GREENWOOD environmental

September 17, 2024

Katherine Wagar, P.Ag
Regional Director South East
(Kootenay Boundary Region)
202 100 N Cranbrook, BC
VIC 3P9
Email: kathie.wagar@gov.bc.ca

RE: Record Ridge Industrial Mineral Mine Project Revision – Annual Production Capacity

In response to the August 13, 2024 determination by the Environmental Assessment Office (EAO), West High Yield (WHY) Resources is revising the proposed Record Ridge Industrial Mineral Mine (RRIMM) Project with the goal of allowing the Project to be piloted for two years of production below the 75,000 tpa, which the EAO now asserts to be the relevant environmental assessment thresholds.

The revised Project proposes a production capacity of not more than 127,000 tonnes of ore during two full years of production, or 63,500 tonnes annually. Project component changes resulting from the reduced production capacity is limited to the open pit and waste rock storage area footprints (both of which are reduced in size), and the total and average daily number of trucks transporting ore over the life of the Project; 68% decrease in truck traffic. Project water management infrastructure will remain unchanged, thus providing additional capacity to manage natural variability and inherent uncertainty. Specifically, Project components remaining unchanged from the October 2023 Application includes:

- Two-year production duration based on full operating schedule;
- Non-winter permit operations (April/May to October/November);
- No on-site camp,
  - day facilities only;
- No underground workings, on-site processing plant, tailings storage facility, or low-grade stockpile;
- Water supply for dust suppression to be provided by independent contractor;
- Water management and mitigation plan – the system as designed is not changing;
- Surface Infrastructure – remaining unchanged includes;
  - Access Road;
  - Soil Stockpile;
  - Primary/Secondary Crusher Pads;
  - Water Management Infrastructure;
  - Maintenance Pad; and,
  - Dry and Office Facilities.

With the revised mine plan, WHY Resources has commissioned this supplemental submission to update components of the Record Ridge Industrial Mineral Mine Joint *Mines Act* and *Environmental Management Act* Application (October 2023)[1]; see Table 1.

Should you have any questions, please contact me at your earliest convenience.

[1] October 2023 data inputs were used to support Table 1 metric updates; updated field and/or desktop information was not considered part of the Table 1 revision scope.

Yours sincerely,

Shane Uren, M.A.Sc., R.P.Bio.

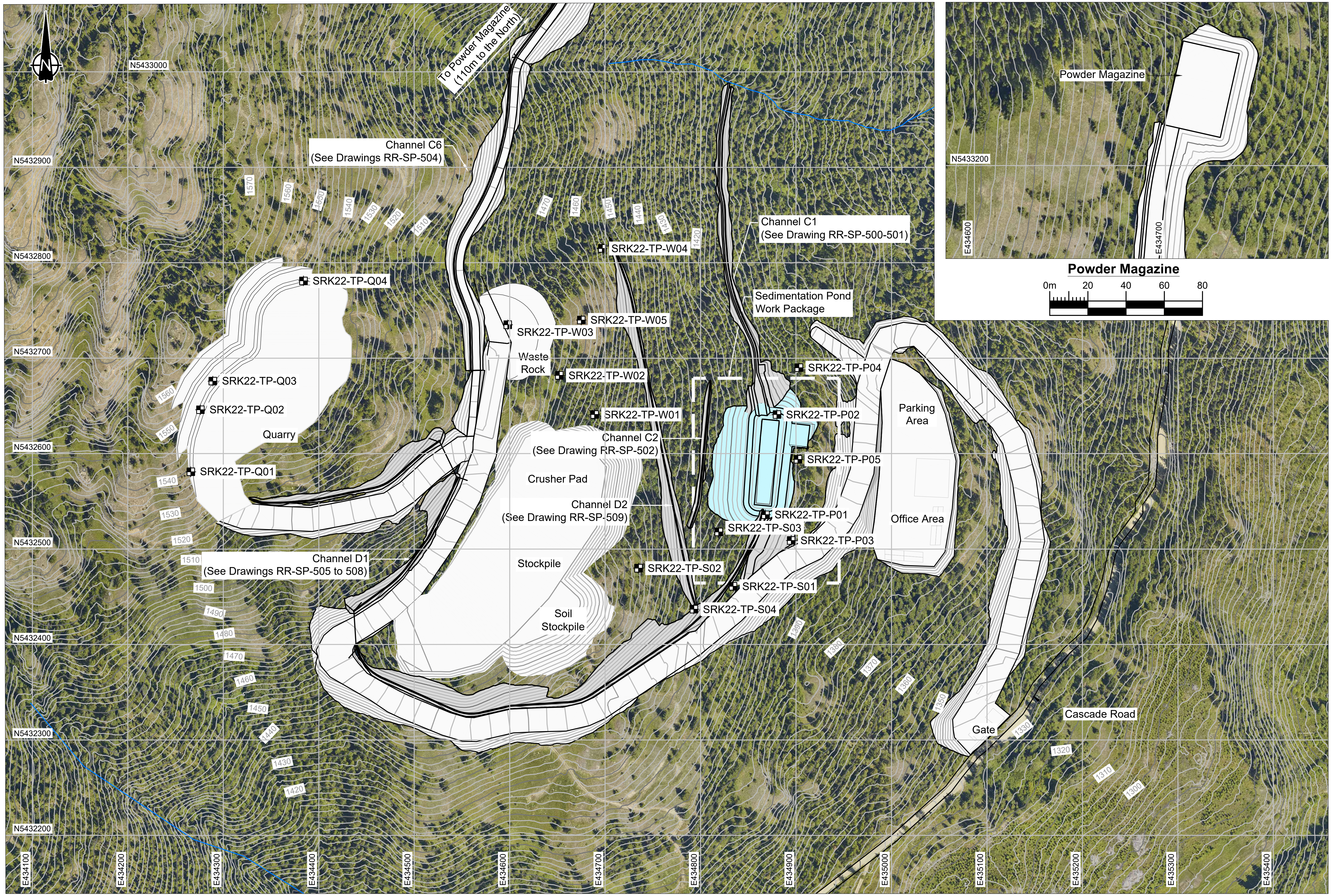
cc: Frank Murasco, President & CEO West High Yield Resources, frank@whyresources.com
Chief Clarence Louie, Osoyoos Indian Band, Chief@oib.ca
Yihting Lim Environmental Protection Officer BC ENV, Yihting.Lim@gov.bc.ca

Table 1. Record Ridge Industrial Mineral Mine Joint *Mines Act* and *Environmental Management Act* Application Revisions

Executive Summary	• Throughput change from 200,000 tonnes per year to 63,500 tonnes per year; • The mine includes a total of not more than 127,000 tonnes of plant feed during two years of production; • Surface footprint vegetated cover reduced from 24.5 ha to 23.1 ha; and, • One red-listed grassland community occurs in up to 5.1 ha, reduced from 5.5 ha.
Chapter 1	• W.H.Y. Resources has reduced the overall disturbance area of the project by limiting the production capacity to 63,500 tonnes per year; • Production capacity reduced to 63,500 tonnes per year, thus does not trigger the provincial or federal environmental assessment process; • The total number of trucks per year and over the life of the Project will be reduced by 67%; • Average daily truck traffic (round trips) with the revised mine plan will be 18; compared to 54 under the October 2023 mine plan; • The mine generated construction grade waste rock over the life of the project is reduced from 320,405 tonnes to 300,000 tonnes; and, • Figure 1.3-3: Key Mine Components (SRK)
Chapter 2	• Figure 2.3-2: Location of Groundwater Monitoring Wells and Mapped Structure (SRK); • Figure 2.6-3: Groundwater Monitoring Wells (SRK); • Figure 2.11-9: Locations of Water Licenses Proximal to RRIMM Project (Greenwood); • Figure 2.13-1: Archaeological Overview Assessment (Greenwood); and, • Table 2.3-5: Soil Savage Depth and Volume Available in Mine Footprint (Greenwood).
Chapter 3	• The mine is designed to supply two years of offsite plant feed material at a rate of no greater than 63,500 tonnes per operating year; and • Figure 3.2-1: Mine Site Layout (SRK).
Chapter 4	• The area of exposed rock at closure due to the presence of the open pit was reduced to 0.9 ha from 1 ha; • Figure 4.2-1: End Land Use Objectives by Mine Component (Greenwood); • Figure 4.2-2: Soil Map Units by Mine Component (Greenwood); • Figure 4.2-3: Baseline TEM and Proposed Project Infrastructure (Greenwood); • Figure 4.2-4: Post Reclamation Ecosystems (Greenwood); • Table 4.2-2: Soil Available for Salvage from Mine Infrastructure Areas; • Table 4.2-3: Volume of Soil Savaged Compared to Replacement Volume Required; and, • Table 4.2-4: Record Ridge Baseline Post-Reclamation Ecosystems within the Footprint.

Table 1. Record Ridge Industrial Mineral Mine Joint *Mines Act* and *Environmental Management Act* Application Revisions (Continued)

Chapter 5	• The mine is designed to supply two years of plant feed material at a rate of no greater than 63,500 tonnes per operating year; and, • A maximum total of approximately 377,000 tonnes of waste stripping (waste rock and topsoil), reduced from 397,088 tonnes.
Chapter 6	• Collected contact water will not be used for dust suppression on site, or along the Cascade Highway; • An area of 23.1 ha will be cleared of vegetation for the life of mine, reduced from 24.5 ha; • One red-listed ecological community, which is mapped as graminoid grassland (Gg) in the TEM but mapped by BC CDC (2023) as Idaho fescue – bluebunch wheatgrass – silky lupine – junegrass, occurs in 5.1 ha of the Surface Footprint, 9% of its occurrence in the RSA. Of this, the majority (3.7 ha) occurs in the ICHmw5 and the remainder (1.4 ha) occurs in the ESSFmh; • Potential edge effects could occur in up to 47.4 ha (3%) of vegetated ecological communities in the RSA, an increase from 46.0 ha (3%). Edge effects were predicted to occur in up to 100 m from the Surface Footprint (i.e., up to the edge of the LSA). With the revised changes of the Project infrastructure being somewhat in the interior of the Surface Footprint, it did not affect the LSA distance and therefore, the area of estimated edge effects, i.e., between the Project Surface Footprint and the LSA, increased slightly while the loss of vegetation [removal of vegetation within the LSA] decreased); • There is no change to the potential edge effect in up to 0.4 ha of a blue-listed mature forested ecological community within the area for edge effects; • Figure 6.6-1: Record Ridge Listed Ecological Communities (Greenwood); • Figure 6.6-2: Rare Plant Locations in the Regional Study Area (Greenwood); • Table 6.6-1: Record Ridge Ecosystems – Area (ha) in the Surface Footprint and Proportion of RSA; and • Table 6.6-2: Record Ridge Ecosystems – Area (ha) of Potential Edge Effects.
Chapter 7	• Figure 7.2-1: Discharge Monitoring Locations (SRK); and, • Figure 7.6-1: Location of Proposed AEMP Sampling Stations (Greenwood).
Chapter 8	• Not Applicable.
Chapter 9	• Production phase of the project includes two years of mining at a rate no greater than 63,500 tonnes per year of mineralized material; and, • A total of 377,000 tonnes of waste stripping (waste rock and topsoil) will be mined over the two-year mine life, reduced from 397,088 tonnes.
Appendices	• Mine Plan (SRK, September 2024); and, • Appendix A - End Land Use Objective and Revegetation Prescription by Project Component (Cascara, August 2024).



Powder Magazine

0m 20 40 60 80

LEGEND

- Test Pit Location
- Cascade Road
- Creeks
- Sedimentation Pond
- Sedimentation Pond Water Management Infrastructure
- Future Site Infrastructure
- Deisgn Culvert Location

NOTES

1. All units are in meters unless otherwise specified.
2. Coordinates in drawing are based on UTM with NAD83 datum, Zone 11.
3. Contours are shown at 2.0m intervals.
4. All survey information to be confirmed by physical topographic survey prior to construction.

Not for Construction

0m 40 80 120 160

DRAWING NO.	DRAWING TITLE
- -	- -

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
F	Issued for Permit			24/09/04
E	Issued for Permit	CV	PHM	23/10/03
D	Issued for Permitting	CV	PHM	23/09/12
C	Issued for Permitting	CV	PHM	23/08/01
B	Issued for Permitting	CV	PHM	23/03/07
A	Issued for Review	MMM	PHM	23/03/02

REVISIONS

PROFESSIONAL ENGINEERS STAMP

srk consulting

WEST HIGH YIELD RESOURCES

DESIGN: CV	DRAWN: TAH	REVIEWED: PHM
CHECKED: MMM	APPROVED: PHM	DATE: October 2023

FILE NAME: CAPR002216 - GA.dwg

Record Ridge

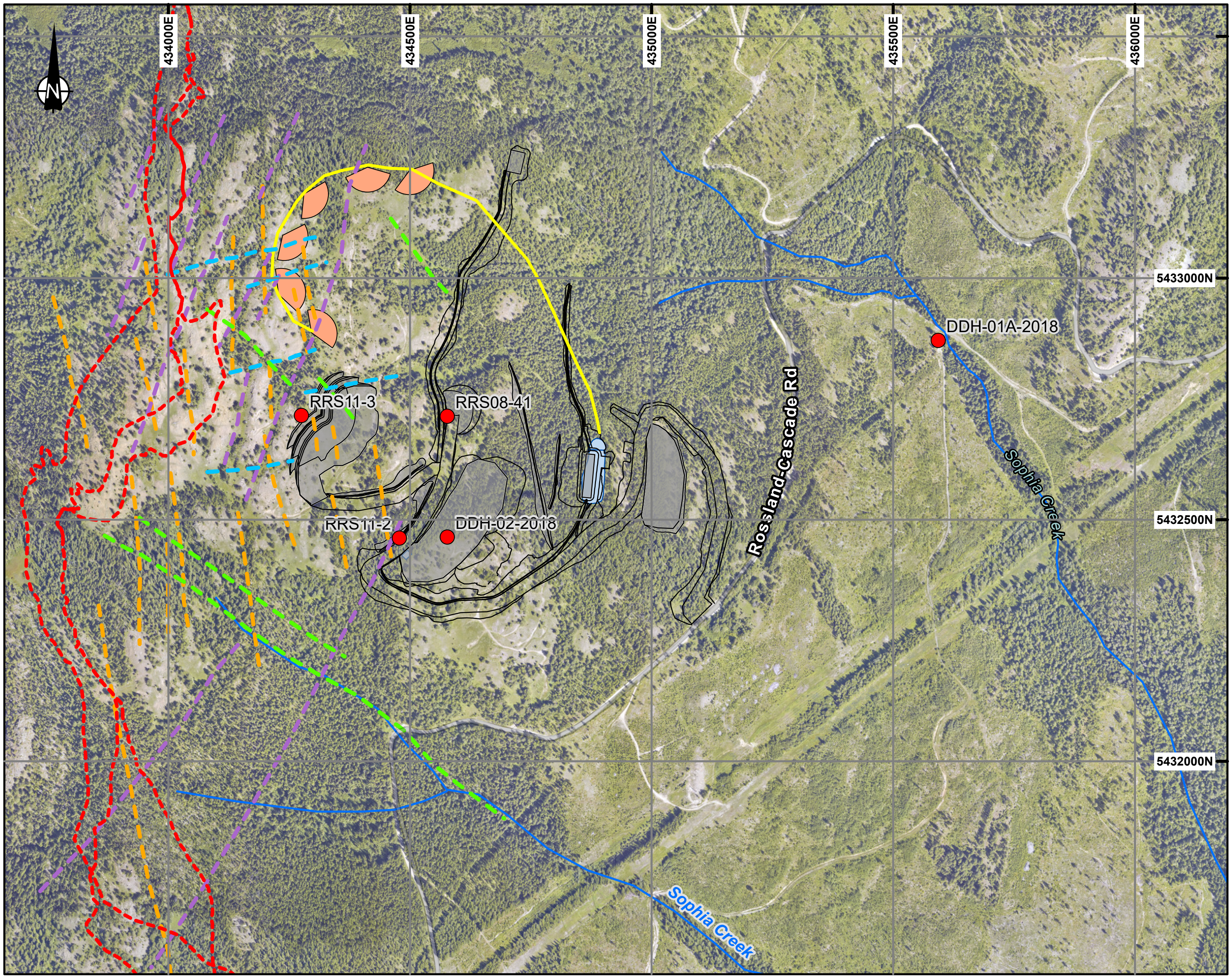
SRK JOB NO.: CAPR0000641 REG. NO.: 1003655

Surface Water Management

General Arrangement

DRAWING NO. RR-SP-100

REVISION NO. F



LEGEND

- Groundwater Monitoring Wells
- Creeks
- Discharge Pipe
- Fault Traces (NE)
- Fault Traces (NNE)
- Fault Traces (NNW)
- Fault Traces (NW)
- Settling Pond
- Land Application Areas

