TRI-STATE

February 14, 2024

Mr. Clayton Wein
Environmental Protection Specialist
Colorado Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, CO 80203

RE: New Horizon North Mine
Permit No. C-2010-089
2023 Annual Reclamation Report

Dear Mr. Wein,

Tri-State Generation and Transmission Association, Inc. (Tri-State), is the parent company to Elk Ridge Mining and Reclamation, LLC New Horizon North Mine. The New Horizon North Mine operates under the Colorado Division of Reclamation, Mining, and Safety Permit No. C-2010-089.

In accordance with Rule 2.04.13(1), by February 15, or other such date as agreed on, each permittee shall file an annual reclamation report covering the previous calendar years for all areas under bond. New Horizon North Mine by permit is required to submit the report annually by March 15. Therefore, enclosed please find the Annual Reclamation Report for the calendar year 2023 as required.

If you should have any additional questions or concerns, please feel free to contact Tony Tennyson at (970) 824-1232 at your convenience.

Sincerely,

DocuSigned by:
Chris Gilbreath
4BE980BE59E442F...

Chris Gilbreath
Senior Manager
Remediation and Reclamation

CG:TT

Enclosure

Cc: Tony Tennyson (via email)
C.F. 11.1 - G474-11.3(21)c-9

P.O. BOX 33695
DENVER, CO 80233-0695
303-452-6111
WWW.TRISTATE.COOP

Elk Ridge Mining & Reclamation, LLC

PERMIT C-2010-089

NEW HORIZON NORTH MINE

2023 ANNUAL RECLAMATION REPORT

JANUARY 1, 2023 to DECEMBER 31, 2023

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A. Rule Requirements

Rule 2.04.13(1)(a-f) states, by February 15, or such date agreed on, each permitted shall file an annual reclamation report covering the previous calendar year for all areas under bond. The report shall include, but are not limited to, text, discussion and maps which address:

- the name and address of the permittee and permit number
- location and number of acres disturbed during that year
- location and number of acres backfilled and graded during that year
- location and number of acres topsoiled during that year
- the species, location and number of acres of vegetation planted during that year, including any augmented seeding or cultural practices
- location, number of acres and date of planting for all previously revegetated areas

Per Section 2.04.13 of Permit No. C-2010-089 the New Horizon North Mine submits the annual reclamation report annually by March 15. Additional requirements for contents of this annual reclamation report can be found in Section 2.05.4(2)(d), Section 2.05.4(2)(e), and Section 2.05.6(2).

B. Permittee

Elk Ridge Mining and Reclamation, LLC
New Horizon North Mine
Permit No. C-2010-089
PO Box 628
Nucla, CO 81424

C. Disturbed Areas

During 2023, 0.0 acres of new disturbance occurred at the New Horizon North Mine.

At the end of 2023, the total disturbance was 157.1 acres. Of this, 0.0 acres are in long-term mining, reclamation, or facilities. All of the active mining areas have been backfilled, graded, and topsoiled. Therefore, there are no active mining areas exist at the New Horizon North Mine.

D. Backfill and Grading

During 2023, 34.0 acres were backfilled and graded.

E. Reclamation Activities

1. Spoil Quality

The spoil sampling and analysis program for the New Horizon North Mine is described in Section 2.05.4(2)(d), Table 2.05.4(2)(d)-1 of the approved permit. All areas for spoil quality (Bench 1) have been sampled for the entire mine site. Please see previous annual reclamation reports for the results of the analyses.

2. Topsoil

During 2022, 34.0 acres were topsoiled. Table 1 provides the overall stockpile volumes for the mine.

3. Seeding

The New Horizon North Mine permanently seeded 34.0 acres in 2023. Please see Table 2 for specific details on each reclamation unit, and Map 1 for the reclamation areas seeded to date.

4. Soil Fertility Testing and Fertilizer Application

The landowner conducted soil testing in 2023. The results of the test are presented in Attachment 1.

The landowner ordered and fertilized reclamation unit NHN-04 in 2023. Documentation of the fertilizer used by the surface landowner is presented in Attachment 2.

5. Irrigation

The CCC Ditch Company commenced water deliveries on April 27, 2023, and New Horizon North Mine began irrigation operations shortly thereafter. The CCC Ditch Company discontinued water delivery for the year on October 22, 2023.

6. Irrigated Pasture Yields

In 2023, the first cutting from reclamation unit NHN-04 yielded 197 tons, the second cutting produced 136 tons, and the third cutting produced 90 tons.

F. Wildlife Monitoring and Mitigation

No wildlife monitoring nor mitigation occurred in 2023.

G. Interim Revegetation Report

Interim vegetation monitoring occurred on reclamation unit NHN-05, and a report with the interim monitoring results is presented in Attachment 3.

H. Weed Management

During 2023, various areas within the permit boundary were treated for noxious weeds by spot spraying and/or hand removal. The actual treatment sites were generally small and random and thus too small to accurately depict on a map.

Target species for noxious weeds included Knapweed(s), Thistle(s), White Top, Russian-olive, saltceder/tamarisk, burdock, mullein, halogeton, purple loosestrife, and Western whorled milkweed. Other target species are included in the Montrose County (2010) and San Miguel County (2002) Noxious Weed lists.

Table 1 – Stockpile Volumes at the End of Report Year

Stockpile Type	Volume (Cubic Yards)
Topsoil Pile 3 - Progresso	16,580

Table 2 – New Horizon North Reclamation Table

New Horizon North Reclamation Table							
Area	Reclamation Period		Status				
	Year	Acreage	Revegetated Years	Bond Release			Notes:
				Phase 1	Phase 2	Phase 3	
NHN-01	2017	3.7	7	2017	2022	2022	3.7 acres planted to Dryland Pasture
NHN-02	2017	2.7	7	2017	2022		2.7 Acres planted to Dryland Pasture
NHN-03	2018	20.6	6	2017	2022		20.6 Acres planted to Dryland Pasture
NHN-04	2019	88.3	5	2017	2022		88.3 Acres planted to Irrigated Pasture
NHN-05	2019	4.9	5	2017	2022		4.9 Acres planted to Dryland Pasture
NHN-06	2020	0.6	4				0.6 Acres planted to Dryland Pasture
NHN-07	2023	34.0	1				34.0 Acres planted to Dryland Pasture - Reclaimed Sediment Control Structures
Total		**154.8**					

Figure 1 - CDRMS Annual Reclamation Report Form

Colorado Division of Reclamation, Mining and Safety

Annual Reclamation Report for Calendar Year – 2023

New Horizon North Mine	C-2010-089	Elk Ridge Mining & Reclamation, LLC.
Mine Name	Permit Number	Permittee

P.O Box 628 – 27646 W. 5th Street Nucla, CO 81424

Address

This report, required by Rule 2.04.13, is due by February 15 of each year, or other date, as agreed upon by the Division. It should include text, discussion, and maps, at a minimum, in addition to any other reclamation monitoring data as required by the approved permit. The location of the acreage reported under each land status category and year of seeding (if applicable) should be clearly identified on a map included with the report.

Land Category	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Acreage in Active Mining Areas[1]	0	0	0	=	0

Land Category	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Acres Disturbed[2]	157.1	0	0	=	157.1
Acres Backfilled and Graded	83.0	34.0	0	=	117.0
Acres Topsoiled	120.8	34.0	0	=	154.8

Acreage in Long-term Facilities[3]	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Non-Permanent Facilities	36.3	0	36.3	=	0
Permanent Facilities (permitted)	0	0	0	=	0
Totals	36.3			=	0

Acres Seeded (permanent)	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
9 Years and Less	120.8	34.0	0	=	154.8
10 Years and Greater	0	0	0	=	0
Totals	120.8			=	154.8

Bond Release	Last Year's Cumulative Total (from last year's ARR)	This Calendar Year			Cumulative Total
		Acres Added (+)	Acres Subtracted (-)		
Phase I Released	120.2	0	0	=	120.2
Phase II Released	118.6	0	0	=	118.6

Phase III Released	3.7	0	0	=	3.7

[1]Includes pits, topsoil stripped areas in advance of pits, and spoil not backfilled and graded
[2]Surface Mine Acres Disturbed = B&G + Long-Term Facilities + Active Mining Areas; Underground Mine Acres Disturbed = B&G + Long-Term Facilities; Separately-permitted Loadouts = B&G + Long-Term Facilities
[3]Includes haul, access and light-use roads, temporary dams and impoundments; permanent dams and impoundments; diversion and collector ditches, water and air monitoring sites; topsoil stockpiles; overburden stockpiles; repair, storage and construction areas; office area, repair shops, and parking; coal stockpiles, loading, and processing areas; railroads; coal conveyors; refuse piles and coal mine waste impoundments; head-of-hollow fills; valley fills; ventilation shafts and entryways; and non-coal waste disposal area (garbage dumps and coal combustion by-products disposal areas).

Attachment 1

Soil Testing Report

SOIL ANALYSIS REPORT 2023

CLIENT:	FRUITA CONSUMERS COOP NUCLA COOP COUNTRY STORE 595 MAIN STREET PO BOX 399 NUCLA, CO 81424
18393	

servi tech
www.servitech.com

1602 Park West Dr.
PO Box 169
Hastings, NE 68902
800.557.7509
402.463.3522
Fax 402.463.8732

LAB NO:	98035
INVOICE NO:	600657
DATE RECEIVED:	04/10/2023
DATE REPORTED:	04/12/2023

SOIL ANALYSIS RESULTS FOR: DUSTIN GARVEY **FIELD IDENTIFICATION:** COAL MINE PIVOT

METHOD USED:

Lab Number	Sample ID	Sample Depth	Soil pH	Buffer pH		Excess Lime	% Organic Matter	Cd Reduction Nitrate Nitrogen ppm	Cd Reduction Nitrate Nitrogen lb. N/A	Mehlich 3 Phosphorus ppm P	Potassium ppm K			Mehlich 3 CP Calcium ppm Ca	Magnesium ppm Mg	Sodium ppm Na	Zinc ppm Zn	Iron ppm Fe	Manganese ppm Mn	Copper ppm Cu	DTPA Sorbitol Boron ppm B
98035	COALMINE PVT	0 - 8						9.8	24	14				20300							0.62

METHOD USED:

Lab Number	Sample ID	Sample Depth	Date Sampled	Hg Thiocyanate Chloride ppm	Hg Thiocyanate Chloride lb. N/A	KCl Extr Ammonium Nitrogen ppm	KCl Extr Ammonium Nitrogen lb. N/A	Bicarb P Phosphorus ppm P	KCl Extr Aluminum ppm Al	c-Bray P1 Bray Phosphorus ppm P	c-Bray P2 Phosphorus ppm P										
98035	COALMINE PVT	0 - 8	04/01/23	<1	2.4	3	7	4	<1	12	40										

FERTILIZER RECOMMENDATIONS: POUNDS ACTUAL NUTRIENT PER ACRE

Lab Number	Sample ID	Crop To Be Grown	Yield Goal	Lime, ECC Tons/A to raise pH to: 6.0	6.5	7.0	N	P2O5	K2O	Zn	B	Mn	Cu	MgO	B	Ca	Cl
98035	COALMINE PVT	ALFALFA	2 tons					55							0	0	

Cation Exchange Capacity

CEC	%H	%K	%Ca	%Mg	%Na

SPECIAL COMMENTS AND SUGGESTIONS:

Lab Number(s): 98035
PHOSPHORUS: The Mehlich-3 phosphorus value was used to calculate the phosphate fertilizer recommendation.

