIONS.....	12
6.0	REFERENCES.....	13

TABLES

Table 1:	Field Indicators for Wetland Classification and Delineation.....	6
Table 2:	Precipitation Trends Associated with Available Air Photo Imagery	9

APPENDICES

Appendix A	Photographs
Appendix B	Figures
Appendix C	Survey Plan
Appendix D	Vegetation Species List
Appendix E	FWMIS Search Results
Appendix F	ABWRET-A Results

1.0 INTRODUCTION

Mountain Ash Limited Partnership (Mountain Ash) is planning to develop an aggregate pit (the Project) along Highway 567 within NW and part of SW 31-026-03 W5M, northeast of the Town of Cochrane, Alberta (Figure 1). The Project will be 163.76 acres (66.26 hectares) in size excluding road rights-of-way. This land is currently owned by 1410266 Alberta Ltd. (a general partner of Mountain Ash Limited Partnership) (Site Plan - Appendix C). It is proposed that sand and gravel will be crushed and screened on-site and shipped to markets around Balzac, Calgary International Airport and north Calgary growth areas. To commence the Project, Mountain Ash will be required to apply for an Aggregate Site Development Permit (ASDP) and Land Use Application submission to Rocky View County (RVC) for development of the aggregate pit.

SLR Consulting (Canada) Ltd. (SLR) was retained to complete a Biophysical Impact Assessment (BIA) and wetland assessment to support Mountain Ash's application (SLR 2019). As the Project will be constructed on private land in the white zone of Alberta and will require the removal of 18 wetlands (Figure 2), this Wetland Assessment and Impact Report (WAIR) was completed as part of the *Water Act* application.

Under the *Public Lands Act*, determination of Crown Ownership Claimability for all wetlands was considered (GoA 2016) which is included in this document.

2.0 DATA REVIEW AND BIOPHYSICAL FINDINGS IN THE FIELD

2.1 Natural Subregion

The Project is located within the Foothills Parkland Natural Subregion which is characterized by short, cool summers where hay or feed crops are the dominant main crops. Where seepage zones or low areas are present, aspen forests with understories of snowberry (*Symphoricarpos albus*), silverberry (*Elaeagnus commutata*), white meadowsweet (*Spiraea alba*), prickly rose (*Rosa acicularis*), saskatoon (*Amelanchier alnifolia*) and a diverse array of herbs on well to imperfectly drained Black and Dark Gray Chernozems can be found (Natural Resources Committee 2006).

2.2 Soils

The underlying parent material where the Project is located is moderately to strongly calcareous, mixed Continental and Cordilleran till (Alberta Soil Information Centre 2016). Fertile loam to clay loam Orthic Black Chernozemic soils are extensive, with Gleysolic soils present in poorly drained and lower slope positions expected (Alberta Agriculture and Forestry 2016). The Dunvegan soil series, a fertile Orthic Black Chernozem formed on glacial till parent material, was identified across the majority of the Project, with the gleyed variant (Dunvegan-GL) identified in depressional areas.

2.3 Vegetation

Information on the types of vegetation which may be present within the Project area (i.e., the property within which the Project will be developed) was achieved by accessing sites and documents such as the *Natural Regions and Sub-regions of Alberta* (Natural Resources Committee 2006). The AEP Alberta Conservation Information System (ACIMS; GoA 2019a) database was also used to determine if any sensitive species had been recorded in the area.

It was determined from the field assessment that the majority of the vegetation onsite is either tame pasture or native pasture, with areas of hay fields. The tame pasture consisted of smooth brome (*Bromus inermis*), slender wheatgrass (*Agropyron trachycaulum*) and forbs such as yarrow (*Achillea millefolium*) and dandelion (*Taraxacum officinale*). The native pasture was comprised of a range of species including fescue (*Festuca*), western wheatgrass (*Agropyron smithii*), shooting star (*Dodecatheon pulchellum*), golden bean (*Thermopsis rhombifolia*) and shrubby cinquefoil (*Potentilla fruticosa*). Treed pockets of trembling aspen (*Populus tremuloides*) with prickly rose, prairie rose (*Rosa arkansana*) and shrubby cinquefoil were found in the south half of the site. Several dwellings onsite contained non-native vegetation. No rare plants were found onsite. A species list is provided in Appendix D.

2.3.1 Rare Plants

Information on rare plants which may be present within the Project area was achieved by accessing sites and documents such as the *Natural Regions and Sub-regions of Alberta* (Natural Resources Committee 2006). The AEP ACIMS (GoA 2019a) database was also used to determine if any rare plants had been recorded in the area.

No rare plants or rare communities were identified during the field investigation.

2.3.2 Parks and Protected Areas

ACIMS was searched for parks or protected areas within the area of the Project. No Parks, Protected Areas or Crown Reservations were identified (GoA 2019a).

2.4 Wildlife and Wildlife Habitat

Wildlife composition within the Foothills Parkland Natural Region closely resembles species found in the Rocky Mountain Natural Region. Birds include dusky flycatcher, white crowned sparrow, clay-colored sparrow, blue grouse, yellow warbler, alder flycatcher, MacGillivray's warbler (Alberta Wilderness Association 2015). Habitat is excellent for elk and moose, and where watercourses are present, bull trout habitat can also be found (Alberta Wilderness Association 2015)

A review of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (GoC 2019a) and the *Species at Risk Act* (SARA; GoC 2019b) was conducted to determine if any federally listed species at risk (SAR) may be present within or near the Project area. The AEP Fisheries and Wildlife Management Information System (FWMIS) Fish and Wildlife Internet Mapping Tool (FWIMT; GoA 2019b) was also accessed to determine if any provincially listed SAR and other inventory data were available for the area.

A review of the FWMIS database indicated that five provincially Sensitive species (AEP 2017a) have been observed in the area of the Project (Appendix E) including:

- great blue heron;
- sora;
- least flycatcher;
- eastern kingbird; and
- barn swallow.

Of these five bird SAR, the barn swallow is also federally listed as Threatened by COSEWIC and SARA (GoC 2019).

A breeding bird survey was completed as part of the BIA for the Project. Four of the five SAR species were observed. A single great blue heron was observed flying over the Project; however, no evidence of nesting was found. The least flycatcher and eastern kingbird were heard singing in aspen stands at a few locations in the Project area. Two barn swallow nests were observed under the eaves troughs of two of the dwellings present on the site.

2.5 Watercourses

No mapped watercourses were identified within the Project area on FWMIS (AEP 2019b). Air photograph interpretation identified that drainages are present within the Project area; however, none of these drainages were observed in the field as having bed and banks, flowing water or riparian vegetation.

3.0 WETLAND ASSESSMENT

Prior to conducting the field portion of the wetland assessment as part of the WAIR, a review of the Alberta Merged Wetland Inventory (AEP 2019a) was conducted to determine if any of the potential wetlands within the Project area have been mapped by the province. Following this, a review of current and available historical air photos was completed to confirm presence and locations of mapped wetlands by the province and to determine if any additional smaller, unmapped wetlands were present within the Project area. Comparison of air photos for both wet and dry years allowed for identification of all potential wetlands which may appear dry during the 2019 site visit. Following this review, a field map of all potential wetlands was created with a centroid location for each wetland marked to allow for field relocation. A total of 10 mapped wetlands and an additional 10 wetlands identified by air photo interpretation were identified for the Project area and assessed in the field.

3.1 Wetland Field Identification, Delineation and Assessment

3.1.1 Qualification of Assessors

The wetland field assessments were conducted on June 2 and 3, 2019 by Kalina Noel, P.Biol. and Katrina Sharko, P.Ag. Under both professional designations, Ms. Noel and Ms. Sharko are permitted to complete wetland assessments as Qualified Wetland Science Practitioners (QWSP) within the province of Alberta. All wetland assessment and reporting was conducted in accordance with the Alberta Wetland Policy (GOA 2013) and its associated Directives and tools (GOA 2017b).

3.1.2 Identified Wetlands

Each wetland identified during the desktop assessment was assessed for vegetation structure and soil structure, in addition to their biological, hydrological, and chemical attributes in the field to determine if these areas met criteria to be considered as wetlands under the Alberta Wetland Policy (GOA 2013). If so, the Alberta Wetland Classification System (GOA 2015a) was used to classify each wetland as a marsh, fen, swamp, or bog.

All 20 wetlands identified from the desktop assessment were located and classified in the field as the following (Figure 2):

- 1 was classified as a Class III graminoid marsh wetland;
- 5 were classified as Class II graminoid marsh wetlands;
- 14 were classified as Class I farmed through wetlands; one of which was identified as a dugout at the time of the assessment.

As noted, 14 wetlands (including the dugout) were classified as Class I graminoid wetlands. At the time of the assessment, these wetlands were identified within cultivated hay fields or tame pastures on the site. Due to the presence of hay crop or tame pasture and the lack of water or graminoid marsh and obligate wetland species present, confirmation of the location and class of the wetland was made by identification of remnant disturbance species such as dandelion, smooth brome or Kentucky blue grass (*Poa pratensis*) or by a depression in the topography. Where no obvious vegetation or topographical signs were observed, the centroid location of the wetland identified during the desktop assessment was used in the field to identify the location of the wetland.

Five wetlands identified as Class II were more notable on the landscape and had wetland species present such as silverweed (*Argentina anserina*), common plantain (*Plantago major*), hair grass (*Deschampsia cespitosa*), dandelion, clover (*Trifolium sp.*) and western dock (*Rumex occidentalis*). Within one wetland, water sedge (*Carex aquatilis*), which is typically found in shallow open water wetlands, was observed. However, no standing water was observed at the time of the assessment and grazing of the sedge had occurred, which indicates that the sedge likely germinated following snow melt earlier in the year. The two largest Class II wetlands were observed in the northwest corner of the site. Although these wetlands are located within an area that is not slated for disturbance, they were still classified and delineated for the purposes of avoidance mitigation. Review of historical air photos revealed that these wetlands were likely Class III or IV wetlands in the past. However, due to ongoing use of the area as pastureland, these wetlands were observed in 2019 to have extensive damage from cattle grazing. This has resulted in the decreased ability of the wetland to retain water and to provide good habitat for obligate wetland species. The remaining two Class II wetlands were also dry at the time of the assessment.