NOTES

1. Coordinate System: NAD 1983 UTM Zone 11N

REFERENCES

1. Record Ridge aerial image captured by Eagle Mapping 2016.

0 100 200 300 400
Meters

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srk consulting

WEST HIGH YIELD RESOURCES

Environmental Assessment

Monitoring Locations

SRK JOB NO.: CAPR000641

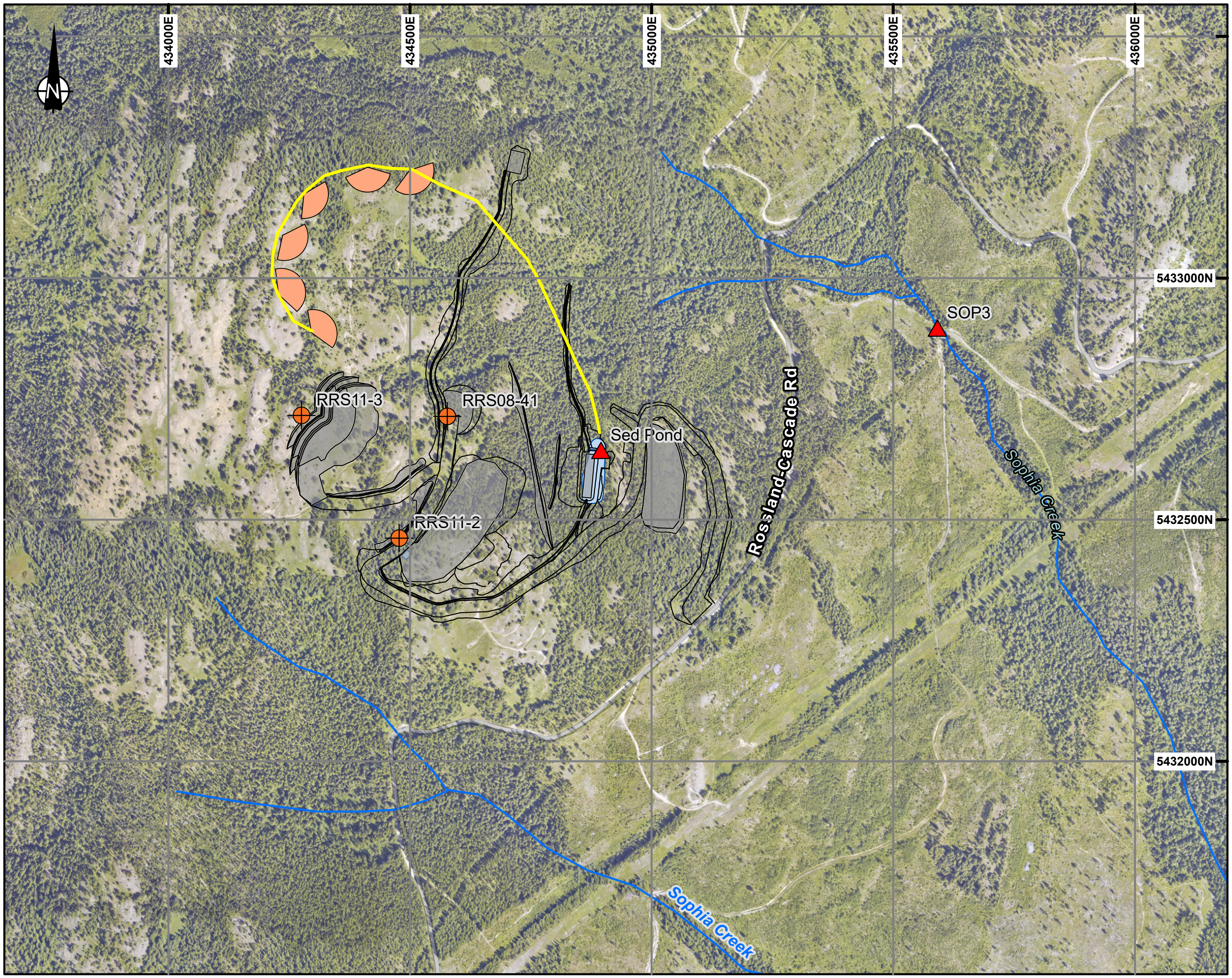
LAYOUT: CAPR000641_RR_Closure_Plan

Record Ridge Industrial Mineral Mine

DATE: SEP 2024

APPROVED: xx

FIGURE: **2.3-2**



LEGEND

- 2016 GW Monitoring
- Surface Water Quality Stations
- Creeks
- Discharge Pipe
- Settling Pond
- Land Application Areas

NOTES

1. Coordinate System: NAD 1983 UTM Zone 11N

REFERENCES

1. Record Ridge aerial image captured by Eagle Mapping 2016.

0 100 200 300 400
Meters

srk consulting

WEST HIGH YIELD RESOURCES

Environmental Assessment

Monitoring Locations

SRK JOB NO.: CAPR000641

LAYOUT: CAPR000641_RR_Closure_Plan

Record Ridge Industrial Mineral Mine

DATE:	APPROVED:	FIGURE:
SEP 2024	xx	**2.6-4**

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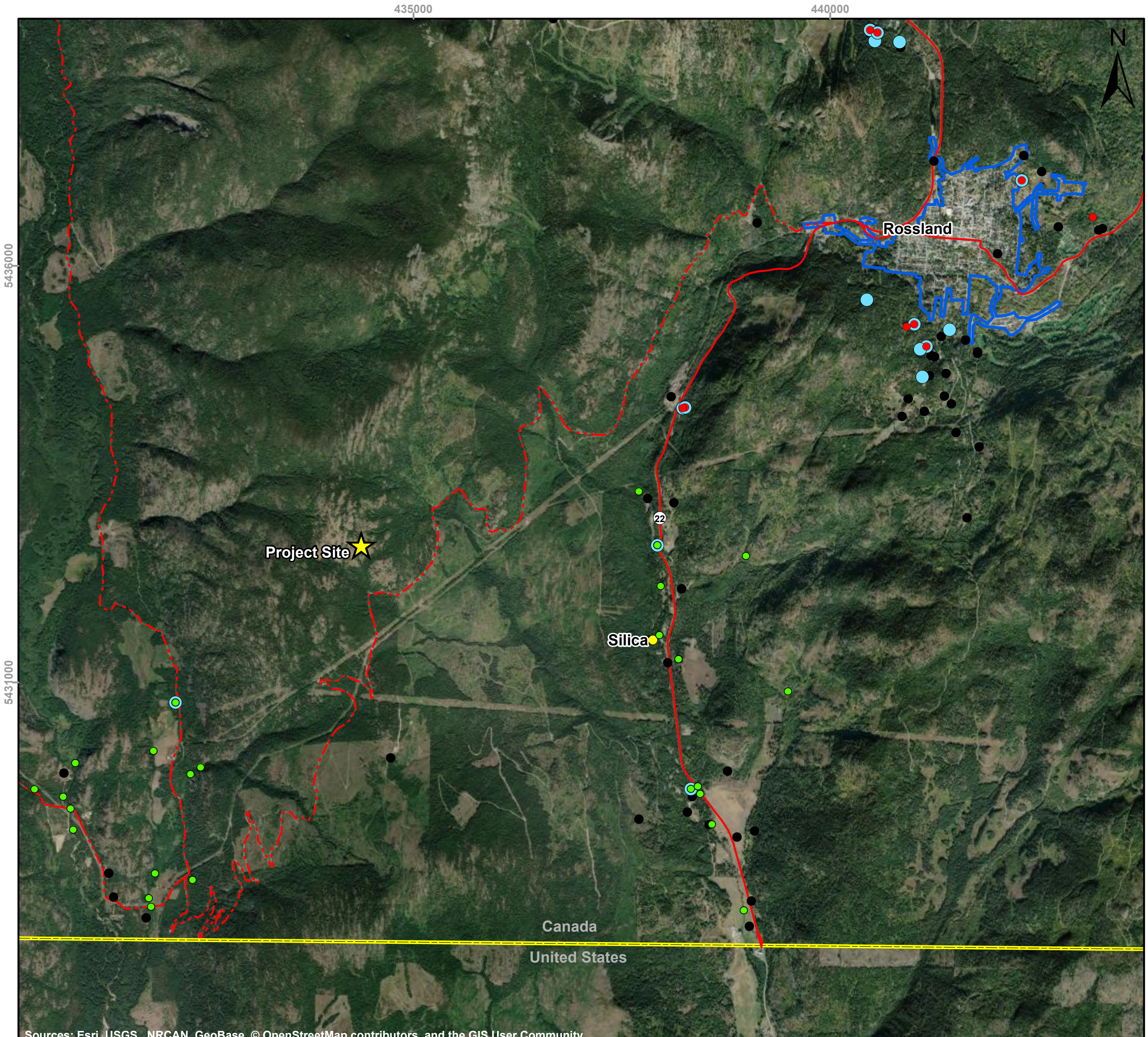
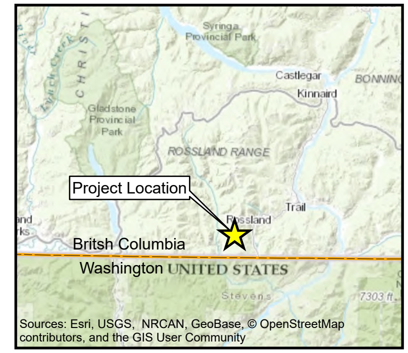


map produced by Spicker GIS Services (www.spickergis.com)



Locations of Water Licenses Proximate to RRIMM Project

- Water Rights Licenses
- Licensed Spring
- Drinking Water Source
- Ground Water Well
- Community
- Paved Road
- Loose Road
- Rossland Water System Outer Limit

1:65,000

0 1,000 2,000

Metres

Coordinate System: NAD 1983 UTM Zone 11N

GREENWOOD environmental

Map ID: RRIMM_MineApp2024 / GW-RR-109_WaterLicences

Date: September 10, 2024

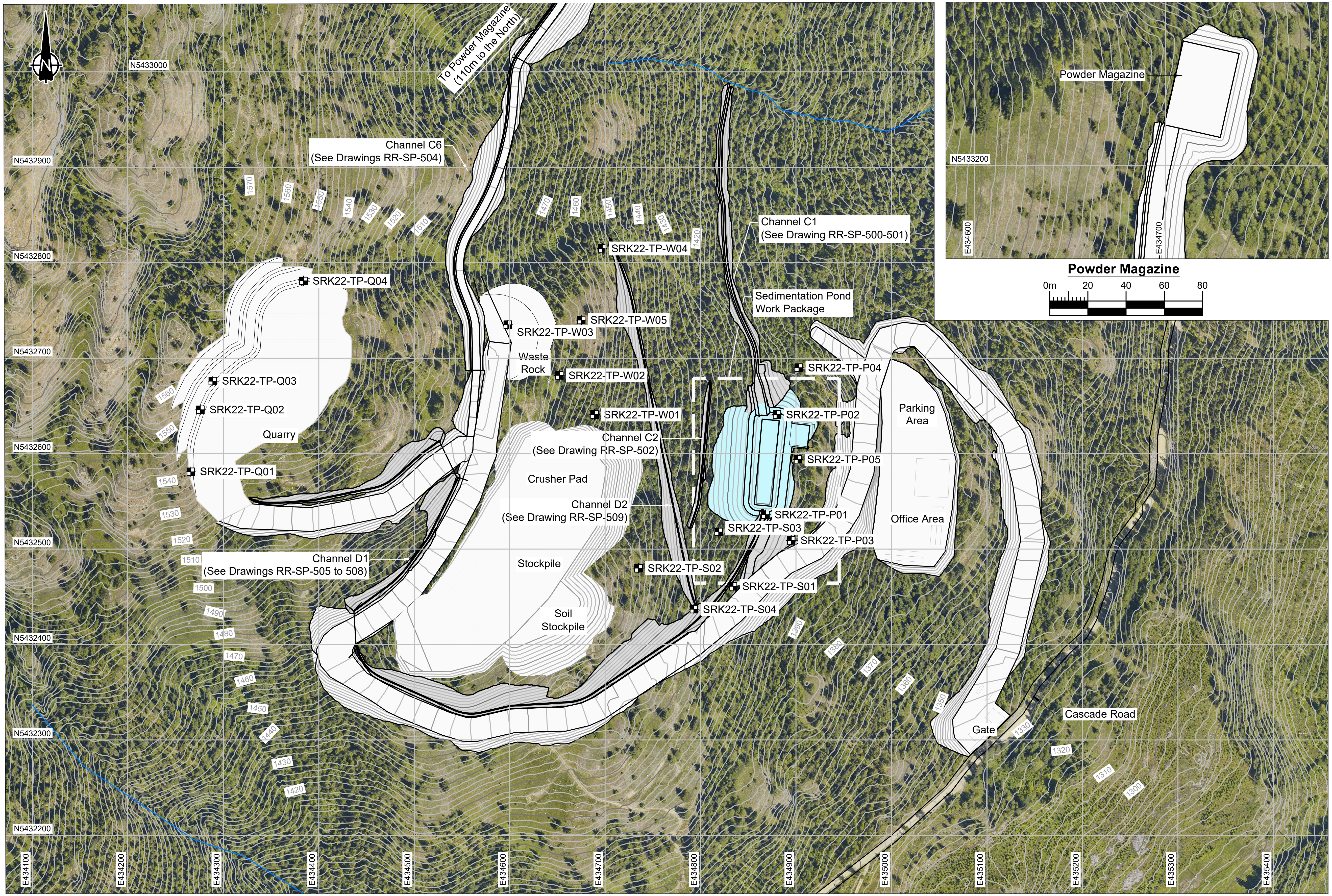
Figure 2.11-9

Table 2.3-5: Soil Available for Salvage from Mine Infrastructure Areas

Infrastructure	SMU	Area (m^2)	Depth of Salvage (m)	Volume Salvageable (m^3)
Open Pit	1	7,645.0	0.36	2,752.2
	2	4,122.2	0.18	742.0
	5	15,883.4	0.16	2,541.3
	7	1,911.2	0.27	516.0
Crusher Pad	2	34,474.0	0.18	6,205.3
	5	2,098.2	0.16	335.7
Waste Storage Facility	2	4,807.8	0.18	865.4
	5	600.0	0.16	96.0
Topsoil Stockpile	2	6,347.9	0.18	1,142.6
	5	1,427.1	0.16	228.3
Powder Magazine	2	2,555.2	0.18	459.9
Parking/Office Area	2	6,656.6	0.18	1,198.2
	5	9,649.6	0.16	1,543.9
Sedimentation Pond	5	1,003.7	0.16	160.6
	2	11,469.3	0.18	2,064.5
Runaway Lane	2	1,080.6	0.18	194.5
Haul Roads[1]	1	1,065.6	0.36	383.6
	2	66,182.2	0.18	11,912.8
	5	30,043.6	0.16	4,807.0
	7	152.9	0.27	41.3
	8	252.9	0.37	93.6
Water Management Infrastructure (channels/ditches)	1	168.3	0.36	60.6
	2	14,538.0	0.18	2,616.8
	5	3,249.0	0.16	519.8
	7	42.1	0.27	11.4
Disturbance Buffer	1	1,140.7	0.36	410.7
	2	34,452.4	0.18	6,201.4
	5	14,248.4	0.16	2,279.7
	7	246.2	0.27	66.5
	8	99.3	0.37	36.7
Total		**277,613.4**		**50,488.5**

[1] Haul roads include the access road to the Powder Magazine

[2] Disturbance buffer is not anticipated to be stripped but is accounted for as part of the maximum disturbance footprint.



LEGEND

- Test Pit Location
- Cascade Road
- Creeks
- Sedimentation Pond
- Sedimentation Pond Water Management Infrastructure
- Future Site Infrastructure
- Deisgn Culvert Location

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Not for Construction

0m 40 80 120 160

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srk consulting

WEST HIGH YIELD RESOURCES

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FILE NAME: CAPR002216 - GA.dwg

Record Ridge

SRK JOB NO.: CAPR0000641 REG. NO.: 1003655

Surface Water Management

General Arrangement

DRAWING NO.: RR-SP-100 REVISION NO.: F

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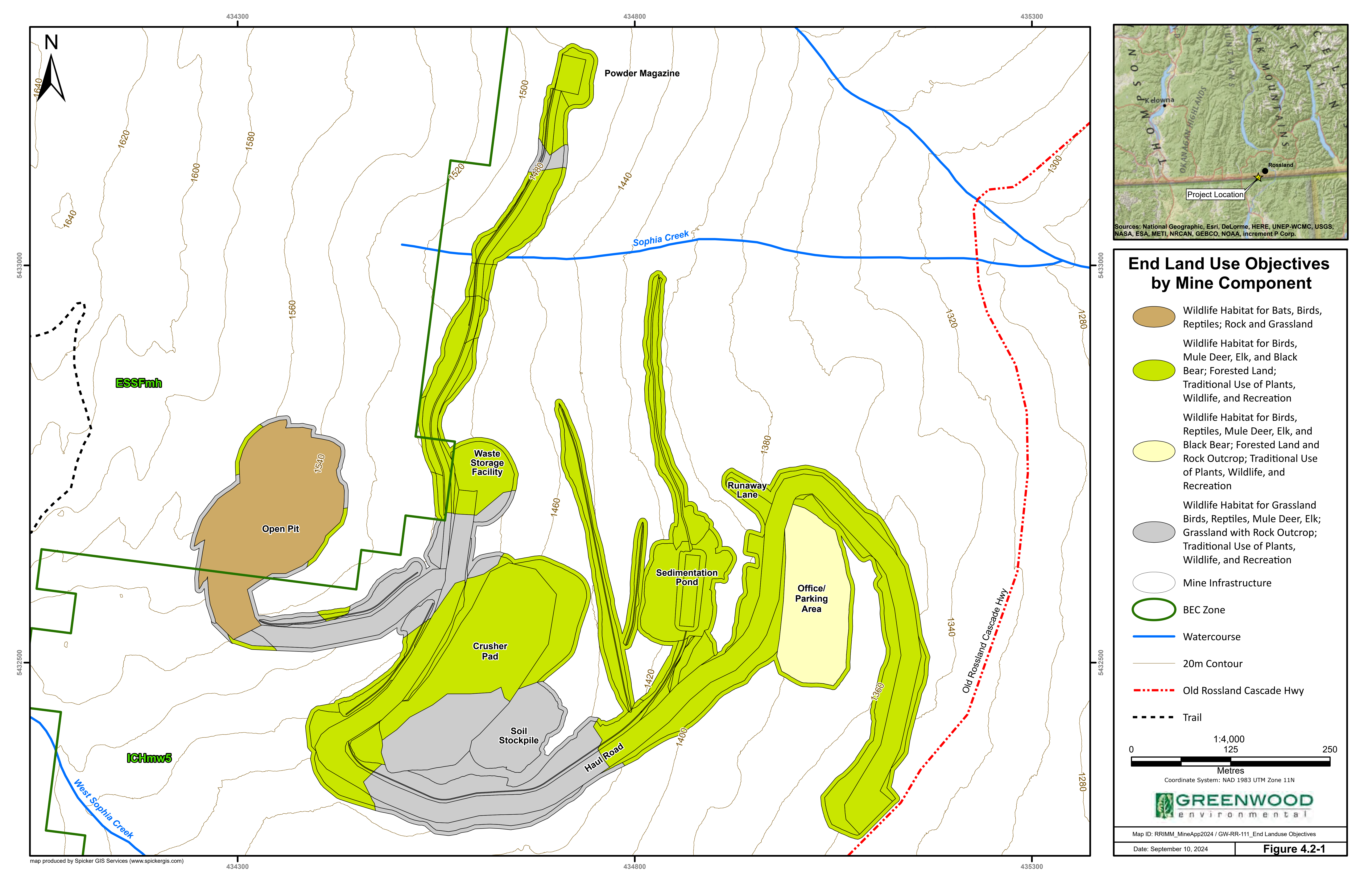
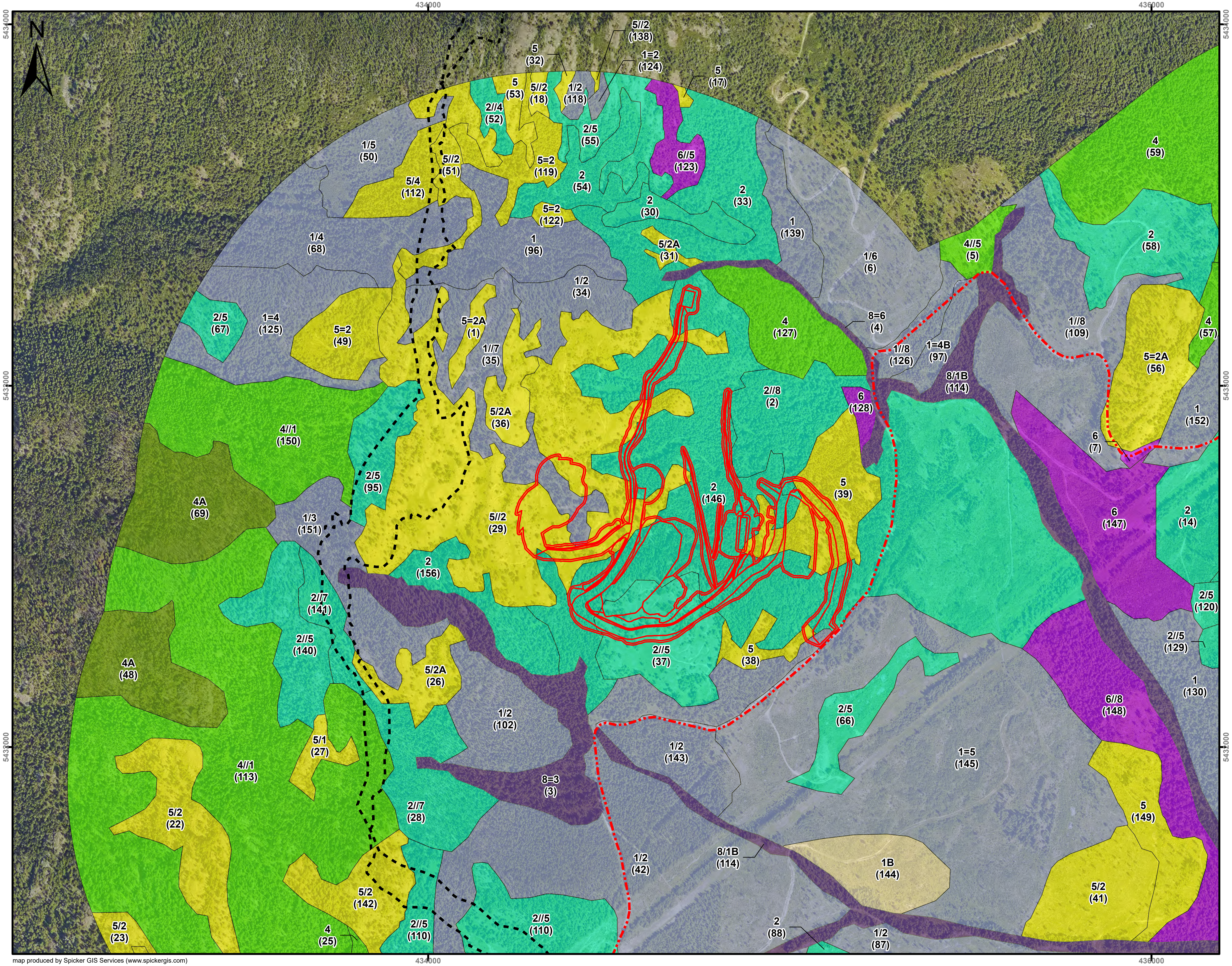


