USIBELLI COAL MINE, INC.
P.O. Box 1000 ▪ Healy, AK 99743
(907) 683-2226 ▪ fax (907) 683-2253

April 3, 2024

Mr. Russell Kirkham,
Coal Regulatory Program
State of Alaska DNR-DMLW
550 W 7th Ave., Suite 900D
Anchorage, Alaska 99501-3577

Request for Phase III Bond Release on 65 Acres within the Poker Flats Mine

Dear Russell,

Usibelli Coal is requesting Phase III bond release for the 65 acres shown on Exhibit 1," Poker Flats Phase III Proposed Bond Release 65 Acres". In these two areas revegetation is completed and meets the standards for Phase III release found within AS 27.21,11 AC-90 and the approved Poker Flats Mine Reclamation Plan as presented in the attached report "*Poker Flats Mine 2021–2022 Vegetation Monitoring".*

Upon approval of this Phase III bond release applicaiton Usibelli is requesting a reduction in bond. The current bond for the Poker Flats Mine is $ 411,292 for 561 acres of disturbance. Usibelli is requesting a full release in bond for these 65 acres. These areas were approved for Phase II release on December 8, 2020 at which time a bond reduction of $58,282 was applied. The final 20% of bond liability for the 65 acres will be for the same amount.

After bond release the final bond amount for the Poker Flats Mine should be $353,010. If you require any additional information or have any questions please contact me.

The establishment of drainages and revegetation were completed between early 2000 and 2014, UCM is now applying for Phase III Bond release. The two contiguous areas totaling 65 acres in the attached ABR vegetation Monitoring Report details two consecutive summers of vegetation monitoring conducted in 2021 and 2022. The report reflects a high vegetation cover, diversity and overall excellent vegetation community established across the entire 65 acres. Reclamation work accomplished supports the approved reclamation plan of backfilling of mine pits, elimination of depressions that could impound significant quantities of water, establishment of stable post-mining slopes and drainage configurations, and establishment of a stable, self-sustaining vegetation community consistent with the proposed post-mining land use of wildlife habitat. Public recreation will be a related secondary land use. These post-mining uses are consistent with the Tanana Basin Area Plan for State Lands.

Sincerely,

Fred Wallis
V.P. Engineering

THIS IS TO CERTIFY that on this April 3, 2024 before me personally appeared Fred Wallis, V.P. Engineering, Usibelli Coal Mine, Inc., who executed this letter and voluntarily signed.

IN MY TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal on the day and year shown.

Notary Public in and for the State of Alaska Kristen E Randall

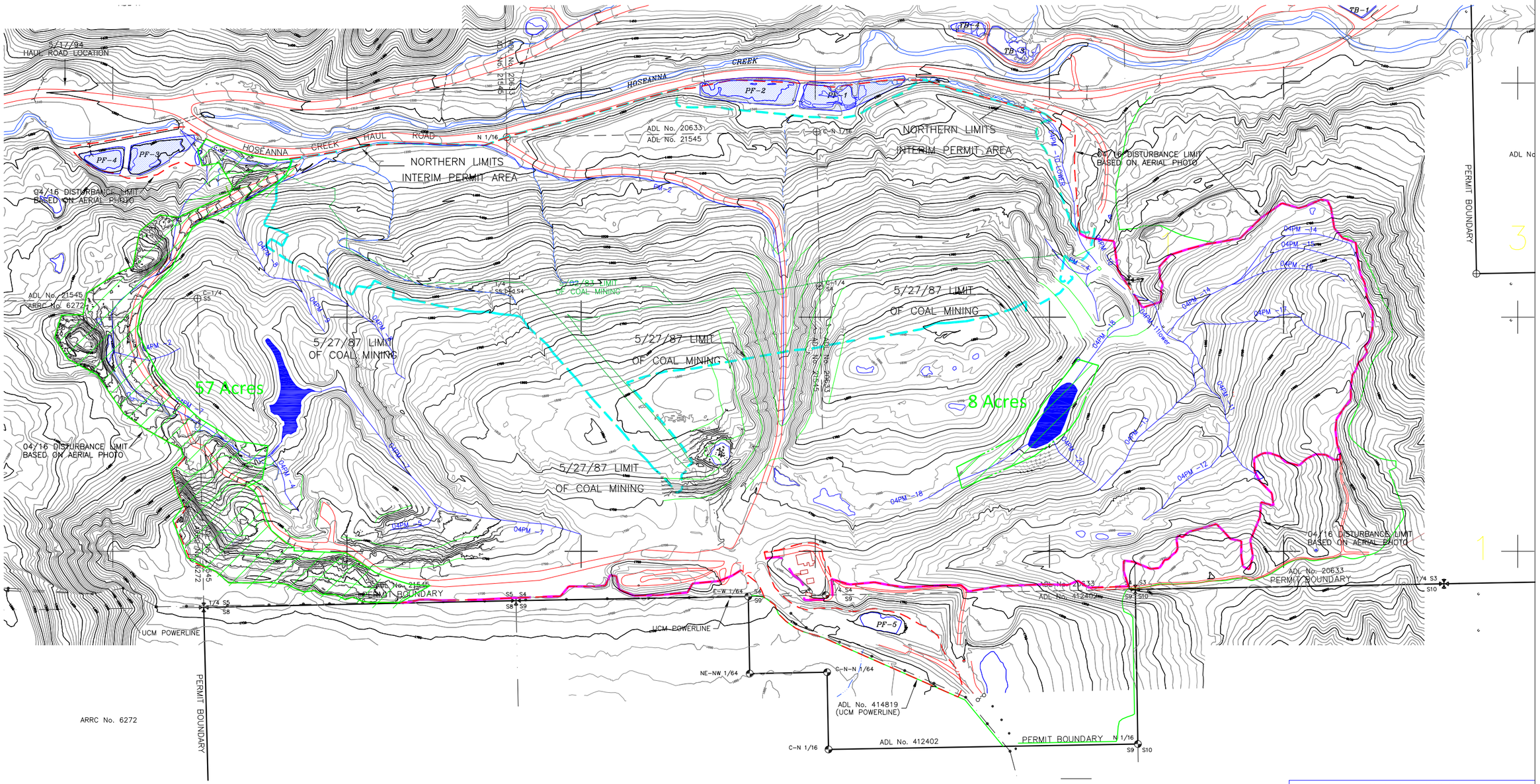
My commission expires 03/21/2028

Dated this 3rd day of April, 2024

KRISTEN E RANDALL My Commission NOTARY PUBLIC Expires 03-21-2028 STATE OF ALASKA

Attachments:

- Poker Flats Phase III Proposed Bond Release 65 Acres Map
- *Poker Flats Mine 2021–2022 Vegetation Monitoring* Report Prepared by Matthew J. Macander; ABR, Inc.-Environmental Research & Services, Dated January 2023.