One wetland was classified as a Class III graminoid wetland. This wetland is located in the southwest corner of the site. Needle spikerush (*Eleocharis acicularis*) (central zone), water sedge (inner zone), wild mint (*Mentha arvensis*), smooth brome, curled dock, and hair grass (outer zone) were observed. As identified in the historical air photos, this wetland has likely always a Class III wetland. Due to limited use of the area as pasture, this wetland has sustained little damage and has therefore retained its function.

Results of vegetation species found within each of the wetlands are detailed in Appendix D and can be cross referenced for location on Figure 2.

3.1.3 Alberta Wetland Rapid Evaluation Tool – Actual (ABWRET-A)

Following submission of the ABWRET-A forms (GoA 2015b) to AEP on July 23, 2019 and providing additional information to AEP on July 29, 2019, SLR received wetland valuation results on July 30, 2019.

As identified in the ABWRET-A results, the following final scores were applied to the wetlands classified:

- 13 are category B wetlands;

- 5 are category C wetlands; and
- 2 are category D wetlands.

Results of the ABWRET-A submission for the 20 classified wetlands can be found in Appendix F.

3.2 Additional Wetland Parameters

3.2.1 Soils

Outside of the low areas and wetlands, the majority of the site was determined to consist of Orthic Black Chernozems of the Dunvegan soil series. Textures were loam to sandy clay loam and on glacial till parent material. Wetlands contained gleyed Dunvegan soil series, with mottling in the Bm_g and C_g and C_{kg} horizons. Several residences were onsite so areas of soil disturbance were noted.

3.2.2 Chemical Gradients

No surface water was present within any of the marsh wetlands except for Wetland 5 which had been excavated to develop a dugout. Evidence of seasonal standing water was observed in Wetlands 1, 17, 19 and 20.

3.2.3 Water Regime and Catchment Area

Mapped drainages were not identified within the Alberta Merged Wetland Inventory (AEP 2019a) or FWMIS (2019b); however, seasonal water flow following snow melt and heavy rainfall likely follows natural swales southward as identified through air photo interpretation. Historical air photos indicate that natural channels linking wetlands and showing flowing water southward were present; however, due to agricultural practices at the Project site, these channels have been removed from the landscape.

3.2.4 Use of Wetlands by Wildlife

No obvious use of wetlands by larger wildlife was observed during the site assessment. Cliff swallows and northern rough-winged swallows were observed around Wetland 5 (dugout). Cliff swallows were observed collecting mud from the dugout walls and transporting it back to the mud nests under the eaves troughs of one of the dwellings onsite. Wetlands 19 and 20 have been heavily used by cattle and hoof shear was very prominent. No indication of other hoofed mammals was observed, although deer and elk scat and a red fox were observed in the Project area. These mammals may be using water from wetlands when present.

3.2.5 Wetland Vegetation

Table 1 includes all plant species identified during the field wetland assessment. Indication of which species are obligate wetland plants within each wetland is listed in the table. In addition, a list of all facultative species which were also observed within these wetland areas is presented.

Table 1: Field Indicators for Wetland Classification and Delineation

Wetland ID ¹	Area (ha) ²	Wetland Species	Wetland Species (F/O) ³	Hydrological Characteristics ⁴
1 marsh	0.291	needle spikerush	O	No water present at time of assessment. Evidence of seasonal water storage for longer periods of time due to presence of obligate wetland plants present.
		water sedge	O	
		wild mint	F	
		smooth brome	F	
		western dock	F	
		hair grass	O	
2 marsh	0.008	dandelion	F	No water present at time of assessment. Evidence of seasonal water storage but no obligate wetland plants present.
		silverweed	F	
		common plantain	F	
3 marsh	0.045	dandelion,	F	No water present at time of assessment. Evidence of seasonal water storage for longer periods of time due to presence of obligate wetland plants present.
		silverweed	F	
		common plantain	F	
		hair grass	O	
		kentucky bluegrass	F	
		clover	F	
4 marsh	0.028	dandelion	F	No water present at time of assessment. Evidence of seasonal water storage but no obligate wetland plants present.
		silverweed	F	
		common plantain	F	
5 dugout	0.067	smooth brome	F	Presenting as a dugout holding water at time of assessment
		slender wheatgrass	F	
6 marsh	0.048	Kentucky bluegrass	F	No water present at time of assessment. Evidence of seasonal water storage but no obligate wetland plants present.
		smooth brome	F	
		Canada thistle	F	
		western dock	F	
7 marsh	0.055	Hay crop	N/A	No evidence of standing water following snowmelt
8 marsh	0.058	Hay crop, dandelion	F	No evidence of standing water following snowmelt
9 marsh	0.028	Hay crop	N/A	No evidence of standing water following snowmelt
10 marsh	0.063	Hay crop	N/A	No evidence of standing water following snowmelt
11 marsh	0.009	Hay crop, western dock	F	No evidence of standing water following snowmelt
12 marsh	0.014	Hay crop	F	No evidence of standing water following snowmelt
13 marsh	0.023	fowl bluegrass	O	No water present at time of assessment. Evidence of seasonal water storage for longer periods of time due to presence of obligate wetland plants present.
		slender wheatgrass	F	
		smooth brome	F	
		timothy grass	F	
14 marsh	0.028	Kentucky bluegrass,	F	No water present at time of assessment. Evidence of seasonal water storage but no obligate wetland plants present.
		smooth brome,	F	
		Canada thistle	F	
		western dock	F	

Wetland ID ¹	Area (ha) ²	Wetland Species	Wetland Species (F/O) ³	Hydrological Characteristics ⁴
15 marsh	0.017	Kentucky bluegrass	F	No water present at time of assessment. Evidence of seasonal water storage but no obligate wetland plants present.
		smooth brome	F	
		Canada thistle	F	
		western dock	F	
16 marsh	0.013	water sedge	O	No water present at time of assessment. Evidence of seasonal water storage for longer periods of time due to presence of obligate wetland plants present.
		Smooth brome	F	
		slender wheatgrass	F	
17 marsh	0.118	Hay crop	N/A	No water present at time of assessment. Evidence of seasonal water storage for longer periods of time due to presence of obligate wetland plants present.
		water sedge	O	
		dandelion	F	
		western dock	F	
18 marsh	0.050	Hay crop, dandelion	F	No evidence of standing water following snowmelt
19 marsh	0.676	water sedge	O	No water present at time of assessment. Evidence of seasonal water storage for longer periods of time due to presence of obligate wetland plants present.
		clover	F	
		dandelion	F	
		western dock	F	
20 marsh	0.722	water sedge	O	No water present at time of assessment. Evidence of seasonal water storage for longer periods of time due to presence of obligate wetland plants present.
		clover	F	
		dandelion	F	
		western dock	F	

Notes:

¹ Wetland classification follows the Alberta Wetland Classification System (AWCS) (GoA 2015a).

² Based on historical imagery delineation (AEP 2019b) and confirmed during June 1-4, 2019 field site visit.

³ Wetland Species – O = Obligate; F = Facultative

⁴ As observed during June 1-4, 2019 site visit.

3.2.6 Wetland Delineation and Classification

Comprehensive Desktop Delineation with Field Verification from the Alberta Wetland Identification and Delineation Directive (GoA 2015c) was used to delineate the wetlands and determine their extents over time. Historical precipitation data for the Project area were assessed to aid in selection of representative historical aerial images (GoA 2015c). The images provide historical information on water levels or wetland permanence across years and across variable climatic conditions. Precipitation trends are identified in Table 2. Air photos selected included:

- August 14, 1953
- September 19, 1962
- May 31, 1974
- April 26, 1980
- May 7, 1994
- September 28, 2008
- Mid-Summer 2016

Climate data was accessed using the *Interpolated Weather Data Since 1961 for Alberta Townships* (Alberta Agriculture and Forestry 2019) to determine monthly precipitation and the total annual precipitation for the corresponding years. This information was used to determine permanence by determining if a wetland only had evidence of water temporarily (i.e., Class II), seasonally (i.e., Class III) or holds water all year round regardless of rainfall and snowmelt (i.e., Class IV/V). Corresponding climate data is as follows:

- 1953 – no data available;
- 1964 – 473.68 mm;
- 1974 – 387.42 mm;
- 1980 – 471.41 mm;
- 1994 – 506.88 mm;
- 2008 – 662.5 mm; and
- 2016 – 441.54 mm.

Rainfall was consistent over each decade with 2000s being slightly wetter. Where drier years occurred, correlated historical air photos which were reviewed showed no standing water, and in some cases, cultivation.

Review of the available air photos between 1954 and 2016 and corresponding climate data revealed that the Class III wetland (wetland 1), 4 of the Class II wetlands (wetlands 3, 17, 19, and 20) and 4 of the Class I wetlands (wetland 2, 4, 11, and 18) show historical water presence seasonally. Of note, wetland 5, which was assessed in 2019, as a dugout was interpreted as a historically functioning Class III wetland. The excavation of the wetland likely occurred between 2008 and 2016 as determined from the available air photos.