434300
434800
435300
5433000
5432500
N
Powder Magazine
Sophia Creek
ESSFmh
ICHmw5
West Sophia Creek
Open Pit
Waste Storage Facility
Crusher Pad
Soil Stockpile
Haul Road
Sedimentation Pond
Runaway Lane
Office/ Parking Area
Old Rossland Cascade Hwy
1640
1620
1600
1580
1560
1540
1520
1500
1480
1460
1440
1420
1400
1380
1360
1340
1320
1300
1280
Kelowna
Rossland
Project Location
Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
End Land Use Objectives by Mine Component
Wildlife Habitat for Bats, Birds, Reptiles; Rock and Grassland
Wildlife Habitat for Birds, Mule Deer, Elk, and Black Bear; Forested Land; Traditional Use of Plants, Wildlife, and Recreation
Wildlife Habitat for Birds, Reptiles, Mule Deer, Elk, and Black Bear; Forested Land and Rock Outcrop; Traditional Use of Plants, Wildlife, and Recreation
Wildlife Habitat for Grassland Birds, Reptiles, Mule Deer, Elk; Grassland with Rock Outcrop; Traditional Use of Plants, Wildlife, and Recreation
Mine Infrastructure
BEC Zone
Watercourse
20m Contour
Old Rossland Cascade Hwy
Trail
1:4,000
0
125
250
Metres
Coordinate System: NAD 1983 UTM Zone 11N
GREENWOOD environmental
Map ID: RRIMM_MineApp2024 / GW-RR-111_End Landuse Objectives
Date: September 10, 2024
map produced by Spicker GIS Services (www.spickergis.com)

Figure 4.2-1



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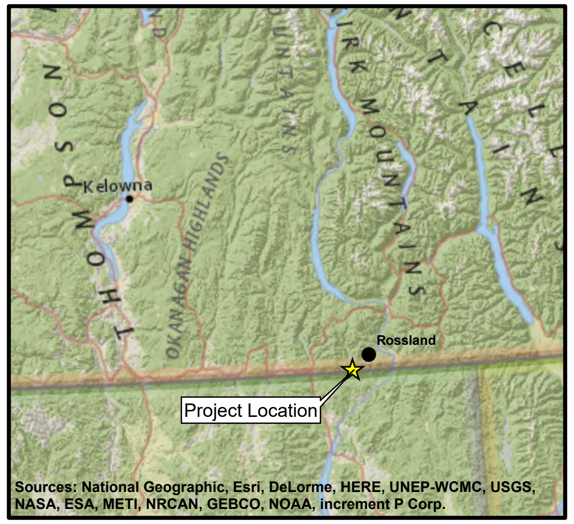


Soil Map Units by Mine Component

- Old Rossland Cascade Hwy
- Trail
- Mine Infrastructure

Decile 1 SMU Values

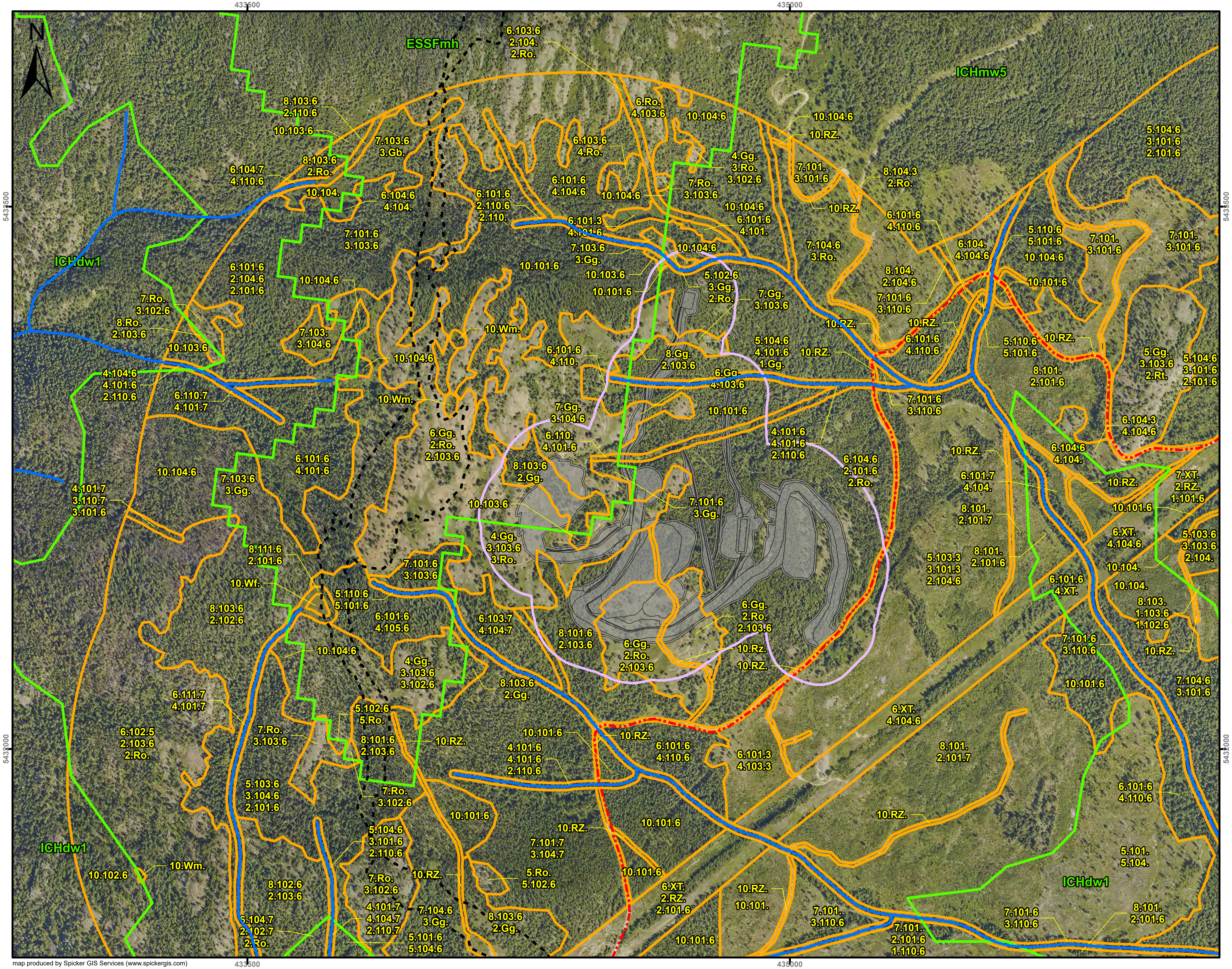
- 1
- 1B
- 2
- 2A
- 3
- 4
- 4A
- 5
- 6
- 8

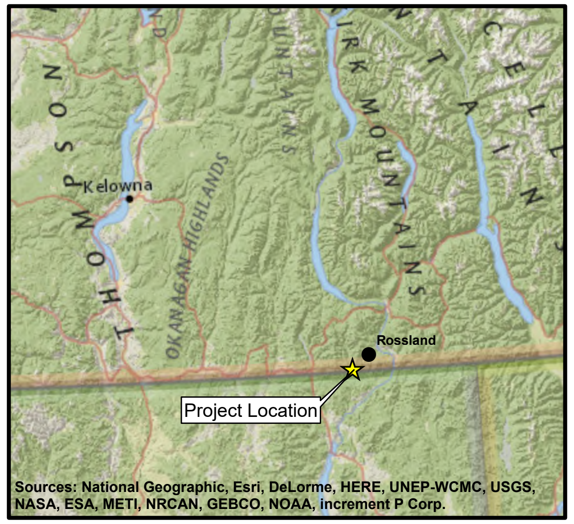
Polygon Label:
6/8 SMU
(77) Polygon ID

1:10,000
0 250 500
Metres
Coordinate System: NAD 1983 UTM Zone 11N

GREENWOOD environmental

Map ID: RRIMM_MineApp2024 / GW-RR-112_Soil Map Units
Date: September 8, 2024
Figure 4.2-2





Baseline TEM and Proposed Project Infrastructure

Surface Footprint

Mine Infrastructure

Old Rossland Cascade Hwy

Trail

Watercourse

Terrestrial Ecosystem Mapping (TEM)

BEC Zone

Vegetation Resources Local Study Area

Terrestrial Ecosystem Mapping Label:

6.101.6
2.104.6
2.101.6

Decile

Ecosystem Map Code

Structural Stage

1:10,000

0 250 500

Metres

Coordinate System: NAD 1983 UTM Zone 11N

GREENWOOD environmental

Map ID: RRIMM_MineApp2024

Date: September 10, 2024

Figure 4.2-3

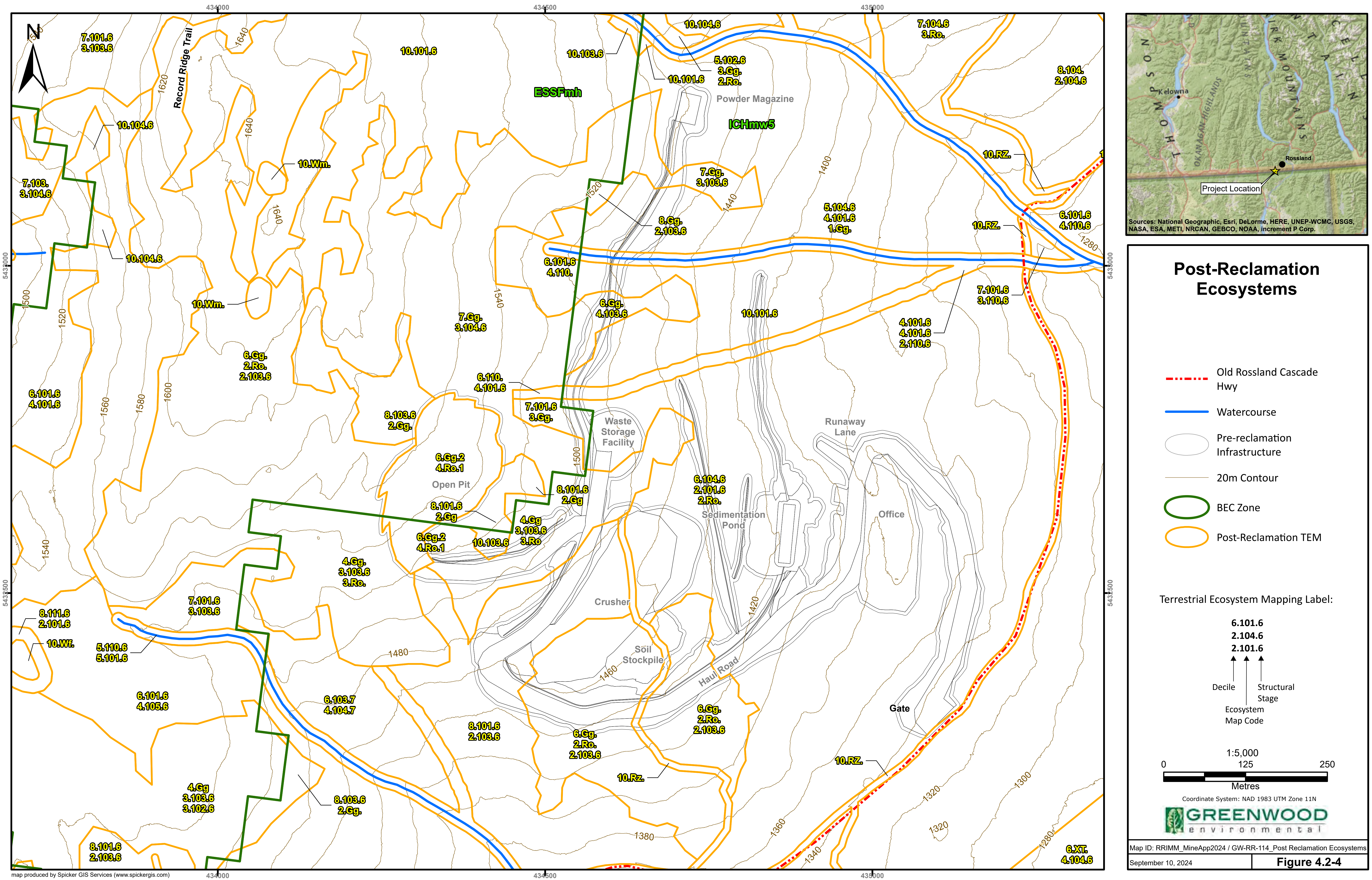

Post-Reclamation Ecosystems
Old Rossland Cascade Hwy
Watercourse
Pre-reclamation Infrastructure
20m Contour
BEC Zone
Post-Reclamation TEM
Terrestrial Ecosystem Mapping Label:
6.101.6
2.104.6
2.101.6
Decile
Ecosystem Map Code
Structural Stage
1:5,000
0
125
250
Metres
Coordinate System: NAD 1983 UTM Zone 11N
GREENWOOD environmental
Map ID: RRIMM_MineApp2024 / GW-RR-114_Post Reclamation Ecosystems
September 10, 2024
Figure 4.2-4
Project Location
Rossland
Kelowna
Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
ESSFmh
ICHmw5
Record Ridge Trail
Powder Magazine
Waste Storage Facility
Open Pit
Runaway Lane
Sedimentation Pond
Office
Crusher
Soil Stockpile
Haul Road
Gate
map produced by Spicker GIS Services (www.spickergis.com)

Table 4.2-2: Soil Available for Salvage from Mine Infrastructure Areas

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Total		**277,613.4**		**50,488.5**

[1] Haul roads include the access road to the Powder Magazine

[2] Disturbance buffer is not anticipated to be stripped but is accounted for as part of the maximum disturbance footprint.

Table 4.2-3: Volume of Soil Salvaged Compared to Replacement Volume Required

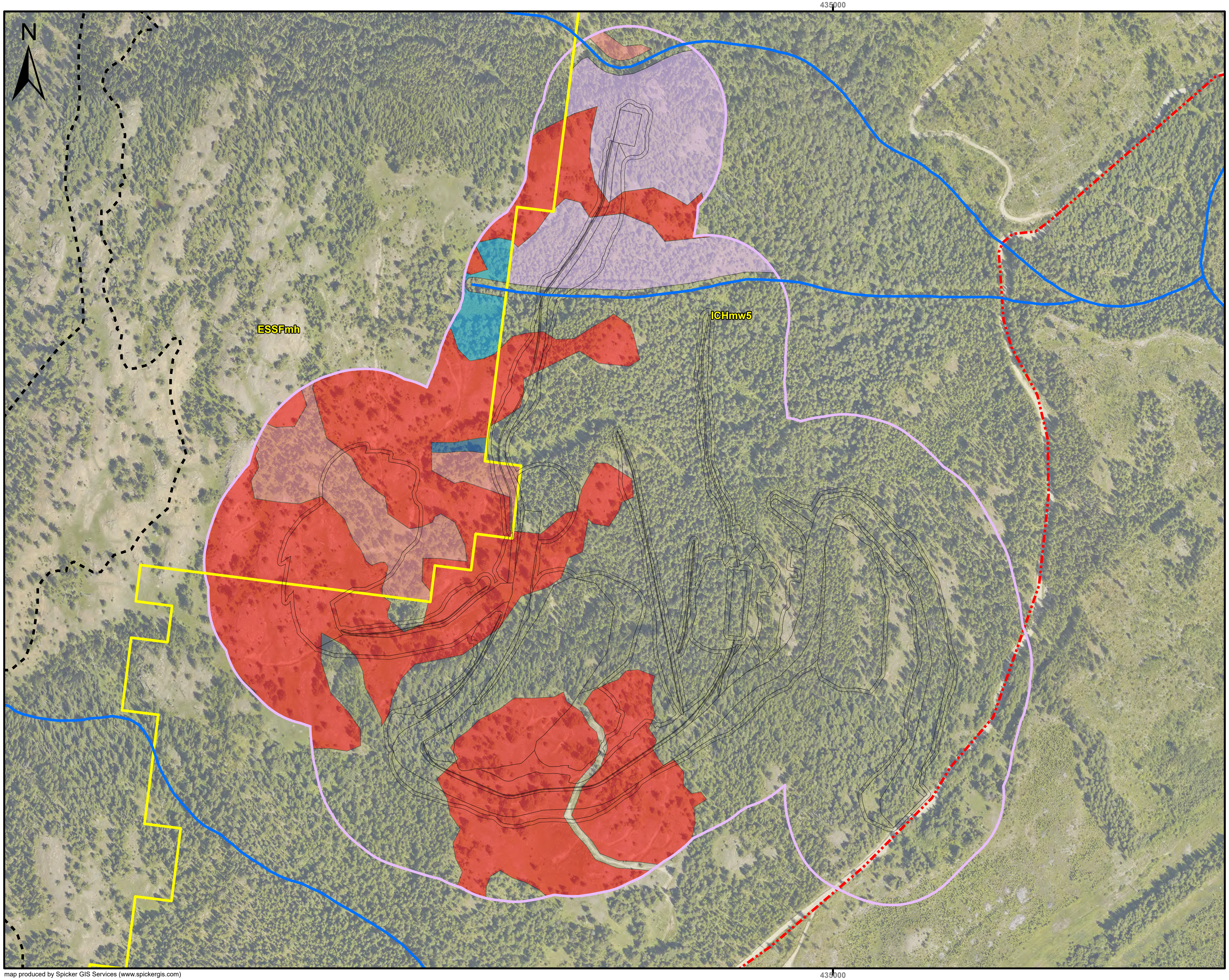
Soil	Volume (m^3)	Area Salvaged/Replaced (m^3)	Depth of Salvage (m)	Depth of Replacement
Salvaged	50,489	277,613	0.16 to 0.37 (0.18*)	
Replaced	50,489	277,613		0.10 to 0.20 (0.15**)

*Weighted average of soil salvage depth was used to reflect the frequency of occurrence of various soil salvage depths in the mine area.
**Normal average was used because the method of soil placement and preparation will be uniform for all mine areas.