Lab Number(s): 98035
PHOSPHORUS: The c-Bray-P1 equivalent was calculated from the Mehlich-3 phosphorus concentrations.

Lab Number(s): 98035
PHOSPHORUS: The c-Bray-P2 equivalent was calculated from the Mehlich-3 phosphorus and calcium concentrations using the Louisiana NRCS correlation.

106 x 88 = 9328 lbs - 11-52-0

55 ÷ .52 = 106 lbs per Acre

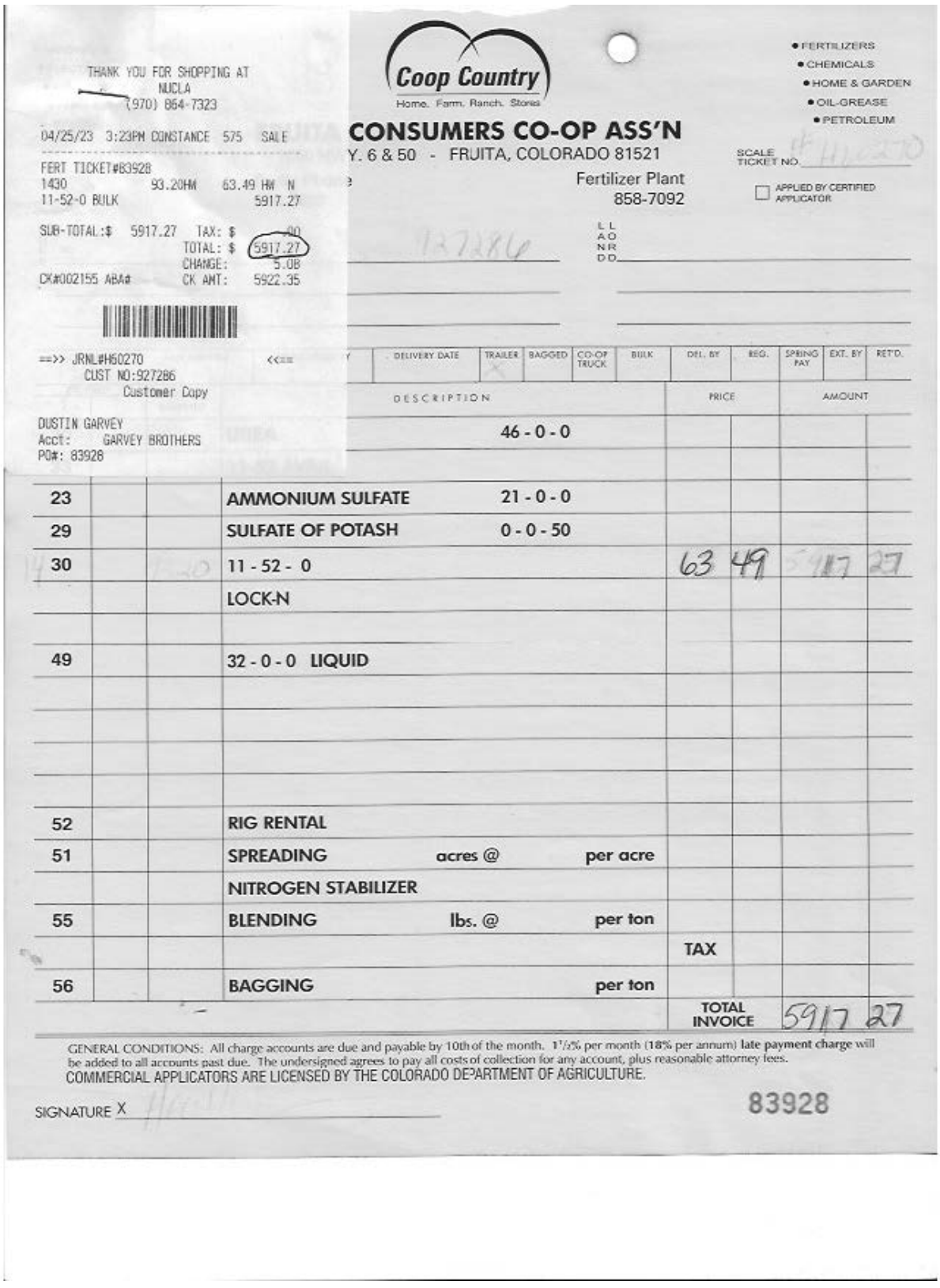
Analyses are representative of the samples submitted. Samples are retained 30 days after report of analysis. Explanations of soil analysis terms are available upon request.

Reviewed and Approved By: Hans Burken, Lab Manager

Page 1 of 1
04/12/2023 4:15 pm

Attachment 2

Fertilizer



THANK YOU FOR SHOPPING AT
NUCLA
(970) 864-7323

04/25/23 3:23PM CONSTANCE 575 SALE

FERT TICKET#83928
1430 93.20HM 63.49 HW N
11-52-0 BULK 5917.27

SUB-TOTAL:$ 5917.27 TAX: $ .00
TOTAL: $ 5917.27
CHANGE: 5.08
CK#002155 ABA# CK AMT: 5922.35

==>> JRNL#H50270 <<
CUST NO:927286
Customer Copy

DUSTIN GARVEY
Acct: GARVEY BROTHERS
PO#: 83928

Coop Country
Home. Farm. Ranch. Store

- FERTILIZERS
- CHEMICALS
- HOME & GARDEN
- OIL-GREASE
- PETROLEUM

CONSUMERS CO-OP ASS'N
Y. 6 & 50 - FRUITA, COLORADO 81521
Fertilizer Plant
858-7092

SCALE TICKET NO. 83928

☐ APPLIED BY CERTIFIED APPLICATOR

LL
AO
NR
DO

			DESCRIPTION			PRICE		AMOUNT	
				46 - 0 - 0					
23			AMMONIUM SULFATE	21 - 0 - 0					
29			SULFATE OF POTASH	0 - 0 - 50					
30			11 - 52 - 0			63	49	5917	27
			LOCK-N						
49			32 - 0 - 0 LIQUID						
52			RIG RENTAL						
51			SPREADING	acres @	per acre				
			NITROGEN STABILIZER						
55			BLENDING	lbs. @	per ton				
						TAX			
56			BAGGING		per ton				
						TOTAL INVOICE		5917	27

GENERAL CONDITIONS: All charge accounts are due and payable by 10th of the month. 1½% per month (18% per annum) late payment charge will be added to all accounts past due. The undersigned agrees to pay all costs of collection for any account, plus reasonable attorney fees.
COMMERCIAL APPLICATORS ARE LICENSED BY THE COLORADO DEPARTMENT OF AGRICULTURE.

SIGNATURE X

83928

Attachment 3

Interim Revegetation Monitoring Report

New Horizon North Mine

Permit No. C-2010-089

2023 Revegetation Monitoring Report

February, 2024

CEDAR CREEK ASSOCIATES, INC.