MINING AND RECLAMATION LEGEND

PHASE III Bond Release Area = 65 ACRES

INTERIM PERMIT AREA

DISTURBANCE BOUNDARY
AS OF 01/20

LEGEND

- GLO–BLM MONUMENT, FIELD LOCATED.
- GLO–BLM MONUMENT OF RECORD, CALCULATED CORNER POSITION.
- PRIMARY MONUMENT, FIELD LOCATED.
- CALCULATED CORNER POSITION.
- AERIAL PHOTO PANEL, H/V CONTROL.
- ELECT. DISTRIBUTION WOOD POLE.

SCALE: 1"= 400'

400' 200' 0' 400' 800'

CONTOUR INTERVAL= 20'

GRID: NAD-27

NOTES:

1. HORIZONTAL DATUM IS BASED ON STATE PLANE CO–OR, ZONE–4, NAD 27.
2. VERTICAL DATUM IS BASED ON MEAN SEA LEVEL.
3. BOUNDARIES ARE APPROXIMATE AND MAY CHANGE WHEN FUTURE SURVEY DATA IS APPLIED.
4. AERIAL TOPOGRAPHY DEPICTED FOR BOND RELEASE AREAS FLOWN SEPTEMBER 2016.

SUBJECT REVISIONS

REV.	DATE:	BY:	DESCRIPTION
0	11/23	RCS	Phase II Bond Release Request–65 Acres

POKER FLATS MINE

USIBELLI COAL MINE INC.

PERMIT NUMBER 01–83–796

POKER PHASE IIi BOND RELEASE 2023

BASE MAP REVISIONS		PLOT. BY: RCS	EXHIBIT No. 1
BY:	DATE:	DATE: 11/23	SHEET No. 1 of 1

USIBELLI COAL MINE, INC.
P.O. BOX 1000, HEALY, ALASKA 99743
(907) 683–2226

POKER FLATS MINE 2021–2022 VEGETATION MONITORING




Prepared for:

Usibelli Coal Mine, Inc.
Healy, Alaska

Prepared by:

Matthew J. Macander

ABR, Inc—Environmental Research & Services
Fairbanks, Alaska

January 2023

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ACKNOWLEDGMENTS

Richard Sivils managed the project for Usibelli Coal Mine Inc. At ABR, Forrest Rosenbower, Tony LaCortliglia, and Brian Houseman assisted with field surveys. Alex Prichard provided statistical support, Pam Odom assisted with report formatting, and Sue Bishop reviewed the report. Brian Houseman capably managed the project for ABR through fall 2021.

INTRODUCTION

The Poker Flats coal mining reclamation area near Healy, Alaska is managed by Usibelli Coal Mine Inc. (UCM). UCM plans to apply for Phase III bond release for a portion (two blocks, totaling 66.4 acres) of the Poker Flats mining area where reclamation was previously completed (Figure 1). Standards for bond release are established by the Alaska Department of Natural Resources, Division of Mining, Land, and Water (DNR-DMLW), and must be met in two consecutive years. These standards were specified in the reclamation plan for Poker Flats Mine (UCM 2020, Section 10.9.3) and are described in this report for reference. Vegetation in the Poker Flats Mine bond release area was measured in July 2021 and August 2022 by ABR, Inc.—Environmental Research & Services (ABR). Erosion control, woody stem density, and woody plant diversity in the reclaimed area were measured and compared to Phase III bond release standards (UCM 2020), as approved by DNR-DMLW on 12 October 2020 (DNR-DMLW 2020).

BOND RELEASE STANDARDS

Measurements of ground cover, woody stem density, and woody plant diversity in the bond release area were compared to the standards for erosion control, woody vegetation, and plant diversity within Section 10.9.3 of the reclamation plan (UCM 2020). Bond release standards are required to be met in two consecutive years and were assessed in 2021 and 2022. The standards are described below for reference.

EROSION CONTROL STANDARD

Ground cover that contributes towards meeting the erosion control standard may include live vegetation, lichens and mosses, dead vegetative mat, incidental woody debris (≥0.5 cm in diameter), stones or gravel (1–10 cm in diameter), rock (≥10 cm in diameter), coal chunks (≥1 cm in diameter), and litter in quantities that will resist erosion. The erosion control standard is achieved when both the following conditions are met:

1) Total ground cover ≥70% (i.e., the lower bound of a one-sided 90% confidence interval ≥70%)

2) Exclusive ground cover ≥65% (i.e., the lower bound of a one-sided 90% confidence interval ≥65%), which excludes stones, gravel, rock, coal chunks and incidental woody debris.

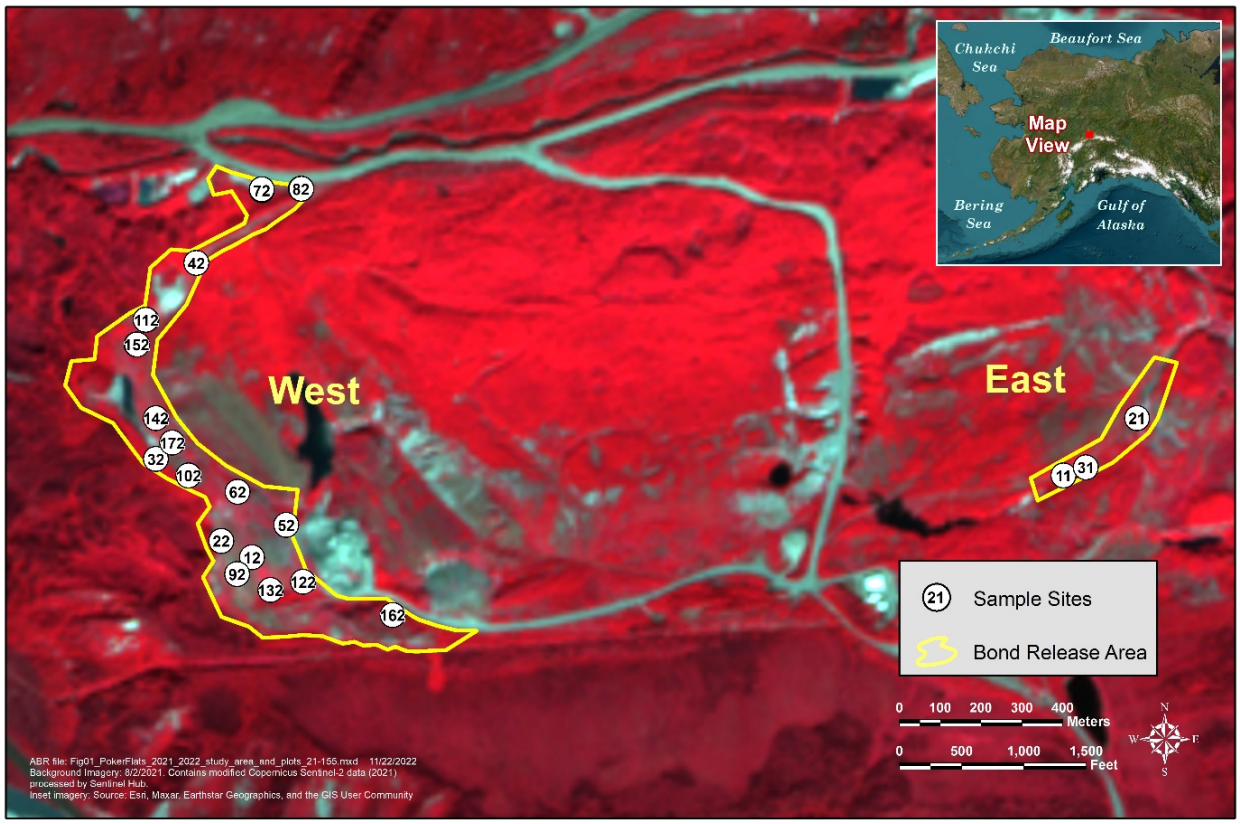

Figure 1. Poker Flats Mine Phase III bond release area and sampling units, 2021–2022, Alaska. The bond release area includes west and east areas.