Table 2: Precipitation Trends Associated with Available Air Photo Imagery

Photo Date ¹	Season	Yearly Precipitation (mm) ²	Monthly Precipitation (mm) ²	Daily Precipitation (mm) ²	Open Water Observation Wetlands	Assessment of Permanence	Comments
1953 Figure 3	Late summer	No data	No data	No data	1, 3-7, 11, 17, 18, 19, 20	1, 3, 5, 7, 11, 17 and 18	Wetlands 1-7, 11, 17-20 have water present. Potential dampness around remaining wetlands as noted by cultivation.
1962 Figure 4	Late summer	473.68	August – wettest (89.61) November - driest (9.01)	Driest – 0 Wettest – 36.42	1, 2, 3, 5, 7, 17, 18, 19, 20		Wetlands 2, 3, 5, 7, 12, 17 and 19 have water present. Remaining wetlands are dry.
1974 Figure 5	Early spring	387.42	May –wettest (85.07) February - driest (6.86)	Driest – 0 Wettest – 39.16	1, 16, 17, 18, 19, 20		Early spring snowmelt as seen on air photo. Wetlands 1-5, 7, 12-20 have water present.
1980 Figure 6	Late spring	471.41	May –wettest (101.38) February - driest (12.85)	Driest – 0 Wettest – 46.24	1—17, 19-20		Early spring snowmelt as seen on air photo. Almost all wetlands have water present.
1994 Figure 7	Mid-summer	506.88	June –wettest (123.69) December - driest (13.16)	Driest – 0 Wettest – 33.13	1,2,3,4,5,7,8-11,17,19,20		Wetlands 1-5, 7-11, 14, 17, 19-20 have water present. Additional dwellings within Project area.
2008 Figure 8	Early fall	662.5	May –wettest (183.41) March – driest (7.42)	Driest – 0 Wettest – 49.82	All dry		All wetlands appear dry on air photo. Possible small amount of water in Wetland 5.
2016 ³ Figure 9	Late summer	441.54	July –wettest (153.9) February – driest (1.58)	Driest – 0 Wettest – 28.28	Dugout only		All wetlands dry except for Wetland 5 which has been excavated as a dugout

Notes:

¹ Air Photo Distribution Services (AEP 2019b) ² Alberta Agriculture and Forestry (2019) ³ ESRI (2016) Air photo

3.3 Wetland Permanence

Following the *Guide for Assessing Permanence of Wetland Basins* (GoA 2016), assessment of wetland permanence was conducted to determine if there is Crown claimability of bed and shores for any of the 20 wetlands. As determined through historical air photo interpretation and review of climate data monthly and annually for the associated dates of the air photos, 10 of the 20 wetlands were classified as currently being, and having been, a Class II seasonally permanent wetland or higher. See Figure 2 and wetland photos for reference and location (Appendix A).

Wetland 1 (Stockpile area) is a Class III graminoid marsh wetland located in the southwest corner of the site. Wetland 1 has had consistent presence on the landscape including holding water. Although no water was observed at the time of the 2019 assessment (Photo 1, Appendix F), obligate wetland species were observed including needle spikerush and water sedge. Presence of water was observed through air photo interpretation on the majority of the available air photos with the furthest evidence dating back to 1954 which supports the permanence of this wetland.

Wetlands 3, 17, 19 and 20 (Stockpile area, Phase 3 and avoidance area) are Class II graminoid marsh wetlands located in the southwest and northwest areas of the site. These wetlands were likely Class III wetlands historically as the presence of water is noted in the majority of the historical air photos. Crown claimability will likely apply to wetlands 3 (Photo 2) and 17 (Photo 3) as a result of development of the aggregate pit. Wetland 19 (Photo 4) and 20 (Photo 5) were observed to be heavily impacted by cattle use (Photos 6 and 7). Although these wetlands will not be disturbed by the development, they will require a mitigation plan to demonstrate how these wetlands will be protected going forward.

Wetlands 7, 11, and 18 (Stockpile area and Phase 3) are Class I graminoid marsh wetlands located in the southwest, south and north areas of the site (Photos 8, 9, and 10, respectively). The dugout (**wetland 5 – Stockpile area**; Photo 11) was also classified as a Class I wetland based on the current state. Although these wetlands were assessed in 2019 as Class I wetlands, historically these wetland areas retained water longer than seasonally and therefore may classify as Class III wetlands under the *Public Lands Act*.

Wetlands 2, 4, 6, 8-10, 12-16 are Class I wetlands, predominantly located along the east side of the Project site are determined, following the review of available historical air photos and a review of historical climate data, as not having permanence. During the site visit in 2019, these wetlands were either cultivated through or lacked evidence of wetland obligate vegetation as the other Crown claimable wetlands presented.

Submission under the *Water Act* and the *Public Lands Act* will be required to allow for Crown consideration of bed and banks for these nine historically interpreted Class III wetlands.

4.0 WETLAND MITIGATION

4.1 Impacts to wetlands

This WAIR is part of the overall regulatory planning for this Project. As wetlands were identified during the BIA as part of Mountain Ash's application for an Aggregate Site Development Permit (ASDP) and Land Use Application submission from Rocky View County (RVC) for development

of the aggregate pit, classification, delineation and assessment of permanence of bed and shores have been completed and is submitted to AEP.

Mountain Ash has considered the larger wetlands in the NW of the Project area and wetlands within the sensitive area in the SW and has adapted the Project footprint to exclude as many wetlands as possible. Wetlands 19 and 20 (NW), will be avoided by establishing mitigation measures for their protection and considered as an exclusion area.

Wetlands 2, 3, 4, 5 and 7 (SW) are located within the stockpile storage area and may be avoided as much as possible by applying mitigation measures. This mitigation plan will be developed following further planning of the stockpile storage area.

The remaining 13 wetlands are proposed to be removed under a phased development approach to accommodate the aggregate removal. Under the Alberta Wetland Mitigation Directive (GoA 2018), two options are available:

- Undertake a wetland replacement project to restore a previously drained wetland or construct a new wetland. This option is called permittee-responsible replacement, or
- Pay a wetland replacement fee.

4.2 Wetland Valuation

As determined through ABWRET-A, wetlands that will be impacted within the extraction area of the aggregate pit include:

- 6 category B wetlands;
- 5 category C wetlands; and
- 2 category D wetlands.

Mountain Ash is applying for approval under the *Water Act* to remove 0.76 ha of wetland. The Project is within Relative Wetland Value Assessment Unit 13 and according to *Table 1: Wetland Replacement Fee Rates per Hectare* within Schedule 1 of the Alberta Wetland Mitigation Directive (GoA 2018), replacement fee rates to AEP will be \$17,700/ha.

4.3 Crown Claimability

Mountain Ash will be avoiding the two largest wetlands in the NW corner of the Project area, (wetland 19 and wetland 20) and where possible wetlands (2, 3, 4, 5, and 7) within a sensitive area within the SW corner of the Project site. As such, the remaining wetlands which are submitted under the *Public Lands Act* for consideration of Crown claimability are wetlands 1, 3, 5, 7, 11, 17 and 18. As identified through air photo interpretation and climate data review between 1953 and 2016, these wetlands have been present on the landscape and have held water at least seasonally. Wetland 1 was classified as a Class III wetland in the field and wetland 5, now a dugout, was likely historically also a Class III wetland. Wetlands 3, 7 and 17, classified as a Class II wetlands in the field, were also likely Class III wetlands historically. Finally, Wetlands 11 and 18 were classified as Class I wetlands in the field. However, historical air photo interpretation shows that these wetlands could have been Class II/III wetlands historically.

5.0 STATEMENT OF LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by SLR Consulting (Canada) Ltd. (SLR) for Mountain Ash Limited Partnership, hereafter referred to as the "Client". It is intended for the sole and exclusive use of Mountain Ash Limited Partnership. The report has been prepared in accordance with the Scope of Work and agreement between SLR and 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 unless payment for the work has been made in full and express written permission has been obtained from SLR.

This report has been prepared in a manner generally accepted by professional consulting principles and practices for the same locality and under similar conditions. No other representations or warranties, expressed or implied, are made.

Opinions and recommendations contained in this report are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames and project parameters as outlined in the Scope of Work and agreement between SLR and the Client. The data reported, findings, observations and conclusions expressed are limited by the Scope of Work. SLR is not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. SLR does not warranty the accuracy of information provided by third party sources.

N:\Edmonton\Projects\General Clients\Mountain Ash (Summit)\212.06650.00003 Summit Pit Multi-discipline\Task_7-Biophys_Reporting\Deliverables\WAIR Report\Wetland Assessment & Impact Report_212.006550.00003_FINAL_Feb12-20.docx

6.0 REFERENCES

- Alberta Agriculture and Forestry. 2016. AGRASID Alberta Soil Information Viewer. <https://soil.agric.gov.ab.ca/agrasidviewer/>
- Alberta Agriculture and Forestry. 2019. Current and Historical Alberta Weather Station Data Viewer. <https://agriculture.alberta.ca/acis/alberta-weather-data-viewer.jsp>
- Alberta Environment and Parks. 2019a. Alberta Merged Wetland Inventory. <https://geodiscover.alberta.ca/geoportal/>
- Alberta Environment and Parks. 2019b. Air Photo Distribution. <https://www.alberta.ca/air-photos-overview.aspx#toc-0>
- Alberta Soil Information Centre. 2016. Alberta Soil Names File (Generation 4) User's Handbook. M.D. Bock (ed.). Agriculture and Agri-Food Canada, Science and Technology Branch, Edmonton, AB.
- Alberta Wilderness Association. 2015. Parkland Natural Region. <https://albertawilderness.ca/issues/wildlands/parkland/#parentHorizontalTab1>
- Esri. 2016. DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
- Government of Alberta. 2013. Alberta Wetland Policy. <https://open.alberta.ca/dataset/5250f98b-2e1e-43e7-947f-62c14747e3b3/resource/43677a60-3503-4509-acfd-6918e8b8ec0a/download/6249018-2013-alberta-wetland-policy-2013-09.pdf>
- Government of Alberta. 2015a. Alberta Wetland Classification System. <https://open.alberta.ca/dataset/92fbfbf5-62e1-49c7-aa13-8970a099f97d/resource/1e4372ca-b99c-4990-b4f5-dbac23424e3a/download/2015-alberta-wetland-classification-system-june-01-2015.pdf>
- Government of Alberta. 2015b. Alberta Wetland Rapid Evaluation Tool- Actual (ABWRET-A) guide. <https://open.alberta.ca/dataset/0fd47f30-d3ee-4b2f-83ac-e96a6499d7ce/resource/ea9e44bd-0ed4-4cdd-94cc-8f5b27f21c8a/download/2015-alberta-wetland-rapid-evaluation-tool-actual-abwret-a-guide-june-2015.pdf>
- Government of Alberta. 2015c. Alberta Wetland Identification and Delineation Directive. <https://open.alberta.ca/dataset/b2a69660-7f44-4c8c-9499-0da23946dafa/resource/3917b05d-7cf8-4d08-b3ae-74a15af625ce/download/2015-alberta-wetland-identification-delineation-directive-june-2015.pdf>
- Government of Alberta. 2016. Guide for Assessing Permanence of Wetland Basins. <https://open.alberta.ca/dataset/02b938d2-a26b-41e8-b343-602b4b6c0c57/resource/98b50b87-6ffe-4c32-ae34-c49e2a3c706c/download/2016-assessingpermanencewetlandbasins-feb2016a.pdf>

