PEABODY WESTERN

Peabody Western Coal Company

December 12, 2024

Ms. Amy Ryser
Western Region Office
Office of Surface Mining
Reclamation and Enforcement
P. O. Box 25065
One Federal Center, Building 41
Lakewood, CO 80225-0065

RE: Phase III Bond Release Application / Peabody Western Coal Company
Kayenta Mine Permit AZ-0001F / N14 and J16 Permanent Program Area

Dear Ms. Ryser:

Peabody Western Coal Company (PWCC) submits the enclosed application materials in accordance with 30 CFR 800.40 for Phase III release of bond on approximately 992 acres of mined and reclaimed lands in the permanent program area of N14 and J16 at Kayenta Mine.

Attached, please find one electronic file of the Bond Release Application. PWCC understands that OSMRE will complete a bond release application review and will provide PWCC a response that will include details of information required so that OSMRE can deem the application complete. Once OSMRE has deemed the application complete, PWCC will submit a complete official application with signed documents to OSMRE electronically on the share drive provided by OSMRE and provide one copy of the application on USB drive for Forest Lake Chapter.

The reclaimed lands described within this Bond Release Application are subject to the Permanent Program Performance Standards at 30 CFR 816, because they were disturbed after issuance of Permanent Program Permit AZ-0001C on July 6, 1990 pursuant to 30 CFR 750. Permit AZ-0001C was changed to AZ-0001D for the 5-year renewals during 1995, 2000, and 2005. Permit AZ-0001D was later changed to AZ-0001E for the 5-year permit renewal in 2010 and AZ-0001F for the 5-year permit renewal in 2015 and 2020.

Please direct any questions and correspondence to me at 928-280-7091 or by email at mshepherd2@peabodyenergy.com .

Respectfully,



Marie Shepherd
Senior Manager Environmental
Kayenta Mine

PEABODY WESTERN COAL COMPANY
KAYENTA MINE
COAL RESOURCE AREA N14 AND J16

PHASE III BOND RELEASE APPLICATION

General Application Information

Date of Request: December 12, 2024

Permittee: Peabody Western Coal Company

Permit Number: AZ-0001F

Date Permit Approved: October 3, 2017

Mine Name: Kayenta Mine

Bond Release Phase Requested: Phase III

Acreage Requested for Release: 992 acres

Bonding Company: See Exhibit A

Bond Number: See Exhibit A

Current Bond Amount: $107,171,138 (See Exhibit A)

Bond Amount Requested for Release: $6,458,202 (See Exhibit A)

PEABODY WESTERN COAL COMPANY
KAYENTA MINE
COAL RESOURCE AREA N14 AND J16

PHASE III BOND RELEASE APPLICATION

Supporting Documentation

Permit, Location, and Bond History for Release Area Exhibit A

Maps & GIS Data Exhibit B

1. Bond Release Area
2. Wildlife/Hydrology Features
3. Years of Seeding, Reseeding, & Rill and Gully Repairs
4. Vegetation Communities – Sample Sites by Year
5. Reference Areas – Sample Sites by Year
6. GIS Shapefiles – bond release area, permit area, vegetation sample sites, reference area sample sites, vegetation communities, permanent transects, rock piles & drains, tree transplants, hydrology, grading years, topsoil years seeding years, reseeding and aerial photography.

Reclamation and Management History Exhibit C

1. Reclamation Narrative
2. Period of Responsibility
3. Permanent Facilities

Post- Mining Land Use Exhibit D

1. Rangeland Grazing
2. Wildlife Habitat
3. Cultural Plants

Revegetation Success Demonstration Exhibit E

Protection of the Hydrologic Balance Exhibit F

Certification that Lands are Free from Enforcement Actions Exhibit G

Notification Letters Exhibit H

1. Tribes (Navajo Nation and Hopi Tribe)
2. Government Agencies (BIA, BLM, NNEPA)
3. Navajo Nation Chapters (Chilchinbeto, Kayenta, Forest Lake, Shonto)
4. Utilities (NTUA)

Newspaper Advertisement Exhibit I

1. Draft Public Notice

PEABODY WESTERN COAL COMPANY
KAYENTA MINE
COAL RESOURCE AREA N14 AND J16

PHASE III BOND RELEASE APPLICATION

2. Final Public Notice
3. Proof of Publication

VERIFICATION

I verify under oath that the information contained in this application for a permit, revision, renewal, bond release, or transfer, sales or assignments of permit rights is true and correct to the best of my information and belief.

Signature of Responsible Official _____

Title Director Operations Support Date 12/12/2024

SUBSCRIBED AND SWORN TO BEFORE ME BY Randy S. Lehn

This 12th Day of December 2024

NOTARY PUBLIC Susie Crank

MY COMMISSION EXPIRES April 5, 2028

SUSIE CRANK
Notary Public - Arizona
Navajo County
Commission # 664886
My Comm. Expires Apr 5, 2028

EXHIBIT A

Permit, Location, and Bond History for Release Area

Introduction

Peabody Western Coal Company (PWCC) is requesting Phase III bond release on portions of lands within the N14 and J16 Coal Resource Areas (CRAs) of Kayenta Mine. The N14 and J16 Phase III bond release application (P3BRA) included in this submittal contains required documentation and information to support Phase III bond release for 488 acres in the N14 CRA and 459 acres in the J16 CRA for mined and reclaimed lands in the permanent program areas within these CRAs as shown on Map 1, Exhibit B. Phase I bond release for the 488 acres in N14 was approved on January 22, 2008 and Phase I approval for the 459 acres in J16 occurred on July 11, 2017. Phase II bond release for the 488 acres in N14 was approved on December 22, 2008 and Phase II approval for the 459 acres in J16 occurred on December 19, 2022. PWCC is also requesting bond release for 45 acres of lands not included in the previous Phase I and II bond releases including two permanent ponds in N14 (16 acres), three miles of permanent roads (8 acres), and pond-associated reclamation areas (21 acres) surrounding the two permanent ponds. The total combined area for this N14 and J16 P3BRA is 992 acres. Information for the technical portions of the N14 and J16 P3BRA are contained in Exhibits B, C, D, E, and F. Certifications, notification letters to the Tribes, government agencies, or utilities, and newspaper advertisement information are included in Exhibits G, H, and I.

Permit and Bond Release Summary Information

The N14 and J16 CRAs are located within the northeastern portion of PWCC's Kayenta Mine. The Kayenta Mine operates under Permit AZ-0001F issued by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to PWCC Kayenta Mine on October 3, 2017. Permanent Program Permit AZ-0001F was renewed five times; on July 6, 1995, on July 6, 2000, on July 6, 2005, on July 6, 2010, and lastly on July 6, 2015. The 5-year renewal application for Permit AZ-0001F was submitted to OSMRE on February 27, 2020. On June 25, 2020, OSMRE administratively delayed their decision to renew Permit AZ-0001F due to COVID-19 pandemic closures and stay-at-home orders. Coal production at the Kayenta Mine ceased on August 26, 2019; reclamation activities continue under Permit AZ-0001F. The N14 and J16 P3BRA shown on Map 1, Exhibit B includes 992 acres of land reclaimed following permanent program standards provided in the Permit Application Package of Permit AZ-0001F.

The mine permit area is located approximately 18 miles south southwest of Kayenta, Arizona (USGS 7.5-minute quadrangle maps Longhouse Valley, Marsh Pass S.E., Shonto S.E., Yucca Hill, and Cliff Rose Hill). The permit area for the N14 and J16 Phase III bond

release is in the USGS 7.5-minute quadrangle maps Yucca Hill and Marsh Pass S.E. within the following lands of Navajo County, Arizona that are described relative to the Gila and Salt River Base Meridian as:

> A total of 992 acres of mined and reclaimed land located within the N14 and J16 CRAs. The computer-generated centroid location of the N14 area is approximately Latitude 36º 31’ 14.45” N and Longitude 110º 18’ 35.39” W. The computer-generated centroid location of the J16 area is approximately Latitude 36º 29’ 8.33” N and Longitude 110º 18’ 7.01” W.

The type of bond and the amount of bond filed for Kayenta Mine Permit AZ-0001F are described in Table A.1. The total bond held for Kayenta Mine is $107,171,138. The portion requested for release in this N14 and J16 P3BRA is $6,458,202. Justification for the release dollars is explained in the following section.

Table A.1. Bond Information for Kayenta Mine.

Bond Surety	Bond Number	Bond Amount
Liberty Mutual	60S003887	$20,871,344.37
SiriusPoint America Insurance	SBP150171_003	$32,649,707.28
Zurich American	8940860	$17,178,247.35
Goldeman Sachs Bank, USA	Letter of Credit	$36,471,839.00
TOTAL		**$107,171,138.00**

Phase III Bond Reduction Cost

PWCC is seeking a reduction in bond for Phase III in the amount of $6,458,202. This amount was determined using direct and indirect unit costs calculated for 992 acres in N14 and J16 as documented in Permit AZ-0001F, Chapter 24, and as documented in Table 24-1-4, Table 24-1-8, and Tables 24-5-21 through 24-5-37. Reclamation cost estimates as of January 2024 (“worst case” or “highest liability”) were used and these rates were adjusted for inflation through July 2025. Reduction in bond at the N14 and J16 CRAs was based upon completion of Phase III reclamation activities for 992 acres including all permit, reclamation, and management requirements; retention of permanent facilities in the postmining landscape to facilitate and enhance the postmining land use, protection of the hydrologic balance, all revegetation costs per 30 CFR 800.40(c), and a postmine land use evaluation.

The project categories and direct costs applicable to this Phase III bond release are listed in Table A.2 for the N14 and J16 CRAs. The Phase III reclamation activities

include revegetation, vegetation maintenance, permanent facilities retention, and environmental monitoring.

The total direct, indirect, and inflation costs as of July 2025 for the Phase III bond categories in the N14 and J16 CRAs are $6,458,202.

Table A.2

Bond Reduction of Direct and Indirect Costs for Revegetation, Permanent Facilities, Vegetation Maintenance, and Environmental Monitoring for 992 acres in N14 & J16 CRAs.

Project Category	**Bond Summary Amount**
Revegetation at J16 (100% of Table 24-1-4)	$1,225,626
20% Vegetation Rework at J16 (100% of Table 24-1-4)	$ 871,556
Revegetation at N14* (see comment below)	$1,086,999
20% Vegetation Rework at N14 (100% of Table 24-1-4)	$ 338,301
Permanent Road Culvert Removal**	$ 28,402
Permanent Road Surfacing Removal**	$ 8,834
Permanent Road Surface Ripping**	$ 12,980
Permanent Road Grade Ripped Areas**	$ 313,777
Permanent Road Topsoil Replacement**	$ 262,694
Permanent Road Revegetation**	$ 211,198
Permanent Pond Retention (16 acres)**	$ 173,436
Permanent Pond Perimeter Area (21 acres)**	$ 260,232
Inflation (9.97% thru July 2025)	$ 477,966
Phase III Total Direct Cost	$5,272,001
Phase III Total Indirect Cost (22.5%)	$1,186,201
Total Direct and Indirect Cost	**$6,458,202**

* Per OSMRE guidelines, this figure was determined by assuming 85% of bond was released by January 2009. The remaining 15% would be about $872,063 which would amount to $1,425,300 by January 2024 (63.44% inflation). The 20% vegetation rework was removed to equal the value shown above.
** Per Permit AZ-0001F, Chapter 24, Tables 24-1-4 and 24-1-8.

Permanent Facilities

Exhibits C and D discuss, and Map 1 in Exhibit B shows the facilities that are proposed for retention in the postmining landscape to facilitate and enhance the postmining land uses. The current facilities located in the N14/J16 P3BRA include fences, two permanent impoundments designated N14-G and N14-H, permanent ancillary roads for local residents to

access grazing areas, and permanent ancillary roads for local residents and visitors to utilize motor vehicles to access the residences and rim areas surrounding the N14 and J16 CRAs. Permanent impoundments are discussed in Exhibit F. Existing cross fences, discussed in Exhibits C and D, are used to facilitate managed grazing within the reclaimed pastures. PWCC is requesting approval from OSMRE, Tribal agencies, and the local transportation committee, if applicable, to leave permanent roads for accessing residences, interior grazing areas, permanent ponds, and rim areas. The postmining access roads, left by PWCC for the purpose of accessing the postmining lands, will be maintained in the manner that other similar residential and range access roads have been traditionally maintained prior to any mining activities. All permanent facilities proposed for retention will enhance and compliment the postmining land use.

Peabody

Kayenta Complex
PO Box 650
Kayenta, Arizona USA 86033

N14/J16 Phase III Bond Release

Exhibit B, Map 1 Permanent Program Bonded Area Summary

Produced by
Gary Altsisi
Professional
Engineer

Map design by
Deep Southwest Enterprises

December 12, 2024
Revision

1 Inch = 500 Feet

10 foot contour interval
Index contours at 50 feet

N

Proposed Phase III Bond Release Area 992 Acres

Termination of Jurisdiction

Unreleased Disturbance

Local Road

Major Wash

Permit Boundary



Post-Mine Ranching at the Kayenta Mine Complex

N14 Phase III Proposal		Current Bond Release Status		
		Phase II Bond Released	No Bond Released	All Status
Post-Mine Category	Reclamation	465 ac	21 ac	486 ac
	Road	22 ac	7 ac	29 ac
	Pond		16 ac	16 ac
	All Categories	487 ac	44 ac	**531 ac**

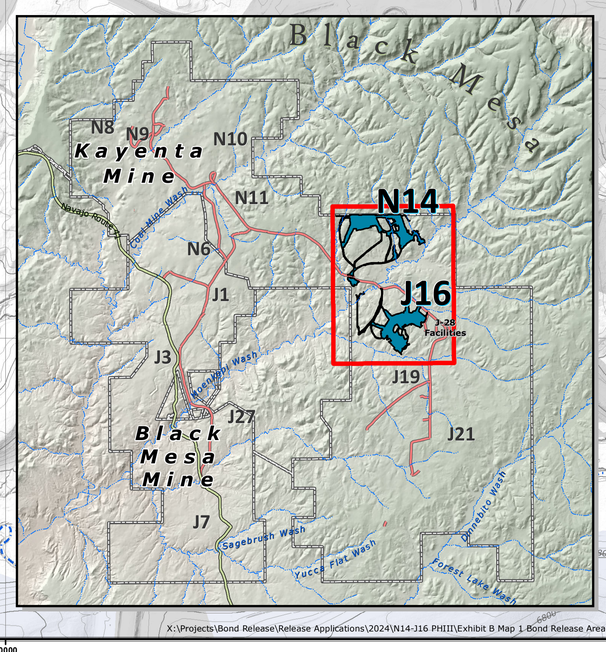
ENGINEER'S CERTIFICATION

Registered Professional Engineer (Civil) CERTIFICATE NO. 37842 GARY ALTSISI Date signed: 12/12/24 ARIZONA, USA

EXPIRES: 09/30/2026

Gary Altsisi
ARIZONA P.E. 37842

J16 Phase III Proposal	
Phase II Bond Released Reclamation	459 ac
Unreleased Post-Mine Road	2 ac
All Categories	**461 ac**



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N14/J16 Phase III Bond Release

Exhibit B, Map 2 Wildlife / Hydrology Features

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Professional Engineer

Map design by
Deep Southwest Enterprises

December 12, 2024
Revision

1 Inch = 500 Feet

10 foot contour interval
Index contours at 50 feet

N

Proposed Phase III Bond Release Area
Termination of Jurisdiction
Unreleased Disturbance

Habitat Rockpile
Spring
Alluvial Site
Stream Site
Well
Ponds
Rock Drain
Terrace
Major Wash
Permit Boundary



N14-G Pond

ENGINEER'S CERTIFICATION

Registered Professional Engineer (Civil)
CERTIFICATE NO.
37842
GARY
ALTSISI
Date Signed: 12/12/24
ARIZONA, USA

EXPIRES: 09/30/2026

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ARIZONA P.E. 37842

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Kayenta Complex
PO Box 650
Kayenta, Arizona USA 86033

N14/J16 Phase III Bond Release

Exhibit B, Map 3 Permanent Program Revegetation Summary

Produced by
Gary Altsisi
Professional
Engineer

Map design by
Deep Southwest Enterprises

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Revision

1 Inch = 500 Feet

10 foot contour interval
Index contours at 50 feet

N

Proposed Phase III Bond Release Area
Termination of Jurisdiction
Unreleased Disturbance
Reseeded
Pond
Road
Seeding Year: 2003
Reseeding Year: 2003
Major Wash
Permit Boundary



Cultural Planting Activity at the Kayenta Mine Complex

ENGINEER'S CERTIFICATION

Registered Professional Engineer (Civil) CERTIFICATE No. 37842 GARY ALTSISI Date signed: 12/12/24 ARIZONA, USA

EXPIRES: 09/30/2026

Gary Altsisi
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N14

Termination of Jurisdiction

N-14 Facilities

Unreleased Disturbance

Moenkopi Wash

AZ-0001F Permit

N14-H Pond

N14-G Pond

J16

Termination of Jurisdiction

Unreleased Disturbance

J-28 Facilities

Unreleased Disturbance

Reed Valley Wash

Dougout Valley Wash

J19

Black Mesa

N8 N9 Kayenta Mine N10 N11 N14 N6 Black Mesa Mine J16 J-28 Facilities J3 J19 J27 J21 J7

East Hwy Wash Navajo Route 9 Sagebrush Wash Yucca Flat Wash Forestdale Wash Forest Lake Wash

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Kayenta Complex
PO Box 650
Kayenta, Arizona USA 86033

N14/J16 Phase III Bond Release

Exhibit B, Map 4
Vegetation Communities
Sample Sites by Year

Produced by
Gary Altsisi
Professional
Engineer

Map design by
Deep Southwest Enterprises

December 12, 2024
Revision

1 Inch = 500 Feet
Cultural Planting Insets
1 Inch = 200 Feet

10 foot contour interval
Index contours at 50 feet

N

Proposed Phase III Bond Release Area
Termination of Jurisdiction
Unreleased Disturbance

Sample Sites
Symbol by Year
2022
2023
2024

Label by Season
Spring G29
Fall G29

Vegetation Communities
Grassland
Shrubland
Woodland
Cultural Vegetation Area

Pond
Road
Major Wash
Permit Boundary



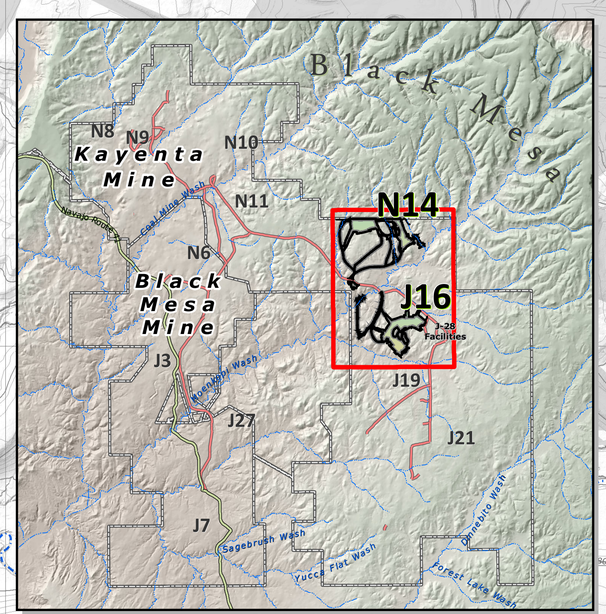
Grassland

ENGINEER'S CERTIFICATION

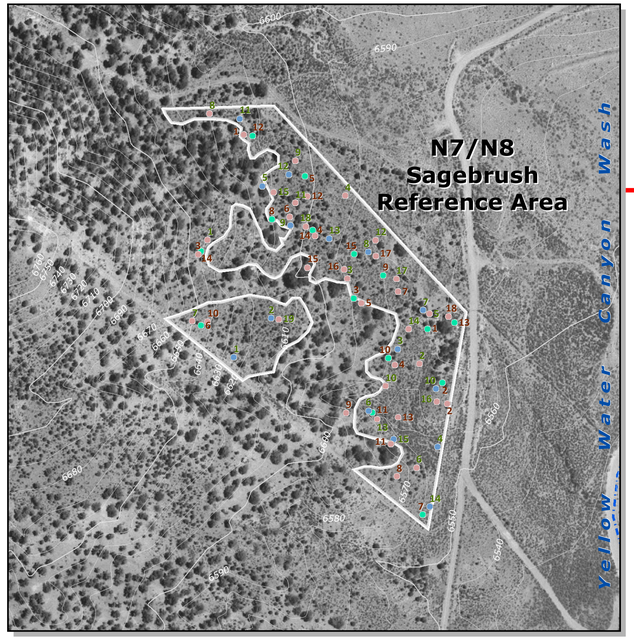
Registered Professional Engineer
CERTIFICATE NO.
37842
GARY
ALTSISI
Date signed: 12/12/24
ARIZONA, USA

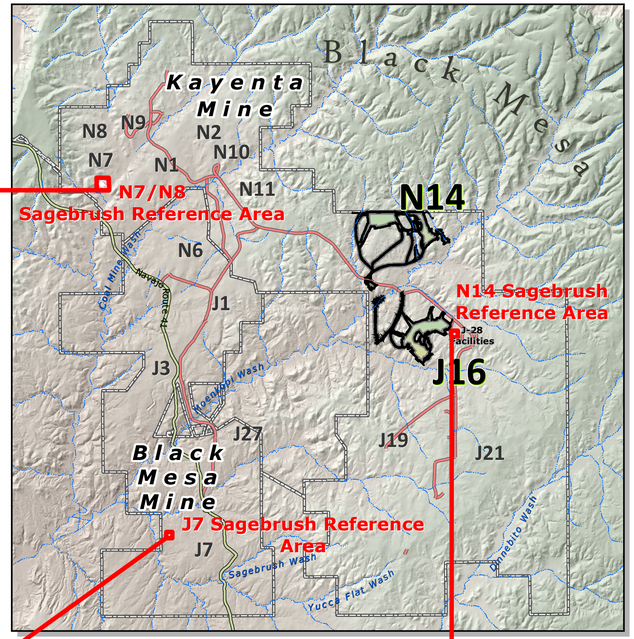
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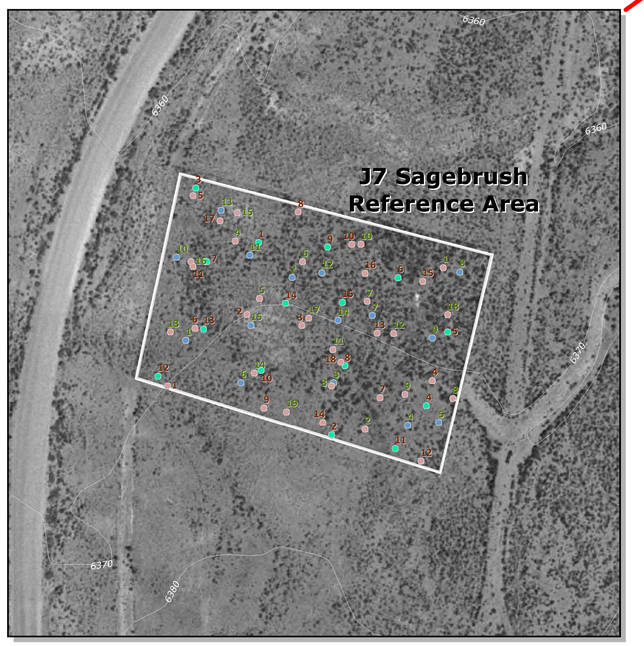
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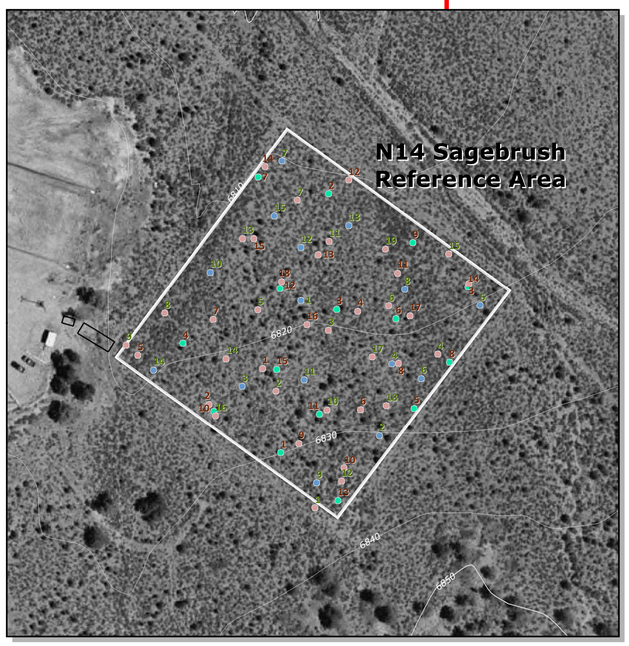


X:\Projects\Bond Release\Release Applications\2024\N14-J16 PHIII\Exhibit B Map 4 Sample Sites.mxd









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N14/J16 Phase III Bond Release

Exhibit B, Map 5 Reference Areas Sample Sites by Year

Produced by
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Professional
Engineer

Map design by
Deep Southwest Enterprises

December 12, 2024
Revision

1 Inch = 10,000 Feet
Reference Area Insets
1 Inch = 200 Feet

10 foot contour interval
Index contours at 50 feet

N

Sample Sites

Symbol by Year
- 2022
- 2023
- 2024

Label by Season
- Spring 15
- Fall 15

Major Wash
Permit Boundary



Grassland

ENGINEER'S CERTIFICATION

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CERTIFICATE NO.
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GARY
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Date signed: 12/12/24
ARIZONA, USA

EXPIRES: 09/30/2026

Gary Altsisi
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EXHIBIT C

Reclamation & Management History

Contents

1 Overview 1
2 Contemporaneous Reclamation 1
3 Period of Responsibility 1
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4.1 Species Selection 3
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Table 3: Reseeding Activities by Year 5
Table 4: Noxious Weeds Observed 2022 – 2024 6

1 Overview

The Office of Surface Mining Reclamation and Enforcement (OSMRE) allows Phase III bond release on areas that have achieved the objectives of their permitted reclamation plan at least 10 years after initial revegetation. The objectives of Peabody Western Coal Company's (PWCC) revegetation program at the Kayenta Mining Complex (KMC) as detailed in Chapter 23 of the AZ-0001F permit application package (PAP) are as follows.

1. To establish diverse, effective, and permanent vegetation communities that are compatible with post-mining land use objectives, satisfy revegetation success criteria, and provide a mosaic of varying vegetal landscapes.
2. To achieve revegetation in a contemporaneous manner.
3. To stabilize and protect soil resources with respect to erosion.
4. To develop highly productive and nutritional grazing sources adaptive to grazing management systems.
5. To enhance wildlife habitat in the post-mining landscape.
6. To provide a source of culturally significant plant materials.

This Exhibit details the reclamation and management history of the 944.7 acres included in the N14/J16 Phase III Bond Release Area (P3BRA) shown on Map 1 of Exhibit B. This P3PBRA includes 486.1 acres in the N14 Coal Resource Area (CRA) and 458.6 acres in the J16 CRA. The following sections demonstrate that the area was revegetated more than 10 years ago using approved methods and techniques to meet these objectives. Details satisfying objectives 2 and 3 are included here. Information supporting objectives 1, 4, 5, and 6 is included in Exhibits D and E of this application package.

2 Contemporaneous Reclamation

Mining occurred in the N14/J16 P3BRA from 1985 through 1998 and generally progressed from north to south. Reclamation activities including backfilling, grading, topsoiling, and seeding occurred concurrent with mining beginning in 1986 and were completed in this area by the end of 2003. Reclamation maintenance activities including interseeding, noxious weed management, and rill and gully repair have been completed, as needed.

3 Period of Responsibility

The 924.3 reclaimed acres included in the N14/J16 P3BRA were reclaimed more than 10 years prior to this bond release request (Table 1). Seeding years are shown on Map 3 in Exhibit B. Final grading occurred between 1983 and 2003 and topsoiling and seeding occurred from 1989 to 2003.

Table 1: Reclamation Activities by Year

N14 CRA				J16 CRA			
Year	**Final Grading**	**Top-soiling**	**Seeding**	**Year**	**Final Grading**	**Top-soiling**	**Seeding**
1983	12.3	5.0		1984	0.6	0.5	0.2
1984	3.5	0.4	3.6	1985	3.6	1.9	
1985	6.5			1986	2.5	2.5	4.4
1986	3.6	2.1		1987	9.6	5.3	1.0
1987	4.1	0.1		1988	14.9	9.1	13.2
1988		0.2		1989		2.6	
1989	7.7	4.2	2.8	1990	5.4	1.1	3.8
1990	1.0		0.5	1991	11.4	2.6	
1991	8.4			1992	4.6	2.2	1.3
1992	6.5	5.0	3.0	1993	9.4		
1993	2.7			1994			2.4
1997	44.3			1998	27.8		
1998	28.0			1999	213.8	114.7	78.6
1999	153.3	5.0		2000	110.0	79.5	108.6
2000	141.7	223.9	225.1	2001	36.8	199.4	198.8
2001	11.1	134.0	139.3	2002	2.2	7.6	41.5
2002	17.8	60.7	41.8	2003	2.7	1.0	
2003	33.6	41.3	69.5	2007	3.4	3.4	4.4
2005		3.4		2012		1.9	
2013		0.3		2013		22.9	
Total [1]	**486.1**	**485.7**	**485.7**	**Total [2]**	**458.6**	**458.4**	**458.3**

[1] The 531 Acres shown on Exhibit B Map 1 for N14 includes 44 acres of previously Unreleased Roads and Reclamation as well Post Mining Impoundments.

