

**NEW GOLD RAINY RIVER MINE
APPENDIX G
VEGETATION PLOT WORK SUMMARY
MEMO**



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Memorandum

To: Garnet Cornell – Environment Supervisor, New Gold Inc.

From: Haley Cunningham, Junior Engineer

Cc: Lindsay Tallon – Okane Consultants

Our ref: 1003-024-006

Date: December 6, 2021

Re: **Rainy River Mine - 2021 Vegetation Trial Monitoring Summary Rev0**

New Gold Inc. (New Gold) has established a vegetation trial at the Rainy River Mine (RRM) to investigate the performance of locally common species with operationally feasible cover system configurations. It is anticipated that learnings from the trial will serve to inform the closure plan, and that this work will contribute to New Gold's commitment to demonstrate to government regulators and community stakeholders that vegetation can be re-established during progressive reclamation and closure. Construction at the trial was finished in September 2019, and many of the experimental tree plots were planted in late October 2019. Hydroseeding of the slopes was completed in the fall of 2020. The purpose of this memorandum is to summarize monitoring activities completed by Okane Consultants (Okane) in 2021 and to document baseline conditions observed.

Background

The vegetation trial is designed as a randomized block study and is sited on the plateau of a dedicated trial area. Combinations of four soil treatments and nine vegetation treatments are arranged in three replicates. A destructive plot area is designated for destructive root sampling and investigation as the trial progresses. Slopes surrounding the block study have

been seeded with various methods and are used to qualitatively evaluate operational seeding techniques, vegetation establishment and erosion. Planned arrangement of the trial area is presented for reference in Figure 1 to 3.



Figure 1: Arrangement of soil treatments in experimental tree plots



Figure 2: Arrangement of vegetation treatments in experimental tree plots

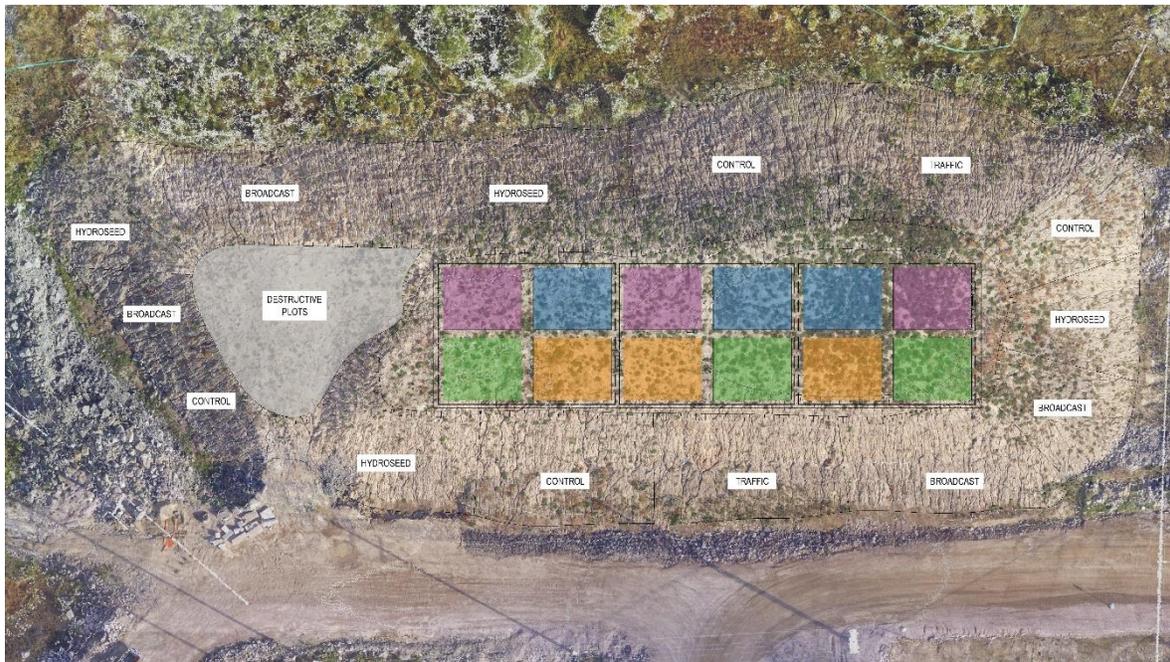


Figure 3: Arrangement of slope treatments

The general cover system configuration planned for use on the Rainy River site stockpiles consists of a 0.5 m barrier layer overlain by a 1.0 m growth medium layer, designed to limit net percolation (NP) and control oxygen (O₂) ingress to the mine rock. The enhanced cover system uses both moisture store-and-release and enhanced runoff principles to achieve reduced NP. The barrier layer within the cover system controls O₂ ingress by effectively eliminating advective gas transport.