Table of Contents

New Horizon North Mine
Permit: C-2010-089

2023 INTERIM REVEGETATION EVALUATION

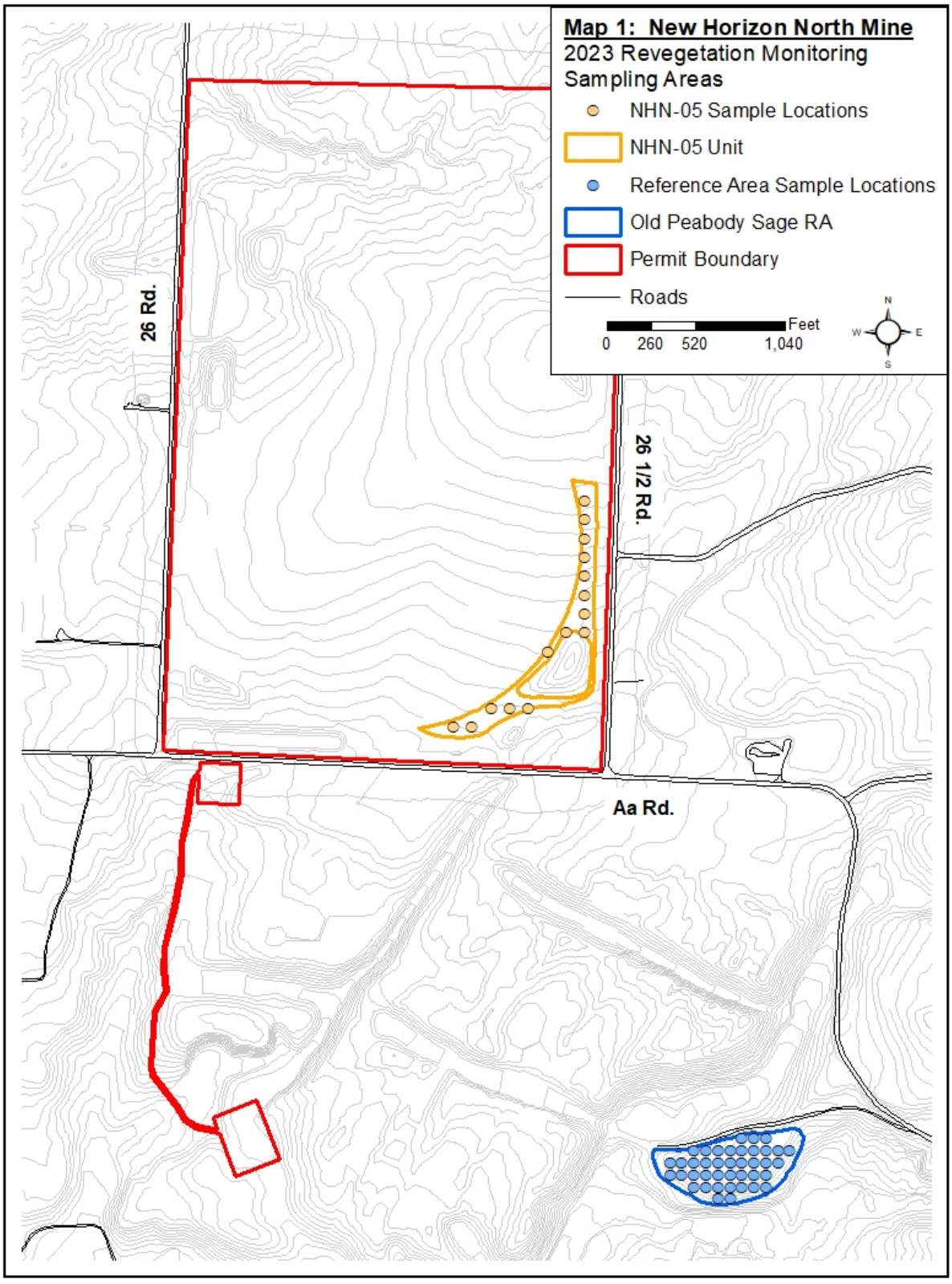
1.0 INTRODUCTION

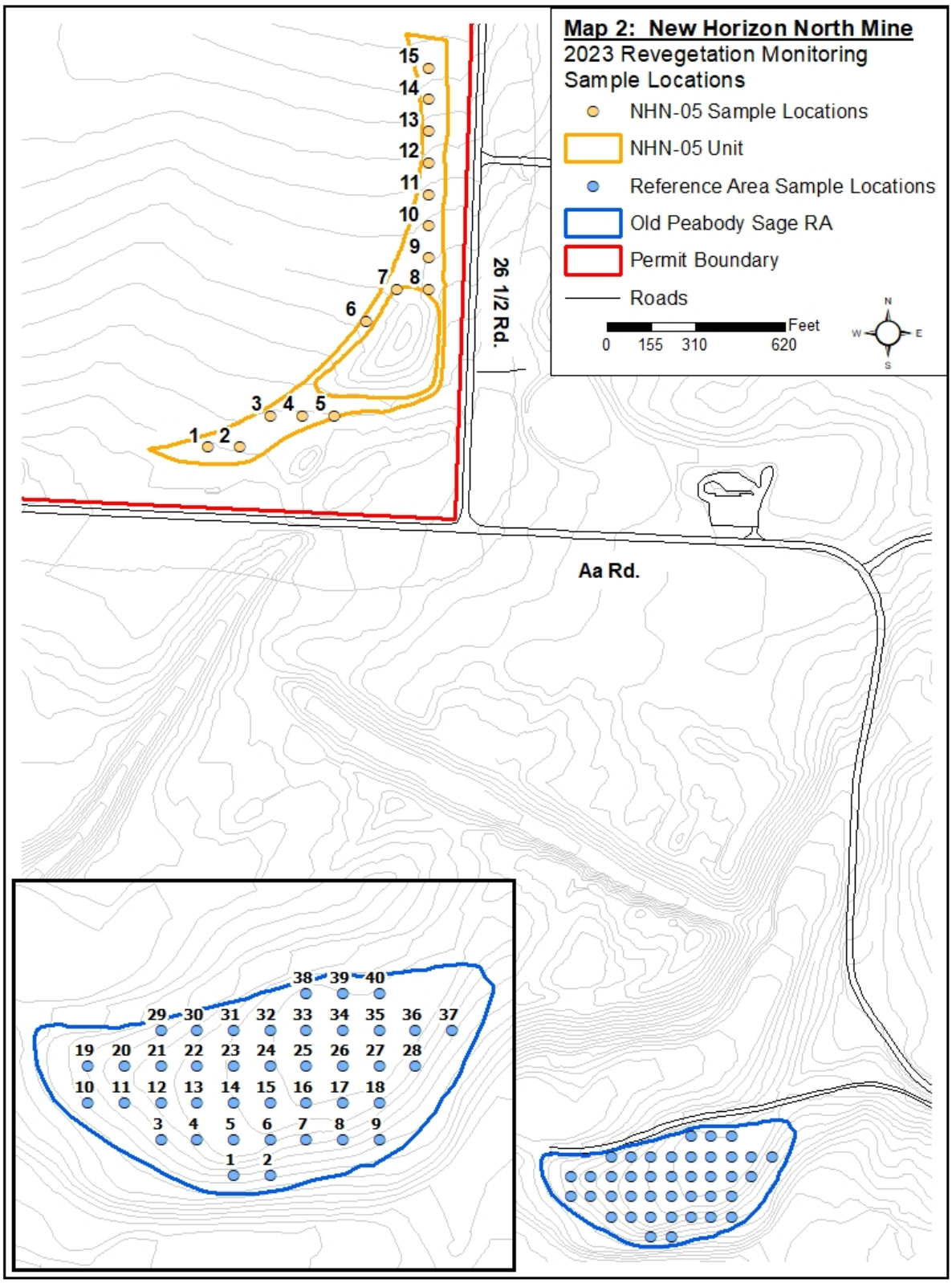
Cedar Creek Associates, Inc. (Cedar Creek) was contracted in 2023 by the New Horizon North Mine (NHN) to conduct interim vegetation monitoring within selected reclamation units. Monitoring was conducted in one reclamation unit (NHN-05, 4.9ac.) for annual compliance and to assess the performance of the revegetation unit as it pertains to bond release standards. At the time of sampling, revegetation within the evaluated unit had experienced 4 growing seasons following completion of seeding in 2019. In general, revegetation is classified into two types of post mining land use at New Horizon North; Irrigated Pasture and Dryland Pasture. Reclamation in NHN-05 has the post mining land use of Dryland Pasture (Section 2.05.4(2)(e), Section 3.0 of permit C-2010-089). As stated in the permit, interim monitoring will occur any year before the fifth growing season at NHN for irrigated pastureland and dryland pasture (Section 6.0 of Permit). It is anticipated that bond release evaluations will occur in years 9 and 10.

Field sampling for the directly measurable variables of ground cover and production were conducted in the NHN-05 Unit and the associated Old Peabody Sage Reference Area (Reference Area). Field efforts occurred on June 1, 2023, and were conducted under the direct supervision of Cedar Creek's Senior Reclamation Ecologist and Soil Specialist, Mr. Jesse H. Dillon. Monitoring areas and sample sizes are provided in Table W. Sample Areas and locations are shown on Maps 1 and 2. Data collection was performed in accordance with Permit Section 2.05.4(2)(e) and Colorado Division of Minerals and Geology's Regulations of the Colorado Mined Land Reclamation Board for Coal Mining (Section 4.15). Methodologies used for the revegetation evaluation are presented in Appendix B, with Raw Data presented in Appendix A, and representative field photos in Appendix C.

Table W. New Horizon North Workload - 2023

Revegetation Monitoring				
	Growing Seasons	Acres	Cover	Production
NHN-05 Dryland Pasture	4	4.9	15	15
Old Peabody Sage Reference Area	-	-	20	40
Total Monitoring		**4.9**	**35**	**55**


Map 1: New Horizon North Mine
2023 Revegetation Monitoring
Sampling Areas
NHN-05 Sample Locations
NHN-05 Unit
Reference Area Sample Locations
Old Peabody Sage RA
Permit Boundary
Roads
Feet
0 260 520 1,040
N
W
E
S
26 Rd.
26 1/2 Rd.
Aa Rd.


Map 2: New Horizon North Mine
2023 Revegetation Monitoring
Sample Locations
NHN-05 Sample Locations
NHN-05 Unit
Reference Area Sample Locations
Old Peabody Sage RA
Permit Boundary
Roads
Feet
0 155 310 620
N
W
E
S
26 1/2 Rd.
Aa Rd.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

1.1 Climate Data

Precipitation data was historically collected from the NOAA station in Uravan, CO, 10.5 miles to the northwest of the mine (2005-2015). In 2016, data was unavailable at the Uravan site, prompting a weather data transformation from a station in Gateway, Colorado (2016-2017). Data from the Gateway station was no longer available in 2018, prompting a second data transformation from a station in Paradox, Colorado, 10 miles west of the Uravan station (2018-present). The data transformation utilized a conversion factor derived from a ratio of monthly average precipitation between the two sites for years 2006 to 2015. Due to the spatial variability of precipitation and the inherent flaws associated with measurements of precipitation at specific locations, the transformed data can be utilized in the manner all weather data should be viewed, as an indicator of general trends. The most recent year's data (2011 to present) are provided on Table P and Charts P1 and P2 and are compared to a 18-year long term average (2005-2023).

Precipitation for the 2022-2023 growing season (June 2022 through May 2023) was determined to be 173% of average when compared to the 18-year average (21.73 in. vs. 12.54 in.). Perusal of Chart P2 indicates that 2022 summer precipitation was above average with 6.10 inches – 183% of the 18-year average for the same period. The following seasons, autumn of 2022 and winter of 2023, were also above average with 6.81 and 5.79 inches, respectively (189% and 202% of average, respectively). Finally, in spring of 2023, the most important season for vegetative growth, the precipitation was 3.02 inches (111% of average). For revegetation communities relying on precipitation (Dryland Pasture), the 2022/2023 precipitation would yield above average vegetation production and vigor. However, the remaining post-mining vegetation community (Irrigated Pasture) is impacted less by local precipitation as it receives irrigation.