Table 4.2-4: Record Ridge Baseline and Post-Reclamation Ecosystems within the Footprint

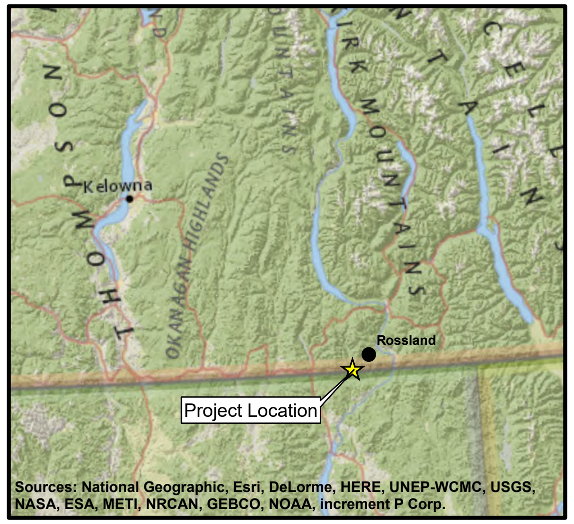
BEC Unit	Ecosystem Name	Site Map Code	Baseline Area (ha)	Post-Reclamation Area (ha)	Difference
Vegetated					
ESSFmh	Subalpine fir Engelman– spruce - rhododendron - foamflower	101	0.1	0.1	0.0
ESSFmh	Subalpine fir Douglas-fir huckleberry - falsebox	103	1.1	0.1	-1.0
ESSFmh	Douglas-fir western redcedar – falsebox – prince’s pine	104	0.2	0.1	-0.1
ESSFmh	Graminoid grassland	Gg	1.4	1.8	0.4
Vegetated ESSFmh Subtotal			2.8	2.1	-0.7
ICHmw5	Western hemlock western –redcedar - falsebox	101	6.1	6.0	-0.1
ICHmw5	Douglas-fir Douglas maple – falsebox	103	2.3	2.2	-0.1
ICHmw5	Douglas-fir western redcedar – falsebox- prince's pine	104	8.1	8.1	0.0
ICHmw5	Western redcedar western–hemlock - oak fern	110	<0.1	<0.1	0.0
ICHmw5	Graminoid grassland	Gg	3.7	3.8	0.1
Vegetated ICHmw5 Subtotal			20.3	20.1	-0.2
Vegetated Total			23.1	22.2	-0.9
Unvegetated					
ESSFmh	Rock	Ro	0.2	1.0	0.8
ICHmw5	Rock	Ro	4.0	4.1	0.1
ICHmw5	Road	Rz	0.4	0.4	0.0
Unvegetated Subtotal			4.6	5.5	0.9
Total Area			**27.7**	**27.7**	**0.0**

435000



435000

map produced by Spicker GIS Services (www.spickergis.com)



Record Ridge Listed Ecological Communities

- Mine Infrastructure
- Old Rossland Cascade Hwy
- Trail
- Watercourse
- Vegetation Resources Local Study Area
- BEC Zone

Listed Ecological Communities

- Red-listed > 60 %
- Red-listed 30 to 60 %
- Red-listed <30 %
- Blue-listed > 60 %
- Blue-listed 30 to 60 %

1:5,000

0 100 200

Metres

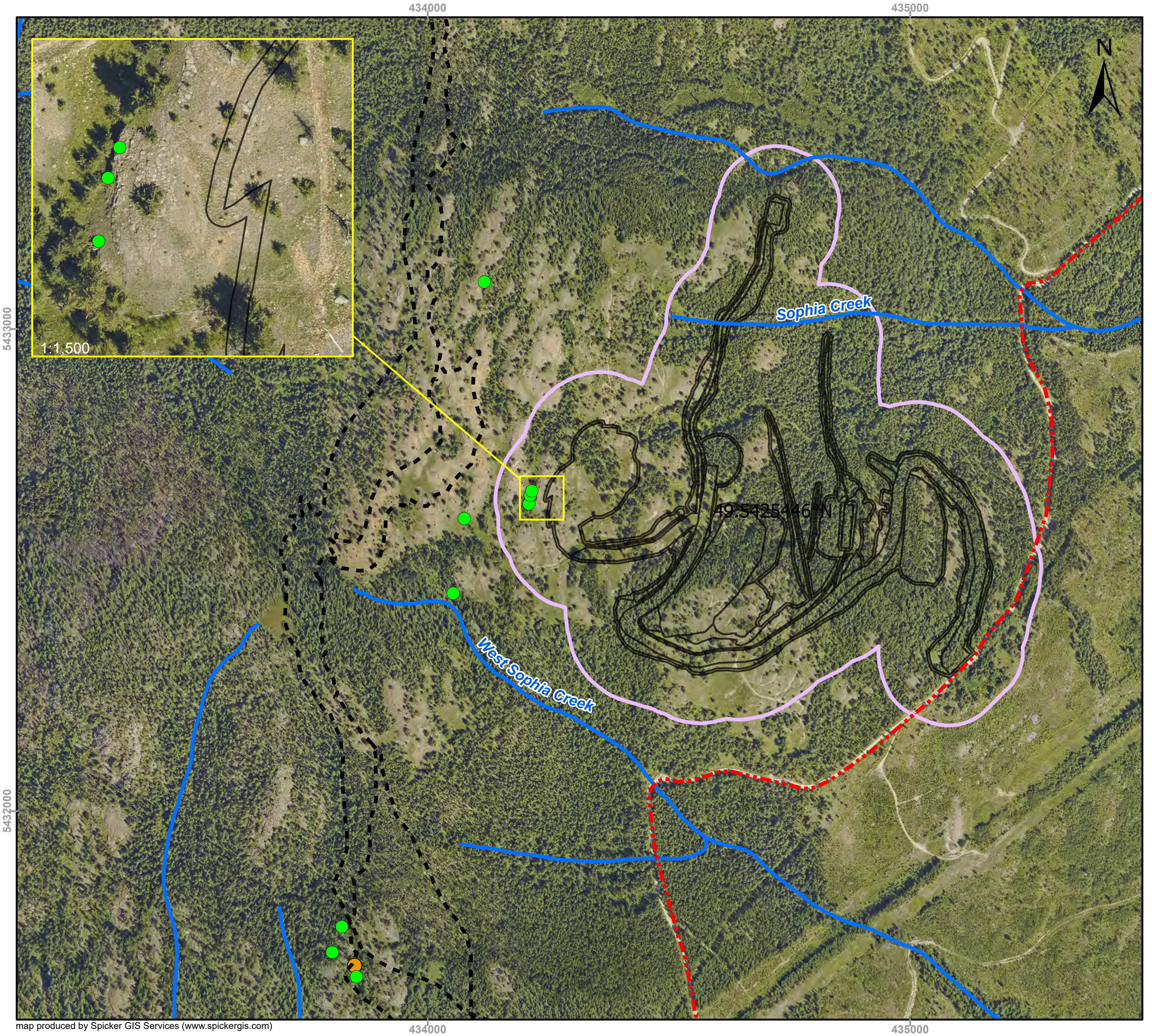
Coordinate System: NAD 1983 UTM Zone 11N

GREENWOOD environmental

Map ID: RRIMM_MineApp2024 / GW-RR-115_Ecological Communities

Date: September 10, 2024

Figure 6.6-1



Rare Plant Locations in the Regional Study Area

Mountain holly fern (2018 field surveys)

Mountain holly fern (BC CDC Occurrence)

Watercourse

Trail

Old Rossland Cascade Hwy

Mine Infrastructure

Vegetation Resources Local Study Area

1:11,000

0 150 300

Meters

Coordinate System: NAD 1983 UTM Zone 11N

GREENWOOD environmental

Map ID: RRIMM_MineApp2024 / GW-RR-116_Rare Plant Locations

Date: September 10, 2024

Figure 6.6-2

map produced by Spicker GIS Services (www.spickergis.com)

Table 6.6-1: Record Ridge Ecosystems – Area (ha) in the Surface Footprint and Proportion of RSA

BEC Unit	Site Map Code	Ecosystem Name	Surface Footprint	RSA	Proportion (%) Lost in RSA[1]
			Area (ha)		
Vegetated					
ESSFmh	101	Subalpine fir Engelmann spruce–- rhododendron -	0.1	48.7	0.3
	103	Subalpine fir Douglas-–fir huckleberry - falsebox	1.1	31.9	3.3
	104	Douglas-fir western redcedar – falsebox – prince's pine	0.2	11.5	1.8
	Gg	Graminoid grassland[2]	1.4	36.6	4.0
Vegetated ESSFmh Subtotal			**2.8**	**137.3**	**2.1**
ICHmw5	101	Western hemlock western redcedar - falsebox	6.1	365.0	1.7
	103	Douglas-fir Douglas maple – falsebox	2.3	113.3	2.0
	104	Douglas-fir western redcedar – falsebox - prince's pine	8.1	129.5	6.3
	110	Western redcedar – western hemlock - oak fern	<0.1	13.4	0.3
	Gg	Graminoid grassland[3]	3.7	20.1	18.5
Vegetated ICHmw5 Subtotal			**20.3**	**680.0**	**3.0**
Vegetated Total[1]			**23.1**	**1,555.1**	**1.5**
Unvegetated					
ESSFmh	RO	Rock	0.2	7.8	2.9
ICHmw5	RO	Rock	4.0	28.1	14.4
	Rz	Roadway	0.4	19.2	2.0
Unvegetated Subtotal[1]			**4.6**	**136.0**	**3.4**
Total Area			**27.8**	**1,691.1**	**1.6**

BEC Unit	Site Map Code	Ecosystem Name	Surface Footprint	RSA	Proportion (%) Lost in RSA[1]
			Area (ha)		

1 Subtotals and totals of the RSA vegetated and unvegetated include other BEC Units and site map codes/ecosystem names than those in the Surface Footprint.

[2] The graminoid grassland unit in the ESSFmh is Gg11, the red-listed ecological community, Idaho fescue - bluebunch wheatgrass - silky lupine – junegrass.

[3] The graminoid grassland unit in ICHmw5 in the footprint is a red-listed ecological community, Idaho fescue - bluebunch wheatgrass–- silky lupine - junegrass (BC CDC 2023c; Section **Error! Reference source not found.** of Chapter **Error! Reference source not found.**).

Table 6.6-2: Record Ridge Ecosystems – Area (ha) of Potential Edge Effects

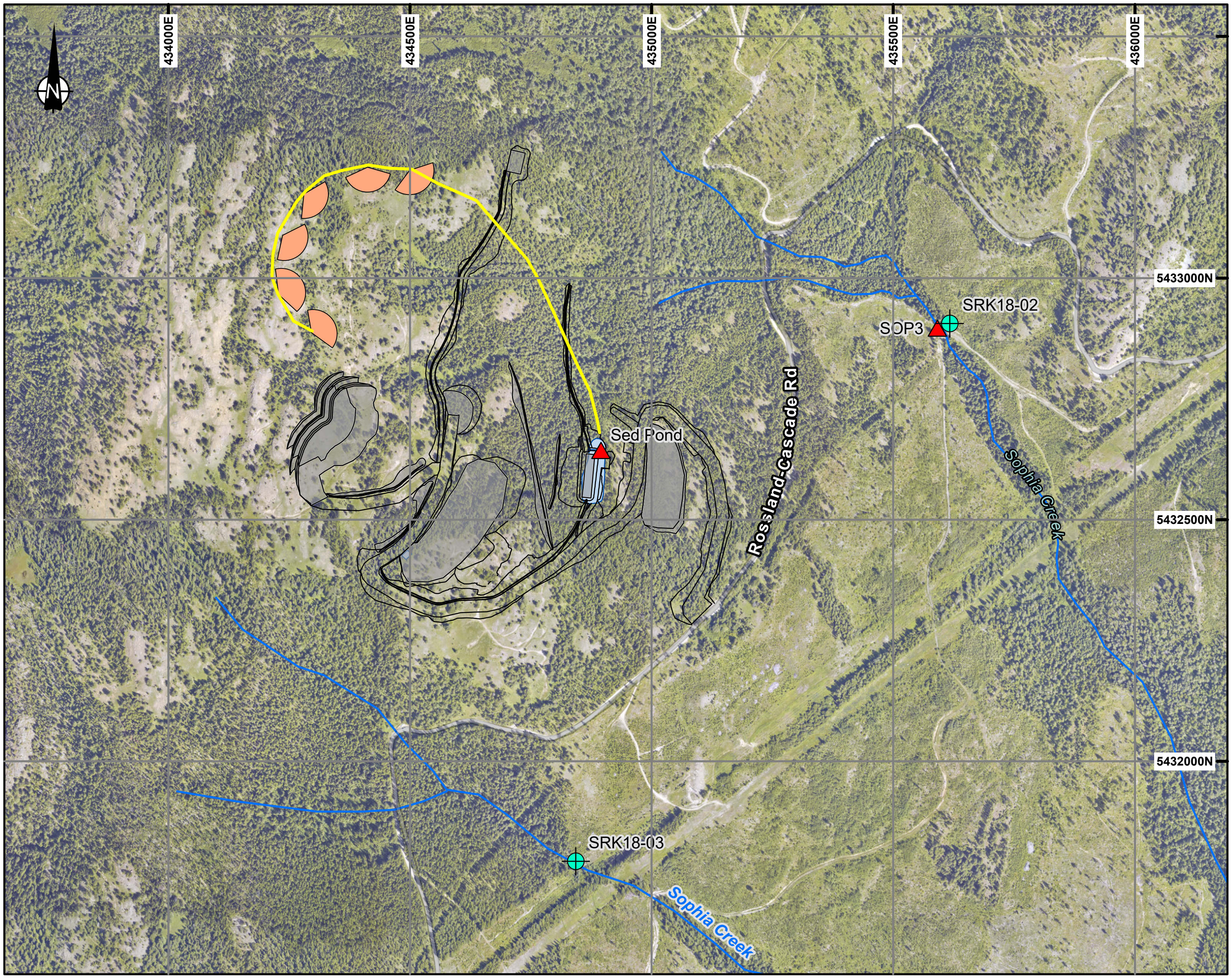
BEC Unit	Site Map Code	Ecosystem Name	Area (ha) of Potential Edge Effects	RSA	Proportion (%) Affected in RSA[1]
			Area (ha)		
Vegetated					
ESSFmh	101	Subalpine fir Engelmann spruce–- rhododendron - foamflower	1.0	48.7	2.1
	103	Subalpine fir Douglas-–fir huckleberry - falsebox	1.6	31.9	5.1
	104	Douglas-fir western redcedar – falsebox – prince’s pine	1.3	11.5	11.5
	110	Subalpine fir–- rhododendron - oak fern (subalpine fir/white-flowered rhododendron/Sitka valerian)[2]	0.4	1.6	23.9
	Gg	Graminoid grassland[3]	4.3	36.6	11.8
Vegetated ESSFmh Subtotal			**8.7**	**137.3**	**6.3**
ICHmw5	101	Western hemlock western redcedar - falsebox	14.4	365.0	3.9
	102	Douglas-fir – lodgepole pine – juniper - kinnikinnick	0.1	37.3	0.2
	103	Douglas-fir - Douglas maple – falsebox	4.8	113.3	4.3
	104	Douglas-fir western redcedar – falsebox - prince's pine	13.2	129.5	10.2
	110	Western redcedar –western hemlock - oak fern	0.4	13.4	2.9
	Gg	Graminoid grassland[3]	5.7	20.1	28.4
Vegetated ICHmw5 Subtotal			**38.7**	**680.0**	**5.7**
Vegetated Total[1]			**47.4**	**1,555.1**	**3.0**

BEC Unit	Site Map Code	Ecosystem Name	Area (ha) of Potential Edge Effects	RSA	Proportion (%) Affected in RSA[1]
			Area (ha)		
Unvegetated					
ESSFmh	Ro	Rock	0.3	7.8	3.5
ICHmw5			5.4	28.1	19.2
	Rz	Roadway	0.6	19.2	3.0
Unvegetated Subtotal[1]			**6.2**	**136.0**	**4.6**
Total Area			**53.6**	**1,691.1**	**3.2**

[1] Subtotals and totals of the RSA vegetated and unvegetated include other BEC Units and site map codes/ecosystem names than those in the Surface Footprint.

[2] The name presented in this table aligns with the naming convention in MacKillop and Ehman (2016) but it is equivalent of the blue-listed ecological community, subalpine fir/white-flowered rhododendron/Sitka valerian (CDC 2023a).

[3] The graminoid grassland unit in LSA is a red-listed ecological community, Idaho fescue - bluebunch wheatgrass–- silky lupine – junegrass mapped by the BC CDC (2023c; Section **Error! Reference source not found.**).