Bare soil and coal dust (particles <1 cm in diameter) are defined as bare ground and therefore are not included in ground cover. Water is neither bare ground nor ground cover and therefore is excluded from the analysis.

WOODY STEM DENSITY STANDARD

An average of 450 woody stems per acre must be present on at least two thirds of any area for which bond release is requested (i.e., the lower bound of a one-sided 90% confidence interval ≥450 woody stems per acre). To be counted, a stem must be ≥8 inches tall, except for spruce and dwarf birch which must be ≥4 inches tall. Where multiple stems emerge from the soil in close proximity but independently of one another, each stem is counted as an individual. Two or more stems connected to one another above the mineral soil surface are counted together as a single individual. Woody stem density must be ≥100 stems per acre in each sample unit included within

the two thirds area. If stem density in any sample unit exceeds 1,000 stems per acre, a value of 1,000 will be used for that unit in the calculation of mean total stem density.

WOODY PLANT DIVERSITY STANDARD

In each area for which bond release is requested, at least 3 woody species must be present, the dominant woody species must account for ≤80% of all woody stems (i.e., the upper bound of a one-sided 90% confidence interval ≤80%), and the two most abundant species combined must account for ≤95% of all woody stems (i.e., the upper bound of a one-sided 90% confidence interval ≤95%).

SAMPLING ADEQUACY

If, for each standard, the number of sampling units is greater than or equal to the minimum number of samples (n = 20) and the calculated standard meets the approved standard as indicated above, the appropriate standard (erosion control, woody stem density or woody plant diversity) will be considered to have been achieved.

METHODS

SAMPLING DESIGN

Sampling design followed Section 10.9.4 of the reclamation plan (UCM 2020). We used the generalized random-tessellation sampling technique (GRTS, Stevens and Olsen 2004) to identify a set of sample units. The GRTS technique provides improved spatial sampling balance compared to simple random sampling while avoiding the potential biases of systematic sampling. In addition, because the sample size does not have to be predefined with GRTS, it allowed us to generate a large number of pre-selected sample units and then sample only the number needed to meet the precision requirements of the standards.

The proposed bond release area includes two portions of the Poker Flats Mine (Figure 1). We buffered each polygon by negative 10 m to ensure that all sample transects would be entirely within the bond release area, converted the buffered polygons to a raster grid with 20 m resolution, then created a point grid over the entire bond release area by placing a single point at the centroid of each pixel (one point per 20-m pixel). We then selected 40 points using the

spsurvey package in R, with 6 in the smaller eastern polygon and the remaining 34 in the larger western polygon.

A transect is a 20-m linear features that is a component of each sample unit. We randomly assigned half the points to east-west aligned transects and the other half to north-south aligned transects, to avoid bias due to systematic terrain features. Then we generated a 20-m transect from each point, with the transect start location 10 m to the east or south of the point, and the transect end location 10 m to the west or north of the point. The points were converted to waypoint format for GPS navigation in the field.

FIELD SURVEY

SAMPLE UNIT LOCATIONS

In 2021, sample units were selected within the bond release area by visiting and sampling the first 20 selected sample units (3 from the eastern region and 17 from the western region), since that has been established as the minimum number of sample units for a bond release area. All 20 sample units measured in 2021 were measured again in 2022. In both years we assessed whether the performance standards were met after sampling 20 plots.

SAMPLE UNIT LAYOUT

At each sample unit, a 2 x 20-m plot (40 m^2) was delineated using a survey tape (Figure 2). Ground cover was measured along a transect on 1 of the 20-m sides using the point-intercept method (described below). Woody stem density and woody plant diversity were assessed within the 40-m^2 plot using the belt transect method (described below). Photos of each sample unit were taken from the center of each 2-m side while facing the opposite 2-m side.