Table P - Annual Precipitation at Uravan, CO, 2011-2023

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	0.18	0.28	0.52	1.21	1.06	0.33	2.10	0.96	1.06	1.34	0.58	1.14	**10.77**
2012	0.86	1.27	0.29	0.09	0.66	0.00	1.09	0.65	1.09	0.19	0.35	0.85	**7.39**
2013	1.47	0.28	0.35	0.33	0.60	0.00	2.96	1.91	3.69	1.59	1.47	0.38	**15.05**
2014	0.14	0.75	0.82	1.07	1.23	0.01	1.27	2.88	1.70	0.32	0.52	0.83	**11.55**
2015	1.09	0.54	0.76	1.29	2.52	1.74	0.92	1.08	0.59	2.64	1.83	1.33	**16.33**
2016*	0.58	1.26	0.72	1.11	2.72	0.34	0.94	1.43	0.90	0.26	1.17	0.72	**12.15**
2017*	1.49	0.73	0.62	0.19	0.66	0.28	0.96	0.73	1.14	0.09	0.24	-	**7.13**
2018†	0.33	0.80	0.33	0.25	0.23	0.16	0.91	0.77	0.15	4.52	0.48	1.31	**10.24**
2019†	0.76	2.48	1.79	2.32	4.21	0.80	1.59	0.20	0.59	0.00	0.00	0.00	**14.74**
2020†	0.41	0.22	0.76	0.48	0.36	0.76	0.71	0.44	1.26	0.16	1.17	0.47	**7.19**
2021†	0.53	0.62	0.58	0.65	1.03	0.81	2.43	2.05	2.28	1.69	0.30	2.89	**15.87**
2022†	0.15	0.32	0.64	0.40	0.17	1.15	1.16	3.79	2.37	3.52	0.91	3.19	**17.77**
2023†	1.92	0.69	2.19	0.44	0.40	0.54	0.07	3.33	2.40	0.51	1.12	1.00	**14.61**
2005-2023 Avg.	**0.80**	**0.87**	**0.93**	**0.75**	**1.06**	**0.63**	**1.17**	**1.57**	**1.54**	**1.38**	**0.71**	**1.29**	**12.71**

Chart P1
Seasonal Precipitation (June - May) at Uravan, CO, 2010-2023

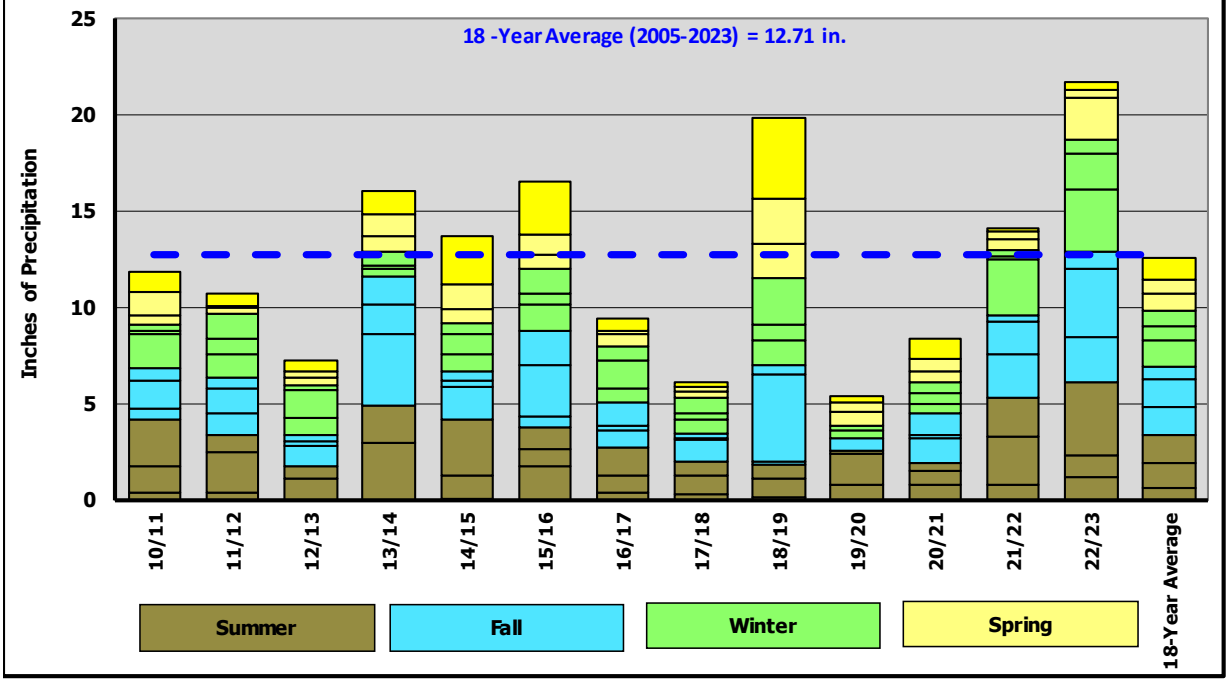
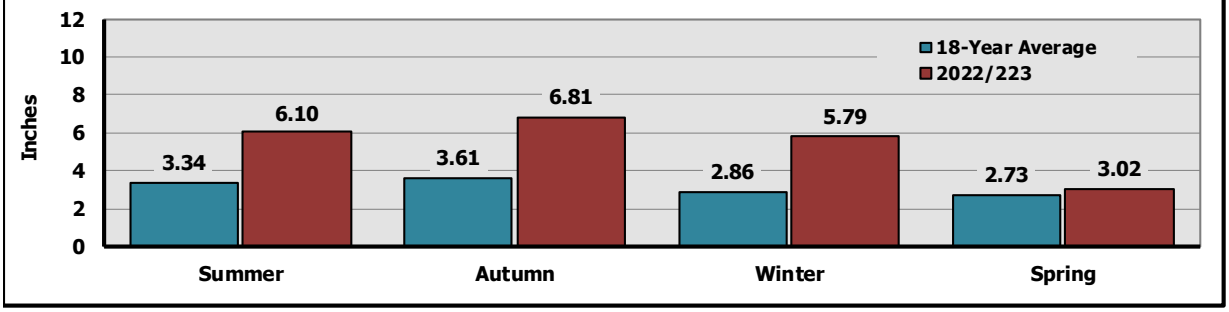


Chart P2 - Seasonal Precipitation at Uravan, CO
2022/2023 vs. 18-Year Average



*2016 and 2017 data derived from Gateway, CO weather data transformation

†2018 to present data derived from Paradox, CO weather data transformation

2.0 REVEGETATION SUCCESS STANDARDS

According to New Horizon's North permit, reclamation success will be assessed against each of the post-mining vegetation/land use types separately. Measured performance standards differ for each post-mining vegetation/land use type. A summary of the permit requirements for the post-mining land use of Dryland Pasture is presented below [full explanation can be found in permit section 2.05.4 (2) (e)].

Dryland Pasture:

1. Ground Cover - Revegetation will be deemed adequate if vegetation cover at the reclaimed site is at least **90%** of the vegetative cover at the reference area (exclusive of noxious weeds). [2.05.4 (2) (e) Section 4.2]
2. Herbaceous Production - Revegetation will be deemed adequate if herbaceous production at the reclaimed site is at least 90% of the herbaceous production at the reference area (exclusive of noxious weeds). [2.05.4 (2) (e) Section 4.2]
3. Forage Quality - At least **75%** of the relative production will be comprised of seeded species or species of comparable quality as livestock forage (exclusive of annuals, biennials, and noxious weeds). [2.05.4 (2) (e) Section 4.2]

3.0 RESULTS

3.1 Dryland Pasture

Revegetation monitoring for Dryland Pasture consisted of the NHN-05 unit (4.9 ac.) and the Old Peabody Sage Reference Area to provide a performance comparison. In 2023, the NHN-05 Unit has existed for four years.

3.1.1 NHN-05 Unit (Year 4)

A total of 11 species were encountered within the NHN-05 Unit in 2023. Species consisted of 3 grass taxa, 6 forb taxa, and 2 shrub taxa (Table 1). Ground cover consisted of 65.9% live vegetation, 0.7% rock, 4.2% litter, and bare ground exposure of 29.2% (Chart 1 and Table 1). Perennial cover across the unit averaged 52.8% (80.2% relative cover), with annual and biennial cover averaging 12.8% absolute cover (19.4% relative cover). Noxious weed cover averaged 0.3% (0.4% relative cover). Dominant taxa were winterfat (*Krascheninnikovia lanata*), alfalfa (*Medicago sativa*), crested wheatgrass (*Agropyron cristatum*), and redstem stork's bill (*Erodium cicutarium*) with 22.3%, 15.1%, 14.5%, and 10.3%, respectively.

Total production within the NHN-05 Unit averaged 1,036.1 pounds per acre in 2023. Most of which were comprised desirable species. Perennial grasses contributed 320.9 pounds per acre and perennial forbs contributed 276.2 pounds per acre. Sub-shrubs also contributed a significant amount to total production, with 417.2 pounds per acre. Given the large contribution from sub-shrubs, relative production of desirables (57.6%) falls below the Forage Quality criteria of 75% relative production (Tables 2 and 3 and Chart 3).