The vegetation trial was constructed in 2019 using the same cover system design, with clay overburden used for both the barrier and growth medium layers. Four soil treatments were chosen to represent potential options for operational revegetation:

- 1) Thin topsoil – a 0.15 m layer of topsoil was applied to the surface;
- 2) Tilled topsoil – a 0.15 m layer of topsoil was applied to the surface and then mixed into the overburden using a skid steer tiller;
- 3) Fertilized overburden – a commercial mix of fertilizer, mainly comprised of bonemeal, was applied to the overburden surface using a skid steer tiller; and
- 4) Control – no amendment or modification to the overburden surface.

The species chosen for inclusion in the trial represent locally common or significant species:

- 1) Aspen;
- 2) Black spruce;

- 3) Black ash;
- 4) Eastern white cedar;
- 5) White spruce;
- 6) Jack pine;
- 7) Ground Cover Mix – may include species typical for the ecosystem, such as bearberry, blueberry, ground cedar, or Labrador tea;
- 8) Shrub Mix – includes available species typical of the ecosystem, such as high bush cranberry, Saskatoon berry, beaked hazelnut, alder or red osier dogwood;
- 9) Community Mix – culturally significant species selected by local communities, not necessarily found in local area.

Experimental tree plot planting on the plateau commenced in late October 2019 but was not completed that year. Planting was completed in November 2020. Of note, Tobacco and Juniper species were not planted and are planned to be excluded from the trial. Commercial availability of tobacco and juniper species is limited, and it would not be feasible to include them in large-scale reclamation operations.

The slope areas surrounding the trial were hydroseeded in late September 2019 and included a test of commercially available ProGanics Biotic Soil Media from Profile Products. Other sections of the landform slopes were broadcast seeded, track packed, or left unseeded as a control. In September 2020, all slopes were treated with ProGanics Biotic Soil Media to prevent further erosion.

Construction of the overburden destructive plot was completed in autumn 2019. Some species were planted on the plot in late October 2019, and planting was completed in November 2020.

Monitoring Activities

Okane personnel visited the vegetation trial in summer 2021 to complete an erosion survey, inventory vegetation that had been planted in November 2020, record growth indicator measurements for early plant growth trajectories, and complete a root investigation at the destructive plots. Haley Cunningham and Lyndsey Thorson visited the site and recorded observations from August 17 to 18, 2021.

Slope Erosion Survey

In general, significant erosion was observed on the sloped areas of the trial. Measured erosional features are included in Table 1.

Table 1: Major erosion features on slope treatments (S-sheet, R-rill, G-gully)

Slope Orientation	Hydroseed	Broadcast	Traffic	Control
North	S, R Uniform shallow erosion over slope	S, R Erosion is minimal over slope	S, R Erosion is minimal, uniform over slope, and shallow rill erosion (Depth < 10 cm)	S, R, G Erosion is uniform over slope (Depth < 30 cm)
	G Lower slope Depth = ~35 cm Width = 40-50 cm	G Mid slope – full slope length Depth = 30 cm Width = 40-60 cm		
East	S, R Erosion is minimal, uniform over slope, and shallow rill erosion (Depth < 3 cm)	S, R Erosion is minimal, uniform over slope, and shallow rill erosion (Depth < 5 cm)	n/a	S, R Erosion is minimal, uniform over slope, and shallow rill erosion (Depth < 5 cm)
	S, R Lower slope – partial slope length Depth = 20 cm Width = 30-40 cm	S, R Uniform shallow erosion over slope	S, R Erosion is minimal, uniform over slope, and shallow rill erosion (Depth < 5 cm)	S, R Erosion is minimal, uniform over slope, and shallow rill erosion (Depth < 5 cm)
South	G Entire slope length (East side) Depth = 37 cm Width = 50-60 cm	G Entire slope length Depth = 40 cm Max width = ~1.2 m		
	Entire slope length (West side) Depth = 30 cm Width = 55-65 cm			
West	S, R Shallow and narrow rill erosion at crest and toe of slope (Depth < 10 cm)	S, R Shallow rill erosion over slope (Depth < 5 cm)	n/a	S, R Shallow rill erosion over slope (Depth < 5 cm)
		G Lower slope Depth = 32 cm Max width = 76 cm		G Lower slope Depth = 33 cm Max width = 66 cm



Figure 4: South Slope Rill (left) and Gully (right) erosion



Figure 5: North Slope Rill (left) and Gully (right) erosion



Figure 6: West Slope Rill (left) and Gully (right)

Annual Growth Measurements

The purpose of the late summer / early fall site visit was to collect annual growth measurements that can be used to quantify vegetation growth in the experimental tree plots at regular annual intervals. General observations were also noted along the slopes and at the Destructive Plot. Haley Cunningham and Lyndsey Thorson collected measurements from August 17 to 18, 2021.