- Government of Alberta. 2017a. Alberta Wild Species General Status Listing – 2015. <https://open.alberta.ca/dataset/ad0cb45c-a885-4b5e-9479-52969f220663/resource/763740c0-122e-467b-a0f5-a04724a9ecb9/download/sar-2015wildspeciesgeneralstatuslist-mar2017.pdf>
- Government of Alberta. 2017b. Professional responsibilities in completion and assurance of wetland science, design and engineering work in Alberta. <https://open.alberta.ca/dataset/c86572a8-560d-4f2e-a751-2467021b074a/resource/48dd8c05-fb55-4893-9769-7159770229c6/download/practicestandardwetland-may01-2017.pdf>
- Government of Alberta. 2018. Alberta Wetland Mitigation Directive. <https://open.alberta.ca/dataset/2e6ebc5f-3172-4920-9cd5-0c472a22f0e8/resource/dfbea0b8-df23-4ddd-8038-a51f69fbff7/download/albertawetlandmitigationdirective-june-2018.pdf>
- Government of Alberta. 2019a. Alberta Conservation Information Management System (ACIMS). <https://www.albertaparks.ca/albertaparkscs/management-land-use/alberta-conservation-information-management-system-acims/>
- Government of Alberta. 2019b. Fisheries and Wildlife Management Information System (Fish and Wildlife Internet Mapping Tool). https://maps.alberta.ca/FWIMT_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT_Pub
- Government of Canada. 2019a. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). <https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html>
- Government of Canada. 2019b. Species at Risk Public Registry. <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>
- Natural Resources Committee. 2006. Natural Regions and Subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece for the Government of Alberta. <https://open.alberta.ca/dataset/dd01aa27-2c64-46ca-bc93-ca7ab5a145a4/resource/98f6a93e-c629-46fc-a025-114d79a0250d/download/2006-nrsrcomplete-may.pdf>
- SLR Consulting (Canada) Ltd. 2019. DRAFT Biophysical Impact Assessment Report. Mountain Ash Limited Partnership Aggregate Operation, NW 31-026-3 W5M, Rocky View, Alberta. 212.06650.00003.

APPENDIX A

Photographs

Wetland Assessment and Impact Report
Mountain Ash Limited Partnership Aggregate Operation
NW and SW 31-026-3 W5M, Rocky View County, Alberta
SLR Project No. 212.06650.00003



Photo 1: Wetland 1 – Southwest corner of Project area (June 3, 2019).



Photo 2: Wetland 3 – Southwest corner of Project area (June 3, 2019)



SITE PHOTOGRAPHS

Wetland Assessment and Impact Report
NW 31-026-03 W5M
Rocky View County, Alberta

Project No: 212.06650.00003.



Photo 3: Wetland 17 – north end of Project area (June 4, 2019).



Photo 4: Wetland 19 – Northwest corner of Project site (June 4, 2019).



SITE PHOTOGRAPHS

Wetland Assessment and Impact Report
NW 31-026-03 W5M
Rocky View County, Alberta

Project No: 212.06650.00003.



Photo 5: Wetland 20 – Northwest corner of Project site (June 4, 2019).



Photo 6: Wetland 19 – Hoof shear within wetland (June 4, 2019).



SITE PHOTOGRAPHS

Wetland Assessment and Impact Report
NW 31-026-03 W5M
Rocky View County, Alberta

Project No: 212.06650.00003.



Photo 7: Wetland 20 – Hoof shear within wetland (June 4, 2019).



Photo 8: Wetland 7 – south end of Project site (June 3, 2019).



SITE PHOTOGRAPHS

Wetland Assessment and Impact Report
NW 31-026-03 W5M
Rocky View County, Alberta

Project No: 212.06650.00003.



Photo 9: Wetland 11 – south end of Project site (June 3, 2019)



Photo 10: Wetland 18 – north end of Project site (June 4, 2019).



SITE PHOTOGRAPHS

Wetland Assessment and Impact Report
NW 31-026-03 W5M
Rocky View County, Alberta

Project No: 212.06650.00003.



Photo 11: Wetland 5 – Historically a wetland – excavated to a dugout (June 4, 2019).



Photo 12: Wetland 8 – located with Wetlands 9 and 10 within hay field (June 5, 2019).



SITE PHOTOGRAPHS

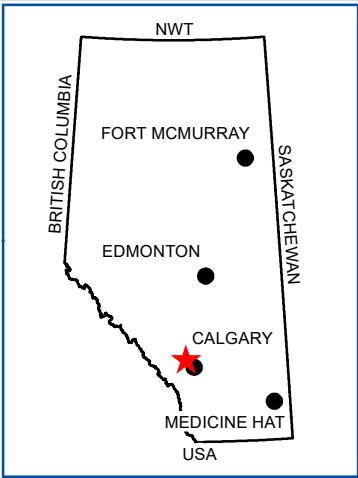
Wetland Assessment and Impact Report
NW 31-026-03 W5M
Rocky View County, Alberta

Project No: 212.06650.00003.

APPENDIX B

Figures

Wetland Assessment and Impact Report
Mountain Ash Limited Partnership Aggregate Operation
NW and SW 31-026-3 W5M, Rocky View County, Alberta
SLR Project No. 212.06650.00003

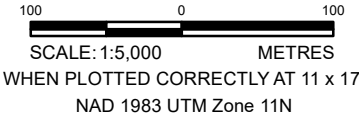


- LEGEND
- AREA ASSESSED
 - EXTRACTION PHASE BOUNDARY
 - SITE LOCATION
 - WETLAND

NOTES

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

Basedata: Contains information licensed under the Open Government Licence – Alberta.
Contains information licensed under the Open Government Licence – Canada.



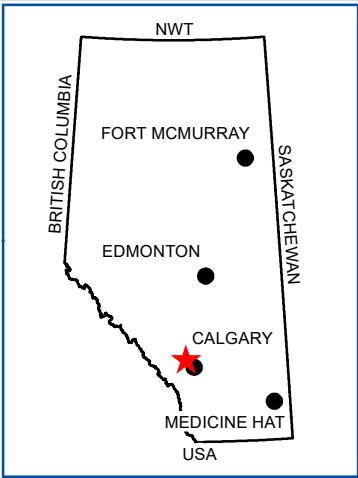
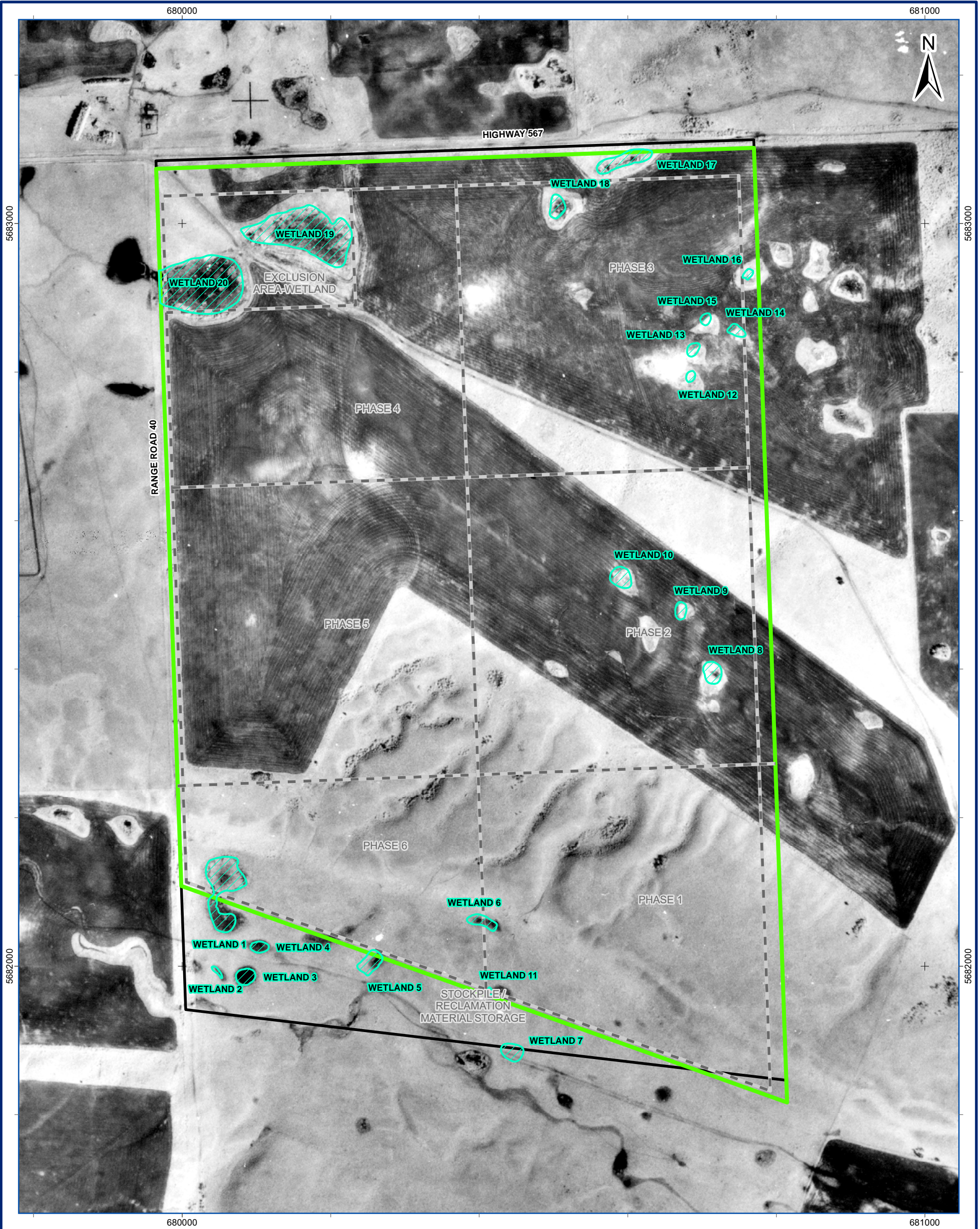
MOUNTAIN ASH LIMITED PARTNERSHIP
AGGREGATE OPERATION
NW & SW 31-26-03 W5M
ROCKY VIEW COUNTY, ALBERTA