[2] The 461 Acres shown on Exhibit B Map 1 for J16 includes 2 acres of previously Unreleased Roads

4 Reclamation Narrative

Reclamation activities on the N14/J16 P3BRA followed the methods and procedures detailed in Chapter 23 of the AZ-0001F PAP. Upon completion of topsoil application and final grading, reclamation areas were ripped on the contour using dozers, graders, or farm equipment equipped with multi-shanked deep rippers. After ripping, a modified offset disk was used to create contour furrows. This prepared seed bed was then seeded with either drill or broadcast methods using an approved seed mixture and seeding rate. Native hay mulch was applied and crimped in most areas after seeding with straw mulch used as an alternative on temporary reclamation areas and erosion blankets or geotextile fabrics used for localized slope stabilization. Most reclamation activities were conducted between April and September except cultural planting and tree/shrub transplanting areas which are typically planted in September through March. However, reclamation activities have been conducted throughout the year as ground conditions allowed.

4.1 Species Selection

PWCC uses the rangeland reclamation seed mixture presented in Chapter 23 Table 1 of the AZ-0001F PAP for most reclamation. However, species used, their relative percentages, and overall seeding rates may vary based on commercial availability of seed in any given year as well as site-specific reclamation goals such as increased shrub density in some areas. The PAP includes a list of approved alternative species (Chapter 23 Appendix A Table A-1) that can be substituted for unavailable species of the same life form and seasonality. Additionally, other seed mixtures are approved for use in specific reclamation situations including drainage channels and small depressions, around ponds, temporary stabilization, rill and gully repairs, and cultural planting areas. Some of the areas in the N14/J16 P3BRA seeded prior to 1993 were seeded with a previously approved rangeland reclamation seed mixture which included some other species. There are 30 species that were most commonly used in reclamation seed mixtures within the N14/J16 P3BRA (Table 2).

4.2 Reclamation Communities

The N14/J16 P3BRA includes three reclamation communities: grassland, shrubland, and woodland. Grassland areas encompass 404 acres of the N14/J16 P3BRA. These areas primarily support livestock and wildlife grazing. Shrubland areas encompass 540 acres and are intended to aid community diversity and increase wildlife habitat potential with an average of twice as many shrubs than the grassland areas. Grassland and shrubland areas were delineated using aerial photography and field reconnaissance in 2017 in the N14 CRA and in 2021 in the J16 CRA. Both community types are established using the same seed mixture, but over the liability period, the microhabitats most suited to shrubs such as north-facing slopes and coarser surface soils tend to develop a greater density of shrubs.

The woodland areas encompasses 12.9 acres and were designed to feature plant species that are culturally important to Navajo or Hopi peoples while also enhancing the diversity of available wildlife habitat. Most of the N14/J16 P3BRA was reclaimed before the cultural planting program was initiated. There are three small areas in the N14 CRA and one area in the J16 CRA that fall within the P3BRA boundary and were reclaimed using a surface mulch of red rock scoria and seeded with the cultural seed mixture. However, one of these areas was not ecologically conducive to establishment of pinyon and juniper trees due to its south-facing aspect. This area was not sampled as a woodland area but was instead included in the shrubland sampling universe. To increase the sampling acreage for the woodland areas, two adjacent woodland areas that were seeded/planted at the same time, but happen to fall within the Interim Program Lands, were also included in the woodland BRU.

Included within each of the reclamation communities in the N14/J16 P3BRA are rock habitat features. Rock features are placed in reclaimed areas to provide wildlife escape and thermal cover, small animal den locations, promote enhanced shrub and tree establishment, and provide raptor perches for hunting and resting. Twenty-four rock features are shown on Map 2 in Exhibit B.

4.3 Tree Transplanting

There are no transplant sites in the N14/J16 P3BRA. Tree transplanting has been discontinued at KMC due to limited long-term survival and placed on the more successful program of planting tree seedlings in red rock areas.

Table 2: N14/J16 P3BRA Reclamation Species

Scientific Name	Synonym	Common Name	Approved Seed Mixture				
			Rangeland	Drainage	Temporary	Rill/Gully	Pre-1993
Agropyron cristatum	*Agropyron desertorum*	crested wheatgrass					x
Agropyron dasystachyum	*Elymus lanceolatus*	thickspike wheatgrass	x		x	x	
Agropyron elongatum	*Thinopyrum ponticum*	tall wheatgrass		x			
Agropyron inerme	*Pseudoroegneria spicata*	bluebunch wheatgrass	x				
Agropyron riparium	*Elymus lanceolatus*	streambank wheatgrass		x			
Agropyron smithii	*Pascopyrum smithii*	western wheatgrass	x	x		x	x
Agropyron trichophorum	*Thinopyrum intermedium*	pubescent wheatgrass	x		x	x	x
Astragalus cicer		Cicer milkvetch				x	
Atriplex canescens		fourwing saltbush	x	x		x	
Atriplex confertifolia		shadscale	x	x			
Bouteloua curtipendula		sideoats grama	x				
Bouteloua gracilis		blue grama	x				
Bromus inermis		Lincoln brome					x
Distichlis spicata		inland saltgrass		x			
Elymus cinereus	*Leymus cinereus*	basin wildrye		x			
Elymus junceus	*Psathyrostachys juncea*	Russian wildrye	x		x		x
Eurotia lanata	*Krascheninnikovia lanata*	winterfat	x				
Hilaria jamesii	*Pleuraphis jamesii*	galleta	x				x
Kochia prostrata	*Bassia prostrata*	prostrate kochia	x	x			
Linum lewisii		blue flax	x				
Medicago sativa		alfalfa					x
Melilotus officinalis		yellow sweetclover			x		x
Onobrychis viciaefolia		sainfoin	x				
Oryzopsis hymenoides	*Achnatherum hymenoides*	Indian ricegrass	x				x
Penstemon palmeri		Palmer penstemon	x				
Ratibida columnaris	*Ratibida columnifera*	prairie coneflower	x				
Sanguisorbia minor		small burnet	x	x		x	
Sarcobatus vermiculatus		greasewood		x			
Sporobolus airoides		alkali sacaton	x	x			x
Sporobolus cryptandrus		sand dropseed	x				

5 Maintenance

Maintenance activities have been performed in the N14/J16 P3BRA, as needed, per the methods outlined in the AZ-0001F PAP. Maintenance activities have included interseeding, reseeding, weed control, erosion monitoring and repairs, fence installation and maintenance, and grazing.

5.1 Interseeding & Reseeding

Interseeding of reclaimed areas is performed as needed based on the results of annual quantitative vegetation monitoring and qualitative field inspections. Germination is evaluated after the first growing season, but poor establishment is often not apparent until after the third growing season. Interseeding is conducted to improve stand density in areas that are developing but require augmentation. PWCC committed to interseeding several areas within the N14/J16 P3BRA as a part of a permit revision approved in July 2024.

Reseeding involves re-tilling of the surface soils and reseeding in areas where monitoring data suggests that the stand will not adequately develop. Historical monitoring of reclaimed areas throughout the KMC has shown that very few areas require reseeding, and most stands establish well and develop to meet the success criteria for bond release. Areas within the N14/J16 P3BRA that required reseeding over the past 25 years are listed in Table 3 and are shown on Map 3 in Exhibit B. While a few of these areas were reseeded less than 10 years ago, these areas have generally been very small and have consisted of terraces that were reworked or removed as a part of rill and gully repairs. At the time when these terraces were reworked, OSMRE indicated that they would allow this limited acreage to be included in the N14/J16 P3BRA.

Table 3: Reseeding Activities by Year

Year	N14 Acres Reseeded	Year	J16 Acres Reseeded
1990	3.3	1990	0.1
1997	3.1	1995	0.1
1998	0.1	1997	2.1
2001	6.1	1998	0.4
2002	2.8	2001	50.3
2003	9.2	2002	25.6
2004	23.8	2003	7.2
2005	4.4	2004	10.6
2008	9.8	2008	14.6
2009	0.1	2012	0.9
2011	0.8	2013	32.4
2012	0.7	2016	9.5
2013	2.1	2017	1.7
2017	2.8	2019	1.7
2018	24.7	2021	1.3
2019	2.9		
Total	96.5	Total	158.6

5.2 Noxious Weed Management

Noxious weeds are minimal on the N14/J16 P3BRA. The KMC is monitored annually for noxious weeds on both the Arizona noxious weed list (Plant Services Division 2024) and the Navajo Nation noxious weed list (Bureau of Indian Affairs 2022). Weed control efforts mine-wide place an emphasis on those species on the "A" and "B" lists by either the Navajo Nation or the State of Arizona. The species listed in these categories must be eradicated or controlled to prevent their spread.

Six noxious weed species were observed during vegetation monitoring in 2022 – 2024 (Table 4) and only two fall into the priority categories on either list. Crossflower was observed on one grassland and one shrubland transect in 2022 and did not contribute the cover. Halogeton was observed on a single grassland transect in both 2022 and 2024 and accounted for 0.03% of the total cover in 2024. The other four species found on the noxious weed lists all have the "C" rating which states that "control efforts are not a high priority…Emphasis is placed on management, education, awareness, and identification/monitoring."

Noxious weed management at KMC has focused on herbicide treatment of vegetation around the electrical substations and fuel storage areas as well as noxious species observed along roadways and conveyors. The lack of priority noxious weeds present in the reclamation on the N14/J16 P3BRA suggests that the KMC noxious weed management program has been effective. Details of noxious weed treatments are reported in annual weed management reports.

Table 4: Noxious Weeds Observed 2022 – 2024

Scientific Name	Common name	Arizona Noxious Weed List	Navajo Nation Noxious Weed List	2022	2023	2024
High Priority Control Species						
Chorispora tenella	crossflower		A	X		
Halogeton glomeratus	halogeton	B	B	X		X
Low Priority Control Species						
*Bromus inermis**	smooth brome		C	X		X
Bromus tectorum	cheatgrass		C	X	X	X
Kochia scoparia	kochia	C	C	X	X	X
Salsola iberica	Russian thistle		C	X	X	X

* Species was included in older PWCC reclamation seed mixtures

6 Roads & Permanent Facilities

Exhibit D discusses and Map 1 in Exhibit B shows the facilities that are proposed for retention in the postmining landscape to facilitate and enhance the postmining land uses. The current facilities located in the N14/J16 P3BRA include fences, two permanent impoundments designated N14-G and N14-H, permanent ancillary roads for local residents to access grazing areas, and permanent ancillary roads for local residents and visitors to utilize motor vehicles to access the residences and rim areas surrounding the N14 and J16 CRAs. Permanent impoundments are discussed in Exhibit F. Existing cross fences are used to facilitate grazing management of the reclaimed pastures. The N14/J16 P3BRA currently includes portions of 9 fenced pastures that are grazed by local resident's

cattle, sheep, and/or horses. Details of PWCC's grazing program are included in Exhibit D. These fences will remain in place unless the Navajo Nation requests their removal. Splitting pastures into smaller units and rotating livestock through the pastures improves rangeland and soil health by allowing each pasture time to re-grow without grazing pressure. PWCC is requesting approval from OSMRE, Tribal agencies, and the local transportation committee, if applicable, to leave permanent roads for accessing residences, interior grazing areas, permanent ponds, and rim areas. The postmining access roads, left by PWCC for the purpose of accessing the postmining lands, will be maintained in the manner that other similar residential and range access roads have been traditionally maintained prior to any mining activities. All permanent facilities proposed for retention will enhance and compliment the postmining land use.

7 References

Bureau of Indian Affairs. 2022. Navajo Nation Integrated Weed Management Plan. August 2022. URL: https://www.bia.gov/sites/default/files/dup/inline-files/appendix_a._navajo_nation_integrated_weed_management_plan_no_appendix.pdf [Accessed July 2024].

Plant Services Division. 2024. Regulated and Restricted Noxious Weeds. Arizona Department of Agriculture. URL: https://agriculture.az.gov/pestspest-control/agriculture-pests/noxious-weeds [Accessed July 2024].

EXHIBIT D

Post-Mining Land Use

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1 Overview

The permitted post-mining land uses for the Kayenta Mining Complex (KMC) are rangeland grazing, wildlife habitat, and cultural plants. To demonstrate that these land uses have been achieved, Peabody Western Coal Company (PWCC) manages a sustainable community-based grazing program, conducts annual monitoring to document wildlife use mine-wide, and conducts annual vegetation monitoring.

The rangeland grazing program was initiated in 1999 and is ongoing. This program uses site-specific annual vegetation production and precipitation information to adjust grazing intensity and duration. The rangeland grazing program actively involves the post-mining land users and serves to educate them regarding sustainable livestock and pasture management. This program was recognized by the Office of Surface Mining Reclamation and Enforcement (OSMRE) in 2005 with the National Excellence in Surface Coal Mining and Reclamation Award.

Wildlife monitoring is conducted year-round at the mine for reclaimed lands and specific species. Formal studies are augmented by opportunistic sightings recorded by mine personnel and contractors engaged in mining and reclamation activities. Reclaimed lands have developed vegetation communities capable of supporting a wide range of wildlife species including birds, mammals, and reptiles. As reclaimed vegetation communities continue to develop it is expected that they will attract additional species and wildlife use will continue to increase. Wildlife monitoring programs conducted since 1981 support increased use over time.

Shrubland, woodland, and cultural plant communities are established as islands interspersed within reclaimed areas on predominantly north-facing hillslopes, below ridgelines, and along drainage bottoms. These areas are selected to improve landscape and community diversity, develop diverse habitat features, establish travel corridors, expand the use of more open rangeland areas, diversify and increase the prey base for predatory mammals and raptors, provide a source of culturally significant plant materials, and introduce sources of native plant propagules for migration into the surrounding rangeland vegetation. The cultural planting program at the KMC was recognized by OSMRE in 1998 with the National Excellence in Surface Coal Mining and Reclamation Award and in 2002 with the Director’s Award. Additionally, this program received the 1996 American Society of Surface Mining and Reclamation Award.

2 Rangeland Grazing Program

There are 10 pastures in the N14 Coal Resource Area (CRA) and six pastures in the J16 CRA. Six of the N14 pastures and three of the J16 pastures are at least partially included in the Phase III bond release area (P3BRA). These pastures total 1,828 acres. Details of the grazing program are included in each year’s annuals report starting in 2000. A summary of the annual grazing program’s use of the N14/J16 P3BRA pastures is included in Table 1.

Table 1: N14/J16 P3BRA Pastures in the Annual Grazing Program

Year	Pastures Grazed	Acres Grazed	Estimated AUMs	Months Grazed	Species
2002**	1	27	8.7	Jan-Mar	Cattle
2003	0	-	-	-	-
2004	0	-	-	-	-
2005**	1	40	15.0	Nov-Dec	Cattle
2006**	1	40	12.0	Jun-Jul	Cattle
2007**	1	42	12.4	Jan	Cattle
2008	2	258	30	Mar-Jul	Cattle
2009	4	740	19	Mar-Sep	Cattle
2010	5	935	59.5	Mar-Nov	Cattle
2011*	2	480	29.6	Aug-Sep	Cattle
2012*	3	698	?	?	Cattle
2013	5	920	?	?	Cattle
2014**	2	195	17.6	?	Cattle/Sheep
2015	0	-	-	-	-
2016	4	724	62.0	Nov-Dec	Cattle
2017	6	1578	258	Jan-Apr; Nov-Dec	Cattle
2018	4	557	104.0	Jan-Mar	Cattle/Sheep
2019	2	341	44.2	Nov-Dec	Cattle
2020	3	776	103.4	Jan-Mar; Nov-Dec	Cattle
2021	2	633	50.9	Jan-Mar	Cattle
2022	4	538	38.5	Nov-Dec	Cattle
2023	5	1145	78.0	Jan-Mar; Dec	Cattle
2024	5	1416	56.1	Jan-Mar	Cattle

* N14 Grazing Only; ** J16 Grazing Only

At least some grazing has occurred in 6 pastures within the N14/J16 P3BRA every year since 2002. Grazing was suspended for three years (2003, 2004, and 2015) due to drought or trespass grazing. Starting in 2005, a predominantly dormant season grazing has been allowed in these pastures, which allows vegetation to grow unhindered during the growing season. There are some cases of extended grazing beyond the dormant season, but these are special cases only.

2.1 Stocking Rates

Annual livestock stocking rates and pasture rotations are determined based on estimated available forage. Reclaimed vegetation productivity samples adjusted for annual and seasonal variations in precipitation are used to calculate available forage. Stocking rates are based on animal units (AU); one AU is the equivalent of a 1000-pound dry cow. An animal unit month (AUM) is the amount of forage required to support one animal unit for one month and is equal to 900 pounds of dry forage. AU equivalents as described in Valentine (1990) were used to

determine mixed age class or mixed species herd stocking rates. A 50% utilization rate is applied along with a 20% reduction to account for wildlife use and trampling loss.

Families participating in PWCC's grazing program are asked to submit a list of their animals and preferred pastures. Total AUs are calculated for each family's herd and grazing durations in each pasture are based on the estimated available AUMs of forage. An effort is made to accommodate each family's preferences when assigning pastures, but available forage, rangeland health, and herd composition are the primary considerations. PWCC staff and contractors visually monitor pastures at least once a month during the winter grazing season to verify the grazing plans are being followed and evaluate forage health.

3 Wildlife Habitat Establishment

Wildlife habitats and ranges are not limited by anthropogenic boundaries. Evaluation of wildlife use on reclaimed habitats requires a holistic approach that considers reclaimed lands, adjacent undisturbed lands, and the interaction of wildlife species between and within these habitat types. Wildlife monitoring is conducted mine-wide every year to document species' presence and habitat use.

PWCC has committed to returning more than 5% of the permanent program reclaimed lands to wildlife habitat. This is achieved through a combination of reclamation components, non-vegetal enhancements, and the development of water sources in the post-mining landscape.

3.1 Reclamation for Wildlife

Post-mining topography, variations in growth media, multiple seed mixtures, shrub and tree establishment, and developed water sources are all components of PWCC's reclamation plan designed to provide a diversity of wildlife habitats. Successful achievement of vegetation cover, diversity, shrub density, and tree transplant survival standards (Exhibit E) demonstrate that reclaimed vegetation communities have been established and are developing to provide suitable habitats for a variety of wildlife species.

3.2 Non-Vegetal Habitat Enhancements

Rock features are placed in reclaimed areas to provide escape and thermal cover, small animal den locations, promote shrub and tree establishment, and provide raptor perches for hunting and resting. At least one rock feature is to be constructed for every 100 acres of reclamation except where local residents have objected to their creation. The N14/J16 P3BRA includes14 features in N14 and 9 features in J16 which meets this minimum density requirement. Locations of these features are shown on Map 2 in Exhibit B.

3.3 Water for Wildlife

There are several permanent sediment control structures in the N14 and J16 CRAs that impound and provide suitable water for wildlife and livestock. Water features such as Ponds N14-G and N14-H are located within the N14/J16 P3BRA, and support wildlife use of this area (Exhibit B Map 2).

3.4 Annual Wildlife Monitoring

Mine-wide wildlife monitoring has been formally conducted at KMC every year since 1981 in compliance with the current Permit Application Package (PAP). Six separate monitoring tasks

were completed annually during active mining until 2018 when mining ceased. Starting in 2019, four of these wildlife monitoring tasks continued to be conducted each year:

1. Red-tailed hawk (*Buteo jamaicensis*) nest monitoring
2. Gunnison's prairie dog (*Cynomys gunnisoni*) colony assessment
3. Navajo special-status species reconnaissance surveys
4. Reclaimed land species reconnaissance

Results from these four monitoring tasks are provided in the following sections. In addition to these specific monitoring tasks, opportunistic wildlife observations are recorded during the year. Complete details of the past wildlife monitoring can be found in each individual year's annual report.

3.4.1 Red-Tailed Hawk Nest Monitoring

The year-round population of red-tailed hawks at KMC has been estimated at 12 to 18 pairs on the northern half of the property. However, the habitat at KMC is thought to be capable of supporting up to 75 pairs in peak years when adequate vegetation can support increased prey (LaRue 1994). Each year known nesting locations are monitored and opportunistic sightings are recorded during other wildlife, meteorological, and vegetation surveys. Nests are often located adjacent to reclaimed areas which provide excellent hunting for small mammals.

Currently, there are two active red-tailed hawk nests, one of which is directly adjacent to the N14 CRA on its western boundary. This nest was identified in 2020 and though no fledglings have been observed in the last four years active nesting, nest improvements, and hunting in the area has been observed.

3.4.2 Gunnison's Prairie Dog Colony Assessment

Gunnison's prairie dog colonies are annually monitored within the KMC permit boundary to determine if suitable habitat exists for the federally threatened black-footed ferret (*Mustela nigripes*) which is considered a prairie dog obligate species. Since survey efforts began, 22 active prairie dog colonies have been documented, though none have fit the Navajo Nation Department of Fish and Wildlife (NNDFW) criteria for formal black-footed ferret surveys.

There are five currently active Gunnison's prairie dog colonies near the Black Mesa facility, J3, J16, and N6 CRAs. In 2018 the colony in J16 was first discovered and has been formally surveyed annually starting in 2020. The colony has fluctuated between 0.5 and 2.0 acres with a population estimate between 14.4 and 28.8 individuals.

3.4.3 Navajo Special-Status Species Reconnaissance Surveys

Special-status species reconnaissance surveys have been performed on the KMC since the mid-1980s to identify suitable habitat and topographical features for species of interest. Threatened, endangered, or candidate species including migratory bird species, non-endangered raptors, or animals of interest (reptiles and mammals) observed were recorded. The most current NNDFW sensitive species list, NNDFW Endangered Species List, Arizona Game and Fish Department (AZGFD) list, Federal Endangered Species list, and Migratory Bird Treaty Act (MBTA) list were used for observations. Species observed that have unknown population distribution, unique habitat

requirements, and/or at-risk population viability are also noted. Both official and opportunistic surveys are conducted throughout the year.

Twenty-six special-status species have been observed within the N14/J16 area during the last six survey years including fourteen sensitive or endangered species for NNDFW and five bird of prey species (Table 2).

3.4.4 Reclaimed Land Species Reconnaissance

Wildlife observations on reclaimed areas have been reported annually since the mid-1980s and have included bats, birds, herps, lagomorphs, ungulates, and other mammals. Formal monitoring efforts specific to bond release began in 2002. Recorded data come from both formal wildlife surveys on reclaimed areas and opportunistic observations made during other field activities performed throughout the year, such as vegetation and meteorological monitoring.

The reclaimed areas throughout the KMC include grasslands, shrublands, woodlands, cultural planting areas, drainages, and ponds that attract an array of bird, mammal, and herp species. Wildlife species observed in the N14 and J16 CRAs between 2018 and 2023 include 107 species (Table 2).

Table 2: Wildlife Species Observed in N14/J16 2018 – 2023

Family	Common Name	Scientific Name
Birds		
Accipitriformes	Northern Goshawk[2,3]	*Accipiter gentilis*
	Golden Eagle[2,3]	*Aquila chrysaetos*
	Red-tailed Hawk[5]	*Buteo jamaicensis*
	Northern Harrier[1]	*Circus hudsonius*
Anseriformes	American Wigeon	*Anus americana*
	Northern Shoveler	*Anas clypeaa*
	Green-winged Teal[1]	*Anas crecca*
	Cinnamon Teal[1]	*Anas cyanoptera*
	Mallard	*Anas platyrhynchos*
	Gadwall	*Anus strepera*
	Lesser Scaup	*Aythya affinis*
	Redhead	*Aythya americana*
	Ring-necked Duck	*Aythya collaris*
	Canvasback	*Aythya valisineria*
	Canada Goose	*Branta canadensis*
	Trumpeter Swan	*Cygnus buccinator*
	Common Merganser[1]	*Mergus merganser*
	Ruddy Duck	*Oxyura jamaicensis*
	Blue-winged Teal	*Spatula discors*
Caprimulgiformes	Black-chinned Hummingbird	*Archilochus alexandri*
	Broad-tailed Hummingbird	*Selasphorus platycercus*
Cathartiformes	Turkey Vulture[5]	*Cathartes aura*
Charadriiformes	Semipalmated Sandpiper	*Calidris pusilla*
	Killdeer	*Charadrius vociferous*
	Black-necked Stilt	*Himantopus mexicanus*
	California Gull	*Larus californicus*
	Franklin's Gull	*Leucophaeus pipixcan*
	Long-Billed Curlew	*Numenius americanus*
	Wilson's Phalarope	*Phaliropis tricolor*
	American Avocet[1]	*Recurvirostra americana*
	Greater Yellowlegs	*Tringa melanoleuca*
	Willet[3]	*Tringa semipalmata*
Columbiformes	Mourning Dove	*Zenaida macroura*
Coraciiformes	Belted Kingfisher[2]	*Megaceryle alcyon*
Falconiformes	Merlin[5]	*Falco columbarius*
	Prairie Falcon[5]	*Falco mexicanus*
	American Kestrel[5]	*Falco sparverius*
Gruiformes	American Coot	*Fulica americana*

Table 2 (continued): Wildlife Species Observed in N14/J16 2018 – 2023

Family	Common Name	Scientific Name
Birds		
Passeriformes	Red-winged Blackbird	*Agelaius phoeniceu*
	Black-throated Sparrow	*Amphispiza bilineata*
	Woodhouse's Scrub-jay	*Aphelocoma woodhouseii*
	Juniper Titmouse	*Baeolophus ridgwayi*
	Canyon Wren	*Catherpes mexicanus*
	Lark Sparrow	*Chondestes grammacus*
	American Crow	*Corvus brachyrhynchos*
	Common Raven	*Corvus corax*
	Yellow Warbler[2,3]	*Dendroica petechia*
	Gray Flycatcher	*Empidonax wrightii*
	Horned Lark	*Eremophila alpestris*
	Brewer' Blackbird	*Euphagus cyanocephalus*
	Pinyon Jay[3]	*Gymnorhinus cyanocephalus*
	Cassin's Finch	*Haemorphous cassinii*
	House Finch	*Haemorhous mexicanus*
	Barn Swallow[1]	*Hirundo rustica*
	Dark-eyed Junco	*Junco hyemalis*
	Song Sparrow	*Melospiza melodia*
	Northern Mockingbird	*Mimus polyglottos*
	Brown-headed Cowbird	*Molothrus ater*
	Ash-Throated Flycatcher	*Myiarchus cinerascens*
	House Sparrow	*Passer domesticus*
	American Cliff Swallow	*Petrochelidon pyrrhonota*
	Western Tanager	*Piranga ludoviciana*
	Spotted Towhee	*Pipilo maculatus*
	Blue-gray Gnatcatcher	*Polioptila caerulea*
	Vesper Sparrow[3]	*Pooecetes gramineus*
	Bushtit	*Psaltriparus minimus*
	Great-Tailed Grackle	*Quiscalus mexicanus*
	Rock Wren	*Salpinctes obsoletus*
	Say's Phoebe	*Sayornis saya*
	Yellow-rumped Warbler	*Setophaga coronata*
	Red-breasted Nuthatch	*Sitta canadensis*
	Western Bluebird	*Sialia mexicana*
	Brewer's Sparrow	*Spizella breweri*
	Chipping Sparrow	*Spizella passerina*
	Lesser Goldfinch	*Spinus psaltria*
	Western Meadowlark	*Sturnella neglecta*
	Mountain Bluebird	*Sialia currucoides*
	Mountain Bluebird	*Sialia currucoides*

Table 2 (continued): Wildlife Species Observed in N14/J16 2018 – 2023

Family	Common Name	Scientific Name
Birds		
Passeriformes	Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
	Violet-green Swallow	*Tachycineta thalassina*
	Tree Swallow[2]	*Tachycineta bicolor*
	Bewick's Wren	*Thryomanes bewickii*
	Bendire's Thrasher	*Toxostoma bendirei*
	Western Kingbird	*Tyrannus verticalis*
	Cassin's Kingbird	*Tyrannus vociferans*
	White-crowned Sparrow	*Zonotrichia leucophrys*
Pelecaniformes	Great Blue Heron[1]	*Ardea herodias*
	White-faced Ibis[3]	*Plegadis chihi*
Piciformes	Northern Flicker	*Colaptes auratus*
Podicipediformes	Pied-billed Grebe	*Podilymbus podiceps*
	Eared Grebe[1]	*Podiceps nigricollis*
Strigiformes	Great Horned Owl[5]	*Bubo virginianus*
Mammals		
Artiodactyla	Elk	*Cervus elaphus*
	Mule Deer	*Odocoileus hemionus*
Carnivora	Coyote	*Canis latrans*
	Bobcat	*Lynx rufus*
Lagomorpha	Black-tailed Jackrabbit	*Lepus californicus*
	Desert Cottontail	*Sylvilargus audubonii*
Rodentia	White-tailed Antelope Squirrel	*Ammospermophilus leucurus*
	Gunnison's Prairie Dog[3]	*Cynomys gunnisoni*
	Gray-collared Chipmunk[3]	*Neotamias cinereicollis*
	Desert Woodrat[1]	*Neotoma lepida*
	Golden-mantled Ground Squirrel	*Spermophilus lateralis*
Herps		
Squamata	Prairie Rattlesnake	*Crotalimus viridis*
	Greater Short-horned Lizard	*Phrynosoma hernandesi*
	Sagebrush Lizard	*Scelophorus graciosus*
	Desert Spiny Lizard	*Sceloporus magister*

[1]NNDFW Sensitive Species, [2]NNDFW Endangered Species, [3]AZGFD Special-status Species, [4]MBTA, [5]Non-endangered Raptors

4 Cultural Planting Program

The Navajo Nation and Hopi Tribe requested that plants of cultural significance be reestablished as a part of reclamation activities at the KMC. Cultural planting areas have been included as a component of the reclamation program since 1991. Culturally important plants that have religious, medicinal, functional, or economic importance were included on the list of potential species listed in the AZ-0001F Permit (Table B-1, Chapter 23). This list was compiled from multiple written references and consultations with the Navajo and Hopi Tribes with input from medicine men, herbalists, and residents of the area. Over 120 species have been identified and over 50 of these species have been used for seeding and planting projects.