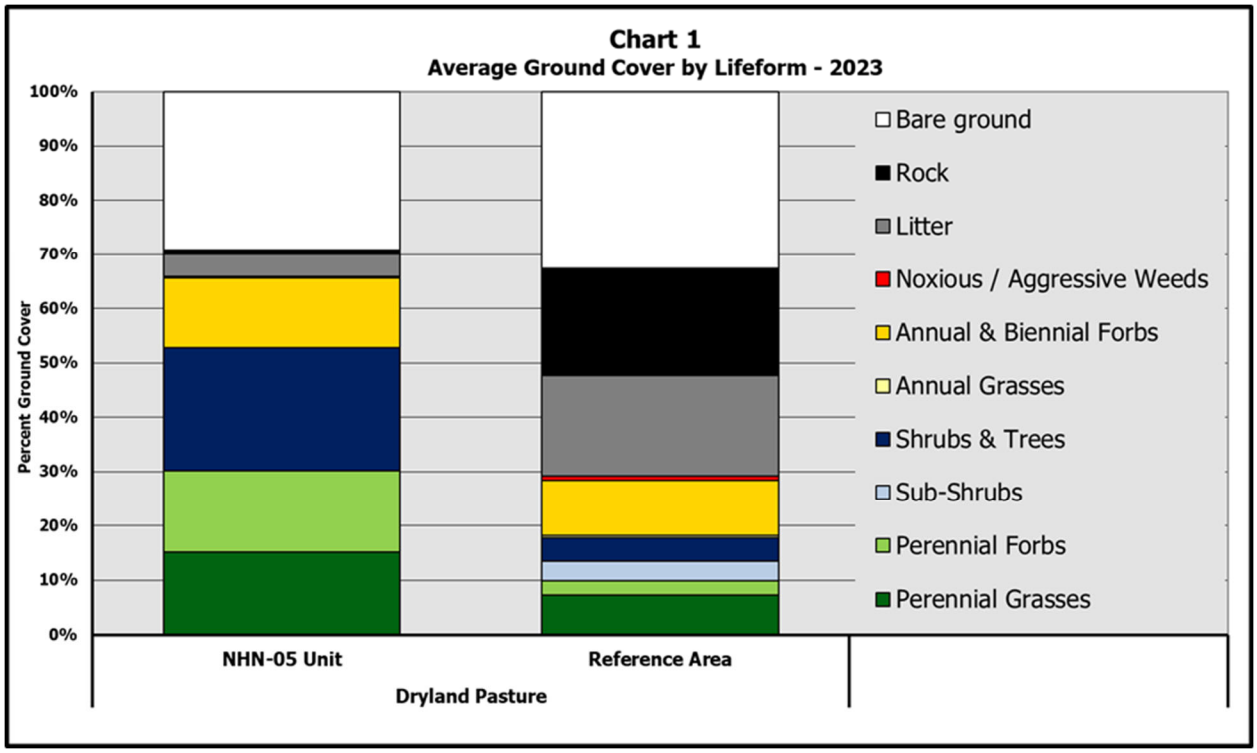
3.1.2 Old Peabody Sage Reference Aera

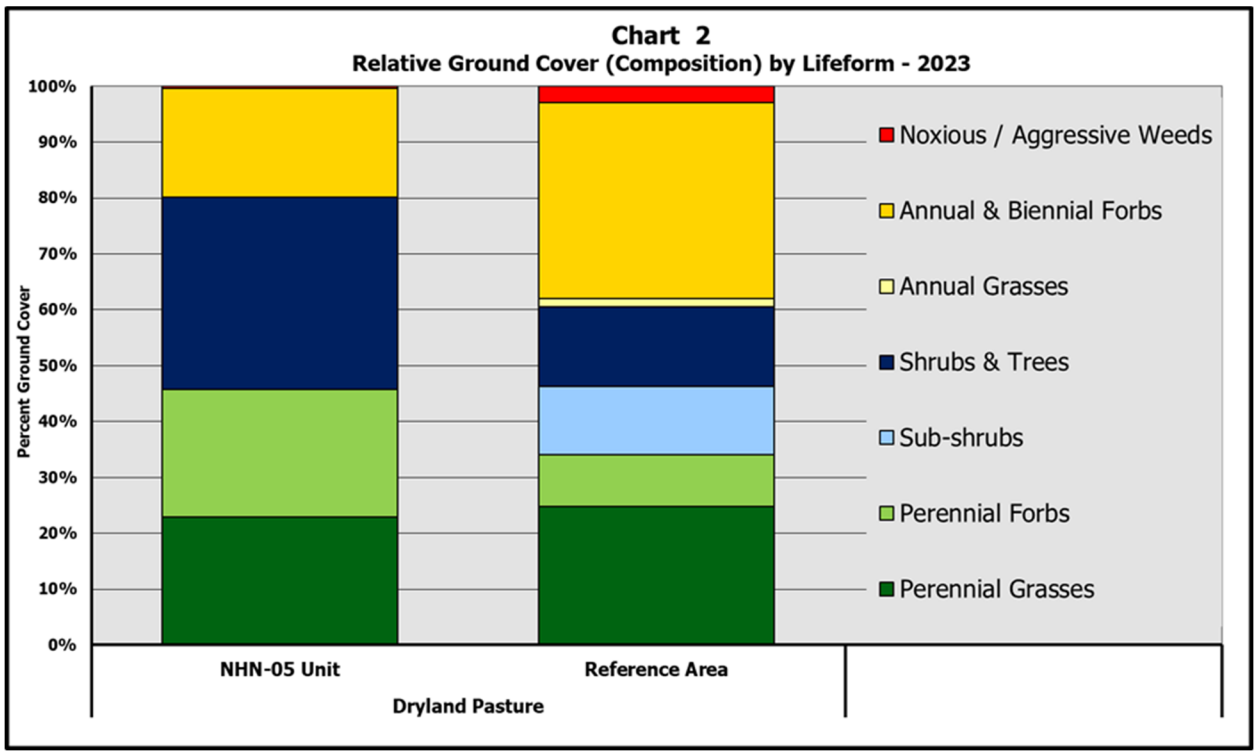
A total of 33 species were encountered within the Reference Area in 2023. Species consisted of 7 grass taxa, 20 forb taxa, 1 sub-shrub taxa, 5 shrub taxa, and 1 non-vascular taxa (Table 1). Ground cover consisted of 29.6% live vegetation, 19.8% rock, 18.3% litter, and bare ground exposure of 32.4% (Chart 1 and Table 1). Perennial cover across the unit averaged 17.6% (59.6% relative cover), with annual and biennial cover averaging 10.7% absolute cover (30.0% relative cover). Noxious weed cover averaged 0.9% (2.9% relative cover). Dominant taxa were redstem stork's bill, James' Galleta (*Hilaria jamesii*), broom snakeweed (*Gutierrezia sarothrae*), big sagebrush (*Artemisia tridentata*), and needle and thread (*Hesperostipa comata*) with 4.8%, 3.9%, 3.6%, 2.4%, and 2.0%, respectively.

Total production within the Reference Area averaged 338.7 pounds per acre in 2023. Most of which were comprised of desirable species. Perennial grasses contributed 129.7 pounds per acre and perennial forbs contributed 59.6 pounds per acre. Sub-shrubs also contributed similar amounts with 102.1 pounds per acre. Annual production contributed 45.5 pounds per acre (Table 2 and Chart 3).

Table 1 New Horizon North - Vegetation Cover - 2023				
Reclamation Monitorring Average Cover Summary				
		Post-Mining Vegetation/Land Use Type -->	**Dryland Pasture**	
		Unit ——>	**NHN-05 Unit**	**Reference Area**
Grasses and Grass-likes				
N P	*Agropyron cristatum*	Crested Wheatgrass	14.47	-
N P	*Agropyron smithii*	Western Wheatgrass	0.60	-
N P	*Bouteloua gracilis*	Blue Grama	-	0.75
X A	*Bromus tectorum*	Cheatgrass	0.27	0.85
N P	*Elymus elymoides*	Squirreltail	-	0.10
N P	*Hesperostipa comata*	Needle and Thread	-	1.95
N P	*Hilaria jamesii*	James' Galleta	-	3.90
N P	*Oryzopsis hymenoides*	Indian Ricegrass	-	0.50
N A	*Vulpia octoflora*	Six-weeks Fescue	-	0.45
Forbs				
N B	*Chaenactis douglasii*	Douglas' Dustymaiden	-	0.30
I A	*Chorispora tenella*	Blue Mustard	-	0.10
N P	*Cryptantha sp.*	Cryptantha	-	0.05
N A	*Descurainia incana*	Tanysmustard	-	0.40
N A	*Descurainia pinnata*	Pinnate Tansymustard	0.20	1.15
N A	*Dreba sp.*		-	0.05
N P	*Eriogonum brevicaule*	Shortstem Buckwheat	-	0.20
I B	*Erodium cicutarium*	Redstem Stork's Bill	10.27	4.80
N P	*Gilia sp.*	Gilia	-	0.50
I A	*Kochia scoparia*	Kochia	1.93	-
I A	*Lappula redowski*	Stickseed	-	1.75
I A	*Lepidium densiflorum*	Common Pepperweed	-	0.45
I P	*Medicago sativa*	Alfalfa	15.07	-
N P	*Mirabilis sp.*	Four O'Clock	-	0.10
N P	*Packera multilobata*	Lobeleaf Groundesel	-	0.30
N P	*Phacelia sp.*	Phacelia	-	0.25
N P	*Phlox longifolia*	Longleaf Phlox	-	0.05
N P	*Physaria acutifolia*	Sharpleaf Twinpod	-	0.05
N A	*Plantago patagonica*	Woolly Plantain	-	1.00
I A	*Salsola tragus*	Pacific Blacksnakeroot	0.33	-
N A	*Silene antirrhina*	Sleepy Silene	-	0.05
I A	*Sisymbrium altissimum*	Tumble Mustard	0.07	0.15
N P	*Sphaeralcea coccinea*	Scarlet Globemallow	-	1.20
Sub-Shrubs				
N P	*Gutierrezia sarothrae*	Broom Snakeweed	-	3.55
Shrubs & Trees				
N P	*Artemisia tridentata*	Big Sagebrush	-	2.35
N P	*Atriplex canescens*	Four-wing Saltbush	0.40	0.50
N P	*Juniperus osteosperma*	Utah Juniper	-	0.30
N P	*Krascheninnikovia lanata*	Winterfat	22.27	0.15
N P	*Opuntia polyacantha*	Plains Pricklypear	-	0.85
Non-Vascular				
N P		Lichen	-	0.45
		Total Plant Cover	**65.87**	**29.55**
		Rock	0.73	19.75
		Litter	4.20	18.30
		Bare ground	29.20	32.40
		Desirable Perennial Cover (Excluding Noxious Weeds)	**52.80**	**17.60**
Summary by Lifeform:				
		Perennial Grasses	**15.07**	**7.20**
		Annual Grasses	-	0.45
		Perennial Forbs	**15.07**	**2.70**
		Annual & Biennial Forbs	12.80	10.20
		Noxious / Aggressive Weeds	0.27	0.85
		Sub-Shrubs	-	**3.55**
		Shrubs & Trees	**22.67**	**4.15**
Sample Adequacy Calculations				
		Mean=	65.87	29.55
		Variance=	47.41	88.58
		n=	15	20
		n_{min}=	1.98	17.88