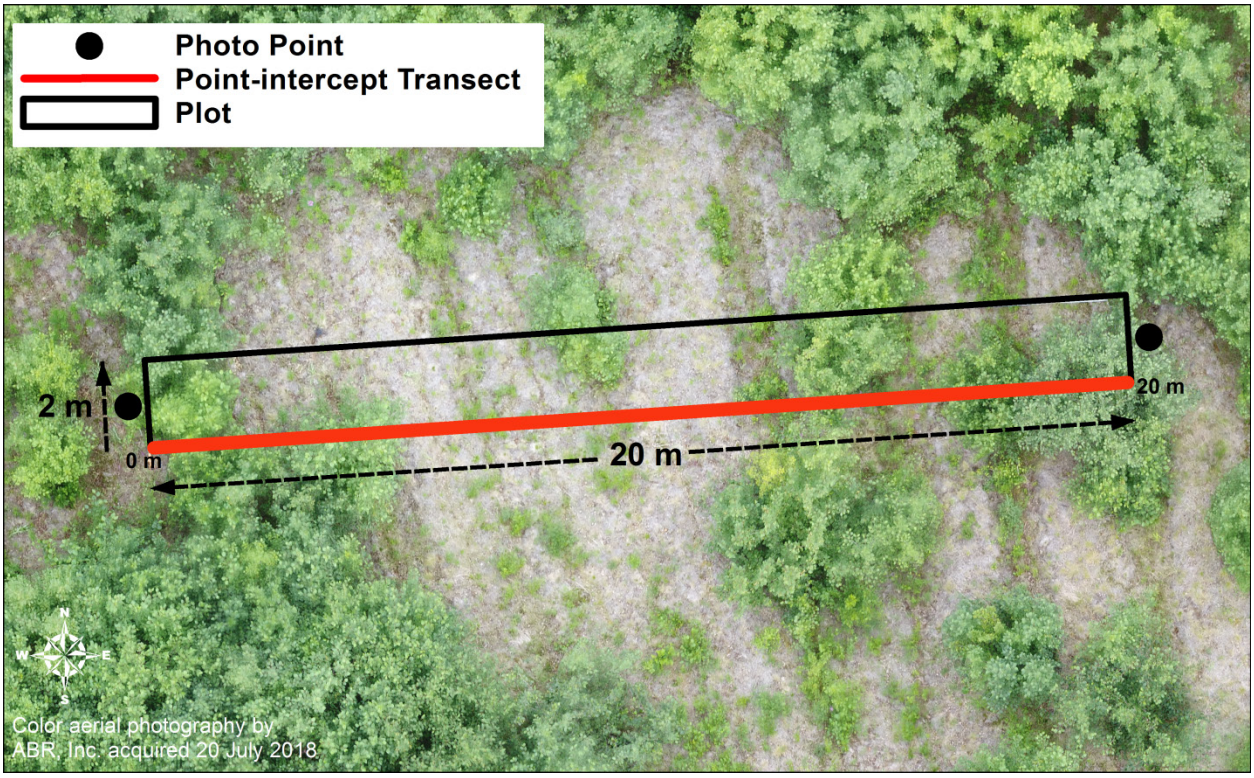

Figure 2. Typical layout for a sample unit at Poker Flats Mine. Background image was taken with an unoccupied aerial vehicle (UAV) during a different UCM vegetation study over Poker Flats sample unit 104, July 2018.

SAMPLE UNIT SETUP

Each sample unit (also referred to as a plot) was established by navigating with the GPS to the start point. With a compass set to 16.75 degrees east (the declination for the study area), one crew member held the zero end of a 50-m tape at the start point while the second crew member walked the opposite end of the tape out exactly 20 m away from the start point and along the predetermined azimuth to the north (0 degrees) or the east (90 degrees). To avoid trampling vegetation along the transect, the second crew member stayed on the right side of the tape. To maintain a straight transect, the tape was threaded between woody stems and through other clumps of vegetation along the azimuth. Ground cover was later sampled along this line. At the 20-m mark, the tape was wrapped around a survey nail in the ground, extended 2 m to the left (i.e., west or north, depending on point-intercept transect azimuth), and checked visually to ensure the corner of the tape was at a 90-degree angle. At the 22-m mark the tape was wrapped

around another survey nail and extended 20 m back toward the start point. A compass was used to orient direction, and distance from the original 20-m transect was measured occasionally to maintain the 2-m plot width. The tape was then secured around a survey nail at the 42-m mark of the tape, extended 2 m to the left (i.e., south or east) and attached to the original starting point at the 0-m mark of the tape.

GROUND COVER TRANSECT

Ground cover was measured quantitatively using the point-intercept method on a 20-m transect at each sample unit. We employed similar techniques to those used for pre-mining vegetation monitoring at Hoseanna Creek Basin prior to 1992 (Helm 2004) and post-mining vegetation monitoring at Gold Run Pass (Helm 1995; 1999). Along each 20-m transect, ground cover was measured at sampling points spaced 0.5 m apart (40 points per transect). At each point, a laser pointer mounted on a steel rod approximately 1.5 m above the ground was used to sample ground cover, and the plant species (or other cover type) that intersected the laser beam was recorded. A GRS densitometer aligned above the laser point was used to make a rapid estimation of vegetation cover above 1.5 m. If multiple layers of vascular plant cover were present at a sampling point, all were recorded, in order from the highest layer to the ground. However, multiple hits of the same species were not recorded. Since the performance standard includes 'litter in quantities that will resist erosion' as ground cover, we did not record isolated, detached pieces of litter as hits; instead, the ground layer underneath was recorded. Attached dead plants and mats of detached dead plant material were recorded as litter. Only the top hit at each point was used to calculate ground cover for the transect; the resulting cover metric is known as top cover. Taxonomic nomenclature followed Viereck and Little (2007) for trees and shrubs, Skinner et al. (2012) for grasses, and Hultén (1968) for other vascular plants. Nonvascular plants were not identified to the species level.

WOODY STEM DENSITY AND WOODY PLANT DIVERSITY BELT TRANSECT

Woody stem density and plant diversity were assessed beginning from the starting (0 m) end of each plot (Figure 2). For sampling efficiency, the stems within the plot were assessed in 1 to several blocks ranging in size from 2 × 2-m to the entire area of the plot (2 × 20-m). The size and number of blocks were determined at the time of sampling following a qualitative assessment of

stem density (smaller blocks were used when stem density appeared to be high). For each block, we tallied all woody stems ≥8 inches in height, except for spruce and dwarf birch, which were tallied if ≥4 inches in height. Where multiple stems emerge from the soil in close proximity but independently of one another, each stem was counted as an individual. Two or more stems connected to one another above the mineral soil surface were together counted as a single individual. The species of each woody stem was recorded in the field, using the taxonomic nomenclature in Viereck and Little (2007). Crew members stopped recording woody stems before reaching the end of the plot if 40 or more stems were counted (equivalent to 4,000 stems per acre if the entire 40-m^2 plot was surveyed). In those cases, the current block was fully counted, and the crew recorded how many of the blocks were measured, so that stem density for the sampled portion of the plot could be calculated. Limiting the stem count to 40 stems reduced the sampling time for plots with high woody stem density, while ensuring that the maximum number of stems allowed to count towards bond release (1,000 stems per acre or 10 stems per plot) was exceeded where it occurred. The protocol stated that, if a water body was present within a plot and was too deep to sample, stem-count data were not collected for that portion of the plot. During the 2021 and 2022 field surveys, we did not encounter any woody stems growing in water that was too deep to sample.

DATA ANALYSIS

Statistical testing of the bond release standards followed Section 10.9.5 of the reclamation plan (UCM 2020).

EROSION CONTROL

Ground cover was estimated using data from all sample units. Nonparametric bootstrap estimates of the mean and lower bound of a one-sided 90% confidence interval were used to compare the results against the bond release standard. The boot package for R (R Core Team 2020) and the adjusted bootstrap percentile method (100,000 simulations) were used to calculate the mean and one-sided confidence interval (Davison and Hinkley 1997, Canty and Ripley 2017). Nonparametric methods were used because cover values were often not normally distributed. Separate estimates were calculated for the 2021 and 2022 data sets.

WOODY STEM DENSITY

We selected the two thirds of the sample units with the highest woody stem density and assessed these sample units to determine if they met the minimum stem count (≥100 stems per acre). Mean woody stem density for these plots was calculated, after limiting the stem density for each sample unit to a maximum of 1,000 stems per acre. Mean woody stem density and the lower bound of a one-sided 90% confidence interval were estimated with the bootstrapping procedure described previously (Davison and Hinkley 1997, Canty and Ripley 2017). Separate estimates were calculated for the 2021 and 2022 data sets.

WOODY PLANT DIVERSITY

Each woody stem was identified to species in all sample units. Woody plant diversity was assessed separately for each year using the two thirds of sample units with the highest woody stem densities. The mean proportion and upper bound of a one-sided 90% confidence interval of the proportion for each species were calculated using the formulas for cluster sampling of proportions, which are listed in Section 10.9.5 of the reclamation plan (UCM 2020). The mean proportion and upper bound of a one-sided 90% confidence interval were also calculated for the top two most abundant species combined. Separate estimates were conducted with the 2021 and 2022 data sets.