Slopes

Vegetation ground coverage generally increased, ranging from 25% to 75% over the slopes (Table 2). Of note, all slopes were treated with ProGanics Biotic Soil Media in September 2020 to minimize further erosion. Ground coverage increased from 2020 in which most slope treatment areas had on average 25% coverage to almost 50% coverage in 2021.

Table 2: Major erosion features on slope treatments (S-sheet, R-rill, G-gully)

Slope Orientation	Hydroseed	Broadcast	Traffic	Control
North	50-75% Various weeds and grasses, uniform coverage	25-50% More sparse vegetation,	50% Various weeds and grasses, more dense and uniform coverage	50-75% Wheat grass and additional weed types, uniform coverage
East	75% Various weeds and grasses, more dense and uniform coverage	75% Various weeds and grasses, more dense and uniform coverage	n/a	75% Various weeds and grasses, more dense and uniform coverage
South	25-50% Mostly wheat grass, uniform coverage	50% Mostly wheat grass, additional weed types, uniform coverage	50-75% Mostly wheat grass, additional weed types, uniform coverage	50-75% Mostly wheat grass, more dense and uniform coverage
West	25-50% Various weeds and grasses, coverage better at base of slope	25-50% Various weeds and grasses, coverage better at base of slope	n/a	25-50% Various weeds and grasses, coverage better at base of slope



Figure 7: South Slope Hydroseed – August 26, 2020 (left) and August 18, 2021 (right)

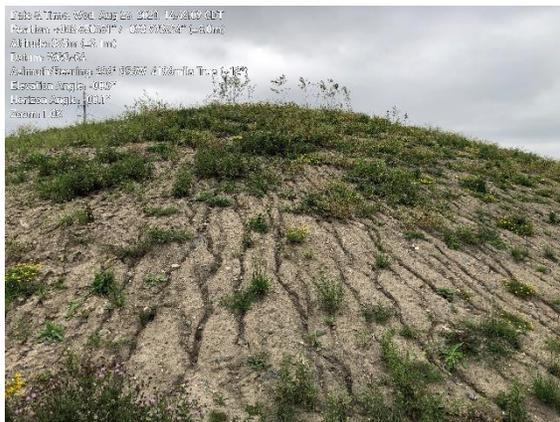


Figure 8: East Slope - August 26, 2020 (left) and August 18, 2021 (right)

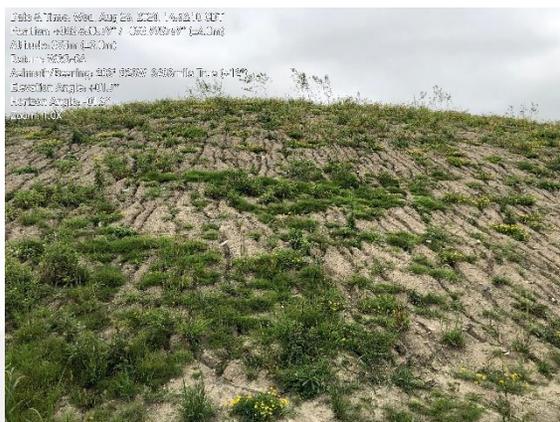


Figure 9: North Slope Control - August 26, 2020 (left) and August 18, 2021 (right)



Figure 10: West Slope Broadcast - August 26, 2020 (left) and August 18, 2021 (right)

Plateau

Jack pine plots were not planted at the time of the field visit. It appears that in the Block 3 filled topsoil treatment, black spruce was planted in the sub-plot designated for white spruce. The Community Mix plots were not planted, except for some grass species in select plots. Of note, the Ground Cover Mix plots appear to have been planted with a tree species, and two shrub species, not typical of ground cover. A quality control check is recommended for the 2022 site visit to verify locations and compositions of vegetation plots.

Overall the general health of the planted vegetation appeared to be struggling compared to last year. Some general observations for the various species include:

- Black Spruce – generally appeared to be doing better for the fertilized overburden and control soil treatments;
- White Spruce – appeared to be struggling for all four soil treatments; and
- Eastern White Cedar – overall appeared to be doing better for the fertilized overburden and control soil treatments.

A general health check was performed during the survey. Vegetation was rated on a qualitative 5-point scale to gauge if the tree/ shrub had established well:

- Healthy (H) – the specimen generally appeared to be in good health;
- Healthy / Struggling (H/S) – the specimen was not in prime condition, showing some sign(s) of poor health;
- Struggling (S) – the specimen was in poor condition, with the majority of the plant showing signs of wilting, lost leaves, or discoloration;

- Struggling / Dead (S/D) – the specimen was in very poor health or unclear if the plant had died; and
- Dead (D) – the specimen was clearly dead or had been completely uprooted.