N=Native, I=Introduced, X=Noxious A=Annual, B=Biennial, P=Perennial





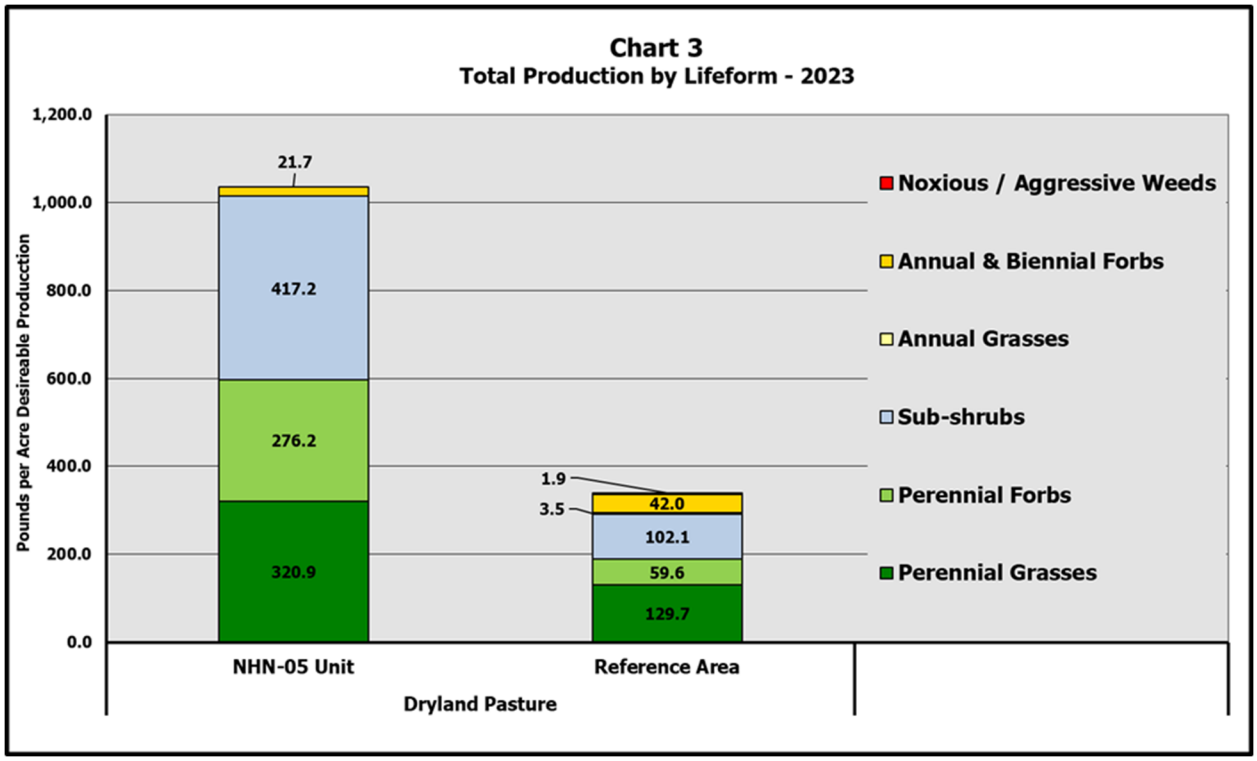
Note: Charts 1 and 2 above don't show values for non-vascular species (lichen) in the Reference Area (0.5% average ground cover and 1.5% relative ground cover, respectively).

Table 2 New Horizon North - Vegetation Production - 2023

Reclamation Monitoring Average Production Summary

Pounds (lbs) per Acre

Area	*Perennial Grasses*	*Perennial Forbs*	*Sub-shrubs*	*Annual Grasses*	*Annual Forbs*	*Noxious Weeds*	TOTAL		
							lbs / ac	Desirable* lbs / ac	Perennial lbs / ac
NHN-05 Unit	320.9	276.2	417.2	-	21.7	-	**1,036.1**	**597.1**	**1,014.3**
Old Peabody Sage Reference Area	129.7	59.6	102.1	3.5	42.0	1.9	**338.7**	**189.3**	**291.4**



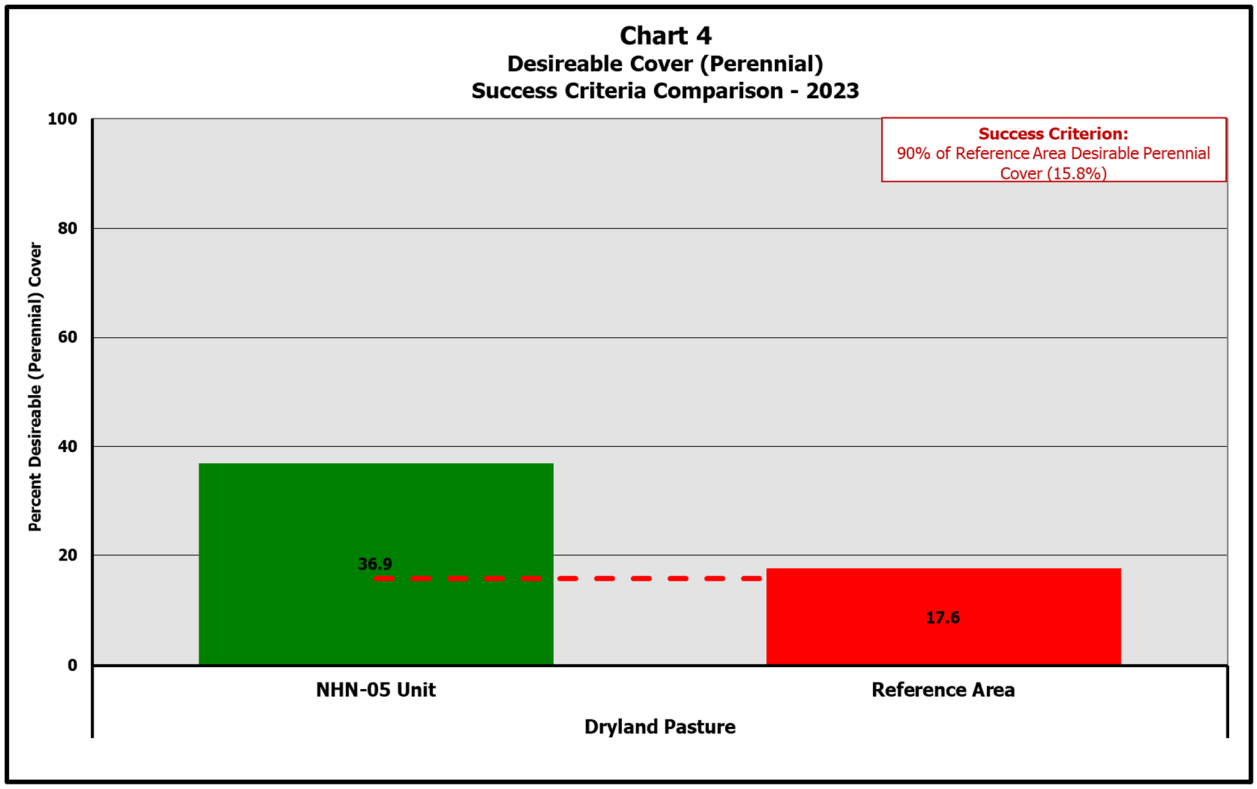


Chart 4
Desireable Cover (Perennial)
Success Criteria Comparison - 2023
Success Criterion:
90% of Reference Area Desirable Perennial Cover (15.8%)
Percent Desireable (Perennial) Cover
100
80
60
40
20
0
36.9
17.6
NHN-05 Unit
Reference Area
Dryland Pasture

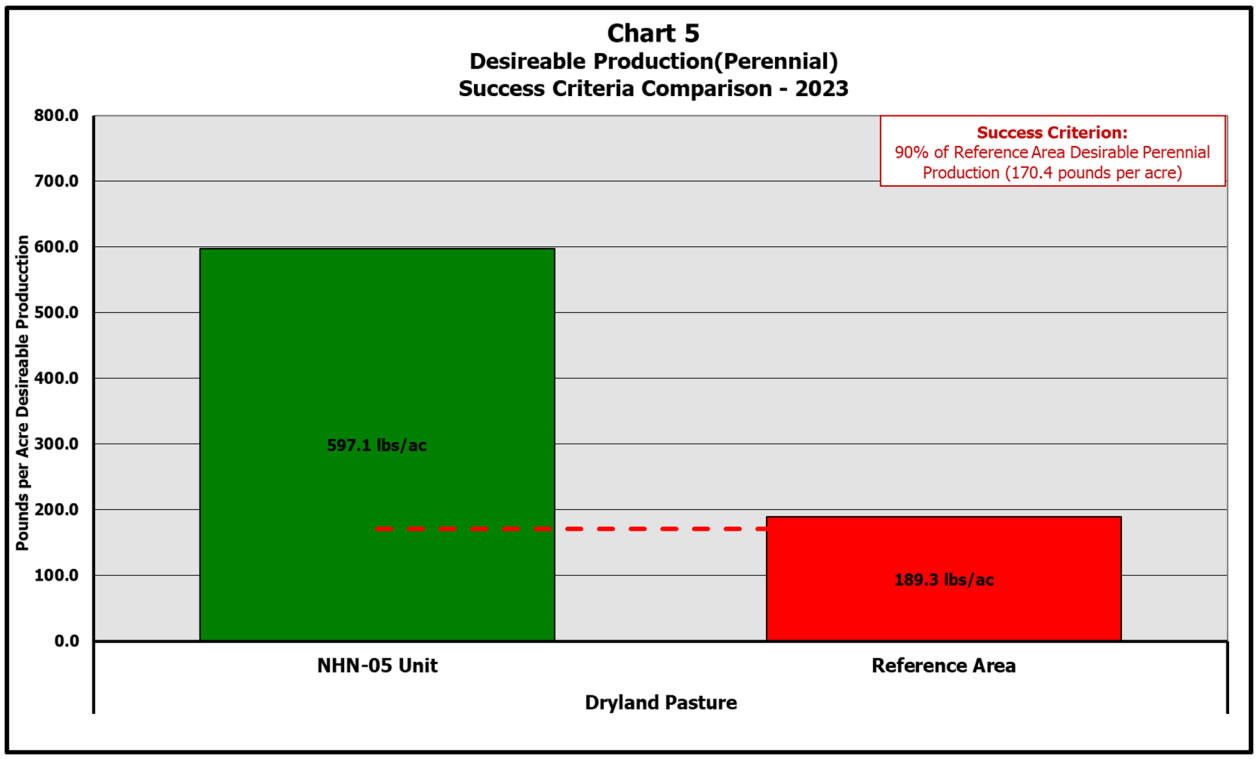


Chart 5
Desireable Production(Perennial)
Success Criteria Comparison - 2023
Success Criterion:
90% of Reference Area Desirable Perennial Production (170.4 pounds per acre)
Pounds per Acre Desireable Producction
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
597.1 lbs/ac
189.3 lbs/ac
NHN-05 Unit
Reference Area
Dryland Pasture

Table 3 Forage Quality Success Summary - 2023				
Reclamation Monitoring - NHN-005 Unit				
Year -->		**2023**		
		Production Results (lbs/acre)	**Relative Production**	**Test Result**
Desirable Production	Perennial Grasses	320.9	57.6%	Pass >75%
	Perennial Forbs	276.2		
Undesirable Production	Sub-shrubs	417.2	42.4%	
	Annual Grasses	-		
	Annual Forbs	21.7		
	Noxious Weeds	-	0.0%	
Total		**1,036.1**	**100.0%**	

Forage quality is usually calculated from Perennial Grasses and Perennial Forbs, because sub-shrubs in the area like snakeweed (*Gutierrezia* sp.) are not palatable. However, in the NHN-05 Unit, sub-shrubs are comprised largely of winterfat which was seeded as a forage species. As such, it would be prudent to include sub-shrubs as a desirable species in this unit, which would put relative production of desirable species at 100%; far exceeding the 75% forage quality standard.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Review of the data indicates that reclamation in the NHN-05 Unit has established vegetation in amounts greater than those found in the Reference Area. Desirable perennial cover in NHN-05 was 30.1% versus 9.9% in the DPRA. Cover in NHN-05 was comprised of more desirable species (45.8% relative cover) than that of the DPRA (33.5% relative cover). Desirable perennial production in NHN-05 was 597.7 pounds per acre versus 189.3 pounds per acre in the reference area. Total Production was comprised largely of desirable species 597.1 pounds per acre (57.6% relative production).