The KMC began using red rock (scoria) for cultural planting sites in 1998 using both seeding and/or transplanting of culturally important species. Most of these areas are on north facing slopes and currently comprise 5 to 10% of the annual reclamation. However, they only comprise about 2% of the reclamation in the N14J16 P3BRA because most of the reclamation was completed in the early days of this program. Planted seedlings are grown in a nursery from locally or regionally collected seed sources. Nursery cultural protocols have been developed over time to maximize success including inoculation with mycorrhizal fungi and all seedlings are hand-planted. The KMC has established over 600 acres of red rock cultural areas mine-wide and transplanted over 500,000 seedlings.

There are five cultural planting areas included in the N14/J16 P3BRA. Four of these areas are identified as Woodland areas on the map in Exhibit B Map 4 because they were also planted with pinyon and juniper trees. The other cultural planting area has red rock on the surface and was seeded with the cultural seed mixture, but due to the lack of trees, it was included in the shrubland sample universe for bond release monitoring. In these areas as well as elsewhere throughout the P3BRA, 53 species identified through this program as having cultural significance were found during vegetation monitoring in 2019 – 2023 (Table 3). Seventeen of these species are included in approved seed mixtures that may have been used in this reclamation, but the other 36 species have volunteered in the reclamation area. Many of these volunteers likely established due to seed sources from cultural planting areas adjacent to this reclamation. Not only have the cultural planting areas been successfully established themselves, but they are promoting the development of vegetation communities with culturally important plants beyond their planting boundaries.

5 References

LaRue, C. 1994. Birds of Northern Black Mesa, Navajo County, Arizona. Great Basin Naturalist 54(1).

Valentine, J. F. 1990. Grazing Management. Academic Press, San Diego, CA.

Table 3: Culturally Important Plant Species Observed in N14/J16 P3BRA

Scientific Name	**Common Name**
Grasses	
Agropyron smithii	western wheatgrass
Bouteloua gracilis	blue grama
Hilaria jamesii	James' galleta
Monroa squarrosa	false buffalograss
Oryzopsis hymenoides	Indian ricegrass
Sporobolus airoides	alkali sacaton
Sporobolus cryptandrus	sand dropseed
Forbs	
Amaranthus graecizans	prostrate pigweed
Astragalus wingatanus	Fort wingate milkvetch
Chenopodium spp.	goosefoot
Cleome serrulata	Rocky Mountain bee plant
Cymopterus spp.	spring parsley
Eriogonum alatum	winged wildbuckwheat
Eriogonum umbellatum	sulfur wild buckwheat
Helianthus annuus	common sunflower
Leucelene ericoides	rose heath
Linum lewisii	Lewis flax
Mentzelia pumila	golden blazingstar
Penstemon barbatus	scarlet bugler
Penstemon linarioides	toadflax penstemon
Petradoria pumila	rock goldenrod
Portulaca oleracea	common purslane
Rumex crispus	curly dock
Sphaeralcea ambigua	desert globemallow
Sphaeralcea coccinea	scarlet globemallow
Sphaeralcea parvifolia	littleleaf globemallow
Townsendia exscapa	ground daisy
Verbesina encelioides	golden crownbeard
Subshrubs	
Artemisia frigida	prairie sagewort
Ceratoides lanata	winterfat
Chrysothamnus greenei	Greene's rabbitbrush
Ephedra viridis	mormon tea
Senecio douglasii var. longilobus	threadleaf ragwort
Shrubs	
Artemisia tridentata	big sagebrush
Atriplex canescens	fourwing saltbush
Atriplex confertifolia	shadscale saltbush
Chrysothamnus nauseosus	rubber rabbitbrush
Cowania mexicana	Stansbury cliffrose

Table 3 (continued): Culturally Important Plant Species Observed in N14/J16 P3BRA

Scientific Name	**Common Name**
Shrubs	
Fallugia paradoxa	apacheplume
Lycium pallidum	rabbitthorn
Purshia tridentata	antelope bitterbrush
Gutierrezia sarothrae	broom snakeweed
Rhus trilobata	skunkbush sumac
Sarcobatus vermiculatus	black greasewood
Shepherdia rotundifolia	roundleaf buffaloberry
Yucca angustissima	narrowleaf yucca
Yucca glauca	small soapweed
Trees	
Juniperus osteosperma	Utah juniper
Pinus edulis	Colorado pinyon
Succulents	
Echinocereus spp.	hedgehog cactus
Mammillaria spp.	pincushion cactus
Opuntia phaeacantha	tulip pricklypear
Opuntia polyacantha	plains pricklypear

EXHIBIT E

N14/J16 Phase III Bond Release Revegetation Success Demonstration

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1 Introduction

The Phase III bond release information contained in this application includes results and analysis of 2022 – 2024 vegetation sampling. This information supports Phase III bond release for a 992-acre area within Coal Resource Areas (CRA) N14 and J16. The combination of these two areas into a larger Phase III bond release area (P3BRA) was approved in 2023 by the Office of Surface Mining Reclamation and Enforcement (OSMRE).

The portion of the P3BRA that falls within the N14 CRA was approved for Phase I bond release in January 2008 and for Phase II bond release in December 2008. The portion of the P3BRA that falls within the J16 CRA was approved for Phase I bond release in July 2017 and for Phase II bond release in December 2022. Map 1 in Exhibit B of this bond release application shows the location and extent of the P3BRA within the Kayenta Mining Complex (KMC) and Map 5 in Exhibit B shows the locations of the three reference areas.

1.1 Justification for a Combined Phase III Bond Release Area

The N14 CRA and J16 CRA Phase III bond release areas are less than ¼ mile apart at their closest point and 3.9 miles apart at their farthest point. The N14 CRA area is approximately 531 acres and was seeded over the period between 1989 and 2003. The J16 CRA area is approximately 461 acres and was seeded between 1984 and 2013, but 94% of the area was seeded in the same time period as the N14 CRA area. As such, all of the N14 CRA and most of the J16 CRA were reclaimed over 20 years ago. See Exhibit C of this bond release application for details of seeding dates.

These two areas were primarily reclaimed using the same methods and seed mixtures. These methods were consistent with the approved AZ-0001C, AZ-0001D, and AZ-0001E Permit Application Packages (PAP) that were in effect at that time. However, the methods used were older methods than those currently approved. These areas were reclaimed concurrent with the surrounding Interim Program lands. See Exhibit C of this bond release application for details of reclamation methods.

These two areas were sampled separately in 2022; however, OSMRE approved their combination in the spring of 2023 prior to 2023 sampling. The combined P3BRA is still smaller in size than the latest KMC Phase III bond release application approved by OSMRE in 2019. That area, the J21 P3BRA was 1,384 acres.

2 Vegetation Sampling

Vegetation sampling was conducted in the N14 P3BRA in May 2022, in the J16 P3BRA in September 2022, and in the combined N14/J16 P3BRA in May 2023 and September 2024. The complete data sets from each sampling event are included as Attachments 1, 2, 3, and 4 and will also be submitted in Microsoft Excel format.

In each year, sampling was conducted within the three approved sagebrush reference areas (SBRA) and the appropriate community types within the N14/J16 Phase III bond release area (N14/J16 P3BRA). The sagebrush reference areas include the J7 SBRA, N7/8 SBRA, and N14 SBRA. The community types sampled in the N14/J16 P3BRA include grassland, shrubland, and woodland.

2.1 Sampling Design

The required number of vegetation sample points within the N14/J16 P3BRA vegetation communities and each of the three sagebrush reference areas were randomly located and sample numbers were randomly generated for each point. The sample points were located within the various community type polygons interspersed within the N14/J16 P3BRA using an area stratified random approach in which fewer samples were allocated to the smallest units, while larger units included more samples. This process was repeated each year, so the sample locations differ each year. GPS equipment was used during field work to locate vegetation sample points.

Table 1 provides a summary of the sampling intensity for the sagebrush reference areas and the three community types within the N14/J16 P3BRA. Some of the areas that were sampled in the woodland community in spring 2022, were reclassified as shrubland areas before the 2023 sampling. Thus, the woodland sample size presented in the 2022 dataset is less than the required 40 samples. Sample locations for N14/J16 P3BRA communities are shown on Map 4 of Exhibit B and sample locations for reference areas are shown on Map 5 of Exhibit B.

2.2 Sample Adequacy

An adequate sample size was based on:

1. A specified minimum (with sample adequacy being met),
2. Sampling to a statistically adequate sample size, or
3. Sampling to a maximum number.

Adequate sample sizes varied depending on the area sampled. These methods were consistent with the methods and procedures detailed in the AZ-0001F PAP. A minimum of 15 samples were collected in each SBRA with additional samples required for adequacy in both the spring and fall of 2022. The maximum of 40 samples were collected in the P3BRA communities. The sample size of 40 allowed for the use of "reverse null" hypothesis testing with highly variable data (e.g., production and shrub density) that would otherwise require very high sample sizes as determined using the sample adequacy calculation below.

Table 2 provides sampling information for statistical sample adequacy calculations for the N14/J16 P3BRA grassland, shrubland, and woodland communities. Table 3 provides sampling information for statistical sample adequacy calculations for the three SBRA communities. Sample adequacy was calculated using the following formula:

$$n_{min} = \frac{t^2 s^2}{(d\bar{x})^2}$$

where:

n_{min} = Minimum sample size
s^2 = Sample variance (n-1 degrees of freedom)
d = Precision (0.10)
$\bar{x}$ = Sample arithmetic mean
t = The (α=0.10) t-table value for a 1 tail t-test, n-1 degrees of freedom (infinite degrees of freedom may be used if n>30)
n = Sample size

Table 1: Sampling Intensity for N14/J16 Phase III P3BRA and Reference Areas

Community	Area	Year	Parameter				
			Vegetation Cover	Prod-uction	Shrub Density	Tree Density	Species Diversity
N14/J16 P3BRA							
Grassland	N14	Spring 2022	40	40	40	-	40
	J16	Fall 2022	40	40	40	-	40
	N14/J16	Spring 2023	40	40	40	-	40
		Fall 2024	40	40	40	-	40
Shrubland	N14	Spring 2022	40	40	40	-	40
	J16	Fall 2022	40	40	40	-	40
	N14/J16	Spring 2023	40	40	40	-	40
		Fall 2024	40	40	40	-	40
Woodland[1]	N14	Spring 2022	-	-	40	18	-
	J16	Fall 2022	-	-	-	Census	-
	N14/J16	Spring 2023	-	-	40	40	-
		Fall 2024	-	-	40	40	-
Sagebrush Reference Areas							
Sagebrush Reference Areas	J7 SBRA	Spring 2022	19	-	-	-	19
		Fall 2022	18	-	-	-	18
		Spring 2023	15	-	-	-	15
		Fall 2024	15	-	-	-	15
	N7/8 SBRA	Spring 2022	19	-	-	-	19
		Fall 2022	18	-	-	-	18
		Spring 2023	15	-	-	-	15
		Fall 2024	15	-	-	-	15
	N14 SBRA	Spring 2022	19	-	-	-	19
		Fall 2022	18	-	-	-	18
		Spring 2023	15	-	-	-	15
		Fall 2024	15	-	-	-	15

[1] The woodland areas were included in the shrubland sample universe for cover sampling.

Table 2: N14/J16 P3BRA Sample Adequacy

Area	Year	Parameter	N[1]	1-tailed t-value	Mean	St. Dev.	Nmin[2]
Grassland							
N14	Spring 2022	Vegetation Cover	40	1.304	13.7	4.9	22
		Production	40	1.304	459.9	222.6	40
		Shrub Density	40	1.304	2,193.4	3,328.8	392
J16	Fall 2022	Vegetation Cover	40	1.304	1,389.1	11.2	20
		Production	40	1.304	274.3	286.6	48
		Shrub Density	40	1.304	1,384.0	1,422.9	180
N14/J16	Spring 2023	Vegetation Cover	40	1.304	17.8	6.9	26
		Production	40	1.304	379.6	248.9	73
		Shrub Density	40	1.304	11,155.2	39,903.7	2,176
	Fall 2024	Vegetation Cover	40	1.304	29.3	14.5	42
		Production	40	1.304	537.9	331.8	65
		Shrub Density	40	1.304	1721.9	1677.7	162
Shrubland							
N14	Spring 2022	Vegetation Cover	40	1.304	15.0	6.1	29
		Production	40	1.304	399.0	250.1	67
		Shrub Density	40	1.304	8800.9	16849.3	623
J16	Fall 2022	Vegetation Cover	40	1.304	31.2	10.1	18
		Production	40	1.304	481.2	276.6	56
		Shrub Density	40	1.304	1808.9	1130.2	66
N14/J16	Spring 2023	Vegetation Cover	40	1.304	18.4	7.1	25
		Production	40	1.304	370.9	221.1	60
		Shrub Density	40	1.304	12927.7	57508.9	3365
	Fall 2024	Vegetation Cover	40	1.304	29.0	13.2	35
		Production	40	1.304	670.5	353.2	47
		Shrub Density	40	1.304	3389.2	4771.5	337
Woodland							
N14	Spring 2022	Shrub Density	40	1.304	4722.7	3758.9	108
		Tree Density	18	1.333	98.9	94.4	162
J16[3]	Fall 2022	Shrub Density	-	-	-	-	-
		Tree Density	-	-	-	-	-
N14/J16	Spring 2023	Shrub Density	40	1.304	7113.4	4662.6	73
		Tree Density	40	1.304	76.9	92.9	248
	Fall 2024	Shrub Density	40	1.304	14127.6	7255.5	45
		Tree Density	40	1.304	77.9	80.1	180

[1] N = Sample Size

[2] N-min = Minimum sample size necessary to detect a 10% reduction in the mean with 90% confidence using n-1 degrees of freedom

[3] Complete census within the one woodland area

Table 3: Reference Area Sample Adequacy

Area	Year	Vegetation Cover				
		N[1]	1-tailed t-value	Mean	St. Dev.	Nmin[2]
J7 SBRA	Spring 2022	19	1.330	9.0	2.9	18
	Fall 2022	18	1.333	23.7	4.6	7
	Spring 2023	15	1.345	14.9	2.0	3
	Fall 2024	15	1.345	21.7	4.4	8
N7/8 SBRA	Spring 2022	19	1.330	16.1	3.7	9
	Fall 2022	18	1.333	24.4	7.8	18
	Spring 2023	15	1.345	17.3	4.3	11
	Fall 2024	15	1.345	15.6	3.8	11
N14 SBRA	Spring 2022	19	1.330	18.9	6.0	18
	Fall 2022	18	1.333	41.4	8.6	8
	Spring 2023	15	1.345	19.2	4.4	9
	Fall 2024	15	1.345	28.1	4.5	5

[1] N = Sample Size
[2] N-min = Minimum sample size necessary to detect a 10% reduction in the mean with 90% confidence using n-1 degrees of freedom

2.3 Data Collection

The revegetation success parameters sampled and evaluated as a part of the 2022, 2023, and 2024 Phase III bond release studies included vegetation cover, biomass production, shrub density, tree density, and species diversity.

2.3.1 Cover

Cover sampling included first hit cover for vegetation by species, surface plant litter, standing dead litter, rock, and bare ground. Second hit cover was taken only for vegetation to provide more comprehensive composition and species diversity information. Cover data was collected using a point-intercept method carried out with a laser light bar which allows for the vertical projection of two intercepts each perpendicular to and 0.5-meters from either side of a 50-meter transect line for a total of 100 first point intercepts per transect.

Allowable vegetation cover was calculated for each N14/J16 P3BRA community and each SBRA transect used in sample adequacy and hypothesis testing calculations. Per the 2024 permit revision specific to the N14/J16 P3BRA, allowable vegetation cover was calculated as total live vegetation cover minus noxious weeds (Arizona or Navajo Nation A- or B-listed).

2.3.2 Production

Herbaceous production sampling was conducted using circular plots 0.5 square meters in size. Three plots were each placed 1 meter away from the cover sampling transect at 19.5, 33.5, 47.5 meters. Production plots were placed on the left side of the transect (as viewed from the starting point) in the spring sampling events and on the right side of the transect in the fall sampling events.

Within each plot, all herbaceous growth in a vertical projection (except for tree species) was clipped, separated by species, and placed in labeled paper bags. Labeling included date, sampler, CRA, transect number, and plant species. Current year's herbaceous growth of shrubs was collected in the same manner; however, woody tissue was not harvested. Clipped materials were accumulated for the three 0.5-square meter plots for each vegetation sample point. The total area clipped for each sample point was 1.5 square meters. The bags containing the clipped material were dried at 30 degrees Celsius for 48 hours and then weighed to the nearest 0.1 gram.

Per permit specification, allowable production was calculated as the total production minus noxious species and annual/biennial production greater than 10% of the average total production across all transects within each sampling area. Production data are presented as pounds per acre.

2.3.3 Shrub & Tree Density

Shrub and tree density was measured along a 2 m x 50 m belt transect oriented and centered along the cover transect. All shrubs and subshrubs (including seedlings) with root crowns located within the belt transect boundaries were tabulated by species and classified into three height categories: 0 to 20 cm, 21 to 50 cm, and greater than 51 cm. Shrub density was measured along all grassland, shrubland, and woodland transects, while tree density was only measured along woodland transects. No shrub or tree density measurements were made in reference areas. Shrub and tree density results are presented as live shrubs per acre.

2.3.4 Species Diversity

Species diversity standards are based on species density data collected during cover sampling. All plant species occurring within one meter on either side of the cover sample transect centerline were observed and recorded in all reclamation and reference areas. The total number of species observed in each sample is the species density and is reported as number of species per 100 square meters. Species density indicates the relative species composition in the reclaimed areas from a different perspective than is available from examination of cover data alone.

3 Bond Release Standards

Data collection for the N14/J16 P3BRA was completed following the procedures detailed in the Study Plans submitted to OSMRE in 2019 and 2023. Formal hypothesis testing followed the current procedures detailed in Chapter 23, Appendix F of the AZ-0001F PAP. Revegetation success standards are detailed in Table 4 and follow those outlined in Table 8 of Chapter 23 of the AZ-0001F PAP as modified in 2024. The production technical standard is subject to annual adjustment to adjust for variations in precipitation or temperature from long-term average values per Chapter 23 of the AZ-0001F PAP as described in Section 3.1.

Table 4: N14/J16 P3BRA Bond Release Revegetation Standards

Community	Parameter	Standard
Grassland	Vegetation Cover[1]	≥ 90% of 3 Sagebrush Reference Areas
	Production	375 pounds/acre (adjusted for climate[2])
	Shrub Density	400 stems/acre
	Shrub Diversity	2 shrub or subshrub species present
	Life Form Similarity	Motyka Similarity Index (Test B)
	Overall Species Density	Diversity Supporting Test A (not required)
	Native Species Presence	Diversity Supporting Test C (not required)
Shrubland	Vegetation Cover[1]	≥ 90% of 3 Sagebrush Reference Areas
	Production	375 pounds/acre (adjusted for climate[2])
	Shrub Density	800 stems/acre
	Shrub Diversity	2 shrub or subshrub species present
	Life Form Similarity	Motyka Similarity Index (Test B)
	Overall Species Density	Supporting Test A (not required)
	Native Species Presence	Supporting Test C (not required)
Woodland	Shrub Density	800 stems/acre
	Shrub Diversity	4 shrub or subshrub species present
	Tree Density	75 stems/acre

[1] Vegetation cover data is adjusted to exclude noxious weeds as described in Section 2.3.1.
[2] The production technical standard is subject to annual adjustment to adjust for variations in precipitation or temperature from long-term average values per Chapter 23 of the AZ-0001F PAP as described in Section 3.1.

3.1 Climate-Adjusted Production Standard

The production technical standard is 375 pounds per acre but is subject to annual adjustment to account for variations in precipitation or temperature from long-term average values per Chapter 23 of the AZ-0001F PAP. The following equation was used to adjust the production standard:

$$y = 42.434(a - b) + 375$$

where:

y = the adjusted production standard for a given year
a = inches of annual rainfall from the previous 12 months (June – May for spring sampling or October – September for fall sampling) minus 8.00 inches
b = percent (%) departure of degree days from the previous 12 months above or below 18363

Based on these calculations, the production standard for both seasons of 2022 sampling and 2024 was decreased below the 375 pounds per acre while the 2023 standard was increased (Table 5).

Table 5: Climate-Adjusted Production Standard for 2022, 2023, and 2024

Climate Station	Spring 2022		Fall 2022		Spring 2023		Fall 2024	
	Jun-May Rainfall (in)	**Jun-May Degree Days**	**Oct-Sept Rainfall (in)**	**Oct-Sept Degree Days**	**Jun-May Rainfall (in)**	**Jun-May Degree Days**	**Oct-Sept Rainfall (in)**	**Oct-Sept Degree Days**
1			9.12		10.81		7.04	
2R	9.66		10.97		13		8.93	
3R	9.4		11.9		21.28			
6R	8.52		8.94		10.34			
7R			16.73					
9		19319	13.69	19255.7	13.91	18203.5		19259.8
12	8.79	19592.6	8.72		17.57		6.91	19620.4
200	13.29		13.61		10.43		11.71	
201	11.94		13.37		17.55		10.99	
202	11.18		13.54		17.48		9.82	
Average	**10.40**	**19455.8**	**12.06**	**19255.7**	**14.71**	**18203.5**	**9.23**	**19440.1**
Difference	**2.40**	**5.95**	**4.06**	**4.86**	**6.71**	**-0.87**	**1.23**	**5.87**
Production Standard	**224.19**		**340.95**		**696.51**		**178.44**	

4 Hypothesis Testing

Hypothesis testing was completed using Microsoft Excel in accordance with the procedures outlined in Chapter 23, Appendix F of AZ-0001F PAP. The process for hypothesis testing of vegetation cover is illustrated in Figure 1 and the process for production and shrub density is illustrated in Figure 2.

All workbooks including data and calculations have been provided in Excel format.

Figure 1: Vegetation Cover Hypothesis Testing Flow Chart

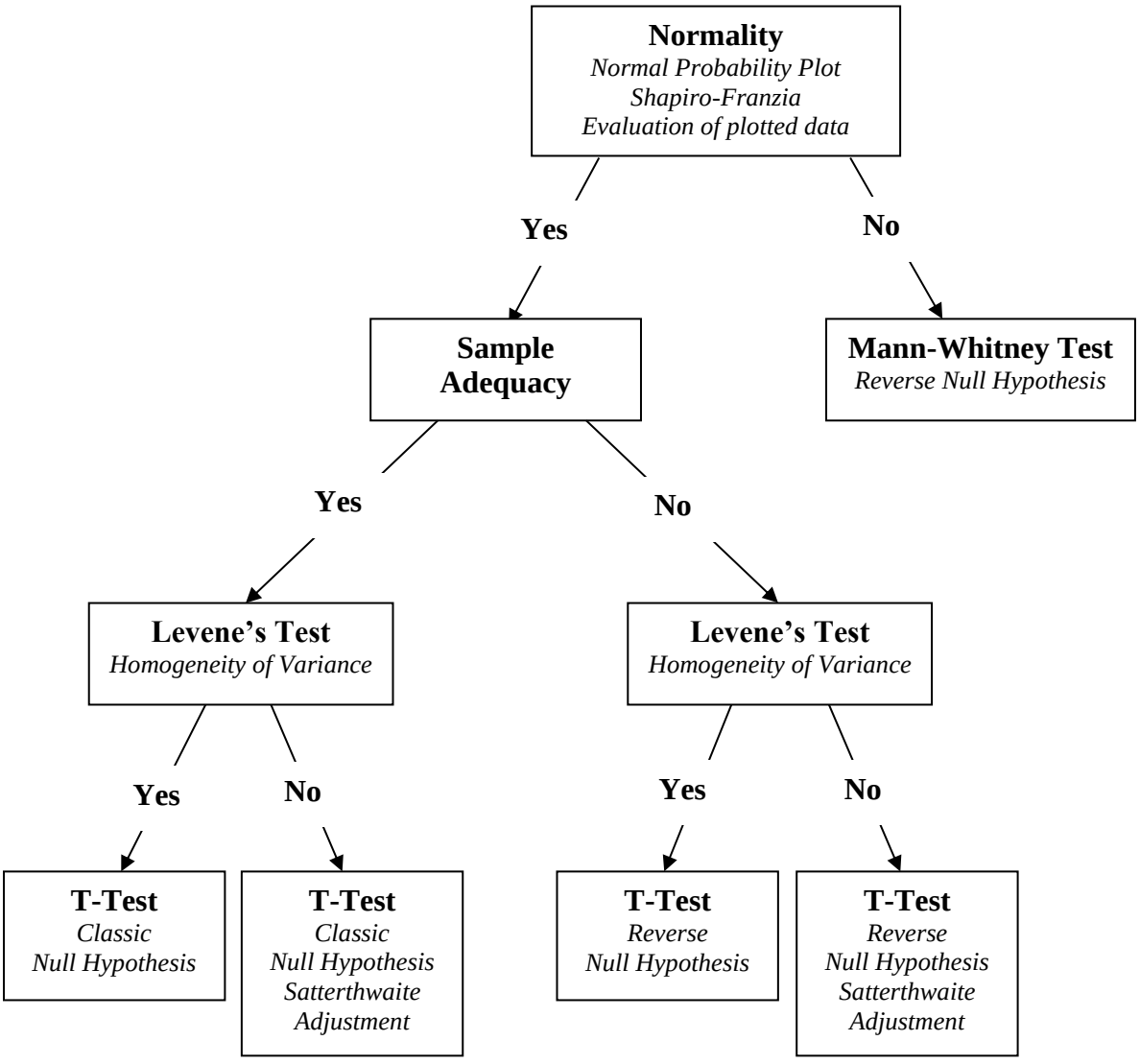
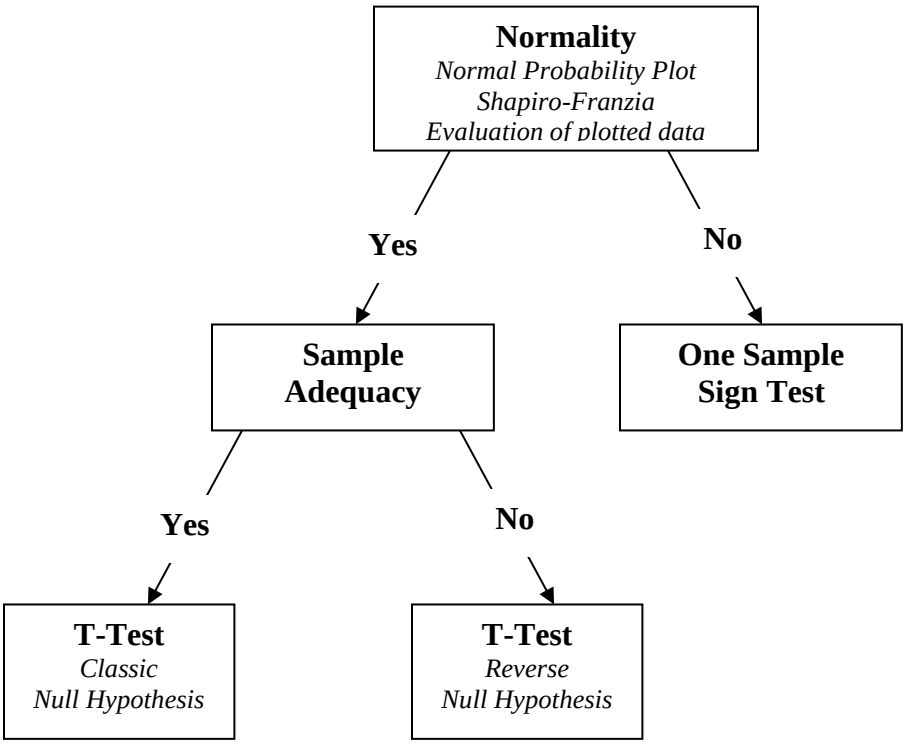


Figure 2: Production and Shrub Density Hypothesis Testing Flow Chart



4.1 Vegetation Cover

Vegetation cover data from each of the N14/J16 P3BRAs was compared to the average of the three sagebrush reference areas. Both the reclamation data and the reference area pooled data were first evaluated for distribution normality. If the datasets were normally distributed, then they were evaluated for sample adequacy. If sample adequacy was indicated, then they were evaluated for homogeneity of variance.

If homogeneity of variance was indicated, then testing proceeded using a two-sample t-test with a classical null hypothesis. The null hypothesis is that the reclamation mean is equal to or greater than 90% of the reference area mean. The standard is passed when the null hypothesis is accepted.