LEGEND

- Surface Water Quality Stations
- 2018 Groundwater Monitoring
- Creeks
- Discharge Pipe
- Settling Pond
- Land Application Areas

NOTES

1. Coordinate System: NAD 1983 UTM Zone 11N

REFERENCES

1. Record Ridge aerial image captured by Eagle Mapping 2016.

0 100 200 300 400
Meters

srk consulting

SRK JOB NO.: CAPR000641

LAYOUT: CAPR000641_RR_Closure_Plan

WEST HIGH YIELD RESOURCES

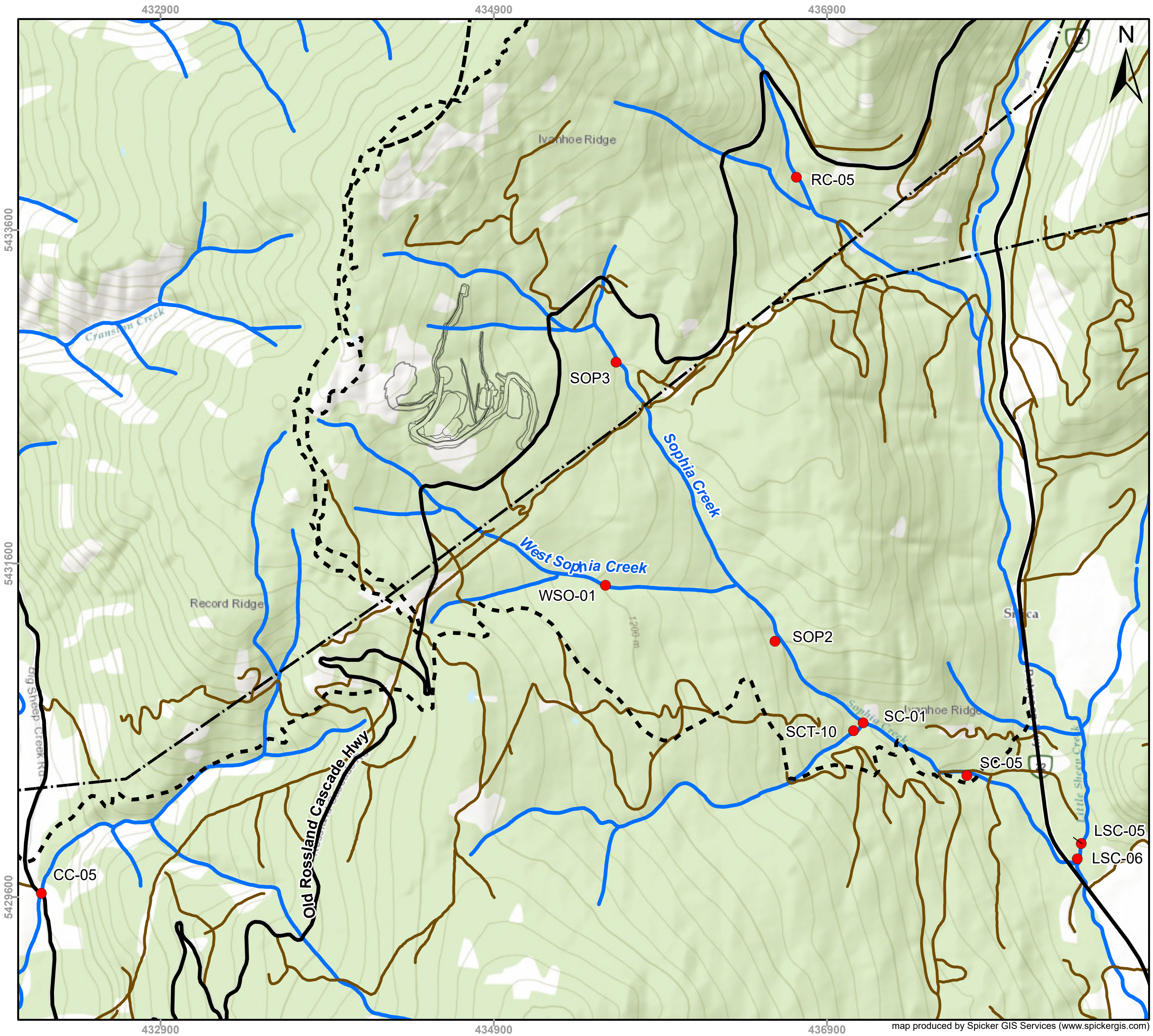
Record Ridge Industrial Mineral Mine

Environmental Assessment

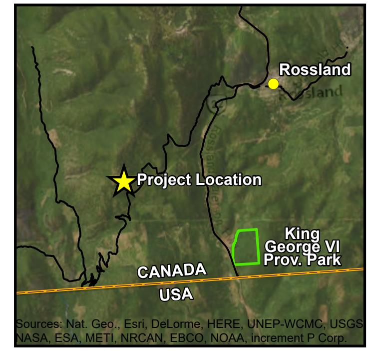
RRIMM Project
Discharge Monitoring Locations

DATE:	APPROVED:	FIGURE:
SEP 2024	xx	**7.2-1**

PROJECT PATH: C:\Users\MSMITH\SRK Consulting\FS714 Record Ridge - !040_AutoCAD\GIS\Projects\CAPR000641_RR_Closure_Plan\CAPR000641_RR_Closure_Plan.aprx



map produced by Spicker GIS Services (www.spickergis.com)



Location of Proposed AEMP Sampling Stations

- Water Quality Sampling Station
- Watercourse
- Roads
- Local, Resource or Service Road
- Trail
- Power Line
- Mine Infrastructure

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0 500 1,000

Meters

Coordinate System: NAD 1983 UTM Zone 11N

GREENWOOD environmental

Map ID: RRIMM_MineApp2024 / GW-RR-117_Proposed AEMP Stations

Date: September 10 2024

Figure 7.6-1

Record Ridge Industrial Mineral Mine – 2024 Mine Plan

Record Ridge Mine Plan, British Columbia, Canada

West High Yield Resources Ltd.

SRK Consulting (Canada) Inc. ▪ 1CW023.002 ▪ September 2024

srk consulting

Record Ridge Industrial Mineral Mine – 2024 Mine Plan

Record Ridge Mine Plan, British Columbia, Canada

Prepared for:
West High Yield Resources Ltd.
PO Box 68121
Calgary, AB, T3G 3N8
Canada

Prepared by:
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Reviewer: Bob McCarthy **Initials:** BM

File Name:
RecordRidge_MinePlan_CW023-002_20240830

Suggested Citation:
SRK Consulting (Canada) Inc. 2024. Record Ridge Industrial Mineral Mine – 2024 Mine Plan. Prepared for West High Yield Resources Ltd.: Calgary, AB. Project number: 1CW023.002. Issued September. 2024.

Contents

Tables

Figures

Appendices

1 Introduction

West High Yield Resources ("W.H.Y.") has engaged SRK Consulting (Canada) Inc. to prepare a mine plan in support of Mines Act and Environmental Management Act permit applications.

The objective of the mine plan presented herein is to develop a quarry to produce an industrial mineral product which will be shipped out of British Columbia for further processing.

In addition to the mine plan, SRK has also completed geotechnical, geochemical and hydrological investigations to support the permit applications and those investigations are referenced herein where applicable.

2 Mine Plan Overview

The proposed Record Ridge Industrial Mineral Mine (RRIMM) Project mine plan will be a conventional truck and shovel open pit operation which will include ripping, loading, and hauling of magnesium-bearing serpentinite. The mine is designed to supply two years of plant feed material at a rate no greater than 63,500 tonnes per year. The mine product material will have primary and secondary crushing on-site before being loaded on to highway dump trucks for transport to a rail loadout in Trail, BC. Drilling and blasting is not contemplated as the primary means of rock fragmentation; however, drilling and blasting may be required as an alternative method of fragmentation in any areas where the planned mechanical rock breaking equipment is ineffective or if mechanical breakage proves to not be feasible for economic or productivity reasons.

Facilities that will be constructed include the open pit and adjacent waste rock storage facility, an access road from the Old Rossland Cascade Highway to the open pit and waste rock storage facility, a soil stockpile, a level pad for primary and secondary crushing, as well as a maintenance pad, dry, and an office building (Figure 2-1). Details of the mine facility designs, and development are provided in Section 9.

The quarry excavation has a maximum height of 30 m and is designed to be mined in 6 m benches. Bench face angles will vary between 60-70° (see Section 4), while 8.0 m wide catch berms are left every 12 m to achieve an inter-ramp wall angle of 35-44°. The excavation is designed to be free draining to the southwest and the highwall of the pit.

The proposed RRIMM Project does not entail underground workings, on-site processing plant (mill) and associated facilities, or a low-grade ore stockpile.

Figure 2-1 illustrates the completed development of the site access roads, waste rock storage facility (WRSF), quarry, ore/crusher pad, soil stockpile, settling pond and explosive magazine if required.

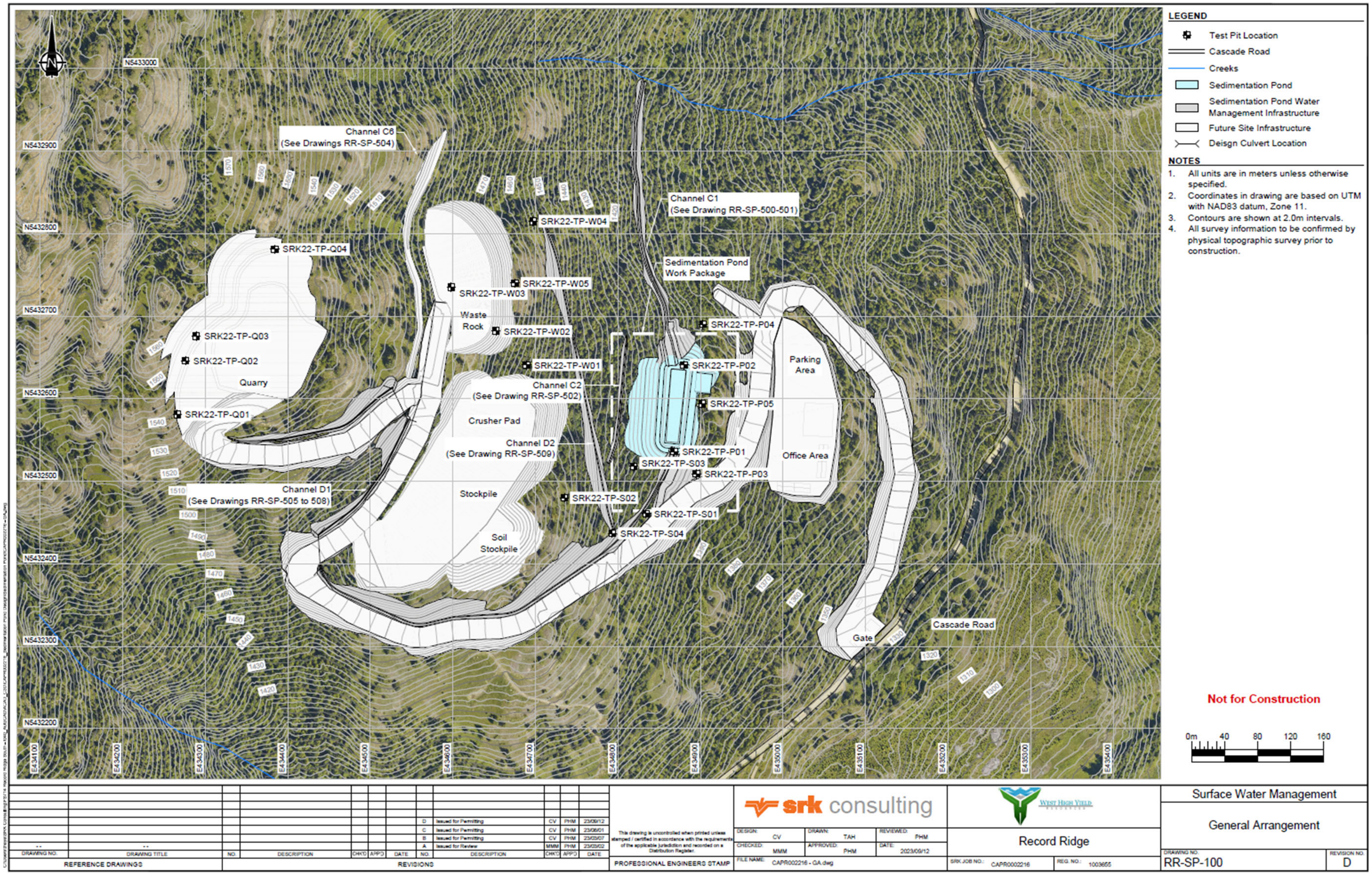


Figure 2-1: Site layout

3 Site Visit

The author completed a site visit on January 27th and 28th, 2023 and prepared a Site Visit report dated January 30th, 2023. Over the course of the site visit, the author made several observations which are applicable to this mine design report:

3.1 Site Access Road

The Old Rossland Cascade highway provides excellent site access for exploration and site development activities; however, it is noted that it is a narrow resource road and during the production scale haulage of ores from the Record Ridge projects, haulage trucks may have difficulty passing each other and other road users. There are also several sharp and steep corners on the route. Consideration of a traffic management plan is recommended to maintain safe and efficient haulage along the access road until the trucks reach Highway 22. Future planning activities could further consider the use of the area's logging road network or an overland conveyor to avoid congestion along the Old Rossland Cascade highway.

3.2 Topography for Mine Development

The author noted that the terrain where the quarry, crusher area and quarry haul road are planned is potentially steeper than it may be perceived from Google Earth and other topography mapping. The current quarry and road designs all accurately account for the slope of the terrain, but consideration should be given for developing infrastructure upslope of the site access road and potential for creating any upslope hazards like falling rock or snow.

4 Geotechnical Criteria

In 2022, SRK completed a geotechnical investigation and the findings and design requirements from that report are summarized here. The geotechnical investigation included mapping of outcrops on site, logging of historical core and test pitting to evaluate the overburden depth and characteristics and evaluation of the local site geologic models.

That resulting data was used to develop a kinematic stability model to support pit design parameters and set of operational considerations which are recommended to be incorporated into mining operations upon successful completion of the permitting process. Generally, a rock mass failure mode would be evaluated to support pit design criteria; however, given the limited information currently available, the ground conditions and the size of the proposed open pit, structurally controlled failure modes are expected to dominate. Hence the geotechnical assessment focuses on rigid block kinematics.

4.1 Kinematic Analysis

4.1.1 Bench and Inter-Ramp

Kinematic analysis was carried out using Rocscience™ Dips (v 8.0) for the two wall orientations. Two sets of kinematic analyses were conducted, one for bench face angle of 70º and another for inter-ramp angle of 44º. The parameters used in the kinematic analyses are presented in Table 4-1.

Table 4-1: Kinematic analyses parameters

Parameter	South Facing Wall	Southeast Facing Wall
Slope Dip Bench Scale	70°	70°
Slope Dip Inter-ramp	44°	44°
Slope Dip Direction	130°	180°
Friction Angle	30°	30°
Lateral Limit Angle	20°	20°

The kinematic analysis assessed the potential risk for wedge, planar or toppling failure. The risk levels of low (0–10%), medium (10–50%), and high (50–100%) are listed for each failure type for both bench and inter-ramp scales for the south and southeast facing walls are in Table 4-2 and Table 4-3 respectively.

Table 4-2: Results of kinematic analysis results for south facing wall

Set ID	Bench Scale				Inter-ramp Scale			
	Wedge Sliding	Planar Sliding	Flexural Toppling	Direct Toppling	Wedge Sliding	Planar Sliding	Flexural Toppling	Direct Toppling
1	Low	Low	Low	Low	Low	Low	Low	Low
2	Low	Low	Low	Low	Low	Low	Low	Low
3	Medium	Low	Low	Low	Low	Low	Low	Low
4	Low	Low	Low	Low	Low	Low	Low	Low
5	Low	Low	Low	Low	Low	Low	Low	Low
Overall	Medium	Low	Low	Low	Low	Low	Low	Low

Table 4-3: Results of kinematic analysis for southeast facing wall

Set ID	Bench Scale				Inter-ramp Scale			
	Wedge Sliding	Planar Sliding	Flexural Toppling	Direct Toppling	Wedge Sliding	Planar Sliding	Flexural Toppling	Direct Toppling
1	Low	Low	Low	Low	Low	Low	Low	Low
2	Low	Low	Low	Low	Low	Low	Low	Low
3	Low	Low	High	Low	Low	Low	Low	Low
4	Low	Low	Low	Low	Low	Low	Low	Low
5	Low	Medium	Low	Medium	Low	Low	Low	Low
Overall	Medium	Low	Medium	Medium	Low	Low	Low	Medium

Wedge failure was found to be a potential risk for both slope orientations. Wedge failures occur because of the intersection between two or more discontinuities, which form a tetrahedral shaped failure block that may slide out when the angle of inclination of the line is greater than the internal angle of friction along the discontinuities (Kolapo et al., 2022). Wedge failures are typically the most common failure mechanism experienced in rock slopes (Kolapo et al., 2022).

Flexural toppling failure was found to be the highest risk for Joint Set 3. Toppling failures are typically seen in joint sets that are vertical or near vertical. Either the rock mass is highly fractured or exhibits closely spaced fabric. Another factor influencing toppling failures is the strength of the rock mass. According to Kolapo et al. (2022), the tensile strength of the rock mass must be low to allow for tensile bending failure at the base of the toppling columns.

Planar sliding failure was found to be a medium risk on Joint Set 5 for walls facing southeast. Note that due to the limited data points, the confidence level on this set was low. However, in SRK (2017) the confidence level was higher, and the structures condition description suggested that they may be of low shear strength.

4.1.2 Modelled Structures

SRK conducted a visual rigid macro-block kinematic assessment of the interaction of the modelled faults with the design pit. This indicated that that the modelled major structures do not pose a kinematic risk.

4.2 Ground Control

The following Operational Considerations have been identified to ensure the geotechnical design parameters proposed herein perform as designed.

4.2.1 Standard Operating Procedures

Procedures should be established to manage fall of ground hazards. These should consider minimum safe distances between equipment, catch benches, berms, and highwalls or embankments for the purposes of maintenance, parking, or general travel. This can include creation of restricted zones to provide minimum safe distances in high hazard areas.

Standard operating procedures for blasting, scaling, monitoring, and working close to the highwalls should be written specific to the RRIMM project site.

4.2.2 Trigger Action Response Plan

A general Trigger Action Response Plan (TARP) that is to be followed for monitoring the pit wall stability and for appropriate responses to specific indicators is included in Appendix A. The TARP includes a section on general pit wall conditions and a section on rainfall triggers.

4.2.3 Mapping

As the open pit is being developed, it is important that new exposures are mapped for their structure orientations, joint properties, and rock strengths. In a timely manner, this information should be used for slope stability analyses and modification to the design and operations as required.

4.2.4 Wall Control Blasting

Blasting plans should be created to reduce final wall damage. Mapping of blast influence should be mapped using industry standard processes and these results used to adjust blast designs on subsequent cuts.

4.2.5 Clean-up and Scaling

Once blasted, waste rock will be loaded and hauled to the waste rock storage facility (WRSF). Before any mining activities are conducted on the fresh face, it is important that scaling and clean-up be done to ensure any loose rock is removed. The loose rock that accumulates at the toe of the bench should be removed. A record of this cleaning should be kept, and quality assured by geotechnical assessment.

4.2.6 Pit Slope Monitoring

Monitoring of the pit slopes for deformation should be implemented as small movements often precede larger ones. Regular inspections by a suitably trained and experienced person shall be done on foot to carefully examine the slopes. The purpose is to see slope failures such as crack formation, subsidence, sloughing, and bulging. Survey monitoring equipment could be installed to give measurements of changes to the slope. Timely review of the data is important for informed decisions on potential failures.

4.2.7 Drainage

Surface drainage should be established to convey water away from slopes. Inspections to identify surface water problems and implementation of water management solutions should be done regularly.

4.3 Open Pit Design Criteria

The SRK geotechnical investigation concluded that the following design parameters should form the basis of the open pit design. The design parameters are divided into the south facing wall (Az >150°) and southeast facing walls (Az<150°).