In 2023, the Dryland Pasture NHN-05 Unit is performing better than expected and is already passing bond release standards for cover and production (Charts 4 and 5). The composition of desirable production (perennial forbs, perennial grasses, and winterfat) far exceeds the 75% forage quality standard (Table 3). It is expected that desirable species will continue to establish within the unit and progress towards meeting the performance criteria in years 9 and 10.

The noxious weed cheatgrass (*Bromus tectorum*) was present with less than 1.0% cover in NHN-05 and the Reference Area, some noxious weeds were also captured with production in the Reference Area (1.9 pounds per acre). Noxious weeds should be monitored and treated as needed.

Appendix A

Raw Data

Table 1 New Horizon North- Vegetation Cover - 2023

NHN-05 Unit - Dryland Pasture

Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.—>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																					
N	P	*Agropyron cristatum*	Crested Wheatgrass	14	33	55	12	6	12	8	1	26		11	15	18	4	2	**14.47**	**21.96**	**93**
N	P	*Agropyron smithii*	Western Wheatgrass	5		2						2							**0.60**	**0.91**	**20**
X	A	*Bromus tectorum*	Cheatgrass							4									**0.27**	**0.40**	**7**
Forbs																					
N	A	*Descurainia pinnata*	Pinnate Tansymustard		3														**0.20**	**0.30**	**7**
I	B	*Erodium cicutarium*	Redstem Stork's Bill						19	7						25	56	47	**10.27**	**15.59**	**33**
I	A	*Kochia scoparia*	Kochia		1	3	8	1	1	4	2		1		1	1	5	1	**1.93**	**2.94**	**80**
I	P	*Medicago sativa*	Alfalfa	21	12	12	5	11	36	24	17	8	37	10	16	11	5	1	**15.07**	**22.87**	**100**
I	A	*Salsola tragus*	Pacific Blacksnakeroot				1				2						2		**0.33**	**0.51**	**20**
I	A	*Sisymbrium altissimum*	Tumble Mustard															1	**0.07**	**0.10**	**7**
Shrubs & Trees																					
N	P	*Atriplex canescens*	Four-wing Saltbush									3			2		1		**0.40**	**0.61**	**20**
N	P	*Krascheninnikovia lanata*	Winterfat	14	13	2	33	43	6	16	42	27	24	43	42	14	5	10	**22.27**	**33.81**	**100**
																			Mean		
			Total Plant Cover	**54**	**62**	**74**	**59**	**61**	**74**	**63**	**64**	**66**	**62**	**64**	**76**	**69**	**78**	**62**	**65.87**		
			Rock	1			1		1	3		1		3	1				**0.73**		
			Litter	18	4	5	3	2	6	5	3	1	1	2	3	1	1	8	**4.20**		
			Bare ground	27	34	21	37	37	19	29	33	32	37	31	20	30	21	30	**29.20**		
			Total Perennial Cover (Excluding Noxious Weeds)	**54**	**58**	**71**	**50**	**60**	**54**	**48**	**60**	**66**	**61**	**64**	**75**	**43**	**15**	**13**	**52.80**		

Sample Adequacy Calculations

Plant Cover Mean = 65.87 **t= 1.35** **n = 15**

Variance = 47.41 **n_{min} = 1.98**

N=Native, I=Introduced A=Annual, B=Biennial, P=Perennial, X=Noxious

Table 2 New Horizon North - Vegetation Cover - 2023

Old Peabody Sage Reference Area

Raw Data

Percent Ground Cover Based on Point-Intercept Sampling

			Transect No.——>	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	Average Cover	Relative Cover	Freq.
Grasses and Grass-likes																										
N	P	*Bouteloua gracilis*	Blue Grama	2		4			3					4		1				1				0.75	2.54	30
X	A	*Bromus tectorum*	Cheatgrass					1		2	8				3		1		1				1	0.85	2.88	35
N	P	*Elymus elymoides*	Squirreltail								1											1		0.10	0.34	10
N	P	*Hesperostipa comata*	Needle and Thread						1	1		1		9				5	2	17		2	1	1.95	6.60	45
N	P	*Hilaria jamesii*	James' Galleta		4	7	4	8	3	10	1	9	10	3		1	2		1		4	2	9	3.90	13.20	80
N	P	*Oryzopsis hymenoides*	Indian Ricegrass		5	2	2											1						0.50	1.69	20
N	A	*Vulpia octoflora*	Six-weeks Fescue								1	5					1					2		0.45	1.52	20
Forbs																										
N	B	*Chaenactis douglasii*	Douglas' Dustymaiden							1		2		2				1						0.30	1.02	20
I	A	*Chorispora tenella*	Blue Mustard														2							0.10	0.34	5
N	P	*Cryptantha sp.*	Cryptantha											1										0.05	0.17	5
N	A	*Descurainia incana*	Tansymustard	1		2	3											1	1					0.40	1.35	25
N	A	*Descurainia pinnata*	Pinnate Tansymustard			3				1		1		1	3	4		1	2	4	2		1	1.15	3.89	55
N	A	*Dreba sp.*																1						0.05	0.17	5
N	P	*Eriogonum brevicaule*	Shortstem Buckwheat	1					2				1											0.20	0.68	15
I	B	*Erodium cicutarium*	Redstem Stork's Bill			12		7		9	12	11			5	4	10			1	14		11	4.80	16.24	55
N	P	*Gilia sp.*	Gilia			2		1		1		2				1			2	1				0.50	1.69	35
I	A	*Lappula redowski*	Stickseed		1		1	6	3	3	2	1	4	2	4					4		1	3	1.75	5.92	65
I	A	*Lepidium densiflorum*	Common Pepperweed				1					1					1				4		2	0.45	1.52	25
N	P	*Mirabilis sp.*	Four O'Clock																	2				0.10	0.34	5
N	P	*Packera multilobata*	Lobeleaf Groundsel								2				3				1					0.30	1.02	15
N	P	*Phacelia sp.*	Phacelia		5																			0.25	0.85	5
N	P	*Phlox longifolia*	Longleaf Phlox																				1	0.05	0.17	5
N	P	*Physaria acutifolia*	Sharpleaf Twinpod											1										0.05	0.17	5
N	A	*Plantago patagonica*	Woolly Plantain			4		1		1	3	1			1	2	4				1		2	1.00	3.38	50
N	A	*Silene antirrhina*	Sleepy Silene										1											0.05	0.17	5
I	A	*Sisymbrium altissimum*	Tumble Mustard												1				1		1			0.15	0.51	15
N	P	*Sphaeralcea coccinea*	Scarlet Globemallow						1	4				1	2	4	2	2	2	1	1	2	2	1.20	4.06	60
Sub-Shrubs																										
N	P	*Gutierrezia sarothrae*	Broom Snakeweed	1	9	2	4		12	2	3	3	4	2	2	2	7	6	5	1		4	2	3.55	12.01	90
Shrubs & Trees																										
N	P	*Artemisia tridentata*	Big Sagebrush		3		2			2	7				18	3	2	4			6			2.35	7.95	45
N	P	*Atriplex canescens*	Four-wing Saltbush													6				3		1		0.50	1.69	15
N	P	*Juniperus osteosperma*	Utah Juniper				1												5					0.30	1.02	10
N	P	*Krascheninnikovia lanata*	Winterfat															3						0.15	0.51	5
N	P	*Opuntia polyacantha*	Plains Pricklypear	4					1	1	3			2				2	2		2			0.85	2.88	40
Non-Vascular																										
N	P		Lichen			1				1	1			1	1		1	1			1		1	0.45	1.52	45
																									Mean	
			Total Plant Cover	**9**	**27**	**39**	**18**	**24**	**26**	**39**	**44**	**37**	**20**	**29**	**43**	**28**	**33**	**28**	**25**	**35**	**36**	**15**	**36**		**29.55**	
			Rock	69	41	8	32	49	31	6	3	12	39	12	6	2	3	23	11	4	1	29	14		**19.75**	
			Litter	5	15	18	25	7	13	14	17	20	14	15	31	27	23	19	40	9	19	22	13		**18.30**	
			Bare ground	17	17	35	25	20	30	41	36	31	27	44	20	43	41	30	24	52	44	34	37		**32.40**	
			Total Perennial Cover (Excluding Noxious Weeds)	**8**	**26**	**17**	**13**	**9**	**23**	**21**	**17**	**15**	**15**	**23**	**25**	**18**	**13**	**23**	**20**	**26**	**13**	**12**	**15**		**17.60**	

Sample Adequacy Calculations	Plant Cover Mean = 29.55	t= 1.33	n = 20
	Variance = 88.58	n_{min} = 17.88	n_{min} = 17.88

N=Native, I=Introduced A=Annual, B=Biennial, P=Perennial, X=Noxious

Table 3 New Horizon - Vegetation Production - 2023

NHN-05 Unit - Dryland Pasture

Raw Data

Air Dry Weight (grams per 0.5 square meter)