SAMPLING ADEQUACY

Determination of sampling adequacy followed Section 10.9.5 of the reclamation plan (UCM 2020). Nonparametric bootstrap methods were used to estimate the mean and 90% confidence intervals for ground cover and woody stem density, to determine whether the standards were met. If a standard was met (e.g., the lower bound of the 90% CI for ground cover or stem density was above the standard), then, by definition, the sample size was adequate for that standard. The sample size must be large enough to (1) meet any assumptions of the statistical test; and (2) calculate a confidence interval that is precise enough to establish that the standard is met with statistical significance (assuming the bond release area exceeds the standard). The first requirement is met by having a minimum number of sample units, the second requirement can be met by calculating the confidence interval and showing that the lower bound is above the

performance standard. Sampling adequacy was determined separately for the 2021 and 2022 data sets.

RESULTS

FIELD SURVEY

A total of 20 sample units in Poker Flats Mine were sampled for ground cover, woody stem density, and woody plant diversity on 13–14 July 2021 and 22–23 August 2022. Sample unit locations are listed in Appendix 1.5. Sampling adequacy was tested after the minimum number of units (20) were sampled. We calculated the nonparametric bootstrapped mean and 90% confidence interval for each standard, using all sample units for ground cover (n = 20) and the densest two thirds of the sample units (n = 14) for woody stem density and woody plant diversity. Once field sampling results from a spatially balanced set of sample units indicated that the standards were achieved with 90% confidence, no more sample units were surveyed.

DATA ANALYSIS

EROSION CONTROL

Mean ground cover was 81.3% (lower 90% CI = 72.6%) in 2021 and 86.9% (lower 90% CI = 78.9%) in 2022 (n = 20; Table 1, Figure 3). Exclusive ground cover was 80.2% (lower 90% CI = 71.2%) in 2021 and 85.5% (lower 90% CI =77.8%) in 2022 (n = 20; Table 1). These results met the 70% ground cover and 65% exclusive ground cover requirements specified by the erosion control standard for Phase III bond release (UCM 2020). There were 7 plots with ground cover <70% in both 2021 and 2022 (Figure 3), but ground cover in the other 13 plots was high enough that mean ground cover met the performance standard.

Table 1. Mean top cover for vegetation and ground cover types in all sample units (n = 20) of the Poker Flats Mine Phase III bond release area, July 2021 and August 2022. Bootstrapped mean cover and the lower bound of a one-sided 90% confidence interval are provided for total ground cover and exclusive ground cover.

	2021		2022	
Cover Type	Mean (%)	Lower CI (%)	Mean (%)	Lower CI (%)
Total Ground Cover	81.3	72.6	86.9	78.9
Exclusive Ground Cover	80.2	71.2	85.5	77.8
Deciduous Trees	2.6		2.5	
Evergreen Trees	0		0.2	
Deciduous Shrubs	22.6		26.5	
Forbs	7		8.5	
Graminoids	25.2		17.8	
Mosses	1		3	
Lichens	0.4		0	
Cryptobiotic Crust	0.5		2.6	
Litter	20.8		24.4	
Woody Litter (≥ 0.5 cm diameter)	0.2		0.1	
Gravel (1–10 cm diameter)	0.8		1	
Rock (≥ 10 cm diameter)	0.2		0.1	
Coal Chunk (≥ 1 cm diameter)	0		0.1	
Bare Ground	18.7		13.1	
Bare Soil (< 1 cm diameter)	17.9		12.8	
Coal Dust (< 1 cm diameter)	0.8		0.4	

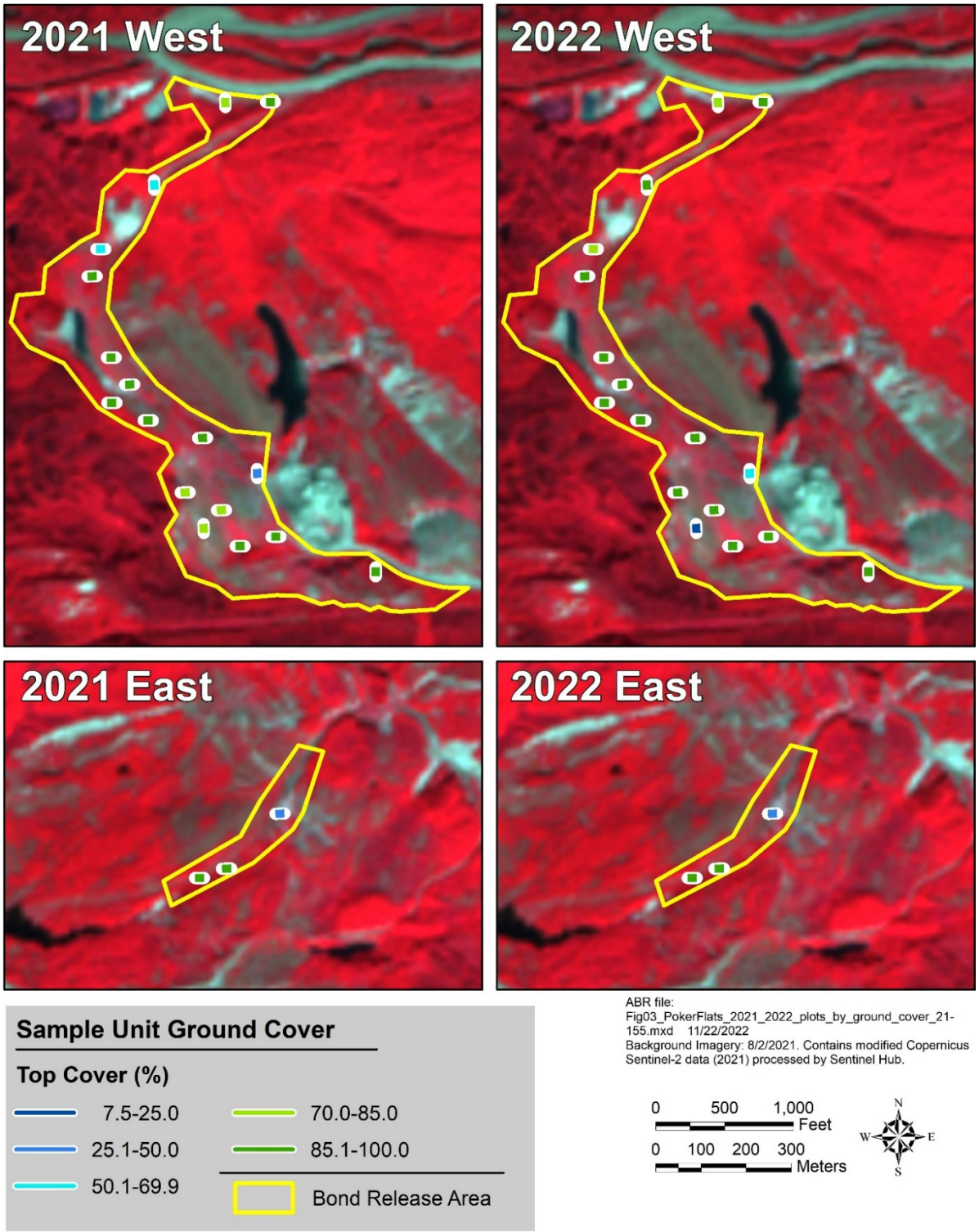

Figure 3. Poker Flats Mine Phase III bond release area and ground cover sampling units, 2021–2022.