Because the standard for success is based on the average of the three reference areas, it is necessary to generate a pooled variance value for use in the t-test. The pooled variance was derived using the following equation:

$$S_p^2 = \frac{(n_{J7} - 1)S_{J7}^2 + (n_{N7/8} - 1)S_{N7/8}^2 + (n_{N14} - 1)S_{N14}^2}{n_{J7} + n_{N7/8} + n_{N14} - 3}$$

where:

S_p^2 = Pooled variance
s^2 = Sample variance of each reference areas (n-1 degrees of freedom)
n = Sample size of each reference area

The two-sample t-test assumes approximate normality of both data sets, independence of observations, and approximate equality of variances between the two groups. If homogeneity of variance is not shown, but the data were normally distributed and there was sample adequacy, then the degrees of freedom for the critical t value were adjusted using Satterthwaite's correction (Bilbrough and Howlin 2012).

The test statistic is:

$$t = \frac{\bar{x}_{br} - 0.9\bar{x}_{ref}}{\sqrt{\frac{(n_{br}-1)S_{br}^2 + (n_{ref}-1)S_p^2}{(n_{br}+n_{ref}-2)}\left(\frac{1}{n_{br}} + \frac{1}{n_{ref}}\right)}}$$

where:

$\bar{x}_{br}$ = Mean of the bond release area
$\bar{x}_{ref}$ = Mean of the three reference areas
S_{br}^2 = Sample variance of the bond release area
S_p^2 = Pooled variance of the reference areas
n_{br} = Sample size of the bond release area
n_{ref} = Sample size of the reference area data

The t-test statistic is compared to a critical t-value (one-tailed, left tail, $\alpha = 0.10$, $n_{br}+n_{ref}$ -2 degrees of freedom). If the test t-value exceeds the critical t-value, the null hypothesis is accepted and revegetation success for cover is supported.

If sample adequacy was not demonstrated, then testing proceeded using a two-sample t-test with a reverse null hypothesis. The reverse null hypothesis is that the reclamation mean is equal to or less than 90% of the reference area mean and the standard is passed when the null hypothesis is rejected. The assumptions for a two-sample t-test as described above still apply and the test statistic is the same. Data transformations and/or Satterthwaite's correction may be applied, as necessary.

If at the beginning of the process, the reclamation data and/or the reference area were not normally distributed, then they were evaluated using a non-parametric Mann-Whitney test with a reverse null hypothesis. This null hypothesis states that the reclamation values tend to be less than 90% of the reference area values. The standard is passed when the one-sided null hypothesis is rejected: the test statistic is greater than $Z_{1-\alpha}$, (in the right tail). The test z-value is calculated as follows:

$$Z = \frac{\sum_{i=1}^{n} R\,(br_i) + \frac{1}{2} - n_{br}\frac{n_{br}+n_{ref}+1}{2}}{\sqrt{\frac{n_{br}n_{ref}(n_{br}+n_{ref}+1)}{12}}}$$

where:

$R(br_i)$ = Ranks of the observations in the revegetation sample
n_{br} = Sample size of the bond release area
n_{ref} = Sample size of the reference area data

4.2 Production

Production data from each of the N14/J16 P3BRA communities will be compared to the climate-adjusted technical standard (Table 5). The technical standard is 375 pounds per acre adjusted for variations in precipitation or temperature during the previous 12 months from the long-term average values per Chapter 23 of the AZ-0001F PAP.

Once the maximum of 40 samples have been collected and dried, the dataset was evaluated for distribution normality. If the datasets were normally distributed, then they were evaluated for sample adequacy. If sample adequacy was indicated, then testing proceeded using a one-sample t-test with a classical null hypothesis. The null hypothesis is that the reclamation mean is equal to or greater than 90% of the technical standard. The standard is passed when the null hypothesis is accepted.

The one-sample t-test assumes approximate normality of the data set and independence of observations. The test statistic is:

$$t = \frac{\bar{x}_{br} - (0.9 * technical\ standard)}{\frac{s}{\sqrt{n_{br}}}}$$

where:

$\bar{x}_{br}$ = Mean of the bond release area
s = sample standard deviation (n-1)
n_{br} = Sample size of the bond release area

The t-test statistic is compared to a critical t-value (one-tailed, left tail, $\alpha = 0.10$, n_{br}-1 degrees of freedom). If the test t-value exceeds the critical t-value, the null hypothesis is accepted and revegetation success for cover is supported.

If sample adequacy was not demonstrated, then testing proceeded using a one-sample t-test with a reverse null hypothesis. The reverse null hypothesis is that the reclamation mean is equal to or less than 90% of the technical standard and the standard is passed when the null hypothesis is rejected. The assumptions for a two-sample t-test as described above still apply and the test statistic is the same.

If at the beginning of the process, the reclamation data were not normally distributed, then they were evaluated using a non-parametric one-sample sign test with a reverse null hypothesis. The null hypothesis is that the reclamation values are indistinguishable from 90% of the technical standard. The standard is passed when the null hypothesis is rejected.

The one-sample sign test does not require sample adequacy. Given that the prescribed minimum sample size of 40 exceeds the capacity of typically available tables of Lower Critical Value of Exact Binomial probabilities, the test statistic is approximated as follows:

$$Z = \frac{M + 0.5 - 0.5n}{0.5\sqrt{n}}$$

where:

M = The number of minuses when 90% of the technical standard is subtracted from every observation
n = Sample size

This calculated z-value will be compared to a critical t-value from the left tail with $\alpha = 0.10$, and n-1 degrees of freedom. If the calculated z-value is less than (i.e., more negative than) the critical t-value, the null hypothesis is rejected and revegetation success for production is supported.

4.3 Shrub Density

Shrub density data collected in the appropriate N14/J16 P3BRAs was compared to the technical standard shown in Table 4. Hypothesis testing for shrub density data followed the process outlined for production data in Section 4.2.

5 Direct Standard Comparisons

5.1 Tree Density

Tree density data collected in the woodland areas of the N14/J16 P3BRA was compared to the technical standard shown in Table 4. If the reclamation mean exceeded 90% of the technical standard, then the P3BRA passed this measure of success.

5.2 Shrub Diversity

Shrub diversity data collected in the appropriate N14/J16 P3BRAs was compared to the technical standards shown in Table 4. If the number of species observed in the N14/J16 P3BRAs was equal to or greater than the standard, then the P3BRA passed this measure of success.

5.3 Species Diversity

Species diversity suitable to support the approved post-mining land uses of rangeland, wildlife habitat, and cultural plants was judged using the following three tests. Success was demonstrated using Test B, with Tests A and C providing supporting information.

5.3.1 Test B: Lifeform Similarity Test (Mandatory)

This test uses the Motyka similarity index to assess the resemblance of the distribution of species density by lifeform of the P3BRA vegetation to that of the reference areas. The Motyka similarity index uses the following equation:

$$IS_{mo} = \frac{2c}{a+b}$$

where:

c = the sum of the smaller of the species density values of the two datasets being compared for each lifeform.
a = the sum of the average species density values of the first dataset for each lifeform.
b = the sum of the average species density values of the second dataset for each lifeform.

Only cover by non-noxious vascular plants will be included. Lifeforms to be used will include:

- Annual/biennial forbs
- Annual grasses
- Perennial forbs
- Perennial warm season grasses
- Perennial cool season grasses
- Subshrubs
- Shrubs

There are two parts to this test. First, it is necessary to determine the average internal resemblance (i.e., calculate between-sample similarity) of each reference area transect.

Each unique pair of transects within the reference areas (990 pairs if 45 samples, 15 in each area, are used) will be compared using the equation above. These 990 IS_{mo} values are then averaged to find the internal similarity of reference areas. Ninety percent (90%) of this value is the standard that will be used for bond release assessment.

Once the standard has been established, the reclaimed area data can be compared to the reference area data. The average species density by lifeform of the reclaimed area data (across all 40 samples) is compared to the average species density by lifeform of the reference area data (across all samples, 45 if there are 15 in each reference area) again using the Motyka equation above. If the resulting IS_{mo} value is greater than the standard calculated above, then the reclamation passes this test.

5.3.2 Test A: Overall Species Density Test (Supporting only)

This test compares the overall richness of the vascular plant species per unit area in the P3BRAs to that observed in the reference areas. If the average vascular, non-noxious plant species density per 100 square meters of the reclaimed area falls within the 90% confidence interval of the three sagebrush reference areas, then this test is passed. The 90% confidence interval includes the values occurring within 1.282 standard deviations about the mean. The 90% confidence interval is calculated for each reference area and the lower limits of each reference area are averaged to establish an average lower limit. The same procedure is performed for the upper limits.

5.3.3 Test C: Native Species Presence Test (Supporting only)

This test evaluates the degree to which the area-based scale of occurrences of native vascular plant species in the reclaimed area matches the reference area. If the cumulative number of native vascular plant species observed during species density sampling of the reclaimed areas exceeds 90% of the average cumulative presence within the three sagebrush reference areas, then the test is passed.

6 Revegetation Success Evaluation Results

All required bond release standards outlined in the AZ-0001F PAP and summarized in Table 4 were passed in at least two out of the three years sampled (Table 6). Summary statistics for each sampling year are provided in Table 7.

Results of hypothesis testing are summarized in the following tables for vegetation cover (Table 8), production (Table 9), and shrub density (Table 10). Direct comparison results are presented in subsequent tables for tree density (Table 11), shrub diversity (Table 12), lifeform similarity (Table 13), and supporting diversity tests (Table 14).

7 References

Bilbrough, C., and S. Howlin. 2012. Handbook of Approved Sampling and Statistical Methods for evaluation of Revegetation Success on Wyoming Coal Mines. Wyoming Department of Environmental Quality Land Quality Division.

Table 6: N14/J16 P3BRA Bond Release Success Summary

Community	Success Parameter	N14 P3PRA	J16 P3PRA	N14/J16 P3PRA		Passed at least 2 Years
		2022		2023	2024	
Bond Release Standards						
Grassland	Vegetation Cover	Pass	Pass	Pass	Pass	Yes
	Production	Pass	Pass	Fail	Pass	Yes
	Shrub Density	Pass	Pass	Pass	Pass	Yes
	Shrub Diversity	Pass	Pass	Pass	Pass	Yes
	Life Form Similarity	Pass	Pass	Fail	Pass	Yes
Shrubland	Vegetation Cover	Pass	Pass	Pass	Pass	Yes
	Production	Pass	Pass	Fail	Pass	Yes
	Shrub Density	Pass	Pass	Pass	Pass	Yes
	Shrub Diversity	Pass	Pass	Pass	Pass	Yes
	Life Form Similarity	Pass	Pass	Pass	Pass	Yes
Woodland	Shrub Density	Pass	Pass	Pass	Pass	Yes
	Shrub Diversity	Pass	Pass	Pass	Pass	Yes
	Tree Density	Pass	Pass	Pass	Pass	Yes
Supporting Tests (not required)						
Grassland	Overall Species Density	Fail	Fail	Fail	Fail	No
	Native Species Presence	Pass	Pass	Fail	Pass	Yes
Shrubland	Overall Species Density	Pass	Fail	Fail	Fail	No
	Native Species Presence	Pass	Pass	Pass	Pass	Yes

Table 7: Summary Statistics for N14/J16 P3BRA and Reference Areas

Sampling Area		Vegetation Cover (%)		Production (Lbs/Acre)		Shrub Density (Stems/Acre)		Tree Density (Stems/Acre)		Species Density (Spp/100m^2)	
		Mean	**St. Dev**	**Mean**	**St. Dev**	**Mean**	**St. Dev**	**Mean**	**St. Dev**	**Mean**	**St. Dev**
Spring 2022											
N14	Grassland	13.7	4.9	459.9	222.6	2193.4	3328.8	-	-	8.7	2.9
	Shrubland	15.0	6.1	399.0	250.1	8800.9	16849.3	-	-	9.8	2.8
	Woodland	-	-	-	-	4722.7	3758.9	98.9	94.4	-	-
SBRA	J7	10.0	3.2	-	-	-	-	-	-	12.6	2.1
	N7/8	17.9	4.1	-	-	-	-	-	-	18.5	2.8
	N14	21.1	6.6	-	-	-	-	-	-	12.4	1.9
Fall 2022											
J16	Grassland	32.6	11.3	537.1	286.6	1384.0	1422.9	-	-	9.8	3.2
	Shrubland	31.2	10.1	481.2	276.6	1808.9	1130.2	-	-	11.0	3.6
	Woodland	-	-	-	-	-	-	98.1	-	-	-
SBRA	J7	26.3	5.1	-	-	-	-	-	-	15.1	1.7
	N7/8	27.1	8.6	-	-	-	-	-	-	20.4	4.0
	N14	45.9	9.5	-	-	-	-	-	-	13.1	1.8
Spring 2023											
N14/ J16	Grassland	17.8	6.9	379.6	248.9	11155.2	39903.7	-	-	6.9	3.7
	Shrubland	18.4	7.1	370.9	221.1	12927.7	57508.9	-	-	7.2	4.7
	Woodland	-	-	-	-	7113.4	4662.6	76.9	92.9	-	-
SBRA	J7	16.5	2.3	-	-	-	-	-	-	14.3	2.5
	N7/8	19.3	4.8	-	-	-	-	-	-	17.5	7.4
	N14	21.3	4.9	-	-	-	-	-	-	16.1	2.1
Fall 2024											
N14/ J16	Grassland	29.3	14.5	537.9	331.8	1721.9	1677.7	-	-	7.9	3.5
	Shrubland	29.0	13.2	670.5	353.2	3389.2	4771.5	-	-	9.0	4.0
	Woodland	-	-	-	-	14127.6	7255.5	77.9	80.1	-	-
SBRA	J7	21.7	4.4	-	-	-	-	-	-	12.7	1.8
	N7/8	15.6	3.8	-	-	-	-	-	-	13.9	1.9
	N14	28.1	4.5	-	-	-	-	-	-	8.9	1.7

Table 8: Results of Hypothesis Testing for N14/J16 P3BRA Vegetation Cover Data

Area	Year	Vegetation Cover (%)		Hypothesis Testing				
		Reclamation Mean	Reference Mean	Statistical Test	DF	Test Statistic	Critical Value	Pass?
Grassland								
N14	Spring 2022	13.7	16.3	T-Test (Classic Null)	95	-1.018	-1.291	Yes
J16	Fall 2022	32.6	33.1	T-Test (Classic Null)	92	1.454	-1.291	Yes
N14/J16	Spring 2023	17.8	19.0	T-Test (Classic Null)	58	0.537	-1.296	Yes
	Fall 2024	29.3	21.8	T-Test (Reverse Null)	45	3.178	1.301	Yes
Shrubland								
N14	Spring 2022	15.0	16.3	T-Test (Classic Null)	95	0.264	-1.291	Yes
J16	Fall 2022	31.2	33.1	T-Test (Classic Null)	92	0.809	-1.291	Yes
N14/J16	Spring 2023	18.4	19.0	T-Test (Classic Null)	58	0.991	-1.296	Yes
	Fall 2024	29.0	21.8	T-Test (Classic Null)	46	3.310	-1.300	Yes

Table 9: Results of Hypothesis Testing for N14/J16 P3BRA Production Data

Area	Year	Production (Lbs/Acre)		Hypothesis Testing				
		Reclamation Mean	Technical Standard	Statistical Test	DF	Test Statistic	Critical Value	Pass?
Grassland								
N14	Spring 2022	459.9	224.2	T-Test (Classic Null)	39	7.334	-1.304	Yes
J16	Fall 2022	537.1	341.0	T-Test (Reverse Null)	39	5.081	1.304	Yes
N14/J16	Spring 2023	379.6	696.5	Sign Test	-	5.218	-1.280	No
	Fall 2024	537.9	178.4	Sign Test	-	-5.850	-1.280	Yes
Shrubland								
N14	Spring 2022	399.0	224.2	T-Test (Reverse Null)	39	4.989	1.304	Yes
J16	Fall 2022	481.2	341.0	T-Test (Reverse Null)	39	3.987	1.304	Yes
N14/J16	Spring 2023	370.9	696.5	Sign Test	-	5.850	-1.280	No
	Fall 2024	670.5	178.4	T-Test (Reverse Null)	39	9.130	1.304	Yes

Table 10: Results of Hypothesis Testing for N14/J16 P3BRA Shrub Density Data

Area	Year	Shrub Density (Stems/Acre)		Hypothesis Testing				
		Reclamation Mean	Technical Standard	Statistical Test	DF	Test Statistic	Critical Value	Pass?
Grassland								
N14	Spring 2022	2,193.4	400	Sign Test	-	-3.953	-1.280	Yes
J16	Fall 2022	1,384.0	400	Sign Test	-	-3.004	-1.280	Yes
N14/J16	Spring 2023	11,155.2	400	Sign Test	-	-3.320	-1.280	Yes
	Fall 2024	1,721.9	400	Sign Test	-	-3.637	-1.280	Yes
Shrubland								
N14	Spring 2022	8,800.9	800	Sign Test	-	-4.902	-1.280	Yes
J16	Fall 2022	1,808.9	800	T-Test (Reverse Null)	39	6.094	1.304	Yes
N14/J16	Spring 2023	12,927.7	800	Sign Test	-	-5.218	-1.280	Yes
	Fall 2024	3,389.2	800	Sign Test	-	-4.585	-1.280	Yes
Woodland								
N14	Spring 2022	4,722.7	800	Sign Test	-	-5.850	-1.280	Yes
N14/J16	Spring 2023	7,113.4	800	Sign Test	-	-6.166	-1.280	Yes
	Fall 2024	14,127.6	800	Sign Test	-	-6.166	-1.280	Yes

Table 11: Results of N14/J16 P3BRA Tree Density Testing

Area	Year	Tree Density (Stems/Acre)		
		Reclamation Mean	Technical Standard	Pass?
Woodland				
N14	Spring 2022	98.9	75	Yes
J16	Fall 2022	98.1	75	Yes
N14/J16	Spring 2023	76.9	75	Yes
	Fall 2024	77.9	75	Yes

Table 12: Results of N14/J16 P3BRA Shrub Diversity Testing

Area	Year	Shrub Diversity		
		Reclamation Species	Technical Standard	Pass?
Grassland				
N14	Spring 2022	7	2	Yes
J16	Fall 2022	6	2	Yes
N14/J16	Spring 2023	9	2	Yes
	Fall 2024	3	2	Yes
Shrubland				
N14	Spring 2022	11	2	Yes
J16	Fall 2022	8	2	Yes
N14/J16	Spring 2023	10	2	Yes
	Fall 2024	6	2	Yes
Woodland				
N14	Spring 2022	16	4	Yes
N14/J16	Spring 2023	15	4	Yes
	Fall 2024	13	4	Yes

Table 13: Results of N14/J16 P3BRA Motyka Similarity Index Testing

Area	Year	Motyka Similarity Index		
		Reclamation Ismo	Reference Standard Ismo	Pass?
Grassland				
N14	Spring 2022	69.62	65.65	Yes
J16	Fall 2022	70.55	64.46	Yes
N14/J16	Spring 2023	61.10	62.87	No
	Fall 2024	73.64	67.02	Yes
Shrubland				
N14	Spring 2022	70.93	65.65	Yes
J16	Fall 2022	72.82	64.46	Yes
N14/J16	Spring 2023	63.66	62.87	Yes
	Fall 2024	76.49	67.02	Yes

Table 14: Results of N14/J16 P3BRA Supporting Diversity Testing

Area	Year	Test A – Overall Species Density					Test C - Native Presence		
		Species Density		90% Confidence Interval			Native Species Present	90% of Reference	Pass?
		Mean	St.Dev.	Lower	Upper	Pass?			
Grassland									
N14	Spring 2022	8.6	2.9	11.0	28.0	No	28	31.2	No
J16	Fall 2022	9.8	3.2	11.7	29.8	No	36	31.8	Yes
N14/ J16	Spring 2023	6.9	3.7	9.8	27.5	No	29	34.2	No
	Fall 2024	7.9	3.5	9.5	24.0	No	33	23.1	Yes
Shrubland									
N14	Spring 2022	9.8	2.8	11.0	28.0	No	41	31.2	Yes
J16	Fall 2022	11.0	3.6	11.7	29.8	No	47	31.8	Yes
N14/ J16	Spring 2023	7.2	4.7	9.8	27.5	No	40	34.2	Yes
	Fall 2024	9.0	4.0	9.5	24.0	No	39	23.1	Yes
Reference Areas									
J7 SBRA	Spring 2022	12.3	2.2	9.5	24.4	-	31	-	-
	Fall 2022	13.4	1.7	11.3	27.9	-	28	-	-
	Spring 2023	13.3	2.5	10.2	26.4	-	29	-	-
	Fall 2024	12.7	1.8	10.4	26.0	-	24	-	-
N7/8 SBRA	Spring 2022	17.5	2.6	14.3	35.8	-	46	-	-
	Fall 2022	19.8	3.8	14.9	38.8	-	50	-	-
	Spring 2023	17.1	7.4	7.6	26.9	-	58	-	-
	Fall 2024	13.9	1.9	11.5	28.5	-	35	-	-
N14 SBRA	Spring 2022	11.8	2.0	9.3	23.7	-	27	-	-
	Fall 2022	11.3	1.8	8.9	22.7	-	28	-	-
	Spring 2023	14.3	2.0	11.7	29.3	-	27	-	-
	Fall 2024	8.9	1.7	6.7	17.4	-	18	-	-

Attachment 1: N14 Raw Data – Spring 2022

N14 Phase III Grassland Cover Data – Spring 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Chenopodium fremontii	0.00	2.50	0.00	0.00	0.00				P																
Chenopodium leptophyllum	0.00	5.00	0.00	0.00	0.00																				
Descurainia pinnata	0.03	42.50	0.18	0.03	0.18		P		P		P					P				P	P		P		P
Descurainia richardsonii	0.00	5.00	0.00	0.00	0.00									P						P					
Lappula redowskii	0.03	45.00	0.18	0.03	0.18		P	P	P		P			P			P	P		P	P				
Machaeranthera canescens	0.00	17.50	0.00	0.00	0.00				P					P			P								
Polygonum ramosissimum	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.05	62.50	0.36	0.05	0.36		P	P	P		P			P		P	P	P		P	P		P		P
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Chenopodium album	0.00	15.00	0.00	0.00	0.00			P	P																
Chorispora tenella	0.00	2.50	0.00	0.00	0.00											P									
Descurainia sophia	0.00	7.50	0.00	0.00	0.00																P				P
Kochia scoparia	0.00	10.00	0.00	0.00	0.00		P	P					P	P											
Ranunculus testiculatus	0.00	5.00	0.00	0.00	0.00																				
Salsola iberica	0.08	12.50	0.55	0.08	0.53		3	P	P																
Sisymbrium altissimum	0.00	20.00	0.00	0.00	0.00		P	P							P										
Tragopogon dubius	0.00	7.50	0.00	0.00	0.00						P			P											
TOTAL INTRO. ANN. & BIEN. FORBS	0.08	47.50	0.55	0.08	0.53		3	P	P		P		P	P	P	P					P				P
INTRODUCED ANNUAL GRASSES																									
Bromus tectorum	0.00	17.50	0.00	0.00	0.00		P			P		P			P										
TOTAL INTRODUCED ANNUAL GRASSES	0.00	17.50	0.00	0.00	0.00		P			P		P			P										
NATIVE PERENNIAL FORBS																									
Astragalus calycosus var. scaposus	0.00	2.50	0.00	0.00	0.00																				
Leucelene ericoides	0.00	2.50	0.00	0.00	0.00																				
Penstemon palmeri	0.00	2.50	0.00	0.00	0.00																				
Sphaeralcea coccinea	0.00	32.50	0.00	0.00	0.00	P					P			P							P	P	P		P
Sphaeralcea parvifolia	0.00	2.50	0.00	0.00	0.00					P															
TOTAL NATIVE PERENNIAL FORBS	0.00	37.50	0.00	0.00	0.00	P				P	P			P							P	P	P		P
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.20	25.00	1.46	0.20	1.42	1				P		P	P	4						P					
Agropyron smithii	0.20	52.50	1.46	0.20	1.42	1				P		P		1	P		P		P	1		P	P	P	P
Oryzopsis hymenoides	0.00	20.00	0.00	0.00	0.00					P					P		P								
TOTAL NATIVE PERENNIAL GRASSES (c)	0.40	62.50	2.92	0.40	2.84	2				P		P	P	5	P		P		P	1		P	P	P	P
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua gracilis	0.30	57.50	2.19	0.30	2.13		1	P	P	P		P			1	P	P			P		P	P		
Buchloe dactyloides	0.03	25.00	0.18	0.03	0.18					P	P	1			P										P
Hilaria jamesii	0.53	65.00	3.83	0.65	4.62		P	1	P	1 1	P	2 2			1		P	P		P	1		1		
Sporobolus airoides	0.10	15.00	0.73	0.13	0.89					P					P 1					1					
Sporobolus cryptandrus	0.13	42.50	0.91	0.15	1.07			P			P		P	P			P	P			1	P			
TOTAL NATIVE PERENNIAL GRASSES (w)	1.08	87.50	7.85	1.25	8.88		1	1	P	1 1	P	3 2	P	P	2 1	P	P	P		1	2	P	1		P
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron desertorum	0.05	2.50	0.36	0.05	0.36					2															
Elymus junceus	10.23	100.00	74.64	10.38	73.71	11	8	6	8	10	9	14 3	6	16	18	11	10	10	15	15	10	16	11	16	15
TOTAL INTRO. PERENNIAL GRASSES (c)	10.28	100.00	75.00	10.43	74.07	11	8	6	8	12	9	14 3	6	16	18	11	10	10	15	15	10	16	11	16	15

N14 Phase III Grassland Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Chenopodium fremontii	0.00	2.50	0.00	0.00	0.00																				
Chenopodium leptophyllum	0.00	5.00	0.00	0.00	0.00											P								P	
Descurainia pinnata	0.03	42.50	0.18	0.03	0.18		P		P		P			P		P	P					1		P	P
Descurainia richardsonii	0.00	5.00	0.00	0.00	0.00																				
Lappula redowskii	0.03	45.00	0.18	0.03	0.18				P	P	P					P	P		P			1		P	P
Machaeranthera canescens	0.00	17.50	0.00	0.00	0.00	P					P		P			P									
Polygonum ramosissimum	0.00	2.50	0.00	0.00	0.00											P									
TOTAL NATIVE ANN. & BIEN. FORBS	0.05	62.50	0.36	0.05	0.36	P	P		P	P	P		P	P		P	P		P			2		P	P
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Chenopodium album	0.00	15.00	0.00	0.00	0.00				P							P								P	P
Chorispora tenella	0.00	2.50	0.00	0.00	0.00																				
Descurainia sophia	0.00	7.50	0.00	0.00	0.00											P									
Kochia scoparia	0.00	10.00	0.00	0.00	0.00																				
Ranunculus testiculatus	0.00	5.00	0.00	0.00	0.00				P						P										
Salsola iberica	0.08	12.50	0.55	0.08	0.53		P									P									
Sisymbrium altissimum	0.00	20.00	0.00	0.00	0.00			P	P		P			P										P	
Tragopogon dubius	0.00	7.50	0.00	0.00	0.00																			P	
TOTAL INTRO. ANN. & BIEN. FORBS	0.08	47.50	0.55	0.08	0.53		P	P	P		P			P	P	P								P	P
INTRODUCED ANNUAL GRASSES																									
Bromus tectorum	0.00	17.50	0.00	0.00	0.00	P					P	P													
TOTAL INTRODUCED ANNUAL GRASSES	0.00	17.50	0.00	0.00	0.00	P					P	P													
NATIVE PERENNIAL FORBS																									
Astragalus calycosus var. scaposus	0.00	2.50	0.00	0.00	0.00								P												
Leucelene ericoides	0.00	2.50	0.00	0.00	0.00								P												
Penstemon palmeri	0.00	2.50	0.00	0.00	0.00								P												
Sphaeralcea coccinea	0.00	32.50	0.00	0.00	0.00				P	P					P							P		P	P
Sphaeralcea parvifolia	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE PERENNIAL FORBS	0.00	37.50	0.00	0.00	0.00				P	P			P		P							P		P	P
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.20	25.00	1.46	0.20	1.42								1				P				2		P		
Agropyron smithii	0.20	52.50	1.46	0.20	1.42	P			P	2		P	2			P	P			1	P				
Oryzopsis hymenoides	0.00	20.00	0.00	0.00	0.00	P				P	P					P								P	
TOTAL NATIVE PERENNIAL GRASSES (c)	0.40	62.50	2.92	0.40	2.84	P			P	2	P	P	3			P	P			1	2		P	P	
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua gracilis	0.30	57.50	2.19	0.30	2.13	P	P	P	2	1	P	7	P	P	P				P						P
Buchloe dactyloides	0.03	25.00	0.18	0.03	0.18	P		P							P		P								P
Hilaria jamesii	0.53	65.00	3.83	0.65	4.62	P		1	P 1	1	4 1	5	P	P	2	P		P	P					1	P
Sporobolus airoides	0.10	15.00	0.73	0.13	0.89	P						3											P		
Sporobolus cryptandrus	0.13	42.50	0.91	0.15	1.07		P	2	P		1		P		P		1					P			P 1
TOTAL NATIVE PERENNIAL GRASSES (w)	1.08	87.50	7.85	1.25	8.88	P	P	3	2 1	2	5 1	15	P	P	2	P	1	P	P			P	P	1	P 1
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron desertorum	0.05	2.50	0.36	0.05	0.36																				
Elymus junceus	10.23	100.00	74.64	10.38	73.71	15	6	7 1	12	12	5	5	1	11	7	8	15	2	9	14	11	9	9 2	9	7
TOTAL INTRO. PERENNIAL GRASSES (c)	10.28	100.00	75.00	10.43	74.07	15	6	7 1	12	12	5	5	1	11	7	8	15	2	9	14	11	9	9 2	9	7