Table 4-4: Open Pit Geotechnical Design Parameters

Parameter	Units	South Facing Wall	Southeast Facing Wall
Bench Height	m	6	6
Bench Face Angle	°	70	60
Catch Berm Width	m	8	8
Distance Between Catch Berms	m	12	12
Inter-ramp Angle	°	44	44
Maximum Wall Height	m	35	35

5 Development Sequence and Schedule

The mine design will provide two years of plant feed MgO-rich product material at a rate no greater than 63,500 tonnes per year. Thus, the mine includes a total of not more than 127,000 tonnes of plant feed material comprising a magnesium-rich product (~21.4% Mg) with 19,000 tonnes of waste being placed in the WRSF facility. Another 50,000 cubic meters of topsoil is expected to be stockpiled for use in reclamation with another 280,000 tonnes of waste will be used in the construction of the crusher pad and haul roads. The mine is planned to operate for six months of the year to avoid operating during winter conditions. Table 5-1 provides a summary of life of mine production plan by year.

The mine development sequence includes a three-month construction period, which includes construction of site access haul roads and pads, as well as scavenging and stockpiling topsoil from the project disturbed areas and mobilization of required project equipment. The production phase of the project includes two years of mining at a rate no greater than 63,500 tonnes per year of mineralized material which will be delivered to the crusher pad before being hauled off-site. In the event the project is not advanced past the two-year production period, the project site will be reclaimed according to the site reclamation plan, which includes removal of site buildings and facilities, relocating the waste rock to the open pit, and capping project features with topsoil followed with revegetation.

Detailed geochemical characterization of the ore product and mine waste rock confirm the mine product is non-acid generating and the waste rock shows localized acid rock generating potential (PAG) that are intermixed with non-potentially acid generating waste rock of the same lithological unit. Neither rock has the potential to produce acid drainage and/or a metal leaching concern[1].

Table 5-1: Annual mining schedule

Parameter	Year 1	Year 2
Operating Days	182 days	182 days
Mobile Crusher Feed	63,500 tonnes	63,500 tonnes
Diluted Mg Grade	18.5 %	19.8 %
Waste and Construction Material	340,000 tonnes	21,500 tonnes
Total Material Mined	404,000 tonnes	85,000 tonnes
Total Mining Rate	2,200 tonnes/day	450 tonnes/day
Ore Mining Rate	350 tonnes/day	350 tonnes/day

[1] SRK Consulting (Canada) Inc. 2018. Record Ridge Industrial Minerals Mine Project – Metal Leaching and Acid Rock Drainage Potential Assessment and Management Plan. Project Number: 1CW012.001. June.

6 Existing Development

There is no existing development within the proposed project footprint except for diamond drill hole pads accessed via skidder trails.

7 Detailed 5 Year Mine Plan

The mine plan for the RRIMM project includes a construction period, two years of production followed by site reclamation.

7.1 Construction Period

Before production can begin, a three-month construction period is required to mobilize equipment, establish site access, and prepare required site facilities. The primary task in the construction period is building the site access haul road, crusher pad and office/maintenance pad. In addition to the road and pad construction, topsoil from the site footprint will be scavenged and placed at the soil stockpile.

7.1.1 Clearing and Grubbing

The construction activity will begin with clearing and grubbing of organic material and topsoil from the access road, maintenance area, crusher pad and the open pit. Topsoil and organic material will be stockpiled for future use in reclamation activities.

7.1.2 Site Access Road

The site access road will require drilling and blasting once the overburden has been cut down to bedrock.

7.1.3 Open Pit Pre-stripping

As soon as the open pit has been cleared and prepared for mining operations, the initial drilling and blasting of the bedrock will commence. The waste rock material mined during this phase will assist with the construction of site facilities including the Office/Maintenance area, the Crusher Pad and the Settling Pond.

7.1.4 Office/Maintenance Area

As the site access road is being developed, the office/maintenance area will also be cleared and leveled. Blasted rock from the road cut and from pre-stripping mining works in the open pit will be used to fill and level the designed office, maintenance, and parking area footprint.

7.1.5 Mobile Crusher Pad

The level pad which will be used to place the mobile crusher and mineral product stockpile will be constructed with waste rock mined during the pre-stripping mining in the open pit.

7.1.6 Sedimentation Pond and Collection Ditches

The sedimentation pond adjacent to the site access road and all of the associated collection ditches and water infrastructure will be constructed during the construction phase to ensure that all mine contact water is controlled and monitored prior to operations.

7.2 Production Period

The production period of the mine is two years mining at a rate no greater than 63,500 tonnes of mineralized material per year along with varying amounts of waste rock. The open pit will be mined as a single phase in 6 m benches. Mineralized material will be hauled to the crusher pad and waste rock will be placed at the WRSF.

Open pit development over the 2-year life of mine is illustrated every six months of operations in the following end-of-period drawings.

7.3 Reclamation Period

After the production period, mine site facilities will be reclaimed according to the Project's reclamation plan.

8 Conceptual Life-of-Mine Plan

The Life of Mine Plan is presented within the Detailed Five-Year Mine Plan.

9 Mine Facility Designs and Development

9.1 Open Pit

The two-year open pit is designed to target near-surface magnesium (Mg) mineralized material. The open pit area consists of undeveloped, bare land with no previous development, mining, or milling history. Pit walls are designed to have low heights for long term geotechnical stability, with 6 m benches which will be double benched. The bench faces are designed at 60° or 70° depending on the wall sector and with 8 m wide catch benches.

Throughout operations, water in contact with the open pit will be collected in a sump. This water will be transferred to a settling pond and sampled and analyzed to ensure it is protective of the environment prior to release to the receiving environment. At closure, the open pit will be free draining such that it will not impound or retain water.

9.2 Mine Design

The open pit mine design was developed using Whittle™ software, which utilizes the Lerch-Grossman pit optimization algorithm that calculates the net revenue of each mineralized block in the resource block model. The pit shell selected to set the limits of the detailed open pit design was selected as a high-grade, low strip-ratio pit shell which supplied 400k tonnes of mineralized material above the economic cut-off grade in the upper benches to leave the open pit free draining on the hill side.

A detailed pit design, consisting of designed toe, crest, and ramp lines, was developed for the open pit using the selected pit shell as a guide. The open pit and surrounding haul road were designed in line with the BC Mines Safety and Reclamation Code. The detailed pit design employed the following design parameters detailed in Table 9-1.

When the decision was taken to target a total of 127,000 tonnes of mineralized material, the lowest benches of the pit design were removed until the design achieved the target tonnage.

Table 9-1:Open pit design parameters

Parameter	Units	Value
Bench Height	m	6.0
Bench Face Angle	°	70 or 60
Catch Berm Width	m	8.0
Distance Between Catch Berms	m	12.0
Inter-ramp Angle	°	44
Maximum Wall Height	m	35

An example of the pit slope design is illustrated in Figure 9-1 below, showing a section with a 70° bench face angle.

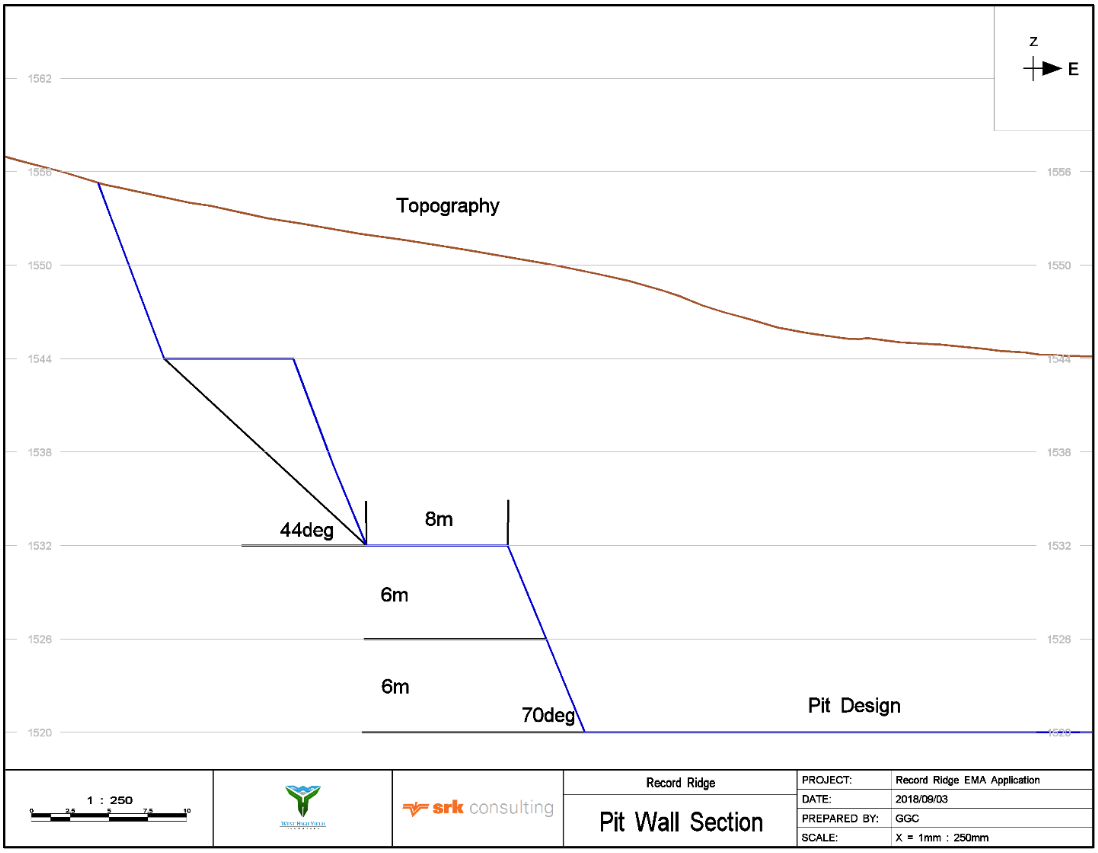


Figure 9-1: Pit slope design with a 70° bench face angle

The open pit design is shown in Figure 9-2 below.

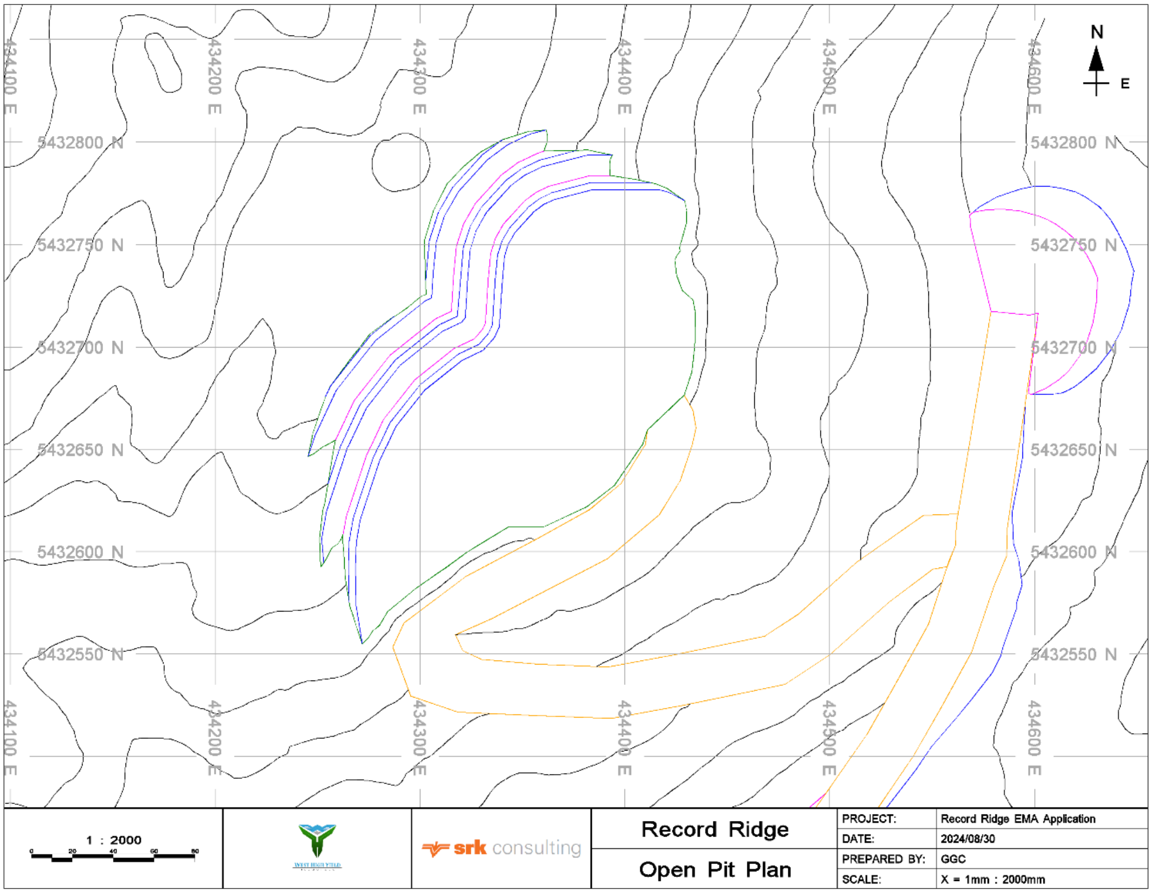


Figure 9-2: Open pit plan view

The cross section below (Figure 9-3) illustrates the shape of the ultimate open pit excavation, the design and maximum height of the pit highwall and the grade of magnesium within the open pit.

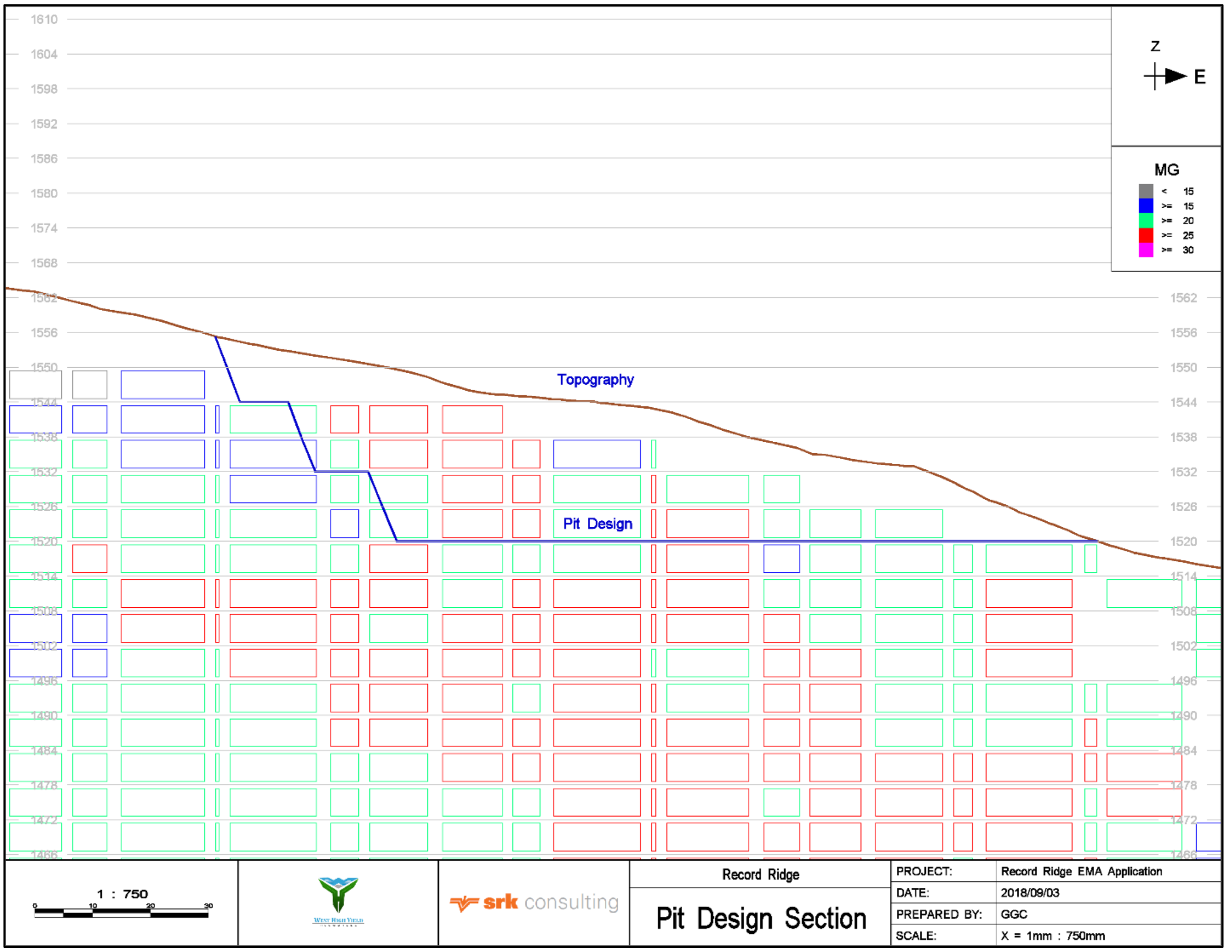


Figure 9-3: Open Pit block model section

9.2.1 Primary Rock Breaking

In an effort to eliminate any potential community impacts associated with drilling and blasting operations such as noise, dust and potential for fly rock, the primary method of rock fragmentation contemplated for the Project will be utilization of mechanical rock breakers to sufficiently fragment the in-situ rock mass to the point where the loading excavators are able to load the material into haul trucks.

The type of rock breaker planned to be employed is a hydraulic, eccentrically articulated ripper tooth which mounts on the arm of a 40-tonne class excavator. This type of rock breaker is expected to generate less noise and to be more productive than a hammer type rock breaker.

The exact productivity of each eccentrically articulated rock break is estimated to be between 500-1500m^3 per day. Mining operations will begin with two units until productivity estimates can be refined and the number of required units can be refined to achieve the mine plan targets and optimize operating costs.

9.2.2 Loading of Blasted Muck

The loading of blasted muck in the pit will be carried out by a two 3.2 m^3 excavator. The backhoe configured excavator will be able to load the 23 tonne capacity haul trucks in five passes and will be capable of mining 2,200 tonnes per 8-hour shift. The excavator productivity parameters are summarized in Table 9-2 below.

Table 9-2: Loader productivity parameters

Parameter	Value
Bucket Size	3.2 m^3
Passes	5
Truck Loading Time	3.25 minutes
Maximum Mining Rate	2,200 tonnes/shift
Shovel Fleet Size	2

9.2.3 Crushing

A mobile rock crushing unit will be mobilized on-site. Run-of-mine feed will be crushed and screened to an appropriate size for haulage to the off-site processing plant. The crushing plant will have a discharge conveyor-stacker which will build a stockpile of crushed ore product sufficient to maintain the ore product haul to the process plant at times when the crusher or pit excavator are not operating.