WETLAND ASSESSMENT
AND IMPACT REPORT

IDENTIFIED WETLANDS

February 12, 2020	Rev 0.0	Figure No.
Project No.	212.06650.00003	2



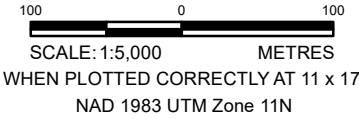


- LEGEND**
- AREA ASSESSED
 - EXTRACTION PHASE BOUNDARY
 - SITE LOCATION
 - WETLAND

NOTES

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

Basedata: Contains information licensed under the Open Government Licence – Alberta.
Contains information licensed under the Open Government Licence – Canada.



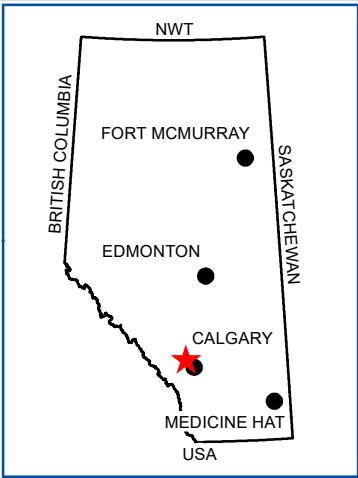
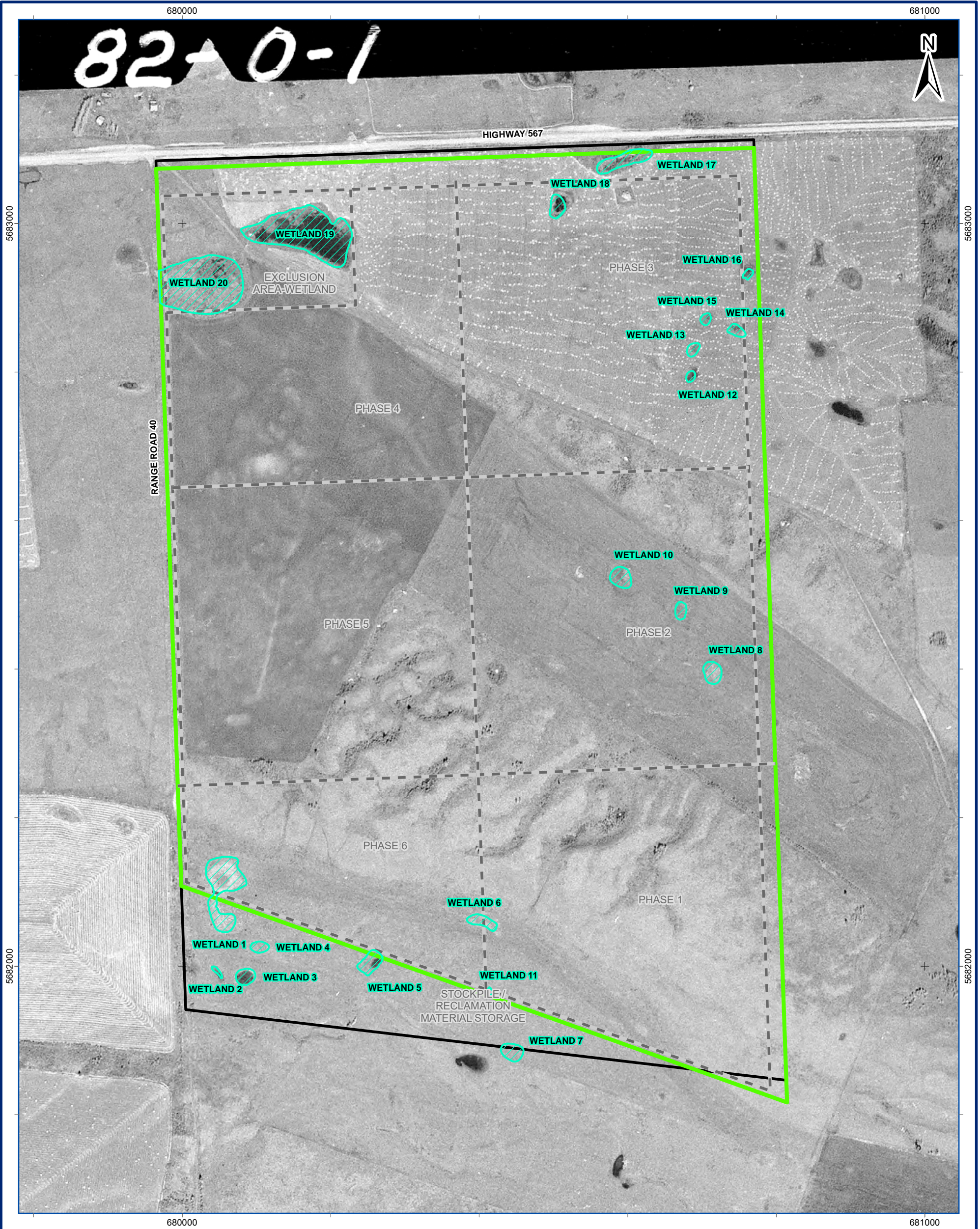
**MOUNTAIN ASH LIMITED PARTNERSHIP
AGGREGATE OPERATION
NW & SW 31-26-03 W5M
ROCKY VIEW COUNTY, ALBERTA**

**WETLAND ASSESSMENT
AND IMPACT REPORT**

AERIAL PHOTOGRAPH (1953)

February 12, 2020	Rev 0.0	Figure No.
Project No.	212.06650.00003	3



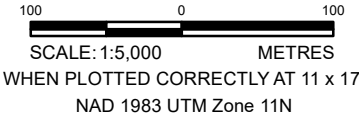


- LEGEND
- AREA ASSESSED
 - EXTRACTION PHASE BOUNDARY
 - SITE LOCATION
 - WETLAND

NOTES

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

Basedata: Contains information licensed under the Open Government Licence – Alberta.
Contains information licensed under the Open Government Licence – Canada.



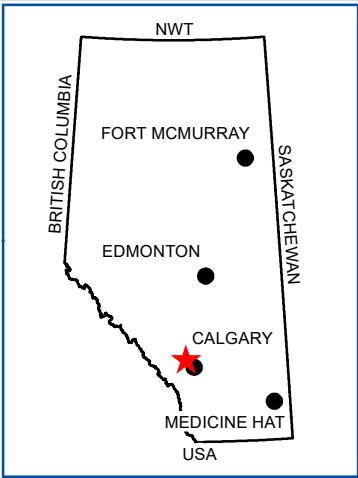
MOUNTAIN ASH LIMITED PARTNERSHIP
AGGREGATE OPERATION
NW & SW 31-26-03 W5M
ROCKY VIEW COUNTY, ALBERTA

WETLAND ASSESSMENT
AND IMPACT REPORT

AERIAL PHOTOGRAPH (1962)

February 12, 2020	Rev 0.0	Figure No.
Project No.	212.06650.00003	4





- LEGEND**
- AREA ASSESSED
 - EXTRACTION PHASE BOUNDARY
 - SITE LOCATION
 - WETLAND

NOTES

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

Basedata: Contains information licensed under the Open Government Licence – Alberta.
Contains information licensed under the Open Government Licence – Canada.