N14 Phase III Grassland Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE SUBSHRUBS																									
Artemisia frigida	0.00	2.50	0.00	0.00	0.00																				
Ceratoides lanata	0.00	10.00	0.00	0.00	0.00										P								P		
Chrysothamnus greenei	0.00	5.00	0.00	0.00	0.00																				
Gutierrezia sarothrae	0.00	10.00	0.00	0.00	0.00	P							P	P											
TOTAL NATIVE SUBSHRUBS	0.00	22.50	0.00	0.00	0.00	P							P	P	P								P		
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.50	42.50	3.65	0.55	3.91	1							1				P		1	P 1	P		1	P	
TOTAL INTRO. SUBSHRUBS	0.50	42.50	3.65	0.55	3.91	1							1				P		1	P 1	P		1	P	
NATIVE SHRUBS																									
Atriplex canescens	1.30	92.50	9.49	1.30	9.24	2	1	P	1	2	P	10	P	1	1	P	3	1	P	5	2	2	2		P
Atriplex confertifolia	0.03	15.00	0.18	0.03	0.18		P			P						P		P				P			
Chrysothamnus nauseosus	0.00	10.00	0.00	0.00	0.00									P											
TOTAL NATIVE SHRUBS	1.33	95.00	9.67	1.33	9.41	2	1	P	1	2	P	10	P	1	1	P	3	1	P	5	2	2	2		P
SUCCULENTS																									
Opuntia macrorhiza	0.00	5.00	0.00	0.00	0.00						P														P
TOTAL SUCCULENTS	0.00	5.00	0.00	0.00	0.00						P														P
BRYOPHYTES																									
Moss spp.	0.00	7.50	0.00	0.00	0.00	P																			
TOTAL BRYOPHYTES	0.00	7.50	0.00	0.00	0.00	P																			
Standing dead	7.63	95.00		7.63		4	1	1	9	8	8	9	8	1	5	12	7	9		3	11	13	1	2	14
Litter	15.45	100.00		15.45		19	16	6	9	23	13	25	8	35	23	11	25	3	28	18	9	6	26	22	5
Bare ground	57.85	100.00		57.85		60	64	78	57	53	69	38	60	37	47	62	52	59	55	57	54	53	58	51	66
Rock	5.38	90.00		5.38		1	6	8	16	1	1	1	17	5	4	4	3	18	1		12	10		9	
TOTALS	100.00		100.00	100.38	100.00	100 0	100 0	100 0	100 0	100 1	100 0	100 5	100 0	100 0	100 1	100 0	100 0	100 0	100 0	100 1	100 0	100 0	100 0	100 0	100 0
TOTAL VEGETATION COVER	13.70	s=(4.94)		14.08	14.08	16 0	13 0	7 0	9 0	15 1	9 0	27 5	7 0	22 0	21 1	11 0	13 0	11 0	16 0	22 1	14 0	18 0	15 0	16 0	15 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	42.15	s=(9.85)		42.53	s=(10.21)	40 0	36 0	22 0	43 0	47 1	31 0	62 5	40 0	63 0	53 1	38 0	48 0	41 0	45 0	43 1	46 0	47 0	42 0	49 0	34 0
Allowable Vegetation Cover	**13.70**	**s=(4.94)**				**16.0**	**13.0**	**7.0**	**9.0**	**15.0**	**9.0**	**27.0**	**7.0**	**22.0**	**21.0**	**11.0**	**13.0**	**11.0**	**16.0**	**22.0**	**14.0**	**18.0**	**15.0**	**16.0**	**15.0**
SPECIES DENSITY (# of species/100 sq.m.)	8.58	s=(2.94)				7	11	10	10	13	10	8	7	13	11	6	10	6	4	11	9	7	9	3	8

N14 Phase III Grassland Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE SUBSHRUBS																									
Artemisia frigida	0.00	2.50	0.00	0.00	0.00						P														
Ceratoides lanata	0.00	10.00	0.00	0.00	0.00	P							P												
Chrysothamnus greenei	0.00	5.00	0.00	0.00	0.00					P			P												
Gutierrezia sarothrae	0.00	10.00	0.00	0.00	0.00								P												
TOTAL NATIVE SUBSHRUBS	0.00	22.50	0.00	0.00	0.00	P				P	P		P												
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.50	42.50	3.65	0.55	3.91			3	P		3 1	2		1	P			P	6		1				
TOTAL INTRO. SUBSHRUBS	0.50	42.50	3.65	0.55	3.91			3	P		3 1	2		1	P			P	6		1				
NATIVE SHRUBS																									
Atriplex canescens	1.30	92.50	9.49	1.30	9.24	1	3	P	P	2	P	P		1	3	2	P	1		P	1	3	P	1	1
Atriplex confertifolia	0.03	15.00	0.18	0.03	0.18													1							
Chrysothamnus nauseosus	0.00	10.00	0.00	0.00	0.00								P				P			P					
TOTAL NATIVE SHRUBS	1.33	95.00	9.67	1.33	9.41	1	3	P	P	2	P	P	P	1	3	2	P	2		P	1	3	P	1	1
SUCCULENTS																									
Opuntia macrorhiza	0.00	5.00	0.00	0.00	0.00																				
TOTAL SUCCULENTS	0.00	5.00	0.00	0.00	0.00																				
BRYOPHYTES																									
Moss spp.	0.00	7.50	0.00	0.00	0.00					P											P				
TOTAL BRYOPHYTES	0.00	7.50	0.00	0.00	0.00					P											P				
Standing dead	7.63	95.00		7.63		4	14	13	15	6	12	16	2	2	7	4	20	8	4		3	14	19	5	11
Litter	15.45	100.00		15.45		31	9	5	8	19	8	8	6	11	21	12	17	10	18	19	26	18	25	6	11
Bare ground	57.85	100.00		57.85		44	51	64	52	56	63	50	85	71	58	70	46	71	59	63	56	53	46	64	62
Rock	5.38	90.00		5.38		5	17	5	11	1	4	4	3	3	2	4	1	7	4	3		1	1	14	8
TOTALS	100.00		100.00	100.38	100.00	100 0	100 0	100 1	100 1	100 0	100 2	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 2	100 0	100 1
TOTAL VEGETATION COVER	13.70	s=(4.94)		14.08	14.08	16 0	9 0	13 1	14 1	18 0	13 2	22 0	4 0	13 0	12 0	10 0	16 0	4 0	15 0	15 0	15 0	14 0	9 2	11 0	8 1
GROUND COVER (Veg+Litter+St.Dead+Rock)	42.15	s=(9.85)		42.53	s=(10.21)	56 0	49 0	36 1	48 1	44 0	37 2	50 0	15 0	29 0	42 0	30 0	54 0	29 0	41 0	37 0	44 0	47 0	54 2	36 0	38 1
Allowable Vegetation Cover	**13.70**	**s=(4.94)**				**16.0**	**9.0**	**13.0**	**14.0**	**18.0**	**13.0**	**22.0**	**4.0**	**13.0**	**12.0**	**10.0**	**16.0**	**4.0**	**15.0**	**15.0**	**15.0**	**14.0**	**9.0**	**11.0**	**8.0**
SPECIES DENSITY (# of species/100 sq.m.)	8.58	s=(2.94)				11	6	8	13	9	13	8	14	7	9	13	9	5	5	4	5	6	4	11	10

N14 Phase III Shrubland Cover Data – Spring 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																													
						S1		S2		S3		S4		S5		S6		S7		S8		S9		S10		S11		S12		S13		S14		S15		S16		S17		S18		S19		S20	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																																											
Chenopodium leptophyllum	0.00	5.00	0.00	0.00	0.00					P						P																										
Cryptantha crassisepala	0.00	2.50	0.00	0.00	0.00																																						
Descurainia pinnata	0.03	37.50	0.17	0.03	0.16	P				P		P						P				P		P		P		P						P		P		P		P		P	
Eriogonum annuum	0.00	2.50	0.00	0.00	0.00											P																										
Lappula redowskii	0.05	30.00	0.33	0.05	0.31			P				P				P								P		P														P		
Lupinus brevicaulis	0.00	2.50	0.00	0.00	0.00																																						
Machaeranthera canescens	0.00	7.50	0.00	0.00	0.00					P												P						P														
TOTAL NATIVE ANN. & BIEN. FORBS	0.08	60.00	0.50	0.08	0.47	P		P		P		P				P		P				P		P		P		P						P		P		P		P		P	
INTRODUCED ANNUAL & BIENNIAL FORBS																																											
Chenopodium album	0.00	12.50	0.00	0.00	0.00	P				P																				P									P		P	
Chorispora tenella	0.00	2.50	0.00	0.00	0.00																									P												
Descurainia sophia	0.00	12.50	0.00	0.00	0.00	P						P																P		P								P				
Kochia scoparia	0.00	2.50	0.00	0.00	0.00																																					P	
Lactuca serriola	0.00	2.50	0.00	0.00	0.00																																						
Ranunculus testiculatus	0.00	7.50	0.00	0.00	0.00																							P		P													
Salsola iberica	0.00	15.00	0.00	0.00	0.00	P										P														P												P	
Sisymbrium altissimum	0.00	12.50	0.00	0.00	0.00											P																							P				P	
Tragopogon dubius	0.00	5.00	0.00	0.00	0.00													P																				P					
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	42.50	0.00	0.00	0.00	P				P		P				P		P								P		P		P								P		P		P	
INTRODUCED ANNUAL GRASSES																																											
Bromus tectorum	0.05	27.50	0.33	0.08	0.47	P										P		P						P	1					P								P					
TOTAL INTRODUCED ANNUAL GRASSES	0.05	27.50	0.33	0.08	0.47	P										P		P						P	1					P								P					
NATIVE PERENNIAL FORBS																																											
Argemone polyanthemos	0.00	2.50	0.00	0.00	0.00																											P											
Astragalus wingatanus	0.00	2.50	0.00	0.00	0.00																																						
Cymopterus purpurascens	0.00	5.00	0.00	0.00	0.00																																						
Cymopterus purpureus	0.00	5.00	0.00	0.00	0.00									P																													
Penstemon barbatus	0.00	2.50	0.00	0.00	0.00																																						
Penstemon linarioides	0.00	5.00	0.00	0.00	0.00																					P														P			
Penstemon palmeri	0.00	10.00	0.00	0.00	0.00																					P																	
Phlox longifolia	0.00	2.50	0.00	0.00	0.00																																						
Sphaeralcea coccinea	0.00	15.00	0.00	0.00	0.00																	P						P														P	
Townsendia exscapa	0.00	2.50	0.00	0.00	0.00																																						
TOTAL NATIVE PERENNIAL FORBS	0.00	32.50	0.00	0.00	0.00									P								P				P		P				P								P		
NATIVE PERENNIAL GRASSES (cool)																																											
Agropyron dasystachyum	0.00	10.00	0.00	0.00	0.00			P						P																												
Agropyron smithii	0.18	42.50	1.17	0.18	1.09	P		3				P								1														P				P		P			
Oryzopsis hymenoides	0.23	27.50	1.51	0.25	1.56																					6								P				P		P		P	
Sitanion hystrix	0.00	7.50	0.00	0.03	0.16																					P	1																
Stipa comata	0.45	10.00	3.01	0.55	3.43																					11	2																
TOTAL NATIVE PERENNIAL GRASSES (c)	0.85	62.50	5.69	1.00	6.23	P		3				P		P						1						17	3							P				P		P		P	

N14 Phase III Shrubland Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																											
						S21		S22		S23		S24		S25		S26		S27		S28		S29		S30		S31		S32		S33		S34		S35		S36		S37		S38		S39		S40	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																																											
Chenopodium leptophyllum	0.00	5.00	0.00	0.00	0.00																																						
Cryptantha crassisepala	0.00	2.50	0.00	0.00	0.00																																					P	
Descurainia pinnata	0.03	37.50	0.17	0.03	0.16	1														P													P								
Eriogonum annuum	0.00	2.50	0.00	0.00	0.00																																						
Lappula redowskii	0.05	30.00	0.33	0.05	0.31	P										P				2		P		P				P														
Lupinus brevicaulis	0.00	2.50	0.00	0.00	0.00			P																																		
Machaeranthera canescens	0.00	7.50	0.00	0.00	0.00																																					
TOTAL NATIVE ANN. & BIEN. FORBS	0.08	60.00	0.50	0.08	0.47	1		P								P				2		P		P				P						P								P	
INTRODUCED ANNUAL & BIENNIAL FORBS																																											
Chenopodium album	0.00	12.50	0.00	0.00	0.00																																					
Chorispora tenella	0.00	2.50	0.00	0.00	0.00																																					
Descurainia sophia	0.00	12.50	0.00	0.00	0.00																																					
Kochia scoparia	0.00	2.50	0.00	0.00	0.00																																					
Lactuca serriola	0.00	2.50	0.00	0.00	0.00																			P																		
Ranunculus testiculatus	0.00	7.50	0.00	0.00	0.00																	P																				
Salsola iberica	0.00	15.00	0.00	0.00	0.00											P										P																
Sisymbrium altissimum	0.00	12.50	0.00	0.00	0.00					P		P																														
Tragopogon dubius	0.00	5.00	0.00	0.00	0.00																																					
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	42.50	0.00	0.00	0.00					P		P				P						P		P				P														
INTRODUCED ANNUAL GRASSES																																											
Bromus tectorum	0.05	27.50	0.33	0.08	0.47			1						P				1								P		P														
TOTAL INTRODUCED ANNUAL GRASSES	0.05	27.50	0.33	0.08	0.47			1						P				1								P		P														
NATIVE PERENNIAL FORBS																																											
Argemone polyanthemos	0.00	2.50	0.00	0.00	0.00																																						
Astragalus wingatanus	0.00	2.50	0.00	0.00	0.00			P																																		
Cymopterus purpurascens	0.00	5.00	0.00	0.00	0.00			P																				P														
Cymopterus purpureus	0.00	5.00	0.00	0.00	0.00																																					P	
Penstemon barbatus	0.00	2.50	0.00	0.00	0.00									P																												
Penstemon linarioides	0.00	5.00	0.00	0.00	0.00																																						
Penstemon palmeri	0.00	10.00	0.00	0.00	0.00			P						P				P																									
Phlox longifolia	0.00	2.50	0.00	0.00	0.00																																					P	
Sphaeralcea coccinea	0.00	15.00	0.00	0.00	0.00			P																				P														P	
Townsendia exscapa	0.00	2.50	0.00	0.00	0.00	P																																				
TOTAL NATIVE PERENNIAL FORBS	0.00	32.50	0.00	0.00	0.00	P		P						P				P										P		P												P	
NATIVE PERENNIAL GRASSES (cool)																																											
Agropyron dasystachyum	0.00	10.00	0.00	0.00	0.00	P				P																																
Agropyron smithii	0.18	42.50	1.17	0.18	1.09					P		P				P								P		P		P										P		P		P		3
Oryzopsis hymenoides	0.23	27.50	1.51	0.25	1.56			1		P				1				1								P	1	P														
Sitanion hystrix	0.00	7.50	0.00	0.03	0.16									P						P																						
Stipa comata	0.45	10.00	3.01	0.55	3.43			5	2									2																									P	
TOTAL NATIVE PERENNIAL GRASSES (c)	0.85	62.50	5.69	1.00	6.23	P		6	2	P		P		1		P		3		P				P		P	1	P						P		P		P		P		3

N14 Phase III Shrubland Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																									
Aristida purpurea	0.00	2.50	0.00	0.00	0.00																				
Bouteloua curtipendula	0.00	2.50	0.00	0.00	0.00																				
Bouteloua gracilis	0.40	70.00	2.68	0.45	2.80	P	1		P	P	P		P		P	P	P		P	P	1		P		
Buchloe dactyloides	0.08	27.50	0.50	0.10	0.62		P						P										P		
Hilaria jamesii	0.58	80.00	3.85	0.90	5.61	1	2 1	P	1	1	1	P	1	P	P	P 1				1	P		P		1
Sporobolus airoides	0.25	32.50	1.67	0.28	1.71		2						2 1				P				1		1		
Sporobolus cryptandrus	0.18	47.50	1.17	0.18	1.09	P			P	P	4	P		P	P				P			P	P	1	1
TOTAL NATIVE PERENNIAL GRASSES (w)	1.48	95.00	9.87	1.90	11.84	1	5 1	P	1	1	5	P	3 1	P	P	P 1	P		P	1	2	P	1	1	2
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron desertorum	0.03	2.50	0.17	0.03	0.16																				
Bromus inermis	0.00	5.00	0.00	0.00	0.00																				
Elymus junceus	8.03	95.00	53.68	8.35	52.02	9	5	9	10	8	2	14 1	6	13	10		10	7	21	8 1	3	16 2	8 1	6	18
TOTAL INTRO. PERENNIAL GRASSES (c)	8.05	95.00	53.85	8.38	52.18	9	5	9	10	8	2	14 1	6	13	10		10	7	21	8 1	3	16 2	8 1	6	18
NATIVE SUBSHRUBS																									
Artemisia frigida	0.00	5.00	0.00	0.00	0.00																				
Ceratoides lanata	0.00	27.50	0.00	0.00	0.00	P	P			P			P		P										
Chrysothamnus greenei	0.03	2.50	0.17	0.03	0.16																				
Gutierrezia sarothrae	0.00	12.50	0.00	0.00	0.00																P			P	
TOTAL NATIVE SUBSHRUBS	0.03	40.00	0.17	0.03	0.16	P	P			P			P		P						P			P	
INTRODUCED SUBSHRUBS																									
Kochia prostrata	1.93	55.00	12.88	2.10	13.08	P	1 2	P		P	P		3	P			7	P	2	6			P		P
TOTAL INTRO. SUBSHRUBS	1.93	55.00	12.88	2.10	13.08	P	1 2	P		P	P		3	P			7	P	2	6			P		P
NATIVE SHRUBS																									
Artemisia tridentata	0.05	10.00	0.33	0.05	0.31																P				
Atriplex canescens	1.80	100.00	12.04	1.80	11.21	P	P	1	P	P	P	7	1	4	2	10	P	3	P	4	1	7	3	3	2
Atriplex confertifolia	0.10	27.50	0.67	0.10	0.62	P		2	P		1	P		1				P					P		
Chrysothamnus nauseosus	0.55	22.50	3.68	0.55	3.43											5								P	
Cowania mexicana	0.00	5.00	0.00	0.00	0.00																				
Purshia tridentata	0.00	2.50	0.00	0.00	0.00																			P	
TOTAL NATIVE SHRUBS	2.50	100.00	16.72	2.50	15.58	P	P	3	P	P	1	7	1	5	2	15	P	3	P	4	1	7	3	3	2
SUCCULENTS																									
Opuntia macrorhiza	0.00	7.50	0.00	0.00	0.00																				P
Opuntia phaeacantha	0.00	2.50	0.00	0.00	0.00																				
TOTAL SUCCULENTS	0.00	10.00	0.00	0.00	0.00																				P
Standing dead	10.13	100.00		10.13		5	15	8	9	11	10	25	5	12	2	21	4	12	7	2	7	13	4	11	8
Litter	14.60	100.00		14.60		13	16	9	9	16	13	20	20	12	14	22	24	10	9	14	15	16	18	7	13
Bare ground	47.58	100.00		47.58		56	48	63	59	55	59	31	40	50	71	1	43	62	59	47	54	44	54	48	52
Rock	12.75	100.00		12.75		16	7	8	12	9	10	3	21	8	1	24	12	6	2	18	18	4	12	24	5
TOTALS	100.00		100.00	101.10	100.00	100 0	100 3	100 0	100 0	100 0	100 0	100 1	100 1	100 0	100 0	100 5	100 0	100 0	100 0	100 1	100 0	100 2	100 1	100 0	100 0
TOTAL VEGETATION COVER	14.95	s=(6.13)		16.05	s=(7.23)	10 0	14 3	12 0	11 0	9 0	8 0	21 1	14 1	18 0	12 0	32 5	17 0	10 0	23 0	19 1	6 0	23 2	12 1	10 0	22 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	52.43	s=(17.39)		53.53	s=(18.17)	44 0	52 3	37 0	41 0	45 0	41 0	69 1	60 1	50 0	29 0	99 5	57 0	38 0	41 0	53 1	46 0	56 2	46 1	52 0	48 0
Allowable Vegetation Cover	**14.95**	**s=(6.13)**				**10.0**	**14.0**	**12.0**	**11.0**	**9.0**	**8.0**	**21.0**	**14.0**	**18.0**	**12.0**	**32.0**	**17.0**	**10.0**	**23.0**	**19.0**	**6.0**	**23.0**	**12.0**	**10.0**	**22.0**
SPECIES DENSITY (# of species/100 sq.m.)	9.83	s=(2.81)				14	11	9	10	9	13	8	9	8	9	11	8	7	11	6	10	4	15	12	13

N14 Phase III Shrubland Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																									
Aristida purpurea	0.00	2.50	0.00	0.00	0.00							P													
Bouteloua curtipendula	0.00	2.50	0.00	0.00	0.00							P													
Bouteloua gracilis	0.40	70.00	2.68	0.45	2.80			2	P		1	5	P	2		P		P		P		1 1	1	P 1	2	P
Buchloe dactyloides	0.08	27.50	0.50	0.10	0.62							3		P		P 1		P			P	P		P	P	
Hilaria jamesii	0.58	80.00	3.85	0.90	5.61	1	1	3	P		P	1		P	1	3 5		1 1		P 1	P	P	1 1	P	P 1	2 2	
Sporobolus airoides	0.25	32.50	1.67	0.28	1.71											P		1		1	P		1	P	1	P	
Sporobolus cryptandrus	0.18	47.50	1.17	0.18	1.09			1	P		P		P		P							P				P
TOTAL NATIVE PERENNIAL GRASSES (w)	1.48	95.00	9.87	1.90	11.84	1	1	6	P		1	9	P	2	1	3 6		2 1		1 1	P	P	3 2	1	1 2	4 2	P
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron desertorum	0.03	2.50	0.17	0.03	0.16																				1
Bromus inermis	0.00	5.00	0.00	0.00	0.00		P	P																	
Elymus junceus	8.03	95.00	53.68	8.35	52.02	11	P	2	5	3	4		10 1	3	11	8 1		9 1		14 2	7 1	4	6	12 1	14	9 1	6
TOTAL INTRO. PERENNIAL GRASSES (c)	8.05	95.00	53.85	8.38	52.18	11	P	2	5	3	4		10 1	3	11	8 1		9 1		14 2	7 1	4	6	12 1	14	9 1	7
NATIVE SUBSHRUBS																									
Artemisia frigida	0.00	5.00	0.00	0.00	0.00			P		P															
Ceratoides lanata	0.00	27.50	0.00	0.00	0.00	P		P					P							P	P			P		
Chrysothamnus greenei	0.03	2.50	0.17	0.03	0.16																				1
Gutierrezia sarothrae	0.00	12.50	0.00	0.00	0.00			P								P									P
TOTAL NATIVE SUBSHRUBS	0.03	40.00	0.17	0.03	0.16	P		P		P			P			P		P		P				P		1
INTRODUCED SUBSHRUBS																									
Kochia prostrata	1.93	55.00	12.88	2.10	13.08			P							1	4 1		10 1	15 1		10	9	4 1	5 1	
TOTAL INTRO. SUBSHRUBS	1.93	55.00	12.88	2.10	13.08			P							1	4 1		10 1	15 1		10	9	4 1	5 1	
NATIVE SHRUBS																									
Artemisia tridentata	0.05	10.00	0.33	0.05	0.31					2					P										P
Atriplex canescens	1.80	100.00	12.04	1.80	11.21	P	2	2	1	P	P	3	6	1	1	1	P	1	1	4	P	P	P	P	1
Atriplex confertifolia	0.10	27.50	0.67	0.10	0.62	P									P	P									
Chrysothamnus nauseosus	0.55	22.50	3.68	0.55	3.43		5			10	P	P				1	1								P
Cowania mexicana	0.00	5.00	0.00	0.00	0.00		P					P													
Purshia tridentata	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE SHRUBS	2.50	100.00	16.72	2.50	15.58	P	7	2	1	12	P	3	6	1	1	2	1	1	1	4	P	P	P	P	1
SUCCULENTS																									
Opuntia macrorhiza	0.00	7.50	0.00	0.00	0.00								P												P
Opuntia phaeacantha	0.00	2.50	0.00	0.00	0.00																		P		
TOTAL SUCCULENTS	0.00	10.00	0.00	0.00	0.00								P										P		P
Standing dead	10.13	100.00		10.13		14	15	16	11	42	2	15	4	5	6	15	4	6	5	17	6	6	11	5	9
Litter	14.60	100.00		14.60		9	23	9	12	17	5	19	16	13	14	16	24	14	19	18	15	13	10	20	8
Bare ground	47.58	100.00		47.58		50	14	52	68	16	79	1	48	71	58	46	48	27	30	55	40	43	56	41	64
Rock	12.75	100.00		12.75		14	33	13	3	9	9	49	14	5	8	6	12	27	23	2	20	16	4	16	7
TOTALS	100.00		100.00	101.10	100.00	100 0	100 2	100 0	100 0	100 0	100 0	100 0	100 1	100 0	100 0	100 9	100 2	100 4	100 2	100 0	100 2	100 1	100 3	100 4	100 0
TOTAL VEGETATION COVER	14.95	s=(6.13)		16.05	s=(7.23)	13 0	15 2	10 0	6 0	16 0	5 0	16 0	18 1	6 0	14 0	17 9	12 2	26 4	23 2	8 0	19 2	22 1	19 3	18 4	12 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	52.43	s=(17.39)		53.53	s=(18.17)	50 0	86 2	48 0	32 0	84 0	21 0	99 0	52 1	29 0	42 0	54 9	52 2	73 4	70 2	45 0	60 2	57 1	44 3	59 4	36 0
Allowable Vegetation Cover	**14.95**	**s=(6.13)**				**13.0**	**15.0**	**10.0**	**6.0**	**16.0**	**5.0**	**16.0**	**18.0**	**6.0**	**14.0**	**17.0**	**12.0**	**26.0**	**23.0**	**8.0**	**19.0**	**22.0**	**19.0**	**18.0**	**12.0**
SPECIES DENSITY (# of species/100 sq.m.)	9.83	s=(2.81)				9	14	14	7	10	9	12	9	7	10	13	13	8	7	5	8	7	10	8	16

J7 Sagebrush Reference Area Cover Data – Spring 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																								
Chenopodium berlandieri	0.00	36.84	0.00	0.00	0.00							P				P		P	P			P	P	P
Chenopodium leptophyllum	0.00	36.84	0.00	0.00	0.00	P	P	P	P	P			P	P										
Cryptantha crassisepala	0.11	78.95	1.06	0.11	1.04	P	P	P		P	P		P	1	1		P	P	P	P	P	P		P
Descurainia pinnata	0.00	10.53	0.00	0.00	0.00		P	P																
Descurainia richardsonii	0.00	31.58	0.00	0.05	0.52												P	P	P	P	P 1		P	
Gilia pumila	0.00	10.53	0.00	0.00	0.00		P	P																
Lappula redowskii	0.00	5.26	0.00	0.00	0.00							P												
Oenothera albicaulis	0.05	52.63	0.53	0.05	0.52		1	P					P	P	P		P	P		P			P	P
Plantago patagonica	0.00	26.32	0.00	0.00	0.00	P	P	P					P	P										
Townsendia annua	2.05	100.00	20.63	2.05	20.21	1	2	2	P	P	4	1	1	4	4	3	6	1	P	1	2	2	4	1
TOTAL NATIVE ANN. & BIEN. FORBS	2.21	100.00	22.22	2.26	22.28	1	3	2	P	P	4	1	1	5	5	3	6	1	P	1	2 1	2	4	1
INTRODUCED ANNUAL & BIENNIAL FORBS																								
Chenopodium album	0.00	10.53	0.00	0.00	0.00		P											P						
Salsola iberica	0.00	5.26	0.00	0.00	0.00																P			
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	15.79	0.00	0.00	0.00		P											P			P			
NATIVE ANNUAL GRASSES																								
Festuca octoflora	0.00	57.89	0.00	0.00	0.00	P	P	P		P	P	P	P	P			P						P	P
TOTAL NATIVE ANNUAL GRASSES	0.00	57.89	0.00	0.00	0.00	P	P	P		P	P	P	P	P			P						P	P
NATIVE PERENNIAL FORBS																								
Allium macropetalum	0.00	5.26	0.00	0.00	0.00							P												
Calochortus nuttallii	0.00	63.16	0.00	0.00	0.00	P			P	P		P	P			P	P	P		P		P	P	P
Delphinium scaposum	0.05	31.58	0.53	0.05	0.52				P									P	P	P	P	1		
Hymenopappus filifolius	0.00	10.53	0.00	0.00	0.00																P		P	
Sphaeralcea coccinea	0.00	26.32	0.00	0.00	0.00				P							P	P			P		P		
Townsendia exscapa	0.00	5.26	0.00	0.00	0.00		P																	
TOTAL NATIVE PERENNIAL FORBS	0.05	78.95	0.53	0.05	0.52	P	P		P	P		P	P			P	P	P	P	P	P	1	P	P
NATIVE PERENNIAL GRASSES (cool)																								
Oryzopsis hymenoides	0.00	26.32	0.00	0.00	0.00				P	P		P			P				P					
Sitanion hystrix	0.11	57.89	1.06	0.11	1.04	P			P	1			P	P		P		P			1	P	P	P
Stipa comata	0.00	5.26	0.00	0.00	0.00																	P		
TOTAL NATIVE PERENNIAL GRASSES (c)	0.11	73.68	1.06	0.11	1.04	P			P	1		P	P	P	P	P		P	P		1	P	P	P
NATIVE PERENNIAL GRASSES (warm)																								
Bouteloua gracilis	0.68	89.47	6.88	0.74	7.25		P	P	P	P	2	3		P	P	P	2	P	P	1	1	P	1	3 1
Hilaria jamesii	0.95	100.00	9.52	0.95	9.33	3	1	2	P	2	6	2	P	P	P	P	1	P	P	P	P	P	P	1
TOTAL NATIVE PERENNIAL GRASSES (w)	1.63	100.00	16.40	1.68	16.58	3	1	2	P	2	8	5	P	P	P	P	3	P	P	1	1	P	1	4 1
NATIVE SUBSHRUBS																								
Ceratoides lanata	0.37	26.32	3.70	0.37	3.63				1						1				2	2		1		
Chrysothamnus greenei	1.21	100.00	12.17	1.32	12.95	P	P 1	1	2	3	P	4	P	P	3	2	P	2	P	3	1	2	P	P 1
TOTAL NATIVE SUBSHRUBS	1.58	100.00	15.87	1.68	16.58	P	P 1	1	3	3	P	4	P	P	4	2	P	2	2	5	1	3	P	P 1