The crushing plant will include a jaw crusher, a vibrating screen deck and a cone crusher. All run of mine product will be fed into the jaw crusher which discharges into the vibrating screen. The fines from the screen deck will form the ore stockpile and the oversize will feed to the cone crusher before circulating back to the screen deck.

In order to minimize the release of fugitive dust to the environment as well as a reduction in noise, the crushing and screening plant will be housed within an engineered, enclosed structure. The structure contemplated will utilize c-cans as the long walls with galvanized steel pipe arches forming a roof and end walls which will be covered in a robust fabric. There will be no concrete footings required and the design specifications for the building will be determined based on the design snow load considerations for the Rossland region which can be substantial.

9.2.4 Ore Haulage & Transport

Crushed rock will be hauled 105 km from the mine site to Trimac Transportation in Trail, BC, then shipped by rail to the seaport of Tacoma, WA. Three (30) tonne capacity highway haulage trucks will be loaded at the mine site by a 4.5 m^3 front end loader. The haul trucks will have a 3.5-hour cycle time to load and return from the process facility and each truck is expected to complete four loads per 12-hour shift. A total fleet of three highway haul trucks will be required to meet the planned production rate.

The ore product haulage equipment productivity is summarized in Table 9-3 below.

Table 9-3: Ore haulage equipment requirements

Parameter	Value
Loader Bucket Size	4.5 m^3
Haul Truck Capacity	30 tonnes
Loader Cycle Time	330 seconds
Haul Loads Per Shift Per Truck	4
Loader Fleet	1
Haul Truck Fleet	3
Truck Loads Per Day	12

9.2.5 Ancillary Equipment

The mine operation will be supported by several ancillary pieces of equipment (Table 9-4). These units will maintain haul roads, clean operating benches within the open pit and support mine production when primary equipment is unavailable for maintenance.

Table 9-4: Ancillary equipment

Equipment	Number of Units	Size
Track Dozer	1	4 m blade width
Excavator	1	3 m^3
Motor Grader	1	3.7 m blade width
Water Truck	1	10,000 litres
Pick-up Trucks	2	1 tonne
Powder Truck	1	1 tonne
Fuel/Lube Truck	1	10,000 litres

9.2.6 Personnel

Mine operation is planned to operate on an 8-hour shift, 5 days per week, day shift only. The product haul between the mine and process plant is planned to operate for 12-hour shifts, 7 days per week, and day shift only. Therefore, the mine will have one operating crew while the product haul will have two alternating crews. In addition to the operating crews, the mine will require supervisory, technical, and maintenance staff. Overall, 36 total positions are anticipated for operating, technical and supervisory, and maintenance support (Table 9-5). Maintenance personnel will primarily work 8-hour shifts, 5 days per week; however, some personnel will work 12-hour shifts to provide full maintenance support for the product haulage operation.

Table 9-5: Technical and supervisory, operating and maintenance positions

Position	Number
Technical and Supervisory	
Manager	1
General Foreman	1
Lead Hand	1
Mine Planner	1
Surveyor	1
Maintenance Foreman	1
Maintenance Planner	1
Security	4
Subtotal	**11**
Operating	
Excavator Operator	2
Crushed Product Loader Operator	2
Rock Breaker Operator	2
23T truck driver	2
30T truck driver	6
Crusher Operator	2
Ancillary Equipment Operator	1
Subtotal	**17**
Maintenance	
Heavy Duty Mechanic	3
Welder/Mechanic	2
Electrician/Instrumentation	1
Lube/Fuel Person	1
Tireman	1
Subtotal	**8**

9.2.7 Drilling

Drilling and blasting are not the primary method of rock fragmentation contemplated for the Project; however, if rock conditions, productivity rates or project economics require it, drilling and blasting may be employed as a contingency fragmentation method. In the event drilling and blasting are employed, the following parameters will be used.

Production and wall control drilling will be completed by a rotary, crawler-mounted drill with a 114 mm bit. The design parameters for a typical production drill pattern are summarized in Table 9-6 below. Due to the nature of drilling and blasting a serpentinite rock mass, it is anticipated that a track mounted, small diameter (89 mm) drill will be required for secondary drilling and blasting. The small diameter drill will also assist the production drill wall control patterns.

Table 9-6: Production drill pattern design summary

Parameter	Value
Bench Height	6.0 m
Subgrade	0.9 m
Total Hole Length	6.9 m
Burden	3.0 m
Spacing	4.0 m
Penetration Rate	15.0 m/hr
Production Rate	3,500 tonnes drilled/day

9.2.8 Explosives

Drilling and blasting are not the primary method of rock fragmentation contemplated for the Project; however, if rock conditions, productivity rates or project economics require it, drilling and blasting may be employed as a contingency fragmentation method. In the event drilling and blasting are employed, the following parameters will be used.

Production blasting will generally be carried out on a bi-weekly basis using conventional bulk and packaged explosives and industry standard initiation systems by a certified blaster. Blast design and explosive requirements are based on the known properties of the rock mass along with conventional blasting principles. Blasting designs and loading requirements will be refined based on actual blast performance and results. Blasting design parameters are summarized in Table 9-7 below.

Table 9-7: Blasting design parameters

Parameter	Value
Blast Pattern	3.0 x 4.0 B x S
Blast Hole Diameter	114 mm
Powder Density (dry)	860 Kg/m^3
Powder Density (wet)	1100 Kg/m^3
Powder Column Height	4.5 m
Powder Factor (dry)	0.20 Kg/tonne
Powder Factor (wet)	0.25 Kg/tonne
Holes Per Blast	60
Tonnes Per Blast	12,000 tonnes

An explosive magazine will be located on-site which will have capacity for a limited number of explosives and detonators. Explosive storage will be located and designed in compliance with the Health, Safety and Reclamation Code for Mines in British Columbia (Ministry of Energy and Mines, 2017) and Natural Resources Canada explosives regulations. The storage volume of the magazine will be limited and will be regularly re-stocked from an explosive supplier. All use, transportation and storage of explosives will be carried out by a licensed explosives contractor.

9.3 Underground Workings

There are no proposed underground workings for the RRIMM Project.

9.4 Processing Plant (Mill) and Associated Facilities

There is no proposed processing plant or associated infrastructure for the RRIMM Project other than the crushing equipment described above.

9.5 Tailings Management Facility and Associated Infrastructure

There is no proposed tailings management facility or associated infrastructure for the RRIMM Project.

9.6 Waste Rock Storage Facility

It is expected that approximately 377,000 tonnes of waste rock will be generated over the life of the project. This material will be visually identified based on colour. Separation of waste rock from ore product will be completed by the geologist during mining activities.

Waste rock will be stored in the Waste Rock Storage Facility (WRSF), shown in Figure 2-1 located north of the crusher pad, or used in construction of the Crusher Pad, site haul roads or the Office/Maintenance area. The WRSF will be a level dump head, developing the dump as a side-hill fill, down topography which has an existing slope of approximately 15°. When completed, waste rock will be backfilled into the open pit.

The table below shows the balance of waste material estimated to be place in the various site facilities including the topsoil stockpile, the WRSF and the crusher pad.

Table 9-8: Waste Placement Balance

	Volume	**Mass**
	(LCM)	*(tonnes)*
Mine Plan	207,000	362,000
Top Soil	50,000	61,000
WRSF	10,000	19,000
Crusher Pad	146,000	282,000
Total Storage	207,000	361,000

The WRSF is designed to a maximum height of 35 m and has angle of repose slopes. It is currently designed to hold 40,000 tonnes of waste, slightly more than the required capacity. A plan view of the dump is illustrated in Figure 9-4 below. Further details on the WRSF is provided in the SRK Report "Waste Rock storage Facility and Soil Stockpile Physical Stability Assessment" dated March 2023.

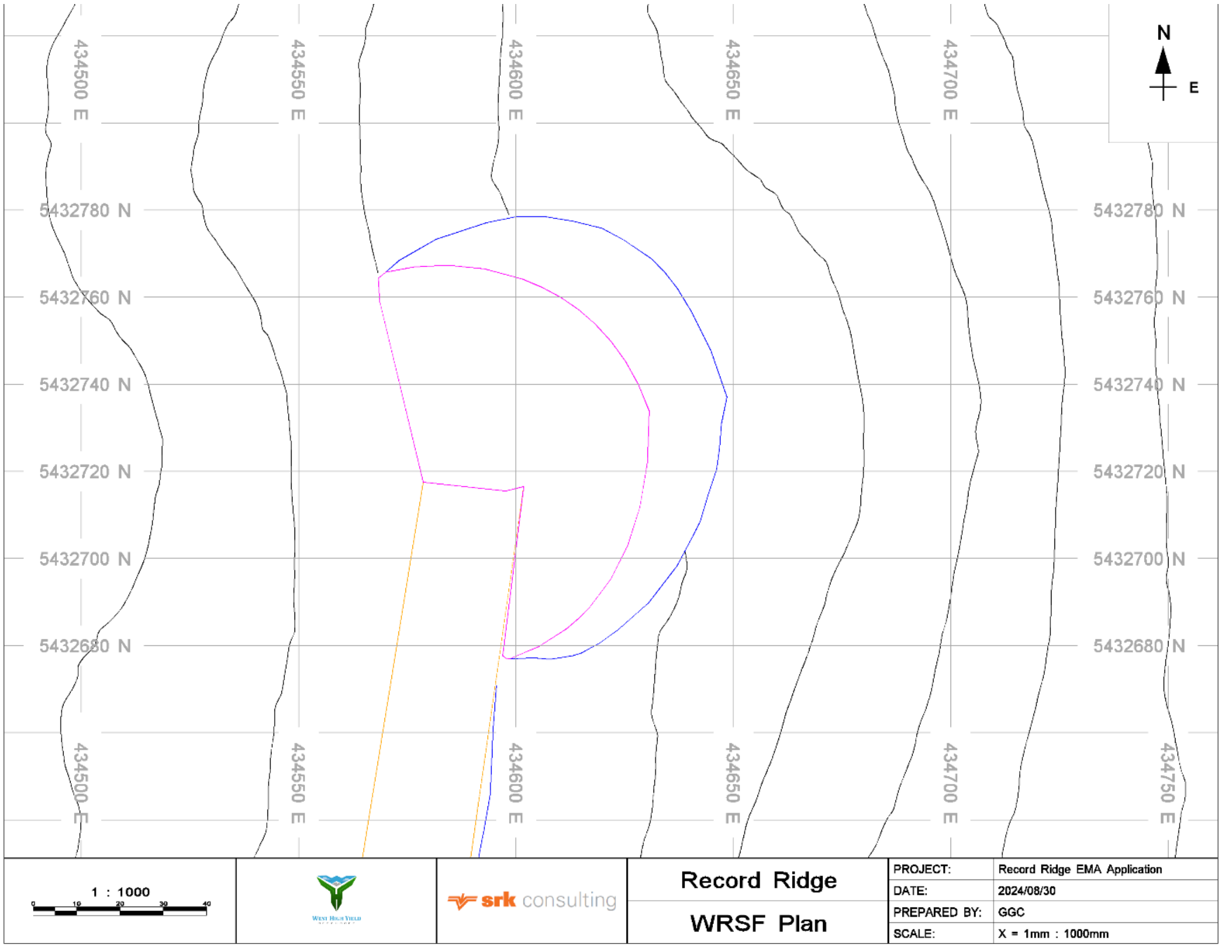


Figure 9-4: WRSF plan view

The height and face angle of the completed waste storage facility are pictured in Figure 9-5.

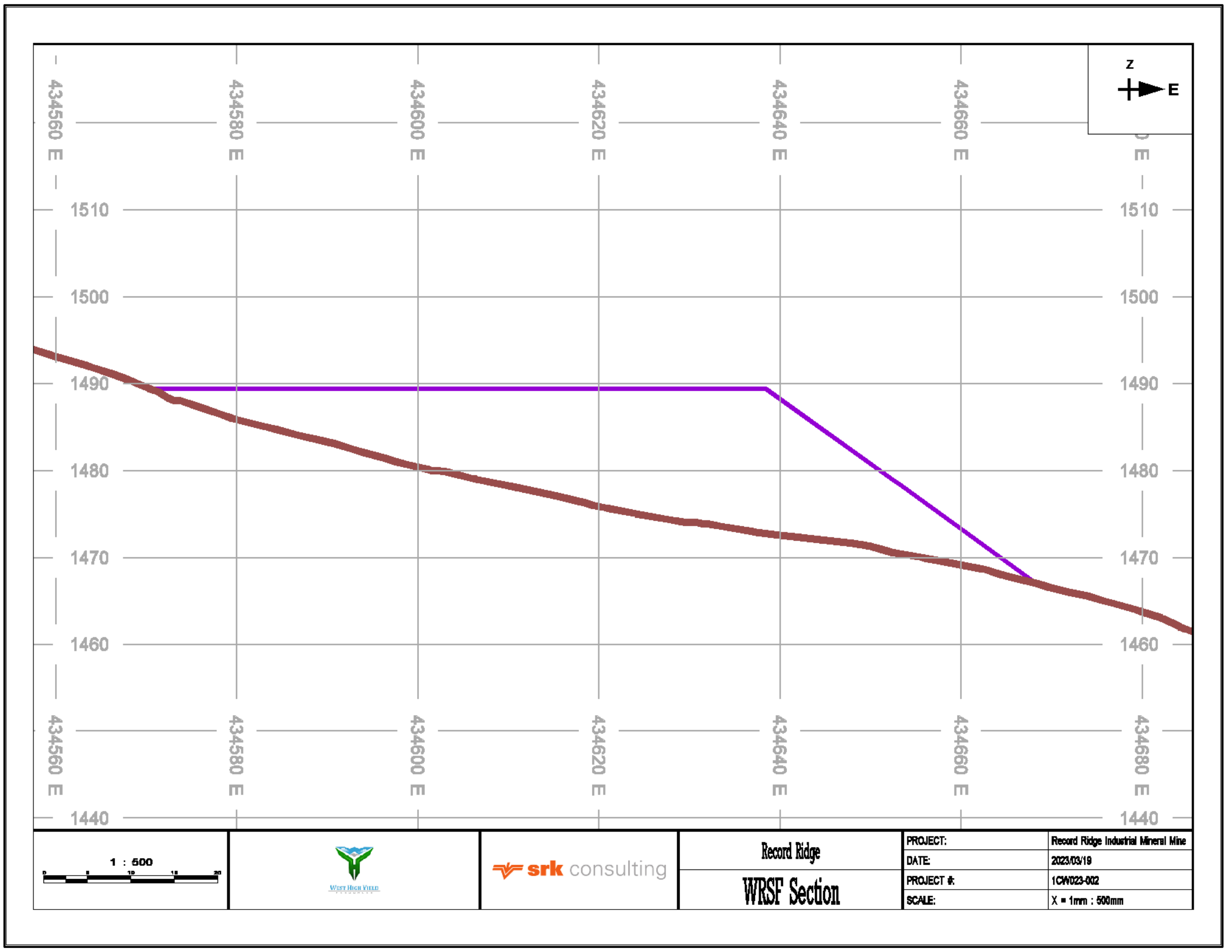


Figure 9-5: WRSF cross section

9.7 Sediment Ponds and Diversion Ditches

Water management infrastructure is designed to maximize diversion of clean water around components of the RRIMM Project, while ensuring capture of contact water throughout the site. This will be accomplished with diversion ditches and a sedimentation pond. Further details on the water management infrastructure are provided in SRK document “Sedimentation Pond Design Report” dated March 2023.

9.7.1 Waste Rock and Stockpiles

Most of the nitrogen nutrient loadings are expected to be contained with the waste rock and ore stockpile. Therefore, seepage and runoff from the waste rock and stockpile areas will be collected and conveyed to a dedicated sedimentation pond – the waste rock sedimentation pond (Figure 2-1). The waste rock sedimentation pond will be excavated into the hillside near the toe of the waste rock area. Toe seepage and runoff will be directed to the pond via diversion channels constructed along the toe.

Seepage from the ore stockpile will be collected in a local sump and pumped or flow by gravity in a pipe to the waste rock sedimentation pond.

Volumes of waste rock and stockpile seepage and runoff are expected to be low because of the small footprint. Water collected in the waste rock sedimentation pond will be used to supplement water required for dust suppression along the unpaved access road. During wet conditions, when road water is not required, waste rock and stockpile seepage will either be stored in the waste rock sedimentation pond or conveyed to the effluent pond.

Water in the waste rock sedimentation pond is conveyed downhill using a siphon. When road watering is required, the siphon will supply a designated water truck filling station within the parking area. If water from the pond can be discharged, the siphon line can be directed to a tee in the effluent line by opening a valve.

9.7.2 General Site Runoff

Runoff from the open pit, haul roads, and other developed areas will be collected in channels and directed to the effluent sedimentation pond where suspended sediment will be removed. Loadings of nitrogen nutrients and other water quality parameters are expected to be relatively low in the general site runoff. Removal of TSS is expected to be the only treatment required. Requirement for coagulant or flocculant addition will be evaluated during the detailed design phase.

Runoff from the office and parking area will be managed by installing energy-dissipating structures such as check dams in the road-side drainage ditches.

9.8 Low Grade Ore Stockpile

There is no proposed low grade ore stockpile for the RRIMM Project.

9.9 Soil Stockpiles

The open pit, ore stockpile, WRSF, and the footprint of the haul road and pads will be cleared of vegetation, with topsoil stripped and stockpiled for future site reclamation activities. The soil stockpile will be located southeast of the crusher pad. Further details of the soil stockpile can be found in the SRK report “Waste Rock Storage Facility and Soil Stockpile Physical Stability Assessment” dated March 2023.

9.10 Maintenance Shop, Fuel Stations and Associated Support Facilities

A maintenance pad and associated equipment parking area will be constructed adjacent to site entrance, near the office building facilities.

9.11 Proposed Mine Access and Mine Haulage Roads

An access haul road will be constructed to connect the Old Rossland Cascade Highway with the open pit, crusher pad, waste rock storage facility, and the site office pad. The main haul road through the project area is designed with a maximum grade of 10%, a width of 25 m and includes vehicle running width, a safety berm and drainage ditch, which complies with the Health, Safety and Reclamation Code for Mines in British Columbia (2021) haul road design guidelines. Included in the haul road design is a runaway lane at the bottom of a long downhill road segment. Roads will be constructed as cut and fills along existing topography and the road surface will be capped with crushed rock to create a safe and efficient driving surface.

9.12 Power Supply Distribution

Abundant hydro electrical power is available in the regional and local area. The smelter at Trail is supplied by BC Hydro and sourced from two locations. The Waneta Plant is located 7 km downstream on the Columbia River and the Brilliant hydroelectric plant is located 25 km upstream near Castlegar, BC. The RRIMM Project area is traversed by electrical transmission lines leading from Rossland westward. These lines would not, however, need to be moved to accommodate the proposed Project. Given the relatively short duration and size of the proposed Project, its electrical requirements will be low and restricted to summer operation. Therefore, power requirements for this proposed Project will be supplied by portable generator(s).

9.13 Additional Ancillary Facilities

Additional on-site infrastructure will include a crusher pad and a number of temporary buildings. A pad will be cleared adjacent to the site entrance which will include mobile office and dry buildings as well as the equipment maintenance pad and equipment parking area. The site entrance will have an access gate and security building.