Table 3 provides a summary of gauged health observed during the experimental tree plot survey. Generally, some vegetation loss and health decline were observed between Autumn 2020 and Autumn 2021.

Table 3: General health of planted trees and shrubs (H-healthy, S-struggling, D-dead)

Species	Soil Treatment	Block 1		Block 2		Block 3	
		2020	2021	2020	2021	2020	2021
Aspen	Thin Topsoil	9H, 1D	6H, 3S, 1D	6H, 1H/S, 3S/D	6H, 4D	10H, 1D	5H/S, 3S, 2D
	Tilled Topsoil	10H	5H, 1S, 4D	9H, 1S/D	10H	9H, 1S	10H
	Fertilized Overburden	9H, 1D	9H, 1D	10H	10H	10H, 1D	10H
	Control	9H, 1D	9H, 1D	10H	10H	10H	10H
Black Spruce	Thin Topsoil	10H	2H, 3S, 5D	10H	3H, 3S, 4D	10H*	10D
	Tilled Topsoil	9H, 1D	4H/S, 1S, 5D	3H, 6S, 1D	10D	10H	1S, 9D
	Fertilized Overburden	10H	10H	10H	10H	9H, 1H/S	10D
	Control	10H	10H	10H	10H	10H	6H, 2S, 2D
Black Ash	Thin Topsoil	10H	10S	9H, 1H/S	10H	9H, 1D	9S, 1D
	Tilled Topsoil	10H	9S	9H, 1D	9H/S, 1D	10H	4H, 6S
	Fertilized Overburden	10H	10H	10H	10H	10H	10H
	Control	10H	10H	10H	10H	9H, 1H/S	9H, 1S
Eastern White Cedar	Thin Topsoil	10S	10S/D	10H	10S	11H/S	11S/D
	Tilled Topsoil	10S	10S/D	10H	10S/D	10S/D	10S
	Fertilized Overburden	10H	10H/S	10H	10H	11H/S	10S, 1D
	Control	10H/S	10S	10H	10H	11H/S	11S
White Spruce	Thin Topsoil	-	10D	-	10D	-	1H, 2S, 7D
	Tilled Topsoil	-	10D	-	10D	-	10D
	Fertilized Overburden	-	3S, 7D	-	10S	-	1S, 9D

Species	Soil Treatment	Block 1		Block 2		Block 3	
		2020	2021	2020	2021	2020	2021
	Control	-	1S, 9S/D	-	3H, 3S, 4D	-	3S, 7D
Jack Pine	Thin Topsoil	-	-	-	-	-	-
	Tilled Topsoil	-	-	-	-	-	-
	Fertilized Overburden	-	-	-	-	-	-
	Control	-	-	-	-	-	-
Ground Cover Mix	Thin Topsoil	6H	4S, 2D	6H	6S	6H	5S
	Tilled Topsoil	4S, 1S/D, 1D	1S, 3S/D, 2D	5H, 1D	6S	6H/S	3S, 3D
	Fertilized Overburden	6H	6S	4H, 1H/S	6H/S	6H	6S
	Control	4H, 2S	6S	5H, 1H/S	6S	6H	6S
Shrub Mix	Thin Topsoil	4H	2S/D, 2D	4H	1S, 3D	4H	2S, 2D
	Tilled Topsoil	4H	4S	4H	4S	H	3S, 1D
	Fertilized Overburden	4H	4H	4H	4H	4H	1H, 2S, 1D
	Control	4H	4H	4H	4H	4H	1H, 3S
Community Mix	Thin Topsoil	-	-	-	-	3H	3H
	Tilled Topsoil	-	-	-	3H	-	3H
	Fertilized Overburden	2H	2H	-	-	-	3H
	Control	3H	3H	-	-	3H	3H

* Planted in white spruce design plot;



Figure 11: Block 2 – Fertilized Overburden - Black Spruce (left) and White Spruce (right)



Figure 12: Block 2 - Fertilized Overburden – Cedar (left) and Tilled Topsoil – Cedar (right)

During the 2021 survey, three trees were randomly selected in each plot to measure the growth indicators. Several growth indicator measurements were recorded during the autumn survey for annual growth comparisons:

- Root Collar – the diameter of the tree base at the widest part of the root collar (where the root joins the stem), or just above the ground surface, whichever is higher;
- Total Height – the distance between the root collar and the base of the terminal bud (of the tallest stem). For leaning trees, this distance was measured along the slope of the stem;
- Diameter at Breast Height (DBH) – the diameter of the tree at 1.3 m above the base; and
- Crown Diameter – the average horizontal width of the crown.

A summary of growth indicator measurements by plot are provided in Appendix A. Average indicator measurements by species are included in Table 4.