J7 Sagebrush Reference Area Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE SHRUBS																								
Artemisia tridentata	3.84	100.00	38.62	3.84	37.82	2	3	2	4	1	4	3	9	1	8	7	4	6	5	1	2	2	5	4
Atriplex canescens	0.53	42.11	5.29	0.53	5.18	3	1			P					P			1	P	3			2	
TOTAL NATIVE SHRUBS	4.37	100.00	43.92	4.37	43.01	5	4	2	4	1	4	3	9	1	8	7	4	7	5	4	2	2	7	4
SUCCULENTS																								
Coryphantha vivipara	0.00	31.58	0.00	0.00	0.00		P					P	P	P				P			P			
Opuntia macrorhiza	0.00	5.26	0.00	0.00	0.00		P																	
Opuntia phaeacantha	0.00	26.32	0.00	0.00	0.00							P			P	P		P					P	
Opuntia whipplei	0.00	5.26	0.00	0.00	0.00															P				
Sclerocactus whipplei	0.00	5.26	0.00	0.00	0.00								P											
TOTAL SUCCULENTS	0.00	52.63	0.00	0.00	0.00		P					P	P	P	P	P		P		P	P		P	
BRYOPHYTES																								
Moss spp.	0.00	36.84	0.00	0.00	0.00						P	P				P	P	P	P	P				
TOTAL BRYOPHYTES	0.00	36.84	0.00	0.00	0.00						P	P				P	P	P	P	P				
LICHEN/FUNGUS																								
Lichen spp.	0.53	84.21	5.29	0.53	5.18	1		P	P		2	1	P		P	P	P	1	P	1	P	2	P	2
TOTAL LICHEN	0.53	84.21	5.29	0.53	5.18	1		P	P		2	1	P		P	P	P	1	P	1	P	2	P	2
Standing dead	16.42	100.00		16.42		17	17	21	20	16	19	13	16	27	12	15	14	9	19	12	13	12	18	22
Litter	19.05	100.00		19.05		21	18	10	8	7	29	25	16	13	19	22	27	24	18	15	26	24	22	18
Bare ground	52.68	100.00		52.68		52	57	62	60	68	34	48	58	54	51	51	43	56	52	52	54	54	47	48
Rock	1.37	42.11		1.37					5	2					1		3		4	9			1	1
TOTALS	100.00		100.00	100.21	100.00	100 0	100 1	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 1	100 0	100 0	100 2
TOTAL VEGETATION COVER	9.95	s=(3.19)		10.16	s=(3.11)	9 0	8 1	7 0	7 0	7 0	16 0	13 0	10 0	6 0	17 0	12 0	13 0	10 0	7 0	11 0	7 1	8 0	12 0	9 2
GROUND COVER (Veg+Litter+St.Dead+Rock)	47.32	s=(7.32)		47.53	s=(7.37)	48 0	43 1	38 0	40 0	32 0	66 0	52 0	42 0	46 0	49 0	49 0	57 0	44 0	48 0	48 0	46 1	46 0	53 0	52 2
Allowable Vegetation Cover	**9.95**	**s=(3.19)**				**9.0**	**8.0**	**7.0**	**7.0**	**7.0**	**16.0**	**13.0**	**10.0**	**6.0**	**17.0**	**12.0**	**13.0**	**10.0**	**7.0**	**11.0**	**7.0**	**8.0**	**12.0**	**9.0**
SPECIES DENSITY (# of species/100 sq.m.)	12.26	s=(2.16)				11	17	12	12	12	7	13	13	12	11	10	11	16	12	14	12	13	14	11

N7/8 Sagebrush Reference Area Cover Data – Spring 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																																	
						1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																																							
Chenopodium graveolens	0.00	21.05	0.00	0.00	0.00	P				P										P								P											
Descurainia pinnata	0.05	10.53	0.29	0.05	0.28															P												1							
Descurainia richardsonii	0.05	26.32	0.29	0.05	0.28			P						P								1				P		P											
Euphorbia glyptosperma	0.00	10.53	0.00	0.00	0.00							P										P																	
Gilia aggregata	0.00	5.26	0.00	0.00	0.00																			P															
Gilia pumila	0.00	26.32	0.00	0.00	0.00			P		P				P								P				P													
Lappula redowskii	0.42	94.74	2.35	0.58	3.08	P		2	1	1				P		P		P		1		P		2	1	P		1		P	1	1		P		P		P		P	
Lupinus brevicaulis	0.00	5.26	0.00	0.00	0.00																					P													
Machaeranthera canescens	0.00	5.26	0.00	0.00	0.00			P																															
Oenothera albicaulis	0.00	5.26	0.00	0.00	0.00											P																							
Phacelia crenulata	0.05	47.37	0.29	0.05	0.28			P						P				P						1						P		P		P		P				P	
TOTAL NATIVE ANN. & BIEN. FORBS	0.58	100.00	3.24	0.74	3.92	P		2	1	1		P		P		P		P		1		P		4	1	P		1		P	1	1		1		P		P		P	
NATIVE ANNUAL GRASSES																																							
Festuca octoflora	0.00	5.26	0.00	0.00	0.00											P																							
TOTAL NATIVE ANNUAL GRASSES	0.00	5.26	0.00	0.00	0.00											P																							
INTRODUCED ANNUAL GRASSES																																							
Bromus tectorum	0.00	10.53	0.00	0.00	0.00			P																				P											
TOTAL INTRODUCED ANNUAL GRASSES	0.00	10.53	0.00	0.00	0.00			P																				P											
NATIVE PERENNIAL FORBS																																							
Allium macropetalum	0.00	10.53	0.00	0.00	0.00							P												P															
Arabis fendleri	0.00	5.26	0.00	0.00	0.00																					P													
Astragalus calycosus var. scaposus	0.00	42.11	0.00	0.00	0.00			P		P				P		P										P				P				P		P				
Astragalus newberryi	0.00	5.26	0.00	0.00	0.00																							P											
Astragalus wingatanus	0.00	57.89	0.00	0.00	0.00	P				P		P								P		P				P				P		P				P		P		P	
Calochortus nuttallii	0.00	36.84	0.00	0.00	0.00	P						P										P			P	P				P		P								
Cryptantha flavoculata	0.00	21.05	0.00	0.00	0.00	P				P														P												P				
Cymopterus purpurascens	0.00	26.32	0.00	0.00	0.00	P				P										P		P				P														
Cymopterus purpureus	0.05	68.42	0.29	0.05	0.28			P						P				P		P				P		P		P		P		1				P		P		P	
Delphinium scaposum	0.00	15.79	0.00	0.00	0.00											P		P										P												
Leptodactylon pungens	0.00	5.26	0.00	0.00	0.00																									P									
Leucelene ericoides	0.11	100.00	0.59	0.11	0.56	P		P		P		P		P		P		1		P		P		P		P		P		1		P		P		P		P		P	
Phlox longifolia	0.00	42.11	0.00	0.00	0.00	P				P		P						P				P								P						P		P	
Sphaeralcea coccinea	0.26	94.74	1.47	0.32	1.68	2		P		1	1	P				P		P		P		P		P		P		P		P		P		P		P		2	
Stanleya pinnata	0.00	21.05	0.00	0.05	0.28													P										P	1							P		P		
TOTAL NATIVE PERENNIAL FORBS	0.42	100.00	2.35	0.53	2.80	2		P		1	1	P		P		P		1		P		P		P		P		1	1	P		1		P		P		P		2	
NATIVE PERENNIAL GRASSES (cool)																																							
Oryzopsis hymenoides	0.58	94.74	3.24	0.58	3.08	1		P		P		2		P		1		P		1		2		P		3		P				P		P		P		1		P	
Poa cusickii	0.00	5.26	0.00	0.00	0.00																							P											
Sitanion hystrix	0.63	89.47	3.53	0.84	4.48	P		3	1	P	1	2				1	1	P				P		1		1		P		1	1	3		P		P		P		P	
Stipa comata	0.00	5.26	0.00	0.00	0.00																					P													
TOTAL NATIVE PERENNIAL GRASSES (c)	1.21	100.00	6.76	1.42	7.56	1		3	1	P	1	4		P		2	1	P		1		2		1		4		P		1	1	3		P		P		P		1		P	

N7/8 Sagebrush Reference Area Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																								
Bouteloua gracilis	0.89	94.74	5.00	0.89	4.76	P	1	1	2		2	P	1	5	P	2	P	1	P	1	P	P	1	P
Hilaria jamesii	0.89	73.68	5.00	1.00	5.32	7		P	P	P	P	2	P	2			P 1	1		3		P	P 1	2
TOTAL NATIVE PERENNIAL GRASSES (w)	1.79	100.00	10.00	1.89	10.08	7	1	1	2	P	2	2	1	7	P	2	P 1	2	P	4	P	P	1 1	2
NATIVE SUBSHRUBS																								
Ceratoides lanata	0.00	15.79	0.00	0.00	0.00				P					P								P		
Chrysothamnus greenei	1.63	100.00	9.12	1.74	9.24	2	2	1	3	1	P	P	1	5	2	4	P	3 1	1	1	P	1	P	4 1
Eriogonum microthecum	0.00	10.53	0.00	0.00	0.00												P				P			
Gutierrezia sarothrae	0.32	78.95	1.76	0.37	1.96	P	P	P		P	1 1	P	1	1	1			P	P	P	P	1	1	
TOTAL NATIVE SUBSHRUBS	1.95	100.00	10.88	2.11	11.20	2	2	1	3	1	1 1	P	2	6	3	4	P	3 1	1	1	P	2	1	4 1
NATIVE SHRUBS																								
Artemisia tridentata	6.32	100.00	35.29	6.42	34.17	3	3	9	8	8 1	7	3	5	6	8 1	9	11	6	6	2	12	4	3	7
Atriplex canescens	2.05	89.47	11.47	2.05	10.92	2	3	2		P	2	3	2		2	1	5	6	3	P	3	1	2	2
Ephedra viridis	0.00	10.53	0.00	0.00	0.00	P														P				
Lycium pallidum	0.00	15.79	0.00	0.00	0.00	P	P											P						
TOTAL NATIVE SHRUBS	8.37	100.00	46.76	8.47	45.10	5	6	11	8	8 1	9	6	7	6	10 1	10	16	12	9	2	15	5	5	9
NATIVE TREES																								
Juniperus osteosperma	0.26	21.05	1.47	0.26	1.40							1	2							1		1		
Pinus edulis	3.26	94.74	18.24	3.32	17.65	2	2	4		11	1	2	3	2	5	1	2	5	1	2	8	1	8 1	2
TOTAL NATIVE TREES	3.53	94.74	19.71	3.58	19.05	2	2	4		11	1	3	5	2	5	1	2	5	1	3	8	2	8 1	2
SUCCULENTS																								
Coryphantha vivipara	0.00	10.53	0.00	0.00	0.00	P														P				
Opuntia fragilis var. fragilis	0.00	5.26	0.00	0.00	0.00																			P
Opuntia polyacantha	0.00	10.53	0.00	0.00	0.00	P										P								
TOTAL SUCCULENTS	0.00	21.05	0.00	0.00	0.00	P										P				P				P
BRYOPHYTES																								
Moss spp.	0.05	42.11	0.29	0.05	0.28		P	P				1	P	P	P		P		P					
TOTAL BRYOPHYTES	0.05	42.11	0.29	0.05	0.28		P	P				1	P	P	P		P		P					
LICHEN/FUNGUS																								
Lichen spp.	0.00	57.89	0.00	0.00	0.00		P	P		P			P	P	P				P	P		P	P	P
TOTAL LICHEN	0.00	57.89	0.00	0.00	0.00		P	P		P			P	P	P				P	P		P	P	P
Standing dead	9.37	100.00		9.37		13	11	11	8	1	5	22	8	9	14	10	13	14	5	11	6	1	5	11
Litter	25.89	100.00		25.89		21	36	25	11	36	29	27	29	28	27	13	37	26	24	29	20	16	38	20
Bare ground	24.74	100.00		24.74		10	24	35	47	25	8	4	23	33	22	38	24	11	28	20	28	34	30	26
Rock	22.11	100.00		22.11		37	13	10	17	18	43	34	23	7	14	18	7	25	28	28	23	40	11	24
TOTALS	100.00		99.71	100.89	99.72	100 0	100 2	100 2	100 0	100 1	100 2	100 0	100 0	100 0	100 2	100 0	100 1	100 4	100 0	100 0	100 0	100 0	100 2	100 1
TOTAL VEGETATION COVER	17.89	s=(4.07)		18.79	s=(4.58)	19 0	16 2	19 2	17 0	20 1	15 2	13 0	17 0	23 0	23 2	21 0	19 1	24 4	15 0	12 0	23 0	9 0	16 2	19 1
GROUND COVER (Veg+Litter+St.Dead+Rock)	75.26	s=(10.88)		76.16	s=(11.26)	90 0	76 2	65 2	53 0	75 1	92 2	96 0	77 0	67 0	78 2	62 0	76 1	89 4	72 0	80 0	72 0	66 0	70 2	74 1
Allowable Vegetation Cover	**17.89**	**s=(4.07)**				**19.0**	**16.0**	**19.0**	**17.0**	**20.0**	**15.0**	**13.0**	**17.0**	**23.0**	**23.0**	**21.0**	**19.0**	**24.0**	**15.0**	**12.0**	**23.0**	**9.0**	**16.0**	**19.0**
SPECIES DENSITY (# of species/100 sq.m.)	17.53	s=(2.55)				22	19	19	14	14	16	18	17	17	17	15	22	21	17	19	14	20	16	16

N14 Sagebrush Reference Area Cover Data – Spring 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																								
Chenopodium leptophyllum	0.00	5.26	0.00	0.00	0.00																			P
Descurainia pinnata	0.21	78.95	1.00	0.21	0.96	1	P	P		P	P	1		P	P	P	2	P	P			P	P	P
Gilia aggregata	0.00	5.26	0.00	0.00	0.00														P					
Gilia pumila	0.00	36.84	0.00	0.00	0.00					P	P					P		P	P	P				P
Lappula redowskii	0.05	100.00	0.25	0.05	0.24	P	P	P	P	P	P	P	P	1	P	P	P	P	P	P	P	P	P	P
Machaeranthera canescens	0.00	10.53	0.00	0.00	0.00								P	P										
Oenothera albicaulis	0.00	15.79	0.00	0.00	0.00									P						P				P
TOTAL NATIVE ANN. & BIEN. FORBS	0.26	100.00	1.25	0.26	1.20	1	P	P	P	P	P	1	P	1	P	P	2	P	P	P	P	P	P	P
NATIVE ANNUAL GRASSES																								
Festuca octoflora	0.00	5.26	0.00	0.00	0.00				P															
TOTAL NATIVE ANNUAL GRASSES	0.00	5.26	0.00	0.00	0.00				P															
INTRODUCED ANNUAL GRASSES																								
Bromus tectorum	0.00	5.26	0.00	0.00	0.00									P										
TOTAL INTRODUCED ANNUAL GRASSES	0.00	5.26	0.00	0.00	0.00									P										
NATIVE PERENNIAL FORBS																								
Agoseris glauca	0.00	5.26	0.00	0.00	0.00								P											
Arabis fendleri	0.05	15.79	0.25	0.05	0.24									P				P	1					
Calochortus nuttallii	0.00	15.79	0.00	0.00	0.00															P		P	P	
Cymopterus purpurascens	0.00	57.89	0.00	0.00	0.00		P	P	P	P	P		P				P		P		P	P	P	
Leucelene ericoides	0.05	73.68	0.25	0.05	0.24						P	P	P	P	P	P	P	P	P	1	P	P	P	
Phlox longifolia	0.00	15.79	0.00	0.00	0.00															P	P			P
Sphaeralcea coccinea	0.00	100.00	0.00	0.05	0.24	P	P	P	P	P	P	P	P 1	P	P	P	P	P	P	P	P	P	P	P
TOTAL NATIVE PERENNIAL FORBS	0.11	100.00	0.50	0.16	0.72	P	P	P	P	P	P	P	P 1	P	P	P	P	P	1	1	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)																								
Oryzopsis hymenoides	0.00	21.05	0.00	0.00	0.00							P		P	P								P	
Sitanion hystrix	0.11	100.00	0.50	0.11	0.48	P	P	P	P	P	P	P	P	1	P	P	P	P	P	1	P	P	P	P
TOTAL NATIVE PERENNIAL GRASSES (c)	0.11	100.00	0.50	0.11	0.48	P	P	P	P	P	P	P	P	1	P	P	P	P	P	1	P	P	P	P
NATIVE PERENNIAL GRASSES (warm)																								
Bouteloua gracilis	4.05	100.00	19.25	4.63	21.15	6	7 1	9 1	5	12	2	5	6 2	4 2	2 1	2	P	1	2 1	5 1	3 1	2	2	2 1
TOTAL NATIVE PERENNIAL GRASSES (w)	4.05	100.00	19.25	4.63	21.15	6	7 1	9 1	5	12	2	5	6 2	4 2	2 1	2	P	1	2 1	5 1	3 1	2	2	2 1
NATIVE SUBSHRUBS																								
Chrysothamnus greenei	0.05	63.16	0.25	0.05	0.24	P	P	1	P	P		P				P	P	P	P			P	P	
Gutierrezia sarothrae	0.11	57.89	0.50	0.11	0.48						P	P	1	P	1	P	P			P	P		P	P
TOTAL NATIVE SUBSHRUBS	0.16	100.00	0.75	0.16	0.72	P	P	1	P	P	P	P	1	P	1	P	P	P	P	P	P	P	P	P
NATIVE SHRUBS																								
Artemisia tridentata	13.79	100.00	65.50	13.95	63.70	11	23	11	11	12	10	15	22	15	9	22 1	11	14 1	5	11	9	12 1	22	17
Atriplex canescens	0.00	10.53	0.00	0.00	0.00													P	P					
Chrysothamnus nauseosus	0.11	15.79	0.50	0.11	0.48								2		P							P		
TOTAL NATIVE SHRUBS	13.89	100.00	66.00	14.05	64.18	11	23	11	11	12	10	15	24	15	9	22 1	11	14 1	5	11	9	12 1	22	17

N14 Sagebrush Reference Area Cover Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE TREES																								
Pinus edulis	2.42	100.00	11.50	2.47	11.30	8	P	1	P	1	2	3	6	5	1	P	3	1	4	1	4	1	4	1 1
TOTAL NATIVE TREES	2.42	100.00	11.50	2.47	11.30	8	P	1	P	1	2	3	6	5	1	P	3	1	4	1	4	1	4	1 1
SUCCULENTS																								
Coryphantha vivipara	0.00	21.05	0.00	0.00	0.00						P		P		P	P								
Opuntia phaeacantha	0.05	42.11	0.25	0.05	0.24	P			P	P	1				P	P		P					P	
Opuntia polyacantha	0.00	5.26	0.00	0.00	0.00																		P	
TOTAL SUCCULENTS	0.05	47.37	0.25	0.05	0.24	P			P	P	1		P		P	P		P					P	
LICHEN/FUNGUS																								
Lichen spp.	0.32	52.63	1.50	0.32	1.44	1	P	P	P	2		P	P	P		2		1						
TOTAL LICHEN	0.32	52.63	1.50	0.32	1.44	1	P	P	P	2		P	P	P		2		1						
Standing dead	17.95	100.00		17.95		12	11	8	8	10	19	20	13	22	20	27	21	19	17	22	23	22	19	28
Litter	17.89	100.00		17.89		33	27	28	31	19	13	29	25	23	12	7	17	15	10	8	12	8	10	13
Bare ground	42.58	100.00		42.58		28	32	42	45	44	53	27	25	29	54	40	45	48	61	51	49	54	43	39
Rock	0.21	21.05		0.21											1		1	1				1		
TOTALS	100.00		100.00	100.84	100.00	100 0	100 1	100 1	100 0	100 0	100 0	100 0	100 3	100 2	100 1	100 1	100 0	100 1	100 1	100 1	100 1	100 1	100 0	100 2
TOTAL VEGETATION COVER	21.05	s=(6.64)		21.89	s=(6.96)	26 0	30 1	22 1	16 0	25 0	15 0	24 0	37 3	26 2	13 1	24 1	16 0	16 1	12 1	19 1	16 1	15 1	28 0	20 2
GROUND COVER (Veg+Litter+St.Dead+Rock)	57.42	s=(10.39)		58.26	s=(10.63)	72 0	68 1	58 1	55 0	56 0	47 0	73 0	75 3	71 2	46 1	60 1	55 0	52 1	39 1	49 1	51 1	46 1	57 0	61 2
Allowable Vegetation Cover	**21.05**	**s=(6.64)**				**26.0**	**30.0**	**22.0**	**16.0**	**25.0**	**15.0**	**24.0**	**37.0**	**26.0**	**13.0**	**24.0**	**16.0**	**16.0**	**12.0**	**19.0**	**16.0**	**15.0**	**28.0**	**20.0**
SPECIES DENSITY (# of species/100 sq.m.)	11.84	s=(2.01)				9	9	9	10	11	13	11	13	14	13	13	11	13	14	12	10	10	15	15

N14 Phase III Grassland Production Data – Spring 2022

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
NATIVE ANNUAL & BIENNIAL FORBS																							
Descurainia pinnata	0.06	1.13	7.50															6.7					
Descurainia richardsonii	0.00	0.03	2.50																		0.2		
Lappula redowskii	0.01	0.16	2.50																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.07	1.32	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.7	-	-	0.2	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Chenopodium album	0.00	0.04	2.50																				
Salsola iberica	0.05	0.89	2.50		6																		
TOTAL INTRO. ANN. & BIEN. FORBS	0.05	0.94	5.00	-	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.05	0.92	5.00																				
TOTAL INTRODUCED ANNUAL GRASSES	0.05	0.92	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Agoseris glauca	0.00	0	0.00																			T	
Sphaeralcea coccinea	0.00	0.06	2.50																				
TOTAL NATIVE PERENNIAL FORBS	0.00	0.06	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.01	0.13	5.00							0.1													
Agropyron smithii	0.10	1.74	5.00										2.9										
Oryzopsis hymenoides	0.05	0.89	2.50																				
TOTAL NATIVE PERENNIAL GRASSES (c)	0.16	2.77	12.50	-	-	-	-	-	-	0.1	-	-	2.9	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	0.09	1.67	12.50		T			2.8							0.4					0.4			
Buchloe dactyloides	0.00	0.06	2.50																				
Hilaria jamesii	0.35	6.3	20.00		3.5	4.7		3.5	0.5				2.2		0.3								
Sporobolus airoides	0.08	1.46	7.50										1.3					2.8			5.7		
Sporobolus cryptandrus	0.38	6.84	12.50						1.2										2.6	31.9			
TOTAL NATIVE PERENNIAL GRASSES (w)	0.92	16.32	37.50	-	3.5	4.7	-	6.3	1.7	-	-	-	3.5	-	0.7	-	-	2.8	2.6	32.3	5.7	-	-
INTRODUCED PERENNIAL GRASSES (cool)																							
Agropyron desertorum	0.02	0.43	2.50					2.9															
Elymus junceus	21.10	376.48	100.00	78.1	23.8	4.9	62.8	9.1	57.2	94.8	44.3	57.3	48.8	51.3	21.1	84	58.5	65.1	72.9	54.3	98.9	64.5	22.6
TOTAL INTRO. PERENNIAL GRASSES (c)	21.13	376.91	100.00	78.1	23.8	4.9	62.8	12.0	57.2	94.8	44.3	57.3	48.8	51.3	21.1	84.0	58.5	65.1	72.9	54.3	98.9	64.5	22.6
NATIVE SUBSHRUBS																							
Chrysothamnus greenei	0.00	0.07	2.50																				
TOTAL NATIVE SUBSHRUBS	0.00	0.07	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	1.34	23.88	10.00																			1.8	
TOTAL INTRO. SUBSHRUBS	1.34	23.88	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	-
NATIVE SHRUBS																							
Atriplex canescens	2.03	36.24	52.50	3.1	7.1	5.3	1.6			20.9		T	11.1		15.3			23.2	6.3	0.5			0.1
Atriplex confertifolia	0.01	0.09	2.50																				
Chrysothamnus nauseosus	0.02	0.33	5.00					0.5															
TOTAL NATIVE SHRUBS	2.06	36.66	60.00	3.1	7.1	5.3	1.6	0.5	-	20.9	-	-	11.1	-	15.3	-	-	23.2	6.3	0.5	-	-	0.1
TOTAL PRODUCTION	25.78	459.86	100.00	81.2	40.4	14.9	64.4	18.8	58.9	115.8	44.3	57.3	66.3	51.3	37.1	84.0	58.5	97.8	81.8	87.1	104.8	66.3	22.7
Standard Deviation	12.48	222.56																					
ALLOWABLE PRODUCTION (lbs/acre)	459.86	(s=222.56)		482.9	240.3	88.6	383.0	111.8	350.3	688.6	263.4	340.7	394.3	305.1	220.6	499.5	347.9	581.6	486.4	518.0	623.2	394.3	135.0
SPECIES DENSITY (# of species/1.5 sq.m.)	2.83	(s=1.26)		2.0	5.0	3.0	2.0	5.0	3.0	3.0	1.0	2.0	5.0	1.0	4.0	1.0	1.0	4.0	3.0	4.0	3.0	3.0	2.0

Noxious Production	0.00

N14 Phase III Grassland Production Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
NATIVE ANNUAL & BIENNIAL FORBS																							
Descurainia pinnata	0.06	1.13	7.50									0.8								0.1			
Descurainia richardsonii	0.00	0.03	2.50																				
Lappula redowskii	0.01	0.16	2.50																	1.1			
TOTAL NATIVE ANN. & BIEN. FORBS	0.07	1.32	10.00	-	-	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-	1.2	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Chenopodium album	0.00	0.04	2.50											0.3									
Salsola iberica	0.05	0.89	2.50																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.05	0.94	5.00	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.05	0.92	5.00	1.6		T				4.6													
TOTAL INTRODUCED ANNUAL GRASSES	0.05	0.92	5.00	1.6	-	-	-	-	-	4.6	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Agoseris glauca	0.00	0	0.00																				
Sphaeralcea coccinea	0.00	0.06	2.50					0.4															
TOTAL NATIVE PERENNIAL FORBS	0.00	0.06	2.50	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.01	0.13	5.00								0.8												
Agropyron smithii	0.10	1.74	5.00				8.8																
Oryzopsis hymenoides	0.05	0.89	2.50					6															
TOTAL NATIVE PERENNIAL GRASSES (c)	0.16	2.77	12.50	-	-	-	8.8	6.0	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	0.09	1.67	12.50			T	1.6			6													
Buchloe dactyloides	0.00	0.06	2.50										0.4										
Hilaria jamesii	0.35	6.3	20.00						7.2	20.5													
Sporobolus airoides	0.08	1.46	7.50																				
Sporobolus cryptandrus	0.38	6.84	12.50							7.7					2.6								
TOTAL NATIVE PERENNIAL GRASSES (w)	0.92	16.32	37.50	-	-	-	1.6	-	7.2	34.2	-	-	0.4	-	2.6	-	-	-	-	-	-	-	-
INTRODUCED PERENNIAL GRASSES (cool)																							
Agropyron desertorum	0.02	0.43	2.50																				
Elymus junceus	21.10	376.48	100.00	53.5	113.2	103.7	63	72.6	74.8	0.1	11.5	144	53.7	29.6	137.3	72.9	34	111.6	52.1	57	90	83.1	100.4
TOTAL INTRO. PERENNIAL GRASSES (c)	21.13	376.91	100.00	53.5	113.2	103.7	63.0	72.6	74.8	0.1	11.5	144.0	53.7	29.6	137.3	72.9	34.0	111.6	52.1	57.0	90.0	83.1	100.4
NATIVE SUBSHRUBS																							
Chrysothamnus greenei	0.00	0.07	2.50					0.5															
TOTAL NATIVE SUBSHRUBS	0.00	0.07	2.50	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	1.34	23.88	10.00			63.6						0.3					94.9						
TOTAL INTRO. SUBSHRUBS	1.34	23.88	10.00	-	-	63.6	-	-	-	-	-	0.3	-	-	-	-	94.9	-	-	-	-	-	-
NATIVE SHRUBS																							
Atriplex canescens	2.03	36.24	52.50	6.5	18.5		4.8	5.6				T	9.5	14.3						26.2	9.4	42.2	12.3
Atriplex confertifolia	0.01	0.09	2.50													0.6							
Chrysothamnus nauseosus	0.02	0.33	5.00								1.7												
TOTAL NATIVE SHRUBS	2.06	36.66	60.00	6.5	18.5	-	4.8	5.6	-	-	1.7	-	9.5	14.3	-	0.6	-	-	-	26.2	9.4	42.2	12.3
TOTAL PRODUCTION	25.78	459.86	100.00	61.6	131.7	167.3	78.2	85.1	82.0	38.9	14.0	145.1	63.6	44.2	139.9	73.5	128.9	111.6	52.1	84.4	99.4	125.3	112.7
Standard Deviation	12.48	222.56																					
ALLOWABLE PRODUCTION (lbs/acre)	459.86	(s=222.56)		366.3	783.2	994.9	465.0	506.1	487.6	231.3	83.3	862.9	378.2	262.8	831.9	437.1	766.5	663.7	309.8	501.9	591.1	745.1	670.2
SPECIES DENSITY (# of species/1.5 sq.m.)	2.83	(s=1.26)		3.0	2.0	4.0	4.0	5.0	2.0	5.0	3.0	4.0	3.0	3.0	2.0	2.0	2.0	1.0	1.0	4.0	2.0	2.0	2.0