Sample No.	*Perennial Grasses*	*Perennial Forbs*	*Sub-shrubs*	*Annual Grasses*	*Annual / Biennial Forbs*	*Noxious Weeds*	TOTAL		TOTAL DESIRABLE	
							g/0.5m^2	lbs / ac	g/0.5m^2	lbs / ac
1	16.0	59.0					**75.0**	**1,336.1**	**75.0**	**1,336.1**
2	41.4	11.6	1.1				**54.1**	**963.7**	**53.0**	**944.1**
3	31.4	65.8					**97.2**	**1,731.5**	**97.2**	**1,731.5**
4	20.4		101.8				**122.2**	**2,176.9**	**20.4**	**363.4**
5	7.3		13.4		12.4		**33.1**	**589.6**	**7.3**	**130.0**
6	8.0	11.8	49.4				**69.2**	**1,232.7**	**19.8**	**352.7**
7	10.4	25.1	10.4		0.3		**46.2**	**823.0**	**35.5**	**632.4**
8		7.6	39.2		0.7		**47.5**	**846.2**	**7.6**	**135.4**
9	28.1	0.3	22.8		2.5		**53.7**	**956.6**	**28.4**	**505.9**
10	24.6	17.6	6.8		0.3		**49.3**	**878.2**	**42.2**	**751.8**
11			18.0				**18.0**	**320.7**	-	-
12	12.4	29.2			0.6		**42.2**	**751.8**	**41.6**	**741.1**
13	6.0	4.6					**10.6**	**188.8**	**10.6**	**188.8**
14	7.0		31.6		1.5		**40.1**	**714.3**	**7.0**	**124.7**
15	57.2		56.8				**114.0**	**2,030.8**	**57.2**	**1,019.0**
Average	**18.0**	**15.5**	**23.4**	-	**1.2**	-	**58.2**	**1,036.1**	**33.5**	**597.1**

Sampling Adequacy: **t = 1.345** **var. = 1043.145**

n= 15 **Mean = 58.16** **n_{min} = 55.790**

Table 4 New Horizon - Vegetation Production - 2023

Old Peabody Sage Reference Area

Raw Data

Air Dry Weight (grams per 0.5 square meter)

Sample No.	*Perennial Grasses*	*Perennial Forbs*	*Sub-shrubs*	*Annual Grasses*	*Annual / Biennial Forbs*	*Noxious Weeds*	TOTAL		TOTAL DESIRABLE	
							g/0.5m^2	lbs / ac	g/0.5m^2	lbs / ac
1	9.1				0.3	0.2	**9.6**	**171.0**	**9.1**	**162.1**
2	7.9		12.4				**20.3**	**361.6**	**7.9**	**140.7**
3	2.8		15.7		2.5		**21.0**	**374.1**	**2.8**	**49.9**
4	21.3		6.3		0.6		**28.2**	**502.4**	**21.3**	**379.4**
5	11.9	4.8			0.9		**17.6**	**313.5**	**16.7**	**297.5**
6	0.4		14.4				**14.8**	**263.6**	**0.4**	**7.1**
7	10.2				0.3		**10.5**	**187.0**	**10.2**	**181.7**
8	11.4				2.8		**14.2**	**253.0**	**11.4**	**203.1**
9	6.6				1.6	1.3	**9.5**	**169.2**	**6.6**	**117.6**
10	1.8	0.3	10.2				**12.3**	**219.1**	**2.1**	**37.4**
11	7.5	0.2	7.0		0.3		**15.0**	**267.2**	**7.7**	**137.2**
12	8.4	0.9			2.0		**11.3**	**201.3**	**9.3**	**165.7**
13	1.0	10.7	12.3		4.3		**28.3**	**504.1**	**11.7**	**208.4**
14	0.2	15.0	14.3		4.5		**34.0**	**605.7**	**15.2**	**270.8**
15	1.4	12.7		4.0			**18.1**	**322.4**	**14.1**	**251.2**
16	18.7				2.0		**20.7**	**368.7**	**18.7**	**333.1**
17	1.6	0.7	5.9		6.0		**14.2**	**253.0**	**2.3**	**41.0**
18	3.0	2.4			3.5		**8.9**	**158.5**	**5.4**	**96.2**
19	7.2		1.0			0.4	**8.6**	**153.2**	**7.2**	**128.3**
20	11.3	0.8	11.4				**23.5**	**418.6**	**12.1**	**215.5**
21	8.4		7.4		1.9		**17.7**	**315.3**	**8.4**	**149.6**
22	3.5		12.5		2.5		**18.5**	**329.6**	**3.5**	**62.3**
23			15.9		0.3		**16.2**	**288.6**	-	-
24		12.5	5.8		4.0		**22.3**	**397.3**	**12.5**	**222.7**
25	0.3	20.1			2.3		**22.7**	**404.4**	**20.4**	**363.4**
26	2.5	10.9			0.7	0.3	**14.4**	**256.5**	**13.4**	**238.7**
27	8.6	8.4		2.2	3.5		**22.7**	**404.4**	**17.0**	**302.8**
28	1.4	0.8	12.9				**15.1**	**269.0**	**2.2**	**39.2**
29	8.0		8.6		1.5		**18.1**	**322.4**	**8.0**	**142.5**
30	10.3	7.3		0.5	0.6	0.3	**19.0**	**338.5**	**17.6**	**313.5**
31	18.5	5.6			2.8		**26.9**	**479.2**	**24.1**	**429.3**
32	22.3		12.5	0.2	2.6		**37.6**	**669.8**	**22.3**	**397.3**
33	30.3				3.4		**33.7**	**600.3**	**30.3**	**539.8**
34	4.2	2.4	11.1	0.4	3.5		**21.6**	**384.8**	**6.6**	**117.6**
35	1.5	7.8	12.1	0.2	4.2		**25.8**	**459.6**	**9.3**	**165.7**
36	2.4	1.1	5.8	0.3	3.0	1.7	**14.3**	**254.7**	**3.5**	**62.3**
37	2.0	1.3	1.1		24.0		**28.4**	**505.9**	**3.3**	**58.8**
38		0.2	8.5				**8.7**	**155.0**	**0.2**	**3.6**
39	17.1	1.1	0.4		1.9		**20.5**	**365.2**	**18.2**	**324.2**
40	6.2	5.9	3.7				**15.8**	**281.5**	**12.1**	**215.5**
Average	**7.3**	**3.3**	**5.7**	**0.2**	**2.4**	**0.1**	**19.0**	**338.7**	**10.6**	**189.3**

Sampling Adequacy: **t = 1.304** **var. = 52.933**

n= 40 **Mean = 19.0** **n_{min} = 24.9**

Appendix B

Vegetation Sampling Methodology

Vegetation Sampling Methodology

Sample Site Selection / Location

The sample layout protocol for revegetation evaluations in 2023 generally followed procedures described in Permit Section 2.05.4(2)(e). The generated coordinates were then loaded into the GPS unit to facilitate sample site location in the field. All transects were kept within the designated sample unit boundaries.

Determination of Ground Cover

Ground cover was evaluated in accordance with Rule 4.15.11 (1) (a) (i) by sampling along a 10-meter transect tape on all evaluated units. In 2023, a laser bar was used to collect ground cover. At ten-centimeter intervals along the laser bar, one meter in width, the plant species encountered by the laser was recorded. In this manner, a total of 100 intercepts per transect were recorded resulting in 1 percent cover per intercept. If no plant cover was encountered, then the observation was recorded as to the presence of plant litter, rock, bare ground, or non-vascular (lichen or moss). Plant material produced in each respective growing season which was still attached to the plant was considered as living plant material whereas all plant material produced in prior years, which was dead or which had fallen to the ground was considered to be litter.

Sample Adequacy Determination

Sampling within each unit was conducted to a minimum of 5, 15, or 30 samples. From these preliminary efforts, sample means and standard deviations for total non-overlapping vegetation ground cover were calculated. The Cochran formula (below) for determining sample adequacy was used to calculate $\mathbf{n_{min}}$, whereby the population is estimated to within 10% of the true mean (μ) with 90% confidence.

When the inequality ($\mathbf{n_{min}} \leq \mathbf{n}$) is true, sampling is deemed adequate; and $\mathbf{n_{min}}$ is determined as follows:

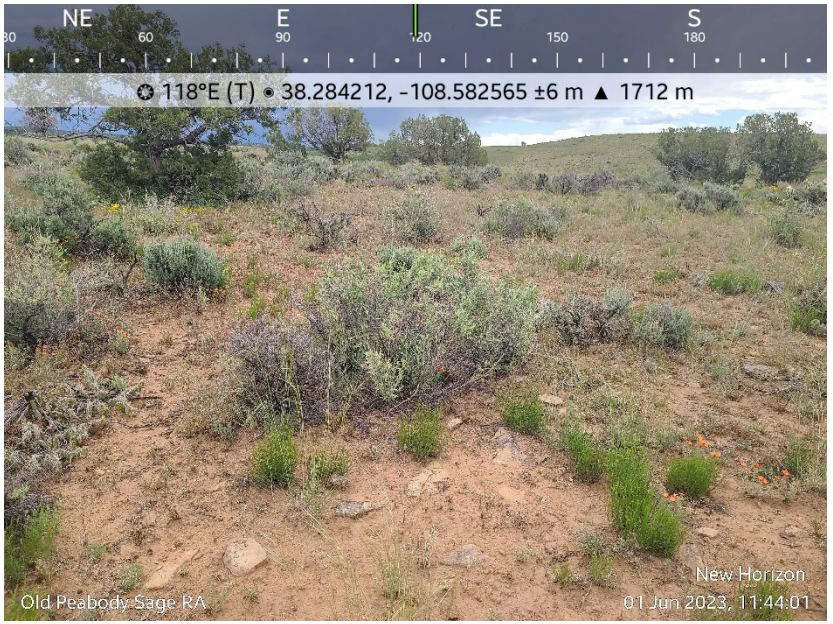
$$\mathbf{n_{min}} = (t^2 s^2) / (0.1 \bar{x})^2$$

where:
n = the number of actual samples collected
t = the value from the one-tailed t distribution for 90% confidence with n-1 degrees of freedom;
s^2 = the variance of the estimate as calculated from the initial samples;
$\bar{x}$ = the mean of the estimate as calculated from the initial samples.

Appendix C

Representative Field Photos

Photograph 1. New Horizon North, Dryland Pasture, NHN-05 Unit, 2023



Photograph 2. New Horizon North, Old Peabody Sage RA, 2023