Table 4: Mean tree growth indicator measurements +/- standard deviation

Tree Species	Root Collar (mm)	Crown Diameter (cm)	Height (cm)		DBH (mm)	
	2020	2020	2020	2021	2020	2021
Aspen	21.5 +/- 2.0	24.6 +/- 10.2	258.6 +/- 26	254.9 +/- 33.2	14 +/- 1.6	15.2 +/- 1.1
Black spruce	22.5 +/- 3.1	26.7 +/- 7.5	99.5 +/- 17.8	107.8 +/- 16.8	n/a	
Black ash	21.6 +/- 2.4	29.9 +/- 9	219.6 +/- 30.4	213.4 +/- 31.3	10.8 +/- 2.2	11.3 +/- 2.4
Eastern white cedar	22 +/- 4.7	16.3 +/- 6.1	99.4 +/- 10.8	96.5 +/- 16.5	n/a	
White spruce	Not planted		Not planted	68.1 +/- 16.7	Not planted	n/a
Jack pine	Not planted					

Measurements expressed as mean +/- SD

Ground cover was estimated at each plot during both the spring and autumn surveys. During the 2021 autumn survey, ground cover increased in all plots, and most notably in plots including topsoil (Table 5). Figures 13 to 16 compare plots from each soil treatment group as observed during the spring and autumn 2020 surveys.

Table 5: Average ground coverage (%) observed in Autumn 2020 and 2021

Soil Treatment	Block 1		Block 2		Block 3		Average	
	2020	2021	2020	2021	2020	2021	2020	2021
Thin Topsoil	67	75	75	75	75	75	72	75
Tilled Topsoil	75	75	75	75	64	75	71	75
Fertilized Overburden	17	19	17	19	25	19	19	19
Control	19	19	17	19	22	19	19	19



Figure 13: Block 2 – Thin Topsoil – Eastern white cedar plot as observed on August 28, 2020, (left), and August 17, 2021 (right)



Figure 14: Block 1 – Tilled Topsoil – Black Spruce plot as observed on August 28, 2020, (left) and August 17, 2021 (right)



Figure 15: Block 2 – Fertilized Overburden – Black ash plot as observed on August 28, 2020, (left) and August 17, 2021 (right)



Figure 16: Block 3 – Control – Aspen plot as observed on August 28, 2020, (left) and August 17, 2021 (right)

Destructive Plot

Minimal erosion was observed in the destructive plot, except for some down-slope erosion on the north edge of the plot. Vegetation was generally noted to have established well. Estimated percent ground cover during the annual survey in autumn was approximately 75% for 2020 and 2021. Only general observations of poor health were noted during the autumn visit; Table 6 includes a summary of general health, extrapolating the number of healthy trees from the totals recorded.

Table 6: General health of trees and shrubs planted in the Destructive Plot (H-healthy, S-struggling, D-dead)

Species	Destructive Plot	
	2020	2021
Aspen	8 H, 4 S	7 H, 2 S, 3 D
Black spruce	14 H	5 H, 3 H/S, 6 D
Black ash	21 H, 1 S	1 H/S, 13 S, 1 S/D, 6 D
Eastern white cedar	11 S	8 S/D
White spruce	-	6 D
Jack pine	10 H, 1 S	1 S/D, 10 D
Shrub (1)	8 H	8 S/D
Shrub (2)	20 H	

Only struggling or dead trees were noted in the autumn survey (**bolded**), all other specimens were labelled as healthy.

Shrub (1) assumed to be raspberry bushes; Shrub (2) unknown and not recorded in 2021.



Figure 17: Destructive plot ground coverage

In addition, a root investigation was complete to investigate root depth and spread (Table 7). Rooting depth did not extend into the underlying till and remained within the overlying topsoil. Root spread appeared to be minimal, it was observed that the root spread did not appear to exceed that in which it was likely originally planted.

Table 7: Destructive Plot Root Investigation

Species	Root Depth	Root Spread
Aspen	23 cm	7 - 10 cm
Black spruce	23 cm	12 - 15 cm
Black ash	23 cm	7 - 10 cm (Max horizontal spread = 38 cm)
Eastern white cedar	23 cm	7 - 10 cm
White spruce	23 cm	5 - 7 cm (Minimal root spread)

Closure

We trust information provided in this memorandum is satisfactory for your requirements. Please do not hesitate to contact me at (306) 850-6140 or hcunningham@okc-sk.com should you have any questions or comments.