Ground cover consisted primarily of graminoids (mean = 17.8–25.3%), deciduous shrubs (mean = 22.6–26.5%), and litter (mean = 20.8–24.4%). Graminoid cover was higher in 2021, while cover values for deciduous shrubs and litter were higher in 2022. Some senescence of graminoids and forbs had occurred by the date of the 2022 survey, which could have contributed to higher litter cover and lower graminoid cover. Based on review of the transect photos, much of the difference in graminoid vs. deciduous shrub cover between years appears to be due to random variation in navigating to the start point for the sample units. Much of the bond release area is comprised of a mosaic of meadows and shrubs, and the recreation-grade GPS locations are generally accurate to within 1–3 m. This level of accuracy is enough to offset plots between years so that individual shrub patches are included to a greater or lesser extent. We note that the performance standards do not require that sample unit locations are the same for the two years of sampling; and interannual variability would likely be even larger if a new set of plot locations was generated for each year. Ground cover values by cover type for each sample unit can be found in Appendices 1.1 and 1.2.

WOODY STEM DENSITY

Mean woody stem density for the highest-density two thirds of the sample units (n = 14, Figure 4) was 1,000 stems per acre in 2021 and 2022, which exceeded the standard (450 stems per acre) for Phase III bond release (UCM 2020). No CI could be calculated with the 2021 or 2022 data set because woody stem density was >1,000 stems per acre for all sample units (n = 14) and therefore capped at 1,000 stems per acre in each sample unit for the mean woody stem density estimate. All the highest-density two thirds of the sample units met the minimum standard of 100 stems per acre. Two plots each year had no woody stems. Woody stem density by species for each sample unit is listed in Appendices 1.3 and 1.4.

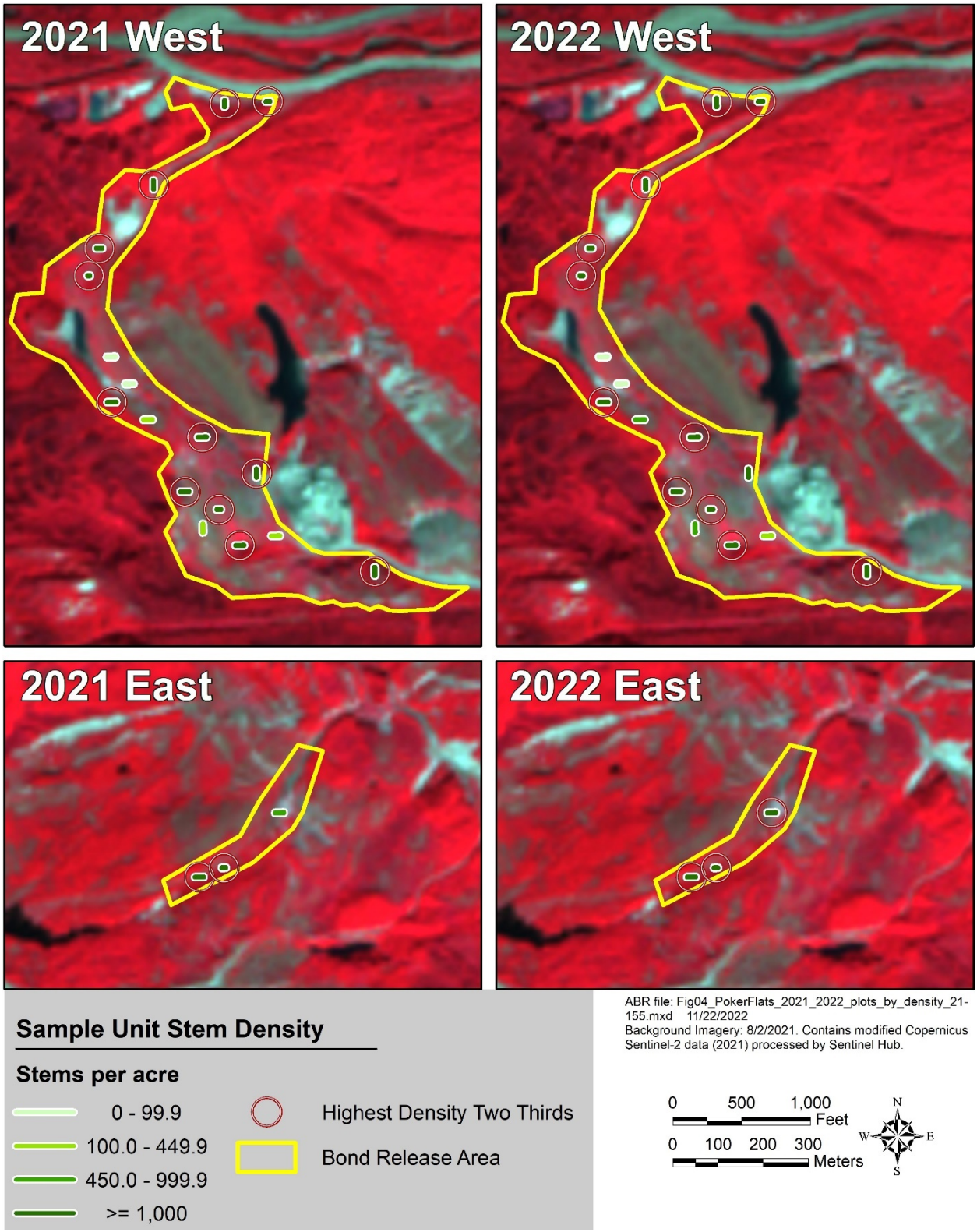

Figure 4. Poker Flats Ridge Mine Phase III bond release area and woody stem density sampling units, 2021–2022.

WOODY PLANT DIVERSITY

The most abundant woody species within the highest-density two thirds of the sample units (n = 14) was Sitka alder (*Alnus sinuata*) in 2021 and 2022 (mean = 50.7% and 57.0%; upper 90% CI = 55.0% and 60.4%, respectively; Table 2). The two most abundant woody species within the highest-density two thirds of the sample units (n = 14) in 2021 and 2022 were Sitka alder and balsam poplar (*Populus balsamifera*). The top two together comprised 78.2% and 80.2% of total stems in 2021 and 2022, respectively, with upper 90% CI of 80.1% and 81.9% (Table 2). In both 2021 and 2022, the dominant woody plant species accounted for ≤ 80% of all woody stems, the two most abundant species combined for ≤ 95% of all woody stems, and at least 3 woody species were present. Woody plant diversity met the standard for Phase III bond release with 90% confidence in 2021 and 2022 (UCM 2020).