100 0 100
SCALE: 1:5,000 METRES
WHEN PLOTTED CORRECTLY AT 11 x 17
NAD 1983 UTM Zone 11N

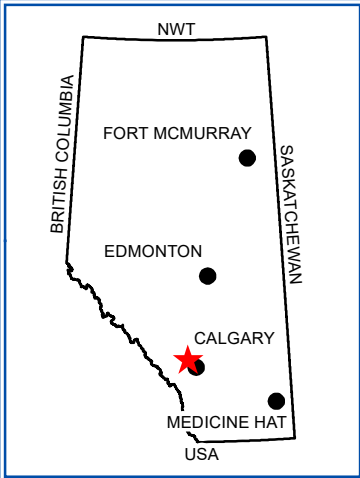
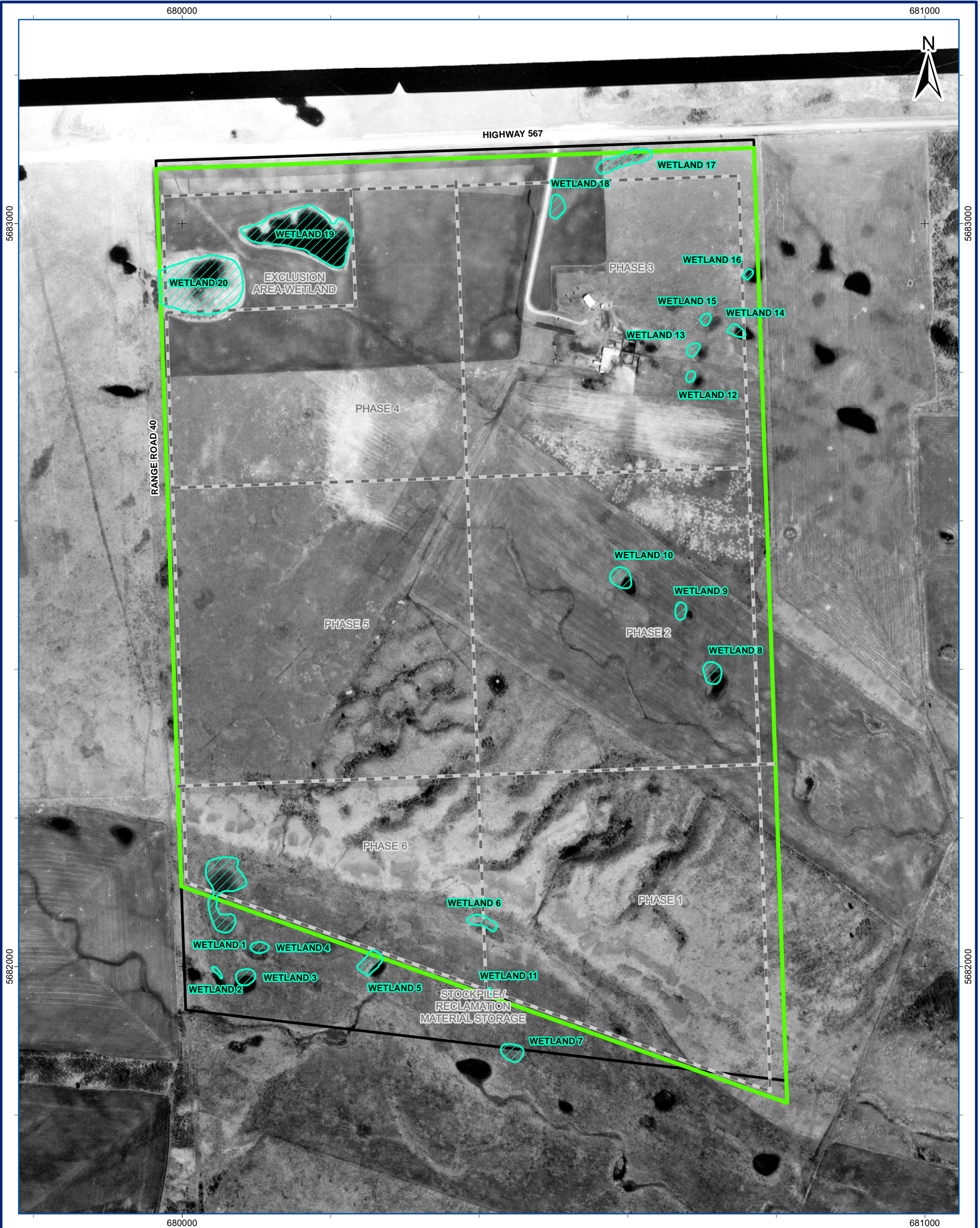
**MOUNTAIN ASH LIMITED PARTNERSHIP
AGGREGATE OPERATION
NW & SW 31-26-03 W5M
ROCKY VIEW COUNTY, ALBERTA**

**WETLAND ASSESSMENT
AND IMPACT REPORT**

AERIAL PHOTOGRAPH (1974)

February 12, 2020	Rev 0.0	Figure No.
Project No.	212.06650.00003	5





- LEGEND**
- AREA ASSESSED
 - EXTRACTION PHASE BOUNDARY
 - SITE LOCATION
 - WETLAND

NOTES

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

Basedata: Contains information licensed under the Open Government Licence – Alberta.
Contains information licensed under the Open Government Licence – Canada.

100 0 100
SCALE: 1:5,000 METRES
WHEN PLOTTED CORRECTLY AT 11 x 17
NAD 1983 UTM Zone 11N

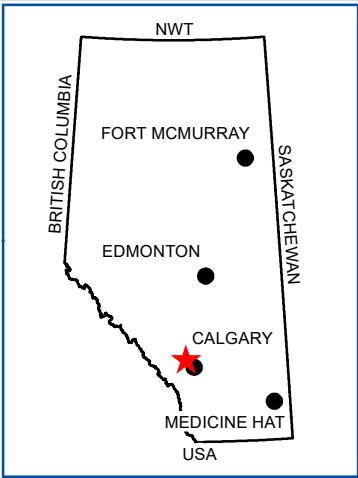
**MOUNTAIN ASH LIMITED PARTNERSHIP
AGGREGATE OPERATION
NW & SW 31-26-03 W5M
ROCKY VIEW COUNTY, ALBERTA**

**WETLAND ASSESSMENT
AND IMPACT REPORT**

AERIAL PHOTOGRAPH (1980)

February 12, 2020	Rev 0.0	Figure No.
Project No.	212.06650.00003	6



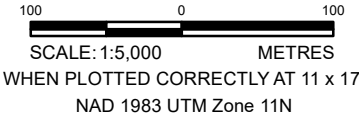


- LEGEND**
- AREA ASSESSED
 - EXTRACTION PHASE BOUNDARY
 - SITE LOCATION
 - WETLAND

NOTES

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

Basedata: Contains information licensed under the Open Government Licence – Alberta.
Contains information licensed under the Open Government Licence – Canada.



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

**WETLAND ASSESSMENT
AND IMPACT REPORT**

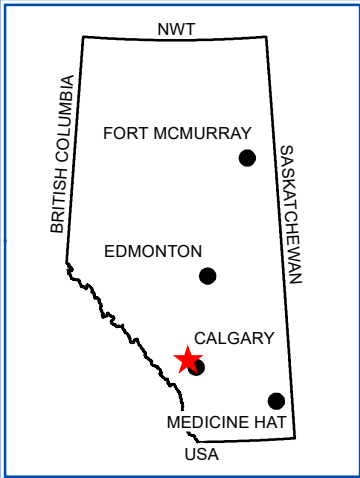
AERIAL PHOTOGRAPH (2008)

February 12, 2020	Rev 0.0	Figure No.
Project No.	212.06650.00003	8





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: Contains information licensed under the Open Government Licence – Alberta.
Contains information licensed under the Open Government Licence – Canada.

- LEGEND**
- AREA ASSESSED
 - EXTRACTION PHASE BOUNDARY
 - SITE LOCATION
 - WETLAND

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**

**WETLAND ASSESSMENT
AND IMPACT REPORT**

AERIAL PHOTOGRAPH (2016)

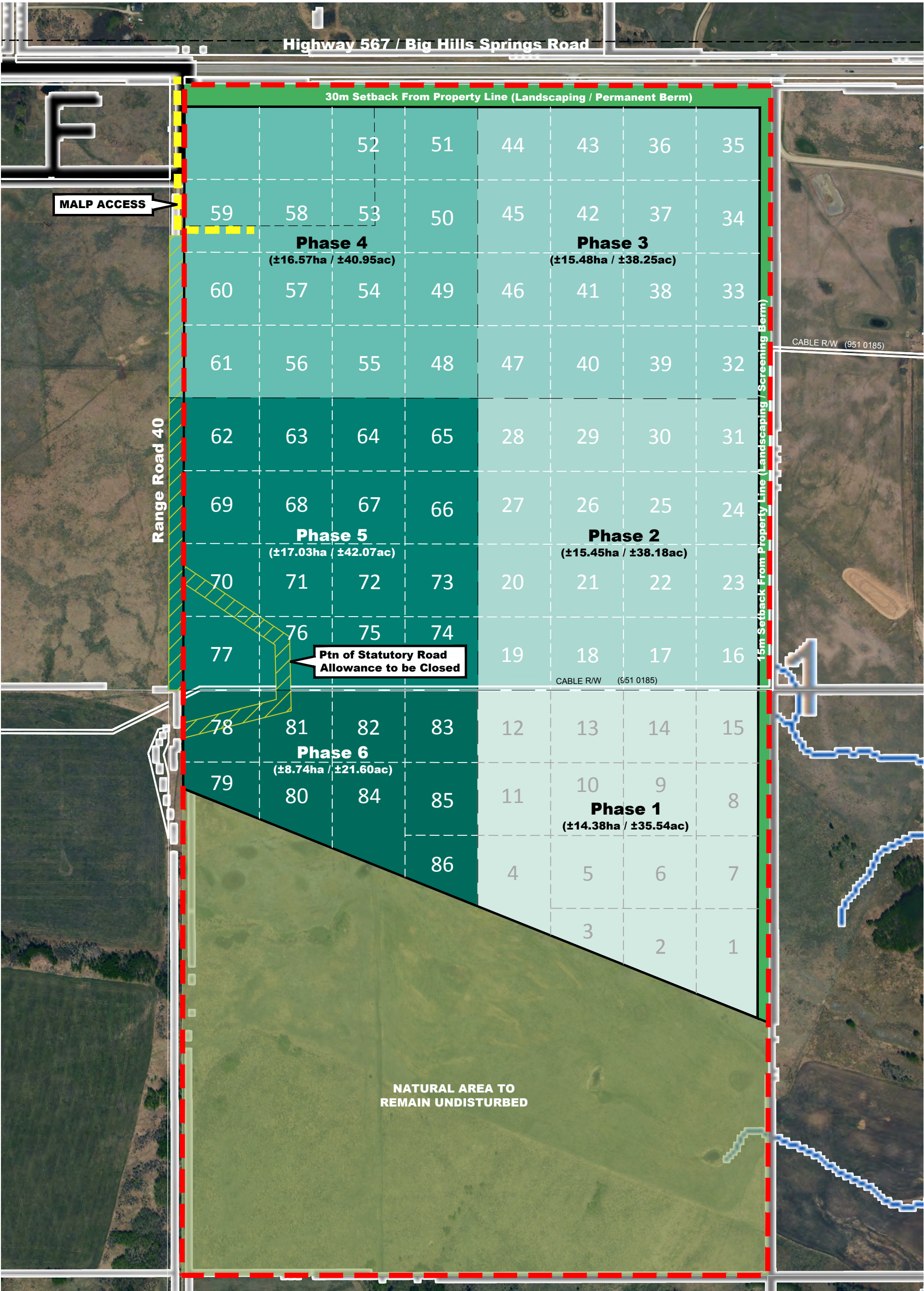
February 12, 2020	Rev 0.0	Figure No.
Project No.	212.06650.00003	9