9.14 Fish Habitat Compensation Works

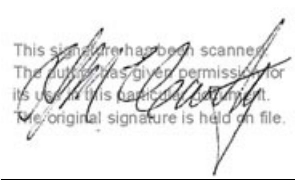
The proposed RRIMM Project will not require fish habitat compensation works.

Closure

This report, Record Ridge Industrial Mineral Mine – 2024 Mine Plan, was prepared by

Grant Carlson, PEng
Associate Consultant

and reviewed by



Bob MCarthy, P.Eng.
Principal Consultant

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

Appendix A – Open Pit Geotechnical Stability TARP

Appendix A, Table 1. End Land Use Objective and Revegetation Prescription by Project Component with Predicted Post-Reclaim Ecosystems – End of Mine Life

Project Component	End Land Use Objective	Expected Site and Soil Conditions and Characteristics[1]	Revegetation Prescription[1]	Predicted Post-Reclamation Ecosystems and Approximate Proportion of the Project Feature/Component	Predicted Structural Stage at Year 5 Post-Reclamation

Open pit	Wildlife habitat for the following indicator species or group:
	• Bats
	• Birds (including migratory birds, passerine species, raptors, and bird species at risk)
	• Reptiles
	Grassland and Rock
		<u>Soil Nutrient</u>: Poor and nonsoil
		<u>Soil Moisture</u>: Submesic - subxeric and nonsoil
		<u>Soil texture</u>: medium and nonsoil
		<u>Average slope:</u> level to gentle slope for part; benches are approximately 49%; part is steeper (>49%)
		<u>Aspect</u>: south (some flat areas are no aspect (999º)); slopes are southeast
			• The open pit will be filled with waste rock and approximately 60% of it will be reclaimed to grassland (Gg), covered with 0.2 m of reclamation material that will be seeded at the rate of approximately 50 kg/ha with native grasses to the area, including the following species:
			  ○ Idaho fescue (*Festuca idahoensis*)
			  ○ bluejoint reedgrass (*Calamagrostis canadensis*)
			  ○ hair bentgrass (*Agrostis scabra*)
			  ○ bluebunch wheatgrass (*Pseudoroegneria spicata*)
			• For the areas with end land use of exposed rock:
			  ○ <u>**ICHmw5 and ESSFmh/Site series 00/RO:**</u>
			    ▪ **Year 1:** exposed rock will be left as is, or placement of rock in piles will be incorporated as available and applicable. No soil will be placed on areas of rock (approximately 40% of the open pit footprint, to reflect the natural rocky outcrops of the area. This includes the rock wall. Bryophytes and lichen are expected to colonize on these rocky areas naturally over time.
				• 51% ESSFmh/Gg
				• 34% ESSFmh/RO
				• 9% ICHmw5/Gg
				• 6% ICHmw5/RO
					• 2b
					• 1
					• 2b
					• 1

Waste Storage Facility (WSF)	Wildlife habitat for the following indicator species or group: • Birds (including migratory birds, passerine species, raptors, and include forested and grassland birds) • Reptiles • Rocky Mountain Mule Deer • Rocky Mountain Elk (foraging habitat) for	<u>Soil Nutrient</u>: Poor <u>Soil Moisture</u>: Submesic to mesic (slightly dry to fresh) <u>Soil texture</u>: medium <u>Average slope</u>: 27% <u>Aspect</u>: east	• After the placement of the 0.4 m reclamation material, the rough and loose site preparation, and coarse woody debris placement (see footnotes to table[1]), the area will be directly seeded with Sitka alder (*Alnus crispa ssp. sinuata*) at 0.2 kilograms (kg) per hectare (/ha) seeding rate. • Overall density of planted woody stakes, and tree and shrub seedlings, will be approximately 1,200 plants/ha combined, with the following average densities: ○ Live staking of woody pioneering species, including willow species (e.g., *Salix scouleriana* and *Salix bebbiana*) and balsam poplar (*Populus balsamifera*), will be implemented where available, suitable and appropriate, tailored to the on-site conditions. Staking densities will be adapted to site conditions. For this project component, an overall average density used in the costing is estimated at 500 plants/ha. However, grid planting will be incorporated as needed, e.g., 400 m^2 grid size and approximately 2.5 patches per ha, with the density within the grids planted at 4,500 stems/ha[1] (i.e., where staking is implemented). • Density of conifer and shrub seedlings will be approximately 700 plants/ha combined (approximately 500 conifers and 200 shrub), with the following species planned by predicted site series/land capability:	• 77% ICHmw5/104 • 10% ICHmw5/Gg ▪ 9% ICHmw5/101 • 4% ICHmw5/RO	• 3 • 2b • 3 • 1

	the first 20 to 30 years • Black bear Grassland, Rock, and Forested land Traditional use plants and wildlife habitat of hunted and trapped wildlife species, and recreation		○ **ICHmw5/Site series 104 and 103:** ▪ Tree and shrub planting: Ratio of 40:20:20:20 of Douglas-fir (*Pseudotsuga menziesii*) : lodgepole pine (*Pinus contorta*) : paper birch (*Betula papyrifera*): black huckleberry (*Vaccinium membranaceum*) at a density of approximately 700 plants/ha, or higher density if willow and poplar stakes are unavailable. ○ **ICHmw5/Site series 101:** ▪ Tree and shrub planting: Ratio of 50:20:20:10 of lodgepole pine (*Pinus contorta*): western redcedar (*Thuja plicata*) : paper birch (*Betula papyrifera*): black huckleberry (*Vaccinium membranaceum*) at a density of approximately 700 plants/ha, or higher density if willow and poplar stakes are unavailable. The revegetation strategy for grassland will be implemented the same as for the open pit project component for grassland; the rock component will not be revegetated. Exposed bedrock will be left where it occurs.		
Office Pad	Wildlife habitat for the following indicator species or group: • Birds (including migratory birds, passerine species, raptors, and bird species at risk) • Rocky Mountain Mule Deer • Rocky Mountain Elk (foraging habitat) for the first 20 to 30 years • Black bear • Reptiles Forested land and Rock Outcrop Traditional use plants and wildlife habitat of hunted and trapped wildlife species, and recreation	Soil Nutrient: Poor Soil Moisture: Submesic (dry) to mesic; some nonsoil Soil texture: medium Average slope: variable but majority is 15%, but up to 25% Aspect: variable, primarily east	• For the areas with end land use of exposed rock: ○ **ICHmw5/Site series 00/RO:** ▪ Exposed rock will be left to reflect natural exposed rock in the area. No soil will be placed on the rock for approximately 20% of this Project component, reflecting the natural rocky outcrops of the area. Bryophytes and lichen are expected to colonize on these rocky areas naturally over time. • For the areas with end land use of forested land, the following will be implemented: ○ **ICHmw5/Site series 104:** ▪ After the placement of the 0.4 m reclamation material, the rough and loose site preparation, and coarse woody debris placement (see footnotes to table[1]), the area will be directly seeded with Sitka alder (*Alnus crispa ssp. sinuata*) at 0.2 kilograms (kg) per hectare (/ha) seeding rate. ▪ Overall density of planted woody stakes, and tree and shrub seedlings, will be approximately 1,200 plants/ha combined, with the following average densities: • Live staking of woody pioneering species, including willow species (e.g., *Salix scouleriana* and *Salix bebbiana*) and balsam poplar (*Populus balsamifera*), will be implemented where available, suitable and appropriate, tailored to the on-site conditions. Staking densities will be adapted to site conditions. For this project component, an overall average density is estimated at 500 plants/ha. However, grid planting will be incorporated as needed, e.g., 400 m^2 grid size and approximately 2.5 patches per ha, with the density within the grids planted at 4,500 stems/ha[1] (i.e., where staking is implemented). ▪ **Tree and shrub planting:** Ratio of 40:20:20:20 of Douglas-fir (*Pseudotsuga menziesii*) : lodgepole pine (*Pinus contorta*) : paper birch (*Betula papyrifera*): black huckleberry	• 80% ICHmw5/104 ▪ 20 % ICHmw5/RO	• 3 • 1

			(*Vaccinium membranaceum*) at a density of approximately 700 plants/ha, or higher density if willow and poplar stakes are unavailable.		

Powder Magazine	Same end-land use objectives as that for the Waste Storage Facility	<u>Soil Nutrient: Poor</u>
		<u>Soil Moisture: Mesic (to submesic)</u>
		<u>Soil texture: medium</u>
		<u>Average slope: 32%</u>
		<u>Aspect: east</u>
			• Overall density of planted woody stakes, and tree and shrub seedlings, will be approximately 1,200 plants/ha combined, with the following average densities:
			  o Live staking of woody pioneering species, including willow species (e.g., *Salix scouleriana* and *Salix bebbiana*) and balsam poplar (*Populus balsamifera*), will be implemented where available, suitable and appropriate, tailored to the on-site conditions. Staking densities will be adapted to site conditions. For this project component, an overall average density is estimated at 500 plants/ha. However, grid planting will be incorporated as needed, e.g., 400 m^2 grid size and approximately 2.5 patches per ha, with the density within the grids planted at 4,500 stems/ha[1] (i.e., where staking is implemented).
			  o Density of conifer and shrub seedlings will be approximately 700 plants/ha combined (approximately 500 conifers and 200 shrub), with the following species planned by predicted site series/land capability:
			  o **<u>ESSFmh/Site Series 104:</u>**
			    ▪ Tree and shrub planting: Ratio of 50:30:20 of subalpine fir (*Abies lasiocarpa*): Engelmann spruce (*Picea engelmanni*): black huckleberry (*Vaccinium membranaceum*) at a density of approximately 700 plants/ha, or higher density if willow and poplar stakes are unavailable.
			  o **<u>ESSFmh/Site series 101</u>**:
			    ▪ Tree and shrub planting: Ratio of 40:40:30 of Engelmann spruce (*Picea engelmannii*): paper birch (*Betula papyrifera*): black huckleberry (*Vaccinium membranaceum*) at a density of approximately 700 plants/ha, or higher density if willow and poplar stakes are unavailable.
				• 90% ESSFmh /104
				• 10% ESSFmh /101
					• 3
					• 3

Topsoil Stockpile	Same end-land use objectives as that for the Waste Storage Facility	<u>Soil Nutrient</u>: Poor
		<u>Soil Moisture</u>: Submesic (slightly dry)
		<u>Soil texture</u>: medium
		<u>Average slope</u>: 33-40%%
		<u>Aspect</u>: east/northeast
			• Areas to be reclaimed as grassland (Gg) will be covered with a minimum 0.2 m of reclamation material that will be seeded at the rate of approximately 50 kg/ha with native grasses to the area, including the following species:
			  o Idaho fescue
			  o bluejoint reedgrass
			  o hair bentgrass
			  o bluebunch wheatgrass
			• Areas to be reclaimed as rock will be same strategy as applied to the Open Pit for site series 00/RO.
				▪ 80% ICHmw5/Gg
				▪ 20% ICHmw5/RO
					• 3
					• 1

Ore Stockpile (Crusher Pad)	Same end-land use objectives as that for the Waste Storage Facility	<u>Soil Nutrient</u>: Poor <u>Soil Moisture</u>: Submesic <u>Soil texture</u>: medium <u>Average slope</u>: 14% <u>Aspect</u>: east to southeast	• Once compacted areas are scarified and the placement of reclamation material complete, the same revegetation strategy as applied to the WFS forested land will be implemented (note: the site series is predicted to be ICHmw5/103 in the forested area but could be ICHmw5/104). The same revegetation prescription applies to both site series. • The revegetation strategy for grassland will be implemented the same as for the open pit project component for grassland; the rock component will not be revegetated. Exposed bedrock will be left where it occurs.	• 72% ICHmw5/103 • 22% ICHmw5/Gg • 6% ICHmw5/RO	• 3 • 2b • 1

Haul Roads (including cut/fill and runaway lane)	Same end-land use objectives as that for the Waste Storage Facility	Soil Nutrient: Poor Soil Moisture: Submesic (dry) Soil texture: medium Average slope: variable but less than 40% Aspect: variable	• For the forested land in the in the ICHmw5, the same revegetation strategy for the ICHmw5/101, 103, and 104 components as described for the WSF will be implemented. • For the forested land in the ESSFmh, the following will be implemented for site series ESSFmh/101 as described for the Powder Magazine. • For the grassland areas, the revegetation strategy for the grassland component of the open pit will be implemented. • The rock component will not be revegetated. Exposed bedrock will be left where it occurs.	• 58% ICHmw5/104 • 24% ICHmw5/Gg • 8% ICHmw5/101 • 7% ICHmw5/RO • 2% ICHmw5/103 • 1% ESSFmh/101	• 3 • 2b • 3 • 1 • 3 • 3
Sedimentation Pond (including cut/fill)	Same end-land use objectives as that for the Waste Storage Facility	Soil Nutrient: Poor-medium Soil Moisture: Submesic (dry) to mesic (fresh) Soil texture: medium Average slope: 20% Aspect: east	• The same revegetation strategy as applied to the Waste Rock Storage Facility.	• 87% ICHmw5/101 • 13% ICHmw5/104	• 3 • 3
Water Management Infrastructure (Channel/Ditches and Fill)	Same end-land use objectives as that for the Waste Storage Facility as well as the Open Pit (Grassland and Rock)	Soil Nutrient: Poor Soil Moisture: Submesic (dry) Soil texture: medium Average slope: variable Aspect: variable	• The same revegetation strategy as applied to the Open Pit for the ESSFmh and ICHmw5 Gg and RO units. • The same revegetation strategy as applied to the Waste Rock Storage Facility for the ICHmw5/101 and 104 will be implemented and for the ESSFmh/101, the same revegetation strategy will be implemented as that described for the Powder Magazine for ESSFmh/101. For ESSFmh/103 units, the following will be implemented: ○ **ESSFmh/Site series 103:** ▪ Tree and shrub planting: Ratio of 40:20:20:20 of Douglas-fir : lodgepole: paper birch: black huckleberry at a density of approximately 700 plants/ha, or higher density if willow and poplar stakes are unavailable. • The revegetation strategy for grassland will be implemented the same as for the open pit project component for grassland; the rock component will not be revegetated. Exposed bedrock will be left where it occurs.	• 42% ICHmw5/104 • 34% ICHmw5/101 • 15% ICHmw5/Gg • 6% ICHmw5/RO • 2% ICHmw5/103 • 1% ESSFmh/101	• 3 • 3 • 2b • 1 • 3 • 3
Disturbance Buffer	Wildlife habitat for the following indicator species or group: • Birds (including migratory birds, passerine species, raptors, and bird species at risk) • Rocky Mountain Mule Deer • Rocky Mountain Elk (foraging habitat) for the first 20 to 30 years • Black bear • Reptiles	Soil Nutrient: Poor Soil Moisture: Submesic (dry) to mesic (slightly dry to fresh) Soil texture: medium (to coarse) Average slope: variable Aspect: variable	• Although this is an area outside of the planned Surface Footprint, it has been assessed as though the vegetation and ground will be directly disturbed and will require reclamation. As such, this area is variable in the predicted slope and aspect. The prescriptions are similar to the prescriptions for adjacent components and will include similar prescriptions to the above for the following biogeoclimatic unit and site series: ○ ICHmw5/101 ○ ICHmw5/Gg (which is the same for ESSFmh/Gg) ○ ICHmw5/103 ○ ICHmw5 00/RO (which is the same for ESSFmh 00/RO) ○ ESSFmh/Site series 101 and 103 • For the site with **ICHmw5/Site series 104 potential, the following will be implemented:** ▪ Tree and shrub planting: Ratio of 40:20:20:20 of Douglas fir: lodgepole: paper birch: black huckleberry at a density of approximately 700 plants/ha, or higher density if willow and poplar stakes are unavailable.	• 42% ICHmw5/104 • 19% ICHmw5/101 • 18% ICHmw5/Gg • 8% ICHmw5/103 • 5% ICHmw5/RO • 4%ESSFmh/Gg • 2% ESSFmh/RO • 1% ESSFmh/101 • 1% ESSFmh/103	• 3 • 3 • 2b • 3 • 1 • 2b • 3 • 3 • 3

	Forested land, Grassland with Rock Outcrop Traditional use plants and wildlife habitat of hunted and trapped wildlife species, and recreation				

[1] Expected/planned general reclamation practices at all sites unless otherwise indicated:

- Reclamation material will be placed on the disturbance areas, with subsequent rough and loose preparations (i.e., micro surface mounding; Polster 2012 and 2017), prior to revegetation to create microsites and mix mineral soil and organics similar to natural disturbance (e.g., root turns).
- In the forested land end land use areas:
    - Live-stakes will be harvested at suitable size that would (a) not adversely impact the donor plant and (b) be of sufficient size to facilitate successful establishment.
    - All live-stakes are to measure between 60 and 75 cm in length and be a minimum of 30 mm in width measured at the base of the stake and free of foliage/branching.
    - All live-stakes are to be soaked (fully submerged) in freshwater for a minimum of 5 days prior to installation.
    - Live-stakes are to be installed so that a minimum of 2/3's of the total length is buried in the soil.
    - Staking and/or planting will be conducted during spring and/or fall when plants are dormant.
    - Staking will be implemented at approximately 1.5 to 3 m inter-spacing and approximately 4,500 stems/ha where it is implemented.
    - Coarse woody debris, including logs, stumps, and root wads would also be placed throughout the reclaimed area to enhance wildlife use, and provide a long term organic source for soil nutrients, soil stability, and to increase biodiversity values. Approximate scattering of coarse woody debris would be 100 m^3/ha and placed in a manner to allow ungulate movement.
    - Collection and scattering, where feasible, of leaf litter and cones from adjacent forests throughout the restoration site to aid in the re-establishment of the nutrient cycling process.
    - Sitka or mountain alder seeding at a rate of 0.2 kg/ha will be applied.
    - Shrub seedlings in above table do not include shrub staking.
    - Grid planting may be incorporated if needed, with 400 m^2 grid size (e.g., 20 m by 20 m) and approximately 2.5 patches per ha
- If on-site wetter site series are determined during closure and reclamation, these will be planted with appropriate species. No wetter site series are predicted, based on the current mapping, however, the mapping scale may not be able to predict such large scale differences.

Citations:

McKechnie, I. M., Burton, P. J., and Massicotte, H. B. 2009. Propagation and fungal inoculation of black huckleberry and velvet-leaf blueberry: how can these species be used in ecological reclamation? Research Extension Note (University Of Northern British Columbia. Natural Resources And Environmental Studies Institute); No. 5. Available at: http://unbc.arcabc.ca/islandora/object/unbc%3A76

Polster, D. 2012. A New Paradigm for the Restoration of Drastically Disturbed Sites. Polster Environmental Services Ltd. in Proceedings of the 36th Annual British Columbia Mine Reclamation Symposium 2012, Kamloops, British Columbia, Canada. 10 p. Available at: https://drive.google.com/file/d/0Bxv_sBXXo2nPaEFkTE4yRFhmdG8/view

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