Appendix A

Plot Growth Indicator Measurements & General Health

Table 8: Plot growth indicator measurements and general health

Block	Soil Treatment	Vegetation Treatment	Date	Total height		DBH		Health Check					Total Count	Ground Cover	Comment
				Mean	+/- SD	Mean	+/- SD	H	H/S	S	S/D	D	(# trees or shrubs)	(%)	
				(mm)	(cm)	(mm)	(cm)								
Block 1	Thin Topsoil	Aspen	8/17/2021	264.9	8.2	15.0	0.8	6		3		1	10	75%	
Block 1	Thin Topsoil	Black spruce	8/17/2021	108.0	8.5	n/a		2		3		5	10	75%	
Block 1	Thin Topsoil	Black ash	8/17/2021	246.1	17.0	11.6	1.2			10			10	75%	
Block 1	Thin Topsoil	Eastern white cedar	8/17/2021	98.3	2.4	n/a						10	10	75%	
Block 1	Thin Topsoil	White spruce**	8/17/2021									10	10	75%	
Block 1	Thin Topsoil	Jack pine	8/17/2021					Not planted							
Block 1	Thin Topsoil	Ground Cover Mix	8/17/2021	254.6	15.0	13.5	0.5			2			2		Trees
				100.0		n/a				2		2	4	75%	Shrubs
Block 1	Thin Topsoil	Shrub Mix	8/17/2021	111.2	10.3	n/a					2	2	4	75%	
Block 1	Thin Topsoil	Community Mix	8/17/2021	-	-	-	-							75%	
Block 1	Tilled Topsoil	Aspen	8/17/2021	276.0	19.3	15.3	0.9	5		1		4	10	75%	
Block 1	Tilled Topsoil	Black spruce	8/17/2021	96.5	19.3	n/a			4	1		5	10	75%	
Block 1	Tilled Topsoil	Black ash	8/17/2021	224.9	8.2	12.0	0.8			9			10	75%	
Block 1	Tilled Topsoil	Eastern white cedar	8/17/2021	112.9	10.3	n/a						10	10	75%	
Block 1	Tilled Topsoil	White spruce**	8/17/2021									10	10	75%	
Block 1	Tilled Topsoil	Jack pine	8/17/2021					Not planted						75%	
Block 1	Tilled Topsoil	Ground Cover Mix	8/17/2021									2	2		Trees
				33.5	10.0	n/a				1	3	4	75%	Shrubs	
Block 1	Tilled Topsoil	Shrub Mix	8/17/2021	82.8	33.2	n/a				4			4	75%	
Block 1	Tilled Topsoil	Community Mix	8/17/2021	-	-	-	-							75%	
Block 1	Fertilized Overburden	Aspen	8/17/2021	264.8	31.7	15.9	1.4	9				1	10	25%	
Block 1	Fertilized Overburden	Black spruce	8/17/2021	99.2	12.2	n/a		10					10	25%	
Block 1	Fertilized Overburden	Black ash	8/17/2021	222.6	43.7	13.1	2.5	10					10	25%	
Block 1	Fertilized Overburden	Eastern white cedar	8/17/2021	97.9	9.4	n/a			10				10	25%	
Block 1	Fertilized Overburden	White spruce	8/17/2021	68.0	6.2	n/a				3		7	10	25%	
Block 1	Fertilized Overburden	Jack pine	8/17/2021					Not planted						25%	
Block 1	Fertilized Overburden	Ground Cover Mix	8/17/2021	240.0	n/a	18.0	n/a			2			2		Trees
				62.0	37.5	n/a				4		4	25%	Shrubs	
Block 1	Fertilized Overburden	Shrub Mix	8/17/2021	94.1	30.1	n/a		4					4	25%	
Block 1	Fertilized Overburden	Community Mix	8/17/2021					2					2	0%	
Block 1	Control	Aspen	8/17/2021	229.6	30.1	15.3	1.2	9				1	10	25%	
Block 1	Control	Black spruce	8/17/2021	109.5	10.8	n/a		10					10		