APPENDIX C

Site Plan

Wetland Assessment and Impact Report
Mountain Ash Limited Partnership Aggregate Operation
NW and SW 31-026-3 W5M, Rocky View County, Alberta
SLR Project No. 212.06650.00003



Legend

	Subject Lands		MALP Access		30.0m Setback (Landscaping / Screening Berm)
	Phase 1		Phase 4		Natural Area to Remain Undisturbed
	Phase 2		Phase 5		Portion of Statutory Road Allowance to be Closed
	Phase 3		Phase 6		

1:5000

Jun 27, 2019 - 12:54pm W:\C2261 Summit Aggregate Phase 2 MSDP 2019Jan28\5.0 Technical\5.1 Technical Production\5.1.1 AutoCAD\C2261-MSDP-2019June06.dwg



MOUNTAIN ASH
• LIMITED PARTNERSHIP •

Summit Pit Operations Along Highway 567
Proposed Phasing & Access Scenario (With Proposed MALP MSDP Amendment)

Mountain Ash Limited Partnership
NW & SW ¼ Sec. 31-26-03-W5M
June 2019

APPENDIX D

Vegetation Species List

Wetland Assessment and Impact Report
Mountain Ash Limited Partnership Aggregate Operation
NW and SW 31-026-3 W5M, Rocky View County, Alberta
SLR Project No. 212.06650.00003

Wetland Assessments - Classification and Species Lists

Wetland ID	Classification	Area (ha)	Predominant species present	Scientific Names
1	Class III	0.291	needle spikerush, water sedge, wild mint , smooth brome, western dock, and hair grass	<i>Eleocharis acicularis</i> , <i>Carex aquatilis</i> , <i>Mentha arvensis</i> , <i>Rumex occidentalis</i> , <i>Deschampsia cespitosa</i>
2	Class I	0.008	Dandelion, silverweed and common plantain	<i>Taraxacum officinale</i> , <i>Argentina anserina</i> , <i>Plantago major</i>
3	Class II	0.045	Dandelion, silverweed, common plantain, hair grass, kentucky bluegrass, clover	<i>Taraxacum officinale</i> , <i>Argentina anserina</i> , <i>Plantago major</i> , <i>Deschampsia cespitosa</i> , <i>Poa pratensis</i> , <i>Trifolium sp.</i>
4	Class I	0.028	Dandelion, silverweed and common plantain	<i>Taraxacum officinale</i> , <i>Argentina anserina</i> , <i>Plantago major</i>
5	Class I	0.067	Dominated by smooth brome and slender wheatgrass	<i>Bromus inermis</i> and <i>Agropyron trachycaulum</i>
6	Class I	0.048	Kentucky bluegrass, smooth brome, canada thistle, western dock	<i>Poa pratensis</i> , <i>Bromus inermis</i> , <i>Cirsium arvense</i> , <i>Rumex occidentalis</i>
7	Class I	0.055	Hay crop	
8	Class I	0.058	Hay crop, dandelion	<i>Taraxacum officinale</i>
9	Class I	0.028	Hay crop	
10	Class I	0.063	Hay crop	
11	Class I	0.009	Hay crop, western dock	<i>Rumex occidentalis</i>
12	Class I	0.014	Hay crop	
13	Class I	0.023	Tame pasture - fowl bluegrass, slender wheatgrass, smooth brome, timothy grass	<i>Poa palustris</i> , <i>Agropyron trachycaulum</i> , <i>Bromus inermis</i> , <i>Phleum pratense</i>
14	Class I	0.028	Kentucky bluegrass, smooth brome, canada thistle, western dock	<i>Poa pratensis</i> , <i>Bromus inermis</i> , <i>Cirsium arvense</i> , <i>Rumex occidentalis</i>
15	Class I	0.017	Kentucky bluegrass, smooth brome, canada thistle, western dock	<i>Poa pratensis</i> , <i>Bromus inermis</i> , <i>Cirsium arvense</i> , <i>Rumex occidentalis</i>
16	Class II	0.013	Smooth brome, slender wheatgrass, water sedge	<i>Bromus inermis</i> and <i>Agropyron trachycaulum</i> , <i>Carex aquatilis</i>
17	Class II	0.118	Hay crop, dandelion, western dock, water sedge	<i>Taraxacum officinale</i> , <i>Rumex occidentalis</i> , <i>Carex aquatilis</i>
18	Class I	0.05	Hay crop, dandelion	<i>Taraxacum officinale</i>
19	Class II	0.676	Tame pasture - clover, dandelion, water sedge, western dock	<i>Trifolium sp.</i> , <i>Taraxacum officinale</i> , <i>Carex aquatilis</i> , <i>Rumex occidentalis</i>
20	Class II	0.722	Tame pasture - clover, dandelion, water sedge, western dock	<i>Trifolium sp.</i> , <i>Taraxacum officinale</i> , <i>Carex aquatilis</i> , <i>Rumex occidentalis</i>

APPENDIX E

FWMIS Search Results

Wetland Assessment and Impact Report
Mountain Ash Limited Partnership Aggregate Operation
NW and SW 31-026-3 W5M, Rocky View County, Alberta
SLR Project No. 212.06650.00003



Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Created: 29-May-2019 08:03

Species present within the current extent :

Fish Inventory

Wildlife Inventory

BARN SWALLOW
EASTERN KINGBIRD
GREAT BLUE HERON
LEAST FLYCATCHER
SORA

Stocked Inventory

No Species Found in Search Extent

Map Extent

Northwest (X,Y)

539826, 5678051

Northeast (X,Y)

542126, 5678051

Projection

10-TM AEP Forest

Centroid (X,Y)

540976, 5677330

Southwest (X,Y)

539826, 5676608

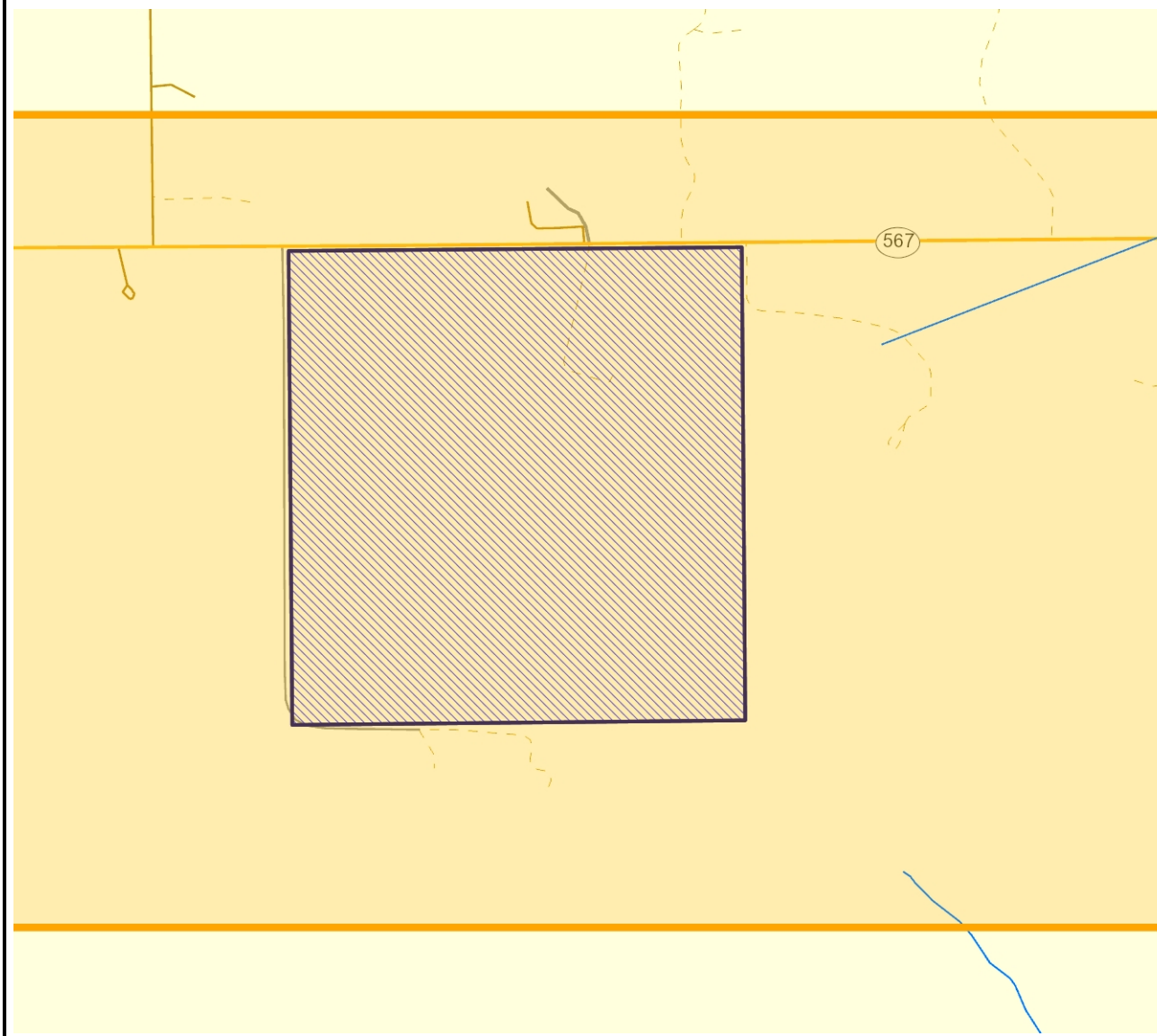
Southeast (X,Y)

542126, 5676608

Contact Information

For contact information, please visit:

<http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx>



Display may contain: Base Map Data provided by the Government of Alberta under the Alberta Open Government Licence. Cadastral and Dispositions Data provided by Alberta Data Partnerships. ©GeoEye, all rights reserved. Information as depicted is subject to change, therefore the Government of Alberta assumes no responsibility for discrepancies at time of use.