Noxious Production	0.00

N14 Phase III Shrubland Production Data – Spring 2022

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
NATIVE ANNUAL & BIENNIAL FORBS																							
Descurainia pinnata	0.07	1.29	5.00	1.4			7.3																
Lappula redowskii	0.01	0.16	5.00						0.4														0.7
TOTAL NATIVE ANN. & BIEN. FORBS	0.08	1.46	10.00	1.4	-	-	7.3	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Kochia scoparia	0.00	0	0.00																				
Ranunculus testiculatus	0.00	0.03	2.50												0.2								
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	0.03	2.50	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.00	0	0.00											T									
TOTAL INTRODUCED ANNUAL GRASSES	0.00	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron smithii	0.11	2.02	10.00		2.3									1.2									
TOTAL NATIVE PERENNIAL GRASSES (c)	0.11	2.02	10.00	-	2.3	-	-	-	-	-	-	-	-	1.2	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	0.14	2.56	27.50	1.1	0.8						0.3			2.4					0.7				
Buchloe dactyloides	0.01	0.13	2.50											0.9									
Hilaria jamesii	0.94	16.83	27.50	4.2	10.6				31.4					9									
Sporobolus airoides	0.07	1.28	10.00		0.7						5.7												
Sporobolus cryptandrus	0.49	8.71	15.00						41.2	6.3											0.3	6.4	1.6
TOTAL NATIVE PERENNIAL GRASSES (w)	1.65	29.51	50.00	5.3	12.1	-	-	-	72.6	6.3	6.0	-	-	12.3	-	-	-	-	0.7	-	0.3	6.4	1.6
INTRODUCED PERENNIAL GRASSES (cool)																							
Agropyron desertorum	0.12	2.19	2.50																				
Elymus junceus	16.40	292.49	97.50	13.6	15.6	69.9	103.2	46	1.8	78.3	21.4	129	77.9		4.3	25.6	88.7	79.1	70.5	110.2	25.5	14.5	95.8
TOTAL INTRO. PERENNIAL GRASSES (c)	16.52	294.67	97.50	13.6	15.6	69.9	103.2	46.0	1.8	78.3	21.4	129.0	77.9	-	4.3	25.6	88.7	79.1	70.5	110.2	25.5	14.5	95.8
NATIVE SUBSHRUBS																							
Ceratoides lanata	0.01	0.1	2.50																				
Chrysothamnus greenei	0.06	1.13	2.50																				
TOTAL NATIVE SUBSHRUBS	0.07	1.23	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	2.21	39.37	35.00								12				37.2		16.8	23.4					
TOTAL INTRO. SUBSHRUBS	2.21	39.37	35.00	-	-	-	-	-	-	-	12.0	-	-	-	37.2	-	16.8	23.4	-	-	-	-	-
NATIVE SHRUBS																							
Artemisia tridentata	0.38	6.69	2.50																				
Atriplex canescens	1.30	23.16	47.50	8.5		22.4		1.1	0.4	2.3	23.1		31.1	T		6			9.7	3.9	1.8	0.8	
Chrysothamnus nauseosus	0.05	0.88	2.50																				
TOTAL NATIVE SHRUBS	1.72	30.73	50.00	8.5	-	22.4	-	1.1	0.4	2.3	23.1	-	31.1	-	-	6.0	-	-	9.7	3.9	1.8	0.8	-
TOTAL PRODUCTION	22.37	399.02	100.00	28.8	30.0	92.3	110.5	47.1	75.2	86.9	62.5	129.0	109.0	13.5	41.7	31.6	105.5	102.5	80.9	114.1	27.6	21.7	98.1
Standard Deviation	14.02	250.08																					
ALLOWABLE PRODUCTION (lbs/acre)	399.02	(s=250.08)		171.3	178.4	548.9	657.1	280.1	447.2	516.8	371.7	767.1	648.2	80.3	248.0	187.9	627.4	609.5	481.1	678.5	164.1	129.0	583.4
SPECIES DENSITY (# of species/1.5 sq.m.)	3.05	(s=1.57)		5.0	5.0	2.0	2.0	2.0	5.0	3.0	5.0	1.0	2.0	6.0	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0

Noxious Production	0.00

N14 Phase III Shrubland Production Data – Spring 2022 (continued)

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
NATIVE ANNUAL & BIENNIAL FORBS																							
Descurainia pinnata	0.07	1.29	5.00																				
Lappula redowskii	0.01	0.16	5.00																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.08	1.46	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Kochia scoparia	0.00	0	0.00					T															
Ranunculus testiculatus	0.00	0.03	2.50																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	0.03	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.00	0	0.00																				
TOTAL INTRODUCED ANNUAL GRASSES	0.00	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron smithii	0.11	2.02	10.00											6.7									3.4
TOTAL NATIVE PERENNIAL GRASSES (c)	0.11	2.02	10.00	-	-	-	-	-	-	-	-	-	-	6.7	-	-	-	-	-	-	-	-	3.4
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	0.14	2.56	27.50			6						2.3		0.6					2.2			0.1	0.7
Buchloe dactyloides	0.01	0.13	2.50																				
Hilaria jamesii	0.94	16.83	27.50			5.6	19.2			1.5		9		8.4						1.7	12.6		
Sporobolus airoides	0.07	1.28	10.00							1.5									0.7				
Sporobolus cryptandrus	0.49	8.71	15.00																				2.8
TOTAL NATIVE PERENNIAL GRASSES (w)	1.65	29.51	50.00	-	-	11.6	19.2	-	-	3.0	-	11.3	-	9.0	-	-	-	-	2.9	1.7	12.6	0.1	3.5
INTRODUCED PERENNIAL GRASSES (cool)																							
Agropyron desertorum	0.12	2.19	2.50																				14.7
Elymus junceus	16.40	292.49	97.50	143.3	31.1	1.9	19.7	5.4	4.2	70.3	152.9	38.9	7.4	6.8	33.8	18.1	45.9	138	57.4	49.3	9.2	62.1	0.8
TOTAL INTRO. PERENNIAL GRASSES (c)	16.52	294.67	97.50	143.3	31.1	1.9	19.7	5.4	4.2	70.3	152.9	38.9	7.4	6.8	33.8	18.1	45.9	138.0	57.4	49.3	9.2	62.1	15.5
NATIVE SUBSHRUBS																							
Ceratoides lanata	0.01	0.1	2.50								0.7												
Chrysothamnus greenei	0.06	1.13	2.50																				7.6
TOTAL NATIVE SUBSHRUBS	0.07	1.23	5.00	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	7.6
INTRODUCED SUBSHRUBS																							
Kochia prostrata	2.21	39.37	35.00					2		7.8			3.6	14.7		21	30.4		56	28.3	11.5	0.1	
TOTAL INTRO. SUBSHRUBS	2.21	39.37	35.00	-	-	-	-	2.0	-	7.8	-	-	3.6	14.7	-	21.0	30.4	-	56.0	28.3	11.5	0.1	-
NATIVE SHRUBS																							
Artemisia tridentata	0.38	6.69	2.50																				45
Atriplex canescens	1.30	23.16	47.50		11.6			0.5				6.2		2				11.1	10.3	3			
Chrysothamnus nauseosus	0.05	0.88	2.50											5.9									
TOTAL NATIVE SHRUBS	1.72	30.73	50.00	-	11.6	-	-	0.5	-	-	-	6.2	-	7.9	-	-	-	11.1	10.3	3.0	-	-	45.0
TOTAL PRODUCTION	22.37	399.02	100.00	143.3	42.7	13.5	38.9	7.9	4.2	81.1	153.6	56.4	11.0	45.1	33.8	39.1	76.3	149.1	126.6	82.3	33.3	62.3	75.0
Standard Deviation	14.02	250.08																					
ALLOWABLE PRODUCTION (lbs/acre)	399.02	(s=250.08)		852.2	253.9	80.3	231.3	47.0	25.0	482.3	913.4	335.4	65.4	268.2	201.0	232.5	453.7	886.7	752.9	489.4	198.0	370.5	446.0
SPECIES DENSITY (# of species/1.5 sq.m.)	3.05	(s=1.57)		1.0	2.0	3.0	2.0	4.0	1.0	4.0	2.0	4.0	2.0	7.0	1.0	2.0	2.0	2.0	5.0	4.0	3.0	3.0	7.0

Noxious Production	0.00

N14 Phase III Grassland Shrub Density Data – Spring 2022

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																		
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.13	5.06	5.00																		1		
Ceratoides lanata	(21-50cm)	0.05	2.02	5.00										1										
Chrysothamnus greenei	(0-20cm)	10.28	415.81	5.00																				
Chrysothamnus greenei	(21-50cm)	0.10	4.05	5.00																				
Gutierrezia sarothrae	(0-20cm)	2.08	83.97	10.00	46							1	1											
TOTAL NATIVE SUBSHRUBS		12.63	510.92	20.00	46							1	1	1								1		
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	16.30	659.64	42.50	2							29				1		1	11	1		3	10	
Kochia prostrata	(21-50cm)	1.20	48.56	25.00															2				8	
TOTAL INTRO. SUBSHRUBS		17.50	708.20	42.50	2							29				1		1	13	1		3	18	
NATIVE SHRUBS																								
Atriplex canescens	(0-20cm)	5.53	223.59	75.00	6	8	10	10	26		27	1	1	8		19	7	2		4	6	6		8
Atriplex canescens	(21-50cm)	11.05	447.18	85.00	5	18	8	13	32	2	61	4		28	2	63	17	1	36	9	17	7		
Atriplex canescens	(>50cm)	6.33	255.96	77.50	8	1	4	14	8	2	27	2	5	1		14	11	2	17	1	12	8		
Atriplex confertifolia	(0-20cm)	0.25	10.12	12.50		2			1								3				1			
Atriplex confertifolia	(21-50cm)	0.18	7.08	10.00											1		1				1			
Chrysothamnus nauseosus	(0-20cm)	0.10	4.05	2.50																				
Chrysothamnus nauseosus	(21-50cm)	0.53	21.25	10.00									2											
Chrysothamnus nauseosus	(>50cm)	0.13	5.06	5.00																				
TOTAL NATIVE SHRUBS		24.08	974.28	95.00	19	29	22	37	67	4	115	7	8	37	3	96	39	5	53	14	37	21		8
TOTAL DENSITY (stems/100 sq. m.)		54.20	(s=82.26)	100.00	67	29	22	37	67	4	115	37	9	38	3	97	39	6	66	15	37	25	18	8
TOTAL DENSITY (stems/acre)		2193.40	(s=3328.8)		2711	1174	890	1497	2711	162	4654	1497	364	1538	121	3925	1578	243	2671	607	1497	1012	728	324
SPECIES DENSITY (# of species/100 sq.m.)		1.85	(s=0.83)		3	2	1	1	2	1	1	3	3	2	2	2	2	2	2	2	2	3	1	1

N14 Phase III Grassland Shrub Density Data – Spring 2022 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.13	5.06	5.00								4												
Ceratoides lanata	(21-50cm)	0.05	2.02	5.00	1																			
Chrysothamnus greenei	(0-20cm)	10.28	415.81	5.00					410			1												
Chrysothamnus greenei	(21-50cm)	0.10	4.05	5.00					1			3												
Gutierrezia sarothrae	(0-20cm)	2.08	83.97	10.00								35												
TOTAL NATIVE SUBSHRUBS		12.63	510.92	20.00	1				411			43												
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	16.30	659.64	42.50			24	1		15	76		324	1			2	128		23				
Kochia prostrata	(21-50cm)	1.20	48.56	25.00			16	1		5	8			1			1	4		2				
TOTAL INTRO. SUBSHRUBS		17.50	708.20	42.50			40	2		20	84		324	2			3	132		25				
NATIVE SHRUBS																								
Atriplex canescens	(0-20cm)	5.53	223.59	75.00	8	4	1	4	6	1	2		3		14		3				3	2	20	1
Atriplex canescens	(21-50cm)	11.05	447.18	85.00	12	18	7	10	4	4		2	1	4	11	1	13			1	13	3	11	4
Atriplex canescens	(>50cm)	6.33	255.96	77.50	5	29		6	8	6			2	5	16	2	10			5	7		6	9
Atriplex confertifolia	(0-20cm)	0.25	10.12	12.50													3							
Atriplex confertifolia	(21-50cm)	0.18	7.08	10.00													4							
Chrysothamnus nauseosus	(0-20cm)	0.10	4.05	2.50								4												
Chrysothamnus nauseosus	(21-50cm)	0.53	21.25	10.00								15				3			1					
Chrysothamnus nauseosus	(>50cm)	0.13	5.06	5.00								4				1								
TOTAL NATIVE SHRUBS		24.08	974.28	95.00	25	51	8	20	18	11	2	25	6	9	41	7	33		1	6	23	5	37	14
TOTAL DENSITY (stems/100 sq. m.)		54.20	(s=82.26)	100.00	26	51	48	22	429	31	86	68	330	11	41	7	36	132	1	31	23	5	37	14
TOTAL DENSITY (stems/acre)		2193.40	(s=3328.8)		1052	2064	1942	890	17361	1255	3480	2752	13355	445	1659	283	1457	5342	40	1255	931	202	1497	567
SPECIES DENSITY (# of species/100 sq.m.)		1.85	(s=0.83)		2	1	2	2	2	2	2	5	2	2	1	2	3	1	1	2	1	1	1	1

N14 Phase III Shrubland Shrub Density Data – Spring 2022

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	7.65	309.58	5.00																				
Artemisia frigida	(21-50cm)	0.63	25.29	2.50																				
Ceratoides lanata	(0-20cm)	0.35	14.16	20.00	1							1		3										
Ceratoides lanata	(21-50cm)	0.28	11.13	20.00	1	2			1		1													
Chrysothamnus greenei	(0-20cm)	0.45	18.21	2.50																				
Chrysothamnus greenei	(21-50cm)	0.63	25.29	2.50																				
Gutierrezia sarothrae	(0-20cm)	1.20	48.56	12.50																1			3	
Gutierrezia sarothrae	(21-50cm)	0.08	3.04	2.50																			3	
TOTAL NATIVE SUBSHRUBS		11.25	455.27	42.50	2	2			1		1	1		3						1			6	
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	166.78	6749.14	55.00	1	100	21		1	14		103	1			1731	3	283	239			8		
Kochia prostrata	(21-50cm)	7.50	303.51	45.00	1	2	6					43				19	2	6	26			1		
TOTAL INTRO. SUBSHRUBS		174.28	7052.66	55.00	2	102	27		1	14		146	1			1750	5	289	265			9		
NATIVE SHRUBS																								
Artemisia tridentata	(0-20cm)	0.15	6.07	5.00																1				
Artemisia tridentata	(21-50cm)	0.10	4.05	2.50																				
Artemisia tridentata	(>50cm)	0.05	2.02	5.00																				
Atriplex canescens	(0-20cm)	4.25	171.99	62.50	4		5	4		10			3			2	16	2	1	1		3	1	2
Atriplex canescens	(21-50cm)	10.63	429.98	97.50	5	2	15	3	4	17	22	4	14	7		3	24	1	6	8	6	27	16	3
Atriplex canescens	(>50cm)	10.88	440.10	92.50	14	2	11	1	13	8	27	1	21	14	12		31		10	4	43	17	12	15
Atriplex confertifolia	(0-20cm)	0.93	37.43	22.50	2		19	5		1	1		1									3		
Atriplex confertifolia	(21-50cm)	0.78	31.36	20.00	1		18	2		1			4				1					3		
Atriplex confertifolia	(>50cm)	0.03	1.01	2.50																				
Chrysothamnus nauseosus	(0-20cm)	0.13	5.06	5.00																				
Chrysothamnus nauseosus	(21-50cm)	1.08	43.50	17.50											12									
Chrysothamnus nauseosus	(>50cm)	2.90	117.36	17.50											23								1	
Cowania mexicana	(21-50cm)	0.03	1.01	2.50																				
Cowania mexicana	(>50cm)	0.03	1.01	2.50																				
Purshia tridentata	(0-20cm)	0.03	1.01	2.50																			1	
TOTAL NATIVE SHRUBS		31.95	1292.97	100.00	26	4	68	15	17	37	50	5	43	21	47	5	72	3	17	14	49	53	31	20
INTRODUCED SHRUBS																								
Tamarix pentandra	(>50cm)	0.03	1.01	2.50																	1			
TOTAL INTRODUCED SHRUBS		0.03	1.01	2.50																	1			
TOTAL DENSITY (stems/100 sq. m.)		217.50	(s=416.34)	100.00	30	108	95	15	19	51	51	152	44	24	47	1755	77	292	282	15	50	62	37	20
TOTAL DENSITY (stems/acre)		8801.91	(s=16848.83)		1214	4371	3845	607	769	2064	2064	6151	1781	971	1902	71022	3116	11817	11412	607	2023	2509	1497	809
SPECIES DENSITY (# of species/100 sq.m.)		2.70	(s=0.99)		4	3	3	2	3	3	3	3	3	2	2	2	3	2	2	3	1	3	4	1
NON-NOXIOUS DENSITY (stems/acre)		8800.90	(s=16849.25)		1214	4371	3845	607	769	2064	2064	6151	1781	971	1902	71022	3116	11817	11412	607	1983	2509	1497	809

N14 Phase III Shrubland Shrub Density Data – Spring 2022 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	7.65	309.58	5.00			1		305															
Artemisia frigida	(21-50cm)	0.63	25.29	2.50					25															
Ceratoides lanata	(0-20cm)	0.35	14.16	20.00	1		2					1						1				4		
Ceratoides lanata	(21-50cm)	0.28	11.13	20.00			2					1					1					2		
Chrysothamnus greenei	(0-20cm)	0.45	18.21	2.50																				18
Chrysothamnus greenei	(21-50cm)	0.63	25.29	2.50																				25
Gutierrezia sarothrae	(0-20cm)	1.20	48.56	12.50			14								10									20
Gutierrezia sarothrae	(21-50cm)	0.08	3.04	2.50																				
TOTAL NATIVE SUBSHRUBS		11.25	455.27	42.50	1		19		330			2			10		1	1				6		63
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	166.78	6749.14	55.00			1						1	115	127		1251	1709		280	153	426	103	
Kochia prostrata	(21-50cm)	7.50	303.51	45.00									1	19	21		42	18		35	33	12	13	
TOTAL INTRO. SUBSHRUBS		174.28	7052.66	55.00			1						2	134	148		1293	1727		315	186	438	116	
NATIVE SHRUBS																								
Artemisia tridentata	(0-20cm)	0.15	6.07	5.00																				5
Artemisia tridentata	(21-50cm)	0.10	4.05	2.50																				4
Artemisia tridentata	(>50cm)	0.05	2.02	5.00					1					1										
Atriplex canescens	(0-20cm)	4.25	171.99	62.50			5	2		2	2	2	4	2	1	82			11		1			2
Atriplex canescens	(21-50cm)	10.63	429.98	97.50	10	3	15	4	3	5	19	18	10	25	2	85	2	4	10	7	3	4	5	4
Atriplex canescens	(>50cm)	10.88	440.10	92.50	8	9	11	6	6	1	22	12	10	15	3	17	4	3	22	4	10		11	5
Atriplex confertifolia	(0-20cm)	0.93	37.43	22.50	4									1										
Atriplex confertifolia	(21-50cm)	0.78	31.36	20.00	1																			
Atriplex confertifolia	(>50cm)	0.03	1.01	2.50	1																			
Chrysothamnus nauseosus	(0-20cm)	0.13	5.06	5.00		3			2															
Chrysothamnus nauseosus	(21-50cm)	1.08	43.50	17.50		11			7	1	7				4	1								
Chrysothamnus nauseosus	(>50cm)	2.90	117.36	17.50		24			45		10				10									3
Cowania mexicana	(21-50cm)	0.03	1.01	2.50		1																		
Cowania mexicana	(>50cm)	0.03	1.01	2.50							1													
Purshia tridentata	(0-20cm)	0.03	1.01	2.50																				
TOTAL NATIVE SHRUBS		31.95	1292.97	100.00	24	51	31	12	64	9	61	32	24	44	20	185	6	7	43	11	14	4	16	23
INTRODUCED SHRUBS																								
Tamarix pentandra	(>50cm)	0.03	1.01	2.50																				
TOTAL INTRODUCED SHRUBS		0.03	1.01	2.50																				
TOTAL DENSITY (stems/100 sq. m.)		217.50	(s=416.34)	100.00	25	51	51	12	394	9	61	34	26	178	178	185	1300	1735	43	326	200	448	132	86
TOTAL DENSITY (stems/acre)		8801.91	(s=16848.83)		1012	2064	2064	486	15945	364	2469	1376	1052	7203	7203	7487	52609	70213	1740	13193	8094	18130	5342	3480
SPECIES DENSITY (# of species/100 sq.m.)		2.70	(s=0.99)		3	3	5	1	4	2	3	2	2	4	4	2	3	3	1	2	2	3	2	5
NON-NOXIOUS DENSITY (stems/acre)		8800.90	(s=16849.25)		1012	2064	2064	486	15945	364	2469	1376	1052	7203	7203	7487	52609	70213	1740	13193	8094	18130	5342	3480

N14 Phase III Woodland Shrub Density Data – Spring 2022

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	8.98	363.21	32.50				1		3		2		1	3					2				7
Artemisia frigida	(21-50cm)	0.75	30.35	10.00																				3
Artemisia frigida	(>50cm)	0.30	12.14	2.50																12				
Ceratoides lanata	(21-50cm)	0.05	2.02	5.00			1																	
Chrysothamnus greenei	(0-20cm)	0.48	19.22	15.00						1				3								1		
Chrysothamnus greenei	(21-50cm)	0.05	2.02	2.50										2										
Eriogonum microthecum	(0-20cm)	0.03	1.01	2.50																				
Gutierrezia sarothrae	(0-20cm)	0.55	22.26	12.50				3				1				1							3	
Gutierrezia sarothrae	(21-50cm)	0.05	2.02	2.50																				
TOTAL NATIVE SUBSHRUBS		11.23	454.26	55.00			1	4		4		3		6	3	1				14		1	3	10
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	8.18	330.83	12.50								1					193							
Kochia prostrata	(21-50cm)	0.88	35.41	7.50													26							
TOTAL INTRO. SUBSHRUBS		9.05	366.24	12.50								1					219							
NATIVE SHRUBS																								
Artemisia tridentata	(0-20cm)	15.10	611.08	50.00				6		7		16		24	100	12			1	34	1		2	5
Artemisia tridentata	(21-50cm)	9.15	370.29	55.00				11		34		13		20	25	21			3	9	4		14	9
Artemisia tridentata	(>50cm)	5.83	235.73	65.00				16	1	15		7	1	5	17	26		2	10	3	3		17	10
Atriplex canescens	(0-20cm)	1.05	42.49	30.00	1	3					5										3	6		
Atriplex canescens	(21-50cm)	6.15	248.88	60.00	12	14	10	3								3	4	7			13	29	2	6
Atriplex canescens	(>50cm)	9.43	381.42	80.00	28	21	32	15	6	5	3	2	4			4	4	11	17			8	10	23
Atriplex obovata	(21-50cm)	0.05	2.02	2.50																				
Chrysothamnus nauseosus	(0-20cm)	3.85	155.80	55.00		1			4	4	1	8		11	10	2	4			6				
Chrysothamnus nauseosus	(21-50cm)	17.35	702.13	80.00	3	9			55	27	1	22	15	32	37	22	8	6	1	62	6	6		
Chrysothamnus nauseosus	(>50cm)	24.78	1002.61	92.50	10	13	1	15	42	47	2	28	27	43	40	27	28	12	13	70	4	14		
Cowania mexicana	(0-20cm)	0.30	12.14	12.50				3					2	2										
Cowania mexicana	(21-50cm)	1.88	75.88	45.00				12				1			2	9		1	1		1	1	18	2
Cowania mexicana	(>50cm)	0.73	29.34	37.50	1			3						1	2	2				1			4	5
Ephedra viridis	(0-20cm)	0.03	1.01	2.50																1				
Ephedra viridis	(21-50cm)	0.05	2.02	2.50																2				
Ephedra viridis	(>50cm)	0.13	5.06	12.50								1				1					1			
Fallugia paradoxa	(0-20cm)	0.13	5.06	5.00																				
Fallugia paradoxa	(21-50cm)	0.08	3.04	5.00																				
Fallugia paradoxa	(>50cm)	0.03	1.01	2.50																				
Lycium berlandieri	(21-50cm)	0.03	1.01	2.50																				
Lycium berlandieri	(>50cm)	0.10	4.05	7.50				1								2								
Purshia tridentata	(0-20cm)	0.10	4.05	7.50													1			2				
Purshia tridentata	(21-50cm)	0.08	3.04	7.50																1				
Purshia tridentata	(>50cm)	0.05	2.02	2.50																				
Sarcobatus vermiculatus	(>50cm)	0.03	1.01	2.50															1					
TOTAL NATIVE SHRUBS		96.43	3902.18	100.00	55	61	43	85	108	139	12	98	49	138	233	131	49	39	47	191	36	64	67	60
TOTAL DENSITY (stems/100 sq. m.)		116.70	(s=92.88)	100.00	55	61	44	89	108	143	12	102	49	144	236	132	268	39	47	205	36	65	70	70
TOTAL DENSITY (stems/acre)		4722.68	(s=3758.88)		2226	2469	1781	3602	4371	5787	486	4128	1983	5827	9551	5342	10846	1578	1902	8296	1457	2630	2833	2833
SPECIES DENSITY (# of species/100 sq.m.)		4.33	(s=1.59)		3	2	3	7	3	5	2	8	4	5	4	7	4	4	5	6	5	4	4	4