Table 2. Mean woody plant stem frequency (%) and the upper bound of one-sided 90% confidence interval (%) for all tree and shrub species in the highest-density two thirds of the sample units (n =14) of Poker Flats Mine Phase III bond release area, July 2021 and August 2022.

	2021		2022	
Species	Mean (%)	Upper Confidence Interval (%)	Mean (%)	Upper Confidence Interval (%)
Top two woody species	78.2	80.1	80.2	81.9
Sitka alder (*Alnus sinuata*)	50.7	55.0	57.0	60.4
Balsam poplar (*Populus balsamifera*)	27.5	31.9	23.2	26.7
Betula hybrids (*Betula* hybrids)	7.6	8.7	2.6	3.2
Resin birch (*Betula neoalaskana*)	2.1	2.6	7.9	9.1
Bebb willow (*Salix bebbiana*)	3.9	5.0	4.7	5.2
White spruce (*Picea glauca*)	3.7	4.1	3.7	4.0
Quaking aspen (*Populus tremuloides*)	2.2	2.8	0.3	0.4
Feltleaf willow (*Salix alaxensis*)	1.3	1.6	0.2	0.2
Littletree willow (*Salix arbusculoides*)	0.5	0.8	0.3	0.5
American red raspberry (*Rubus idaeus*)	0.3	0.3	0.0	0.0
Russet buffaloberry (*Shepherdia canadensis*)	0.3	0.3	0.0	0.0
Unknown willow (*Salix* sp.)	0.0	0.0	0.2	0.3

CONCLUSIONS

Vegetation within the Poker Flats Mine bond release area, as measured in 2021 and 2022, met the bond release standards for erosion control, woody stem density, and woody plant diversity (UCM 2020) with 90% confidence. According to Section 10.9.5 of the reclamation plan (UCM 2020): if, for each standard, the number of sampling units is greater than or equal to the minimum number of samples and the calculated standard meets the approved standard, the appropriate standard (erosion control, woody stem density or woody plant diversity) will be considered to have been achieved. Vegetation sampling results were adequate to meet the vegetation requirements of Phase III bond release in both 2021 and 2022; therefore, the additional Phase III bond release requirement that standards be met in two consecutive years was achieved.

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APPENDICES

Appendix 1.1. Ground cover (%) of vegetation and other cover types for individual sample units in the Poker Flats Mine Phase III bond release area, July 2021.

	Ground Cover (%)													Bare Ground	
Sample Unit	Deciduous Trees	Evergreen Trees	Deciduous Shrubs	Forbs	Graminoids	Mosses	Lichens	Cryptobiotic Crust	Litter	Woody Litter (≥ 0.5 cm diameter)	Gravel (1–10 cm diameter)	Rock (≥ 10 cm diameter)	Coal Chunk (≥ 1 cm diameter)	Bare Soil (< 1 cm diameter)	Coal Dust (< 1 cm diameter)
11	0	0	42.5	12.5	17.5	0	2.5	0	20	0	0	0	0	5	0
12	5	0	10	2.5	52.5	0	0	0	12.5	2.5	0	0	0	15	0
21	0	0	0	5	0	0	0	0	2.5	0	0	0	0	77.5	15
22	0	0	5	0	70	0	0	0	10	0	0	0	0	15	0
31	15	0	47.5	0	5	0	5	0	25	0	0	0	0	2.5	0
32	0	0	82.5	0	10	2.5	0	0	5	0	0	0	0	0	0
42	2.5	0	22.5	2.5	0	5	0	10	10	0	2.5	0	0	45	0
52	0	0	2.5	5	17.5	0	0	0	12.5	0	0	2.5	0	60	0
62	2.5	0	22.5	0	25	7.5	0	0	30	0	0	0	0	12.5	0
72	2.5	0	60	0	0	0	0	0	12.5	0	0	2.5	0	22.5	0
82	7.5	0	72.5	0	0	0	0	0	7.5	0	2.5	0	0	10	0
92	0	0	5	5	45	0	0	0	17.5	0	0	0	0	27.5	0
102	0	0	0	0	32.5	0	0	0	55	0	2.5	0	0	10	0
112	2.5	0	17.5	10	7.5	5	0	0	10	2.5	2.5	0	0	42.5	0
122	0	0	0	55	20	0	0	0	10	0	2.5	0	0	12.5	0
132	0	0	32.5	15	47.5	0	0	0	2.5	0	2.5	0	0	0	0
142	0	0	0	0	25	0	0	0	75	0	0	0	0	0	0
152	7.5	0	30	2.5	40	0	0	0	20	0	0	0	0	0	0
162	7.5	0	0	17.5	52.5	0	0	0	22.5	0	0	0	0	0	0
172	0	0	0	7.5	37.5	0	0	0	55	0	0	0	0	0	0
Mean	2.6	0.0	22.6	7.0	25.3	1.0	0.4	0.5	20.8	0.3	0.8	0.3	0.0	17.9	0.8

Appendix 1.2. Ground cover (%) of vegetation and other cover types for individual sample units in the Poker Flats Mine Phase III bond release area, August 2022.

	Ground Cover (%)													Bare Ground	
Sample Unit	Deciduous Trees	Evergreen Trees	Deciduous Shrubs	Forbs	Graminoids	Mosses	Lichens	Cryptobiotic Crust	Litter	Woody Litter (≥ 0.5 cm diameter)	Gravel (1–10 cm diameter)	Rock (≥ 10 cm diameter)	Coal Chunk (≥ 1 cm diameter)	Bare Soil (< 1 cm diameter)	Coal Dust (< 1 cm diameter)
11	0	0	5	35	45	0	0	0	15	0	0	0	0	0	0
12	2.5	0	35	5	22.5	7.5	0	0	20	0	2.5	0	0	5	0
21	0	0	15	15	7.5	0	0	0	2.5	0	0	0	0	52.5	7.5
22	2.5	0	20	0	22.5	0	0	0	52.5	0	0	0	0	2.5	0
31	7.5	0	65	0	2.5	10	0	0	12.5	0	0	0	0	2.5	0
32	0	0	85	0	0	0	0	0	15	0	0	0	0	0	0
42	2.5	0	2.5	2.5	12.5	10	0	35	15	0	12.5	0	0	7.5	0
52	0	0	10	25	7.5	0	0	2.5	15	0	0	0	2.5	37.5	0
62	2.5	0	55	5	10	0	0	5	15	0	0	0	0	7.5	0
72	0	0	60	0	0	0	0	0	5	2.5	2.5	0	0	30	0
82	2.5	0	82.5	0	0	0	0	0	12.5	0	0	2.5	0	0	0
92	0	0	0	0	10	0	0	0	15	0	0	0	0	75	0
102	0	2.5	0	5	5	20	0	5	62.5	0	0	0	0	0	0
112	22.5	0	12.5	2.5	5	5	0	2.5	17.5	0	2.5	0	0	30	0
122	0	0	0	30	32.5	2.5	0	0	32.5	0	0	0	0	2.5	0
132	0	0	47.5	0	37.5	0	0	0	12.5	0	0	0	0	2.5	0
142	0	0	0	5	32.5	0	0	0	62.5	0	0	0	0	0	0
152	7.5	0	35	5	37.5	0	0	0	15	0	0	0	0	0	0
162	0	2.5	0	15	35	5	0	2.5	40	0	0	0	0	0	0
172	0	0	0	20	30	0	0	0	50	0	0	0	0	0	0
Mean	2.5	0.3	26.5	8.5	17.8	3.0	0.0	2.6	24.4	0.1	1.0	0.1	0.1	12.8	0.4