© 2019 Government of Alberta

APPENDIX F

ABWRET-A Results

Wetland Assessment and Impact Report
Mountain Ash Limited Partnership Aggregate Operation
NW and SW 31-026-3 W5M, Rocky View County, Alberta
SLR Project No. 212.06650.00003

Function (ABWRET-A Raw Score)	Wetland 19	Wetland 20	Wetland 18	Wetland 17	Wetland 16	Wetland 15	Wetland 14	Wetland 13	Wetland 12	Wetland 10	Wetland 9	Wetland 8	Wetland 4	Wetland 3	Wetland 2	Wetland 11	Wetland 1	Wetland 6	Wetland 7	Wetland 5
Surface Water Storage (WS)	6.12	6.11	2.75	6.20	6.20	2.75	2.74	2.74	2.74	5.85	5.84	5.84	6.16	6.16	6.16	2.64	6.17	5.84	5.82	5.47
Stream Flow Support (SFS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Phosphorus Retention (PR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	5.35	5.36	4.26	4.76	4.78	4.31	4.36	4.31	4.35	4.76	4.73	4.77	4.92	4.89	4.83	4.22	5.20	4.80	4.94	4.51
Amphibian Habitat (AM)	2.74	2.76	2.28	2.52	2.47	2.29	2.29	2.29	2.29	2.50	2.46	2.52	4.15	4.13	2.94	2.31	2.98	2.47	2.59	3.79
Waterbird Habitat (WB)	4.83	4.85	3.94	4.68	4.28	3.93	3.59	3.93	3.59	4.55	4.18	4.59	5.30	5.34	4.89	3.93	5.04	4.29	4.26	4.68
Songbird, Raptor, & Mammal Habitat (SBM)	3.39	3.30	2.70	2.95	2.91	2.75	2.76	2.75	2.75	2.90	2.90	2.93	3.56	3.46	3.32	2.60	3.51	2.55	2.89	3.38
Pollinator & Native Plant Habitat (PH)	3.14	3.11	1.75	2.90	3.09	1.83	1.83	1.83	1.82	2.27	2.81	2.75	3.09	3.00	2.89	1.72	3.11	2.42	2.80	3.06
Human Use & Recognition (HU)	3.20	3.28	2.54	3.01	3.01	2.74	2.74	2.74	2.74	2.52	3.02	3.02	3.64	3.56	3.56	2.97	3.65	3.72	3.27	2.97
Function (ABWRET-A Normalized Score)	Wetland 19	Wetland 20	Wetland 18	Wetland 17	Wetland 16	Wetland 15	Wetland 14	Wetland 13	Wetland 12	Wetland 10	Wetland 9	Wetland 8	Wetland 4	Wetland 3	Wetland 2	Wetland 11	Wetland 1	Wetland 6	Wetland 7	Wetland 5
Surface Water Storage (WS)	0.84	0.84	0.25	0.86	0.86	0.25	0.25	0.25	0.25	0.79	0.79	0.79	0.85	0.85	0.85	0.23	0.85	0.79	0.79	0.73
Stream Flow Support (SFS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Phosphorus Retention (PR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Nitrate Removal & Retention (NR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	0.54	0.54	0.40	0.46	0.47	0.41	0.41	0.41	0.41	0.47	0.46	0.47	0.49	0.48	0.47	0.39	0.52	0.47	0.49	0.43
Amphibian Habitat (AM)	0.35	0.35	0.28	0.32	0.31	0.28	0.28	0.28	0.28	0.31	0.31	0.32	0.58	0.58	0.38	0.28	0.39	0.31	0.33	0.52
Waterbird Habitat (WB)	0.36	0.36	0.25	0.34	0.29	0.25	0.21	0.25	0.21	0.33	0.28	0.33	0.42	0.42	0.37	0.25	0.39	0.29	0.29	0.34
Songbird, Raptor, & Mammal Habitat (SBM)	0.34	0.32	0.21	0.26	0.25	0.22	0.22	0.22	0.22	0.25	0.25	0.25	0.37	0.35	0.32	0.19	0.36	0.18	0.24	0.34
Pollinator & Native Plant Habitat (PH)	0.25	0.24	0.00	0.20	0.24	0.02	0.02	0.02	0.02	0.10	0.19	0.18	0.24	0.22	0.20	0.00	0.24	0.12	0.19	0.23
Human Use & Recognition (HU)	0.42	0.44	0.29	0.39	0.39	0.33	0.33	0.33	0.33	0.29	0.39	0.39	0.51	0.49	0.49	0.38	0.51	0.53	0.44	0.38
Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	Wetland 19	Wetland 20	Wetland 18	Wetland 17	Wetland 16	Wetland 15	Wetland 14	Wetland 13	Wetland 12	Wetland 10	Wetland 9	Wetland 8	Wetland 4	Wetland 3	Wetland 2	Wetland 11	Wetland 1	Wetland 6	Wetland 7	Wetland 5
Normalized Hydrological Health (HH)	0.84	0.84	0.25	0.86	0.86	0.25	0.25	0.25	0.25	0.79	0.79	0.79	0.85	0.85	0.85	0.23	0.85	0.79	0.79	0.73
Normalized Water Quality (WQ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Normalized Ecological Health (EH)	0.54	0.54	0.40	0.46	0.47	0.41	0.41	0.41	0.41	0.47	0.46	0.47	0.58	0.58	0.47	0.39	0.52	0.47	0.49	0.52
Normalized Human Use (HU)	0.42	0.44	0.29	0.39	0.39	0.33	0.33	0.33	0.33	0.29	0.39	0.39	0.51	0.49	0.49	0.38	0.51	0.53	0.44	0.38
RWVAU #	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Normalized Value Score (ABWRET_a)	0.76	0.76	0.52	0.73	0.74	0.53	0.53	0.53	0.53	0.71	0.72	0.72	0.78	0.78	0.75	0.53	0.76	0.73	0.73	0.71
Value Category (a, b, c, d)	c	c	d	c	c	d	d	d	d	d	c	c	c	c	c	d	c	c	c	c
Abundance Factor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Final Score(A, B, C, D)	B	B	D	B	B	C	C	C	C	C	B	B	B	B	B	D	B	B	B	B



global environmental solutions

Calgary, AB

1185-10201 Southport Rd SW
Calgary, AB T2W 4X9
Canada

Tel: (403) 266-2030

Fax: (403) 263-7906

Edmonton, AB

6940 Roper Road
Edmonton, AB T6B 3H9
Canada

Tel: (780) 490-7893

Fax: (780) 490-7819

Grande Prairie, AB

9905-97 Avenue
Grande Prairie, AB T8V 0N2
Canada

Tel: (780) 513-6819

Fax: (780) 513-6821

Guelph, ON

105-150 Research Lane
Guelph, ON N1G 4T2
Canada

Tel: (226) 706-8080

Fax: (226) 706-8081

Kamloops, BC

8 West St. Paul Street
Kamloops, BC V2C 1G1
Canada

Tel: (250) 374-8749

Fax: (250) 374-8656

Kelowna, BC

#107-1726 Dolphin Avenue
Kelowna, BC V1Y 9R9
Canada

Tel: (250) 762-7202

Fax: (250) 763-7303

Markham, ON

200 - 300 Town Centre Blvd
Markham, ON L3R 5Z6
Canada

Tel: (905) 415-7248

Fax: (905) 415-1019

Nanaimo, BC

9-6421 Applecross Road
Nanaimo, BC V9V 1N1
Canada

Tel: (250) 390-5050

Fax: (250) 390-5042

Ottawa, ON

400 - 2301 St. Laurent Blvd.
Ottawa, ON K1G 4J7
Canada

Tel: (613) 725-1777

Fax: (905) 415-1019

Prince George, BC

1586 Ogilvie Street
Prince George, BC V2N 1W9
Canada

Tel: (250) 562-4452

Fax: (250) 562-4458

Regina, SK

1048 Winnipeg Street
Regina, SK S4R 8P8
Canada

Tel: (306) 525-4690

Fax: (306) 525-4691

Saskatoon, SK

620-3530 Millar Avenue
Saskatoon, SK S7P 0B6
Canada

Tel: (306) 374-6800

Fax: (306) 374-6077

Toronto, ON

36 King Street East, 4th Floor
Toronto, ON M5C 3B2
Canada

Tel: (905) 415-7248

Fax: (905) 415-1019

Vancouver, BC (Head Office)

200-1620 West 8th Avenue
Vancouver, BC V6J 1V4
Canada

Tel: (604) 738-2500

Fax: (604) 738-2508

Victoria, BC

Unit 303 - 3960 Quadra Street
Victoria, BC V8X 4A3
Canada

Tel: (250) 475-9595

Fax: (250) 475-9596

Winnipeg, MB

1353 Kenaston Boulevard
Winnipeg, MB R3P 2P2
Canada

Tel: (204) 477-1848

Fax: (204) 475-1649

Whitehorse, YT

6131 6th Avenue
Whitehorse, YT Y1A 1N2
Canada

Tel: (867) 689-2021

Yellowknife, NT

1B Coronation Drive
Yellowknife, NT X1A 0G5
Canada

Tel: (867) 688-2847