Block	Soil Treatment	Vegetation Treatment	Date	Total height		DBH		Health Check					Total Count	Ground Cover	Comment
				Mean	+/- SD	Mean	+/- SD	H	H/S	S	S/D	D	(# trees or shrubs)	(%)	
				(mm)	(cm)	(mm)	(cm)								
Block 1	Control	Black ash	8/17/2021	208.2	8.5	12.0	0.8	10					10	25%	
Block 1	Control	Eastern white cedar	8/17/2021	98.1	6.2	n/a					10		10	25%	
Block 1	Control	White spruce	8/17/2021	65		n/a					1	9	10	25%	
Block 1	Control	Jack pine	8/17/2021					n/a						0%	
Block 1	Control	Ground Cover Mix	8/17/2021	280.0	n/a	19.0	n/a					2	2	25%	Trees
				67.8	37.5	n/a				4	4	25%	Shrubs		
Block 1	Control	Shrub Mix	8/17/2021	113.2	6.2	n/a		4					4	25%	
Block 1	Control	Community Mix	8/17/2021					3					3	0%	
Block 2	Thin Topsoil	Aspen	8/17/2021	243.7	24.8	14.6	0.9	6				4	10	75%	
Block 2	Thin Topsoil	Black spruce	8/17/2021	128.8	17.8	6.0	n/a	3	3			4	10	75%	
Block 2	Thin Topsoil	Black ash	8/17/2021	174.1	17.8	9.3	1.2	10					10	75%	
Block 2	Thin Topsoil	Eastern white cedar	8/17/2021	92.3	13.1	n/a				10			10	75%	
Block 2	Thin Topsoil	White spruce**	8/17/2021									10	10	75%	
Block 2	Thin Topsoil	Jack pine	8/17/2021					n/a						75%	
Block 2	Thin Topsoil	Ground Cover Mix	8/17/2021	240.0	n/a	15.0	n/a					2	2	75%	Trees
				60.6	35.0	n/a				4	4	75%	Shrubs		
Block 2	Thin Topsoil	Shrub Mix	8/17/2021	70.0		n/a					1	3	4	75%	
Block 2	Thin Topsoil	Community Mix	8/17/2021	-	-	-	-							75%	
Block 2	Tilled Topsoil	Aspen	8/17/2021	259.5	52.1	15.0	0.8	10					10	75%	
Block 2	Tilled Topsoil	Black spruce**	8/17/2021					3		6		1	10	75%	
Block 2	Tilled Topsoil	Black ash	8/17/2021	186.4	45.2	11.2	1.7		9			1	10	75%	
Block 2	Tilled Topsoil	Eastern white cedar	8/17/2021	102.8	10.3	n/a					10		10	75%	
Block 2	Tilled Topsoil	White spruce	8/17/2021									10	10	75%	
Block 2	Tilled Topsoil	Jack pine	8/17/2021					Not planted						75%	
Block 2	Tilled Topsoil	Ground Cover Mix	8/17/2021									2	2	75%	Trees
				49.3	30.9	n/a				4	4	75%	Shrubs		
Block 2	Tilled Topsoil	Shrub Mix	8/17/2021	62.8	29.5	n/a						4	4	75%	
Block 2	Tilled Topsoil	Community Mix	8/17/2021					3					3	75%	
Block 2	Fertilized Overburden	Aspen	8/18/2021	254.6	14.7	15.0	0	10					10	25%	
Block 2	Fertilized Overburden	Black spruce	8/18/2021	119.5	10.8	n/a		10					10	25%	
Block 2	Fertilized Overburden	Black ash	8/18/2021	222.2	22.5	13.2	3.8	10					10	25%	
Block 2	Fertilized Overburden	Eastern white cedar	8/18/2021	96.6	2.4	n/a		10					10	25%	
Block 2	Fertilized Overburden	White spruce	8/18/2021	61.6	2.4	n/a				10			10	25%	