Appendix 1.3. Woody stem density (stems per acre) by species for individual sample units in the Poker Flats Mine Phase III bond release area, July 2021.

Sample Unit	Total	American Red Raspberry	Balsam Poplar	Bebb Willow	False Mountain Willow	Gray-leaf Willow	Prickly Rose	Quaking Aspen	American Red Currant	Alaska Paper Birch	Siberian Alder	Sitka Alder	Tea-leaf Willow
11	6,072	0	0	101	0	0	0	0	607	0	5,262	101	0
21	607	0	405	0	0	0	0	0	101	0	101	0	0
31	9,917	0	405	405	0	0	0	0	1,214	0	7,691	202	0
12	8,501	0	1,214	0	1,619	810	607	1,417	0	0	2,429	405	0
22	2,935	0	0	0	911	0	0	101	0	0	1,619	304	0
32	2,834	0	0	202	0	0	0	0	0	101	2,530	0	0
42	4,554	0	3,441	304	0	304	0	101	0	0	405	0	0
52	1,113	0	202	0	0	0	0	101	0	0	708	101	0
62	3,238	0	708	304	304	0	0	0	0	0	1,720	202	0
72	5,802	0	405	0	0	0	0	0	0	0	5,397	0	0
82	8,298	0	4,250	405	0	0	0	0	0	0	3,643	0	0
92	202	0	202	0	0	0	0	0	0	0	0	0	0
102	304	0	0	0	0	0	0	101	101	0	0	101	0
112	6,361	0	6,361	0	0	0	0	0	0	0	0	0	0
122	304	0	0	0	0	0	0	0	0	0	101	202	0
132	4,857	0	0	0	0	0	0	0	0	0	4,857	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0
152	17,541	0	12,481	3,036	0	337	0	0	0	0	1,687	0	0
162	2,834	101	607	101	1,316	0	0	0	202	0	0	506	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean	4,314	5	1,534	243	208	73	30	91	111	5	1,908	106	0

Appendix 1.4. Woody stem density (stems per acre) by species for individual sample units in the Poker Flats Mine Phase III bond release area, August 2022.

Sample Unit	Total	American Red Raspberry	Balsam Poplar	Bebb Willow	False Mountain Willow	Gray-leaf Willow	Prickly Rose	Quaking Aspen	American Red Currant	Alaska Paper Birch	Siberian Alder	Sitka Alder	Tea-leaf Willow
11	2,935	0	101	0	0	0	0	0	0	0	2,732	101	0
21	3,441	0	0	304	0	0	0	0	0	0	3,036	0	101
31	10,120	0	1,417	810	0	0	0	0	1,012	0	6,679	202	0
12	9,513	0	2,226	405	1,214	0	405	0	0	0	4,655	607	0
22	4,453	0	101	0	911	0	0	0	0	0	3,137	304	0
32	3,643	0	101	202	0	0	0	0	607	0	2,732	0	0
42	4,857	0	2,935	911	0	0	0	202	0	0	506	304	0
52	2,125	0	304	0	0	0	0	0	0	0	1,822	0	0
62	3,441	0	304	0	101	0	0	0	0	0	2,834	202	0
72	4,655	0	304	0	0	0	0	0	0	0	4,351	0	0
82	7,421	0	4,217	0	0	0	0	0	0	0	3,205	0	0
92	708	0	405	101	0	0	0	101	0	0	101	0	0
102	911	0	101	0	0	0	0	0	0	0	0	810	0
112	8,096	0	7,893	202	0	0	0	0	0	0	0	0	0
122	202	0	0	0	0	0	0	0	0	0	0	202	0
132	7,489	0	101	0	0	0	0	0	0	0	7,387	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0
152	11,638	0	5,566	1,265	0	253	0	0	759	0	3,289	506	0
162	3,137	0	0	202	0	0	0	0	2,429	0	0	506	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean	4,439	0	1,304	220	111	13	20	15	240	0	2,323	187	5

Appendix 1.5. Sample unit locations. Starting and ending coordinates for the point-intercept transect at each sample unit (n = 20) in the Poker Mine Phase III bond release area, July 2021 and August 2022. Coordinates are in WGS 1984 UTM Zone 5N (m).

Sample Unit	X Start	Y Start	X End	Y End	Surveyed 2021	Surveyed 2022
11	699,900	7,092,050	699,920	7,092,050	TRUE	TRUE
21	700,080	7,092,190	700,100	7,092,190	TRUE	TRUE
31	699,960	7,092,070	699,980	7,092,070	TRUE	TRUE
12	697,920	7,091,850	697,940	7,091,850	TRUE	TRUE
22	697,840	7,091,890	697,860	7,091,890	TRUE	TRUE
32	697,680	7,092,090	697,700	7,092,090	TRUE	TRUE
42	697,790	7,092,560	697,790	7,092,580	TRUE	TRUE
52	698,010	7,091,920	698,010	7,091,940	TRUE	TRUE
62	697,880	7,092,010	697,900	7,092,010	TRUE	TRUE
72	697,950	7,092,740	697,950	7,092,760	TRUE	TRUE
82	698,040	7,092,750	698,060	7,092,750	TRUE	TRUE
92	697,890	7,091,800	697,890	7,091,820	TRUE	TRUE
102	697,760	7,092,050	697,780	7,092,050	TRUE	TRUE
112	697,660	7,092,430	697,680	7,092,430	TRUE	TRUE
122	698,040	7,091,790	698,060	7,091,790	TRUE	TRUE
132	697,960	7,091,770	697,980	7,091,770	TRUE	TRUE
142	697,680	7,092,190	697,700	7,092,190	TRUE	TRUE
152	697,640	7,092,370	697,660	7,092,370	TRUE	TRUE
162	698,270	7,091,700	698,270	7,091,720	TRUE	TRUE
172	697,720	7,092,130	697,740	7,092,130	TRUE	TRUE