Block	Soil Treatment	Vegetation Treatment	Date	Total height		DBH		Health Check					Total Count	Ground Cover	Comment	
				Mean	+/- SD	Mean	+/- SD	H	H/S	S	S/D	D	(# trees or shrubs)	(%)		
				(mm)	(cm)	(mm)	(cm)									
Block 2	Fertilized Overburden	Jack pine	8/18/2021	Not planted											0%	
Block 2	Fertilized Overburden	Ground Cover Mix	8/18/2021	225.0	n/a	12.0	n/a	2					2	25%	Trees	
				40.6	47.5	n/a		4					4		Shrubs	
Block 2	Fertilized Overburden	Shrub Mix	8/18/2021	132.7	13.1	n/a		4					4	25%		
Block 2	Fertilized Overburden	Community Mix	8/18/2021	-	-	-	-							0%		
Block 2	Control	Aspen	8/18/2021	265.2	27.2	15.3	1.2	10					10	25%		
Block 2	Control	Black spruce	8/18/2021	96.5	4.7	n/a		10					10	25%		
Block 2	Control	Black ash	8/18/2021	227.4	20.1	12.0	0.8	10					10	25%		
Block 2	Control	Eastern white cedar	8/18/2021	96.3	8.5	n/a		10					10	25%		
Block 2	Control	White spruce	8/18/2021	60.0	12.1	n/a		3	3		4		10	25%		
Block 2	Control	Jack pine	8/18/2021	Not planted											0%	
Block 2	Control	Ground Cover Mix	8/18/2021	235.0	n/a	17.0	n/a				2		2	25%	Tree	
				60.0	17.5	n/a					4		4		Shrubs	
Block 2	Control	Shrub Mix	8/18/2021	116.3	8.5	n/a		4					4	25%		
Block 2	Control	Community Mix	8/18/2021	-	-	-	-							0%		
Block 3	Thin Topsoil	Aspen	8/18/2021	278.8	25.5	16.0	0.8	5	3		2		11	75%		
Block 3	Thin Topsoil	Black spruce**	8/18/2021								10		10	75%	Planted in white spruce design plot	
Block 3	Thin Topsoil	Black ash	8/18/2021	243.2	8.5	12.0	0.8			9		1	10	75%		
Block 3	Thin Topsoil	Eastern white cedar	8/18/2021	89.4	10.8	n/a					11		11	75%		
Block 3	Thin Topsoil	White spruce	8/18/2021	91.4	18.4	n/a		1	2		7		10	75%		
Block 3	Thin Topsoil	Jack pine	8/18/2021	Not planted											75%	
Block 3	Thin Topsoil	Ground Cover Mix	8/18/2021	225.0	n/a	14.0	n/a			2			2	75%	Tree	
				71.4	12.5	n/a				4			4		Shrubs	
Block 3	Thin Topsoil	Shrub Mix	8/18/2021	87.5	2.5	n/a				2			2	75%		
Block 3	Thin Topsoil	Community Mix	8/18/2021					3					3	75%		
Block 3	Tilled Topsoil	Aspen	8/18/2021	279.6	14.7	15.7	0.5	10					10	75%		
Block 3	Tilled Topsoil	Black spruce	8/18/2021	110.0		n/a				1		9	10	75%		
Block 3	Tilled Topsoil	Black ash	8/18/2021	203.7	22.7	11.8	2.2	4		6			10	75%		
Block 3	Tilled Topsoil	Eastern white cedar	8/18/2021	117.9	9.4	n/a				10			10	75%		
Block 3	Tilled Topsoil	White spruce**	8/18/2021									10	10	75%		
Block 3	Tilled Topsoil	Jack pine	8/18/2021	Not planted											75%	
Block 3	Tilled Topsoil	Ground Cover Mix	8/18/2021	220.0	n/a	15.0	n/a			1		1	2	75%	Trees	
				29.6	5.0	n/a				2		2	4		Shrubs	
Block 3	Tilled Topsoil	Shrub Mix	8/18/2021	47.6	42.4	n/a				3		1	4	75%		

Block	Soil Treatment	Vegetation Treatment	Date	Total height		DBH		Health Check					Total Count	Ground Cover	Comment	
				Mean	+/- SD	Mean	+/- SD	H	H/S	S	S/D	D	(# trees or shrubs)	(%)		
				(mm)	(cm)	(mm)	(cm)									
Block 3	Tilled Topsoil	Community Mix	8/18/2021	-	-	-	-	3						3	75%	
Block 3	Fertilized Overburden	Aspen	8/18/2021	231.1	15.5	14.7	0.5	10						11	25%	
Block 3	Fertilized Overburden	Black spruce	8/18/2021					9	1					10	25%	
Block 3	Fertilized Overburden	Black ash	8/18/2021	214.7	10.8	9.0	0.8	10						10	25%	
Block 3	Fertilized Overburden	Eastern white cedar	8/18/2021	86.5	4.7	n/a				1			9	11	25%	
Block 3	Fertilized Overburden	White spruce	8/18/2021	90.0		n/a				1			9	10	25%	
Block 3	Fertilized Overburden	Jack pine	8/18/2021					Not planted						0%		
Block 3	Fertilized Overburden	Ground Cover Mix	8/18/2021	235.0	n/a	12.0	n/a			2				2	25%	Trees
				63.2	30.0		n/a			4				4		Shrubs
Block 3	Fertilized Overburden	Shrub Mix	8/18/2021	89.6	24.9	n/a		1		2		1		4	25%	
Block 3	Fertilized Overburden	Community Mix	8/18/2021					3						3	0%	
Block 3	Control	Aspen	8/18/2021	220.5	34.2	14.9	1.4	10						10	25%	
Block 3	Control	Black spruce	8/18/2021	107.1	16.5	n/a		10						10	25%	
Block 3	Control	Black ash	8/18/2021	199.7	27.2	9.2	3.1	9		1				10	25%	
Block 3	Control	Eastern white cedar	8/18/2021	75.9	37.9	n/a					11			11	25%	
Block 3	Control	White spruce	8/18/2021	58.9	10.8	n/a				3		7		10	25%	
Block 3	Control	Jack pine	8/18/2021					Not planted						0%		
Block 3	Control	Ground Cover Mix	8/18/2021	235.0	n/a	12.0	n/a			2				2	25%	Trees
				44.2	17.5		n/a			4				4		Shrubs
Block 3	Control	Shrub Mix	8/18/2021	81.7	16.5	n/a		1		3				4	25%	
Block 3	Control	Community Mix	8/18/2021					3						3	0%	

*Only one tree tall enough for DBH, no SD given

** Dead species were not measured