N14 Phase III Woodland Shrub Density Data – Spring 2022 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38	W39	W40
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	8.98	363.21	32.50					10			13				8			3	1			305	
Artemisia frigida	(21-50cm)	0.75	30.35	10.00					1											1			25	
Artemisia frigida	(>50cm)	0.30	12.14	2.50																				
Ceratoides lanata	(21-50cm)	0.05	2.02	5.00			1																	
Chrysothamnus greenei	(0-20cm)	0.48	19.22	15.00						11			2						1					
Chrysothamnus greenei	(21-50cm)	0.05	2.02	2.50																				
Eriogonum microthecum	(0-20cm)	0.03	1.01	2.50														1						
Gutierrezia sarothrae	(0-20cm)	0.55	22.26	12.50											14									
Gutierrezia sarothrae	(21-50cm)	0.05	2.02	2.50											2									
TOTAL NATIVE SUBSHRUBS		11.23	454.26	55.00			1		11	11		13	2		16	8		1	4	2			330	
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	8.18	330.83	12.50			18		24	91														
Kochia prostrata	(21-50cm)	0.88	35.41	7.50			3			6														
TOTAL INTRO. SUBSHRUBS		9.05	366.24	12.50			21		24	97														
NATIVE SHRUBS																								
Artemisia tridentata	(0-20cm)	15.10	611.08	50.00	201				6			76	6	1	13		4		83	6				
Artemisia tridentata	(21-50cm)	9.15	370.29	55.00	42			1	8			33	6	1	34	1	5		65	7				
Artemisia tridentata	(>50cm)	5.83	235.73	65.00	29			3	5			7	1	3	24	1	3		20	3			1	
Atriplex canescens	(0-20cm)	1.05	42.49	30.00		3	2	2		2			3			10								2
Atriplex canescens	(21-50cm)	6.15	248.88	60.00		7	9	16		2	4	1	21		2	53		3				3	3	19
Atriplex canescens	(>50cm)	9.43	381.42	80.00		23	17	27	1	8	17		10	1	2	20	1	8			12	9	6	22
Atriplex obovata	(21-50cm)	0.05	2.02	2.50							2													
Chrysothamnus nauseosus	(0-20cm)	3.85	155.80	55.00	4				2	15		8	30	10			24	1	3	1		3	2	
Chrysothamnus nauseosus	(21-50cm)	17.35	702.13	80.00	16		5		16	37		85	69	15	2	5	66		17	12	12	11	7	7
Chrysothamnus nauseosus	(>50cm)	24.78	1002.61	92.50	25	4	7	3	44	78	6	63	39	29	3		88	11	35	18	23	24	45	10
Cowania mexicana	(0-20cm)	0.30	12.14	12.50					4											1				
Cowania mexicana	(21-50cm)	1.88	75.88	45.00					7	1		1	2		5		1			9		1		
Cowania mexicana	(>50cm)	0.73	29.34	37.50					1			2		2		1	1			2				1
Ephedra viridis	(0-20cm)	0.03	1.01	2.50																				
Ephedra viridis	(21-50cm)	0.05	2.02	2.50																				
Ephedra viridis	(>50cm)	0.13	5.06	12.50										1						1				
Fallugia paradoxa	(0-20cm)	0.13	5.06	5.00					1											4				
Fallugia paradoxa	(21-50cm)	0.08	3.04	5.00					2											1				
Fallugia paradoxa	(>50cm)	0.03	1.01	2.50																1				
Lycium berlandieri	(21-50cm)	0.03	1.01	2.50											1									
Lycium berlandieri	(>50cm)	0.10	4.05	7.50											1									
Purshia tridentata	(0-20cm)	0.10	4.05	7.50													1							
Purshia tridentata	(21-50cm)	0.08	3.04	7.50					1			1												
Purshia tridentata	(>50cm)	0.05	2.02	2.50					2															
Sarcobatus vermiculatus	(>50cm)	0.03	1.01	2.50																				
TOTAL NATIVE SHRUBS		96.43	3902.18	100.00	317	37	40	52	100	143	29	277	187	63	87	91	194	23	223	66	47	51	64	61
TOTAL DENSITY (stems/100 sq. m.)		116.70	(s=92.88)	100.00	317	37	62	52	135	251	29	290	189	63	103	99	194	24	227	68	47	51	394	61
TOTAL DENSITY (stems/acre)		4722.68	(s=3758.88)		12829	1497	2509	2104	5463	10158	1174	11736	7649	2550	4168	4006	7851	971	9186	2752	1902	2064	15945	2469
SPECIES DENSITY (# of species/100 sq.m.)		4.33	(s=1.59)		2	2	4	3	8	5	3	6	5	5	6	5	5	3	4	6	2	3	4	3

N14 Phase III Woodland Tree Density Data – Spring 2022

		AVERAGE DENSITY		FREQUENCY	Trees per 100 sq.m.																		
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)				W4		W6		W8		W10	W11	W12	W13			W16			W19	W20
NATIVE TREES																								
Juniperus osteosperma	(0-20cm)	0.06	2.25	5.56											1									
Juniperus osteosperma	(21-50cm)	0.06	2.25	5.56																				
Juniperus osteosperma	(>50cm)	0.72	29.23	38.89				1		4		2				1				1				
Pinus edulis	(0-20cm)	0.22	8.99	22.22				1						1										
Pinus edulis	(21-50cm)	0.17	6.74	11.11						1				2										
Pinus edulis	(>50cm)	1.22	49.46	44.44				2				2		1						6				1
TOTAL NATIVE TREES		2.44	98.92	72.22				4		5		4		4	1	1				7				1
TOTAL DENSITY (stems/100 sq. m.)		2.44	(s=2.33)	72.22				4		5		4		4	1	1	0			7			0	1
TOTAL DENSITY (stems/acre)		98.92	(s=94.37)					162		202		162		162	40	40	0			283			0	40
SPECIES DENSITY (# of species/100 sq.m.)		1.00	(s=0.77)					2		2		2		1	1	1	0			2			0	1

N14 Phase III Woodland Tree Density Data – Spring 2022

		AVERAGE DENSITY		FREQUENCY	Trees per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W21					W26		W28			W31		W33		W35	W36	W37			
NATIVE TREES																								
Juniperus osteosperma	(0-20cm)	0.06	2.25	5.56																				
Juniperus osteosperma	(21-50cm)	0.06	2.25	5.56	1																			
Juniperus osteosperma	(>50cm)	0.72	29.23	38.89								2							2					
Pinus edulis	(0-20cm)	0.22	8.99	22.22											1		1							
Pinus edulis	(21-50cm)	0.17	6.74	11.11																				
Pinus edulis	(>50cm)	1.22	49.46	44.44								3			5		2							
TOTAL NATIVE TREES		2.44	98.92	72.22	1							5			6		3		2					
TOTAL DENSITY (stems/100 sq. m.)		2.44	(s=2.33)	72.22	1					0		5			6		3		2	0	0			
TOTAL DENSITY (stems/acre)		98.92	(s=94.37)		40					0		202			243		121		81	0	0			
SPECIES DENSITY (# of species/100 sq.m.)		1.00	(s=0.77)		1					0		2			1		1		1	0	0			

Attachment 2: J16 Raw Data – Fall 2022

J16 Phase III Grassland Cover Data – Fall 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Amaranthus retroflexus	0.00	7.50	0.00	0.00	0.00										P										
Chenopodium berlandieri	0.03	5.00	0.08	0.03	0.08							1													
Chenopodium fremontii	0.00	2.50	0.00	0.00	0.00																				
Chenopodium leptophyllum	0.00	22.50	0.00	0.00	0.00	P				P		P						P	P		P				
Descurainia pinnata	0.00	2.50	0.00	0.00	0.00		P																		
Dyssodia papposa	0.00	10.00	0.00	0.00	0.00				P														P		P
Euphorbia glyptosperma	0.28	55.00	0.84	0.28	0.83			1					P	P		P	P		P	P	P	1	4	P	P
Euphorbia serpyllifolia	0.00	5.00	0.00	0.00	0.00								P												
Lappula redowskii	0.05	50.00	0.15	0.05	0.15			P	P	P		P			1		P				P		P	P	
Machaeranthera canescens	0.00	7.50	0.00	0.00	0.00						P				P										
Portulaca oleracea	0.30	25.00	0.92	0.30	0.90												1			P					
Verbesina encelioides	0.00	10.00	0.00	0.00	0.00										P										
Viguiera annua	0.00	2.50	0.00	0.00	0.00																		P		
TOTAL NATIVE ANN. & BIEN. FORBS	0.65	87.50	2.00	0.65	1.96	P	P	1	P	P	P	1	P	P	1	P	1	P	P	P	P	1	4	P	P
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Amaranthus albus	0.00	2.50	0.00	0.00	0.00																				
Chenopodium album	0.03	5.00	0.08	0.03	0.08					1															
Halogeton glomeratus	0.00	2.50	0.00	0.00	0.00															P					
Kochia scoparia	0.30	30.00	0.92	0.30	0.90	P	5					1													
Melilotus officinalis	0.00	2.50	0.00	0.00	0.00						P														
Salsola iberica	0.05	32.50	0.15	0.05	0.15				P			1													
TOTAL INTRO. ANN. & BIEN. FORBS	0.38	52.50	1.15	0.38	1.13	P	5		P	1	P	2								P					
NATIVE ANNUAL GRASSES																									
Bouteloua barbata	0.00	5.00	0.00	0.00	0.00																				
Bouteloua simplex	0.08	15.00	0.23	0.08	0.23																		2		
Eragrostis pectinacea	0.00	2.50	0.00	0.00	0.00		P																		
Monroa squarrosa	0.03	30.00	0.08	0.03	0.08							P					P					P	P	P	
TOTAL NATIVE ANNUAL GRASSES	0.10	42.50	0.31	0.10	0.30		P					P					P					P	2	P	
INTRODUCED ANNUAL GRASSES																									
Eragrostis cilianensis	0.00	2.50	0.00	0.00	0.00																				
TOTAL INTRODUCED ANNUAL GRASSES	0.00	2.50	0.00	0.00	0.00																				
NATIVE PERENNIAL FORBS																									
Baileya pleniradiata	0.00	5.00	0.00	0.00	0.00														P				P		
Sphaeralcea coccinea	0.00	22.50	0.00	0.00	0.00		P						P		P		P					P			
TOTAL NATIVE PERENNIAL FORBS	0.00	27.50	0.00	0.00	0.00		P						P		P		P		P			P	P		
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.03	5.00	0.08	0.03	0.08						1											P			
Agropyron smithii	0.05	27.50	0.15	0.05	0.15						2		P								P				
Agropyron spicatum	0.00	5.00	0.00	0.00	0.00				P													P			
Agropyron trachycaulum	0.00	2.50	0.00	0.00	0.00																				
Oryzopsis hymenoides	0.00	7.50	0.00	0.00	0.00						P														
TOTAL NATIVE PERENNIAL GRASSES (c)	0.08	37.50	0.23	0.08	0.23				P		3		P								P	P			

J16 Phase III Grassland Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Amaranthus retroflexus	0.00	7.50	0.00	0.00	0.00														P						P
Chenopodium berlandieri	0.03	5.00	0.08	0.03	0.08													P							
Chenopodium fremontii	0.00	2.50	0.00	0.00	0.00																		P		
Chenopodium leptophyllum	0.00	22.50	0.00	0.00	0.00			P													P		P		
Descurainia pinnata	0.00	2.50	0.00	0.00	0.00																				
Dyssodia papposa	0.00	10.00	0.00	0.00	0.00							P													
Euphorbia glyptosperma	0.28	55.00	0.84	0.28	0.83			P	P			P		P	P		P	2	2	P					1
Euphorbia serpyllifolia	0.00	5.00	0.00	0.00	0.00																		P		
Lappula redowskii	0.05	50.00	0.15	0.05	0.15	P		P	P	P				P	P		P	P		P			P		1
Machaeranthera canescens	0.00	7.50	0.00	0.00	0.00			P																	
Portulaca oleracea	0.30	25.00	0.92	0.30	0.90	P		2				P		P	P		P		2						7
Verbesina encelioides	0.00	10.00	0.00	0.00	0.00			P					P	P											
Viguiera annua	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.65	87.50	2.00	0.65	1.96	P		2	P	P		P	P	P	P		P	2	4	P	P		P		9
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Amaranthus albus	0.00	2.50	0.00	0.00	0.00			P																	
Chenopodium album	0.03	5.00	0.08	0.03	0.08	P																			
Halogeton glomeratus	0.00	2.50	0.00	0.00	0.00																				
Kochia scoparia	0.30	30.00	0.92	0.30	0.90				3			P		P	2	P		P	P	1					P
Melilotus officinalis	0.00	2.50	0.00	0.00	0.00																				
Salsola iberica	0.05	32.50	0.15	0.05	0.15	P		P	P	P	P				P	P		1		P			P		P
TOTAL INTRO. ANN. & BIEN. FORBS	0.38	52.50	1.15	0.38	1.13	P		P	3	P	P	P		P	2	P		1	P	1			P		P
NATIVE ANNUAL GRASSES																									
Bouteloua barbata	0.00	5.00	0.00	0.00	0.00												P						P		
Bouteloua simplex	0.08	15.00	0.23	0.08	0.23			1		P							P				P				P
Eragrostis pectinacea	0.00	2.50	0.00	0.00	0.00																				
Monroa squarrosa	0.03	30.00	0.08	0.03	0.08			P					P	P		P	P	P	1						
TOTAL NATIVE ANNUAL GRASSES	0.10	42.50	0.31	0.10	0.30			1		P			P	P		P	P	P	1		P		P		P
INTRODUCED ANNUAL GRASSES																									
Eragrostis cilianensis	0.00	2.50	0.00	0.00	0.00																		P		
TOTAL INTRODUCED ANNUAL GRASSES	0.00	2.50	0.00	0.00	0.00																		P		
NATIVE PERENNIAL FORBS																									
Baileya pleniradiata	0.00	5.00	0.00	0.00	0.00																				
Sphaeralcea coccinea	0.00	22.50	0.00	0.00	0.00			P				P			P								P		
TOTAL NATIVE PERENNIAL FORBS	0.00	27.50	0.00	0.00	0.00			P				P			P								P		
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.03	5.00	0.08	0.03	0.08																				
Agropyron smithii	0.05	27.50	0.15	0.05	0.15	P	P	P				P			P	P						P		P	
Agropyron spicatum	0.00	5.00	0.00	0.00	0.00																				
Agropyron trachycaulum	0.00	2.50	0.00	0.00	0.00							P													
Oryzopsis hymenoides	0.00	7.50	0.00	0.00	0.00				P											P					
TOTAL NATIVE PERENNIAL GRASSES (c)	0.08	37.50	0.23	0.08	0.23	P	P	P	P			P			P	P				P		P		P	

J16 Phase III Grassland Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua curtipendula	0.13	2.50	0.38	0.13	0.38						5														
Bouteloua gracilis	2.80	87.50	8.60	2.85	8.60	P	P	2	2	P	12		4	1	4	21	P	1	1	P	P 1	P	18	P	3 1
Buchloe dactyloides	0.03	15.00	0.08	0.03	0.08						1								P		P				P
Hilaria jamesii	3.30	82.50	10.14	3.30	9.95	2	P	P		1	2	P		7		21	P	11	12	P	2	1	2		10
Sporobolus airoides	9.85	85.00	30.26	9.95	30.02	33		11	P	19	7	P	1	18	20	6	2	15	21	P		P	13 2		32
Sporobolus cryptandrus	0.05	22.50	0.15	0.05	0.15		P				P						1		P		P	P	1		
TOTAL NATIVE PERENNIAL GRASSES (w)	16.15	97.50	49.62	16.30	49.17	35	P	13	2	20	27	P	5	26	24	48	3	27	34	P	2 1	1	34 2	P	45 1
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron intermedium	0.03	2.50	0.08	0.03	0.08						1														
Elymus junceus	12.83	95.00	39.40	13.10	39.52	2	29 2	14	23	1	3	13 1	16	12 1	13		23	1	5	21 1	20	18	12	36	7
TOTAL INTRO. PERENNIAL GRASSES (c)	12.85	95.00	39.48	13.13	39.59	2	29 2	14	23	1	4	13 1	16	12 1	13		23	1	5	21 1	20	18	12	36	7
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.00	7.50	0.00	0.00	0.00							P									P				
Chrysothamnus greenei	0.00	2.50	0.00	0.00	0.00																				
Gutierrezia sarothrae	0.03	7.50	0.08	0.03	0.08						1												P		
TOTAL NATIVE SUBSHRUBS	0.03	15.00	0.08	0.03	0.08						1	P									P		P		
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.83	57.50	2.53	0.90	2.71		P	5 1		2			P	1	P		1 1	2		3 1	8	1	4		P
TOTAL INTRO. SUBSHRUBS	0.83	57.50	2.53	0.90	2.71		P	5 1		2			P	1	P		1 1	2		3 1	8	1	4		P
NATIVE SHRUBS																									
Atriplex canescens	1.50	85.00	4.61	1.53	4.60	3	P		1	P		1	5	3		P	2	P	2	4			3	3	P
Atriplex confertifolia	0.00	2.50	0.00	0.03	0.08																				P 1
TOTAL NATIVE SHRUBS	1.50	85.00	4.61	1.55	4.68	3	P		1	P		1	5	3		P	2	P	2	4			3	3	P 1
SUCCULENTS																									
Opuntia phaeacantha	0.00	10.00	0.00	0.03	0.08																				P 1
TOTAL SUCCULENTS	0.00	10.00	0.00	0.03	0.08																				P 1
BRYOPHYTES																									
Moss spp.	0.00	2.50	0.00	0.03	0.08				P 1																
TOTAL BRYOPHYTES	0.00	2.50	0.00	0.03	0.08				P 1																
Standing dead	2.05	67.50		2.08		1	3	3	4		8		1	3		4		7	3	1				1	5
Litter	12.43	100.00		12.43		19	14	7	9	8	15	14	12	15	9	23	11	22	22	10	2	17	11	13	3
Bare ground	46.03	100.00		46.03		37	43	55	61	61	39	48	53	30	52	21	51	32	27	54	66	62	27	39	39
Rock	6.95	95.00		6.95		3	6	2		7	3	21	8	10	1	4	8	9	7	7	2		3	9	1
TOTALS	100.00		100.00	100.63	99.92	100 0	100 2	100 1	100 1	100 0	100 0	100 1	100 0	100 1	100 0	100 0	100 1	100 0	100 0	100 2	100 1	100 0	100 2	100 1	100 3
TOTAL VEGETATION COVER	32.55	s=(11.25)		33.15	s=(11.6)	40 0	34 2	33 1	26 1	24 0	35 0	17 1	26 0	42 1	38 0	48 0	30 1	30 0	41 0	28 2	30 1	21 0	59 2	39 0	52 3
GROUND COVER (Veg+Litter+St.Dead+Rock)	53.98	s=(13.06)		54.60	s=(13.2)	63 0	57 2	45 1	39 1	39 0	61 0	52 1	47 0	70 1	48 0	79 0	49 1	68 0	73 0	46 2	34 1	38 0	73 2	61 1	61 3
Allowable Vegetation Cover	**32.55**	**s=(11.25)**				**40.0**	**34.0**	**33.0**	**26.0**	**24.0**	**35.0**	**17.0**	**26.0**	**42.0**	**38.0**	**48.0**	**30.0**	**30.0**	**41.0**	**28.0**	**30.0**	**21.0**	**59.0**	**39.0**	**52.0**
SPECIES DENSITY (# of species/100 sq.m.)	9.75	s=(3.18)				7	10	7	8	9	14	11	9	7	9	5	12	7	10	9	11	11	15	6	11

J16 Phase III Grassland Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua curtipendula	0.13	2.50	0.38	0.13	0.38																				
Bouteloua gracilis	2.80	87.50	8.60	2.85	8.60	P	10	P		5	1	P	P	2			10	P		P	4	3	3	3	2
Buchloe dactyloides	0.03	15.00	0.08	0.03	0.08										P			P							
Hilaria jamesii	3.30	82.50	10.14	3.30	9.95	2	10	2	P	10	7	P			2	P	1	1		P	23	2	P	1	P
Sporobolus airoides	9.85	85.00	30.26	9.95	30.02	17	35	1	11	15	25		P	P	8	P	22 2	8			15	14	5	19	1
Sporobolus cryptandrus	0.05	22.50	0.15	0.05	0.15			P									P								
TOTAL NATIVE PERENNIAL GRASSES (w)	16.15	97.50	49.62	16.30	49.17	19	55	3	11	30	33	P	P	2	10	P	33 2	9		P	42	19	8	23	3
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron intermedium	0.03	2.50	0.08	0.03	0.08																				
Elymus junceus	12.83	95.00	39.40	13.10	39.52	4	3	18 1	8	4	5	30	32 1	26	10	8	16 2	18	25	13 1		1	14	3	6 1
TOTAL INTRO. PERENNIAL GRASSES (c)	12.85	95.00	39.48	13.13	39.59	4	3	18 1	8	4	5	30	32 1	26	10	8	16 2	18	25	13 1		1	14	3	6 1
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.00	7.50	0.00	0.00	0.00												P								
Chrysothamnus greenei	0.00	2.50	0.00	0.00	0.00			P																	
Gutierrezia sarothrae	0.03	7.50	0.08	0.03	0.08			P																	
TOTAL NATIVE SUBSHRUBS	0.03	15.00	0.08	0.03	0.08			P									P								
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.83	57.50	2.53	0.90	2.71		1					P		P		P	P		P			4	P	P	1
TOTAL INTRO. SUBSHRUBS	0.83	57.50	2.53	0.90	2.71		1					P		P		P	P		P			4	P	P	1
NATIVE SHRUBS																									
Atriplex canescens	1.50	85.00	4.61	1.53	4.60	P	P	2	2	1	P	1 1	2	6	1	P	5	P	P	P	P		2	4	7
Atriplex confertifolia	0.00	2.50	0.00	0.03	0.08																				
TOTAL NATIVE SHRUBS	1.50	85.00	4.61	1.55	4.68	P	P	2	2	1	P	1 1	2	6	1	P	5	P	P	P	P		2	4	7
SUCCULENTS																									
Opuntia phaeacantha	0.00	10.00	0.00	0.03	0.08	P		P			P														
TOTAL SUCCULENTS	0.00	10.00	0.00	0.03	0.08	P		P			P														
BRYOPHYTES																									
Moss spp.	0.00	2.50	0.00	0.03	0.08																				
TOTAL BRYOPHYTES	0.00	2.50	0.00	0.03	0.08																				
Standing dead	2.05	67.50		2.08		5	1	2	3	4	2	6	2	2						1	6	1	1	2	1
Litter	12.43	100.00		12.43		12	15	7	5	15	15	18	4	7	10	8	11	13	17	14	17	17	19	8	9
Bare ground	46.03	100.00		46.03		46	22	59	58	27	44	39	56	51	58	75	33	47	47	43	26	53	50	59	51
Rock	6.95	95.00		6.95		14	3	6	10	19	1	6	4	6	9	9	2	10	6	28	9	5	6	1	13
TOTALS	100.00		100.00	100.63	99.92	100 0	100 0	100 1	100 0	100 0	100 0	100 1	100 1	100 0	100 0	100 0	100 4	100 0	100 0	100 1	100 0	100 0	100 0	100 0	100 1
TOTAL VEGETATION COVER	32.55	s=(11.25)		33.15	s=(11.6)	23 0	59 0	26 1	24 0	35 0	38 0	31 1	34 1	34 0	23 0	8 0	54 4	30 0	30 0	14 1	42 0	24 0	24 0	30 0	26 1
GROUND COVER (Veg+Litter+St.Dead+Rock)	53.98	s=(13.06)		54.60	s=(13.2)	54 0	78 0	41 1	42 0	73 0	56 0	61 1	44 1	49 0	42 0	25 0	67 4	53 0	53 0	57 1	74 0	47 0	50 0	41 0	49 1
Allowable Vegetation Cover	**32.55**	**s=(11.25)**				**23.0**	**59.0**	**26.0**	**24.0**	**35.0**	**38.0**	**31.0**	**34.0**	**34.0**	**23.0**	**8.0**	**54.0**	**30.0**	**30.0**	**14.0**	**42.0**	**24.0**	**24.0**	**30.0**	**26.0**
SPECIES DENSITY (# of species/100 sq.m.)	9.75	s=(3.18)				11	7	21	9	8	7	12	6	11	12	9	14	12	8	9	6	6	14	7	13

J16 Phase III Shrubland Cover Data – Fall 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																											
						1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																																											
Amaranthus retroflexus	0.00	5.00	0.00	0.00	0.00																P												P									
Chenopodium berlandieri	0.00	5.00	0.00	0.00	0.00																											P									
Chenopodium fremontii	0.00	2.50	0.00	0.00	0.00																																					
Chenopodium graveolens	0.00	7.50	0.00	0.00	0.00											P																									
Chenopodium leptophyllum	0.00	7.50	0.00	0.00	0.00																	P																	P		
Conyza canadensis	0.00	2.50	0.00	0.00	0.00																																					
Dyssodia papposa	0.00	7.50	0.00	0.00	0.00																													P									
Erigeron divergens	0.00	2.50	0.00	0.00	0.00																			P																		
Euphorbia glyptosperma	0.15	65.00	0.48	0.15	0.46	P										1		P		P				P		P		1		P				P		P		P		P			
Lappula redowskii	0.10	30.00	0.32	0.10	0.31											P								3				P		P				P		P							
Machaeranthera canescens	0.00	10.00	0.00	0.00	0.00																					P				P												
Machaeranthera tanacetifolia	0.00	2.50	0.00	0.00	0.00																					P																
Portulaca oleracea	0.15	30.00	0.48	0.15	0.46															P		1		P								P		1							
Verbesina encelioides	0.00	17.50	0.00	0.00	0.00							P										P		P				P						P							P	
Viguiera annua	0.00	5.00	0.00	0.00	0.00																																					
TOTAL NATIVE ANN. & BIEN. FORBS	0.40	85.00	1.28	0.40	1.23	P						P				1		P		P		1		3		P		1		P				P		1		P		P		P	
INTRODUCED ANNUAL & BIENNIAL FORBS																																											
Amaranthus albus	0.00	2.50	0.00	0.00	0.00																																					
Amaranthus graecizans	0.00	2.50	0.00	0.00	0.00																																					
Chenopodium album	0.00	5.00	0.00	0.00	0.00																																					
Kochia scoparia	0.03	15.00	0.08	0.03	0.08													P												P												P
Polygonum aviculare	0.00	2.50	0.00	0.00	0.00																																					
Salsola iberica	0.15	30.00	0.48	0.15	0.46													P				P						P				P		P						P		
TOTAL INTRO. ANN. & BIEN. FORBS	0.18	42.50	0.56	0.18	0.54													P				P						P				P		P						P	P
NATIVE ANNUAL GRASSES																																											
Bouteloua barbata	0.00	10.00	0.00	0.00	0.00											P						P												P								
Bouteloua simplex	0.00	7.50	0.00	0.00	0.00																							P														
Monroa squarrosa	0.00	20.00	0.00	0.00	0.00											P								P				P						P								
TOTAL NATIVE ANNUAL GRASSES	0.00	25.00	0.00	0.00	0.00											P						P		P				P						P								
NATIVE PERENNIAL FORBS																																												
Heterotheca villosa var. foliosa	0.00	2.50	0.00	0.00	0.00																					P																
Leucelene ericoides	0.00	2.50	0.00	0.00	0.00																					P																
Penstemon breviculus	0.00	2.50	0.00	0.00	0.00																					P																
Penstemon palmeri	0.00	2.50	0.00	0.00	0.00																					P																
Ratibida columnaris	0.00	2.50	0.00	0.00	0.00																					P																
Sphaeralcea coccinea	0.00	45.00	0.00	0.00	0.00	P		P				P		P						P				P		P		P		P		P						P				
Sphaeralcea parvifolia	0.00	2.50	0.00	0.00	0.00															P																						
TOTAL NATIVE PERENNIAL FORBS	0.00	45.00	0.00	0.00	0.00	P		P				P		P						P				P		P		P		P								P				
INTRODUCED PERENNIAL FORBS																																												
Astragalus cicer	0.03	2.50	0.08	0.03	0.08																					1																
TOTAL INTRO. PERENNIAL FORBS	0.03	2.50	0.08	0.03	0.08																					1																

J16 Phase III Shrubland Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																											
						21		22		23		24		25		26		27		28		29		30		31		32		33		34		35	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																																	
Amaranthus retroflexus	0.00	5.00	0.00	0.00	0.00																												
Chenopodium berlandieri	0.00	5.00	0.00	0.00	0.00																							P					
Chenopodium fremontii	0.00	2.50	0.00	0.00	0.00											P																	
Chenopodium graveolens	0.00	7.50	0.00	0.00	0.00							P				P																	
Chenopodium leptophyllum	0.00	7.50	0.00	0.00	0.00											P																	
Conyza canadensis	0.00	2.50	0.00	0.00	0.00																									P			
Dyssodia papposa	0.00	7.50	0.00	0.00	0.00																					P							
Erigeron divergens	0.00	2.50	0.00	0.00	0.00																												
Euphorbia glyptosperma	0.15	65.00	0.48	0.15	0.46	P		P		1		P		P		2		P		P						1		P		P		P	
Lappula redowskii	0.10	30.00	0.32	0.10	0.31	P										P										P		P					
Machaeranthera canescens	0.00	10.00	0.00	0.00	0.00																	P								P			
Machaeranthera tanacetifolia	0.00	2.50	0.00	0.00	0.00																												
Portulaca oleracea	0.15	30.00	0.48	0.15	0.46									P		4				P						P							
Verbesina encelioides	0.00	17.50	0.00	0.00	0.00									P																			
Viguiera annua	0.00	5.00	0.00	0.00	0.00											P				P													
TOTAL NATIVE ANN. & BIEN. FORBS	0.40	85.00	1.28	0.40	1.23	P		P		1		P		P		6		P		P			P			1		P		P		P	
INTRODUCED ANNUAL & BIENNIAL FORBS																																	
Amaranthus albus	0.00	2.50	0.00	0.00	0.00																					P							
Amaranthus graecizans	0.00	2.50	0.00	0.00	0.00											P																	
Chenopodium album	0.00	5.00	0.00	0.00	0.00																			P						P			
Kochia scoparia	0.03	15.00	0.08	0.03	0.08																							P		1		P	
Polygonum aviculare	0.00	2.50	0.00	0.00	0.00											P																	
Salsola iberica	0.15	30.00	0.48	0.15	0.46	P				P		3												P		P				3			
TOTAL INTRO. ANN. & BIEN. FORBS	0.18	42.50	0.56	0.18	0.54	P				P		3		P										P		P		P		1		3	
NATIVE ANNUAL GRASSES																																	
Bouteloua barbata	0.00	10.00	0.00	0.00	0.00																												
Bouteloua simplex	0.00	7.50	0.00	0.00	0.00					P								P															
Monroa squarrosa	0.00	20.00	0.00	0.00	0.00	P				P		P						P															
TOTAL NATIVE ANNUAL GRASSES	0.00	25.00	0.00	0.00	0.00	P				P		P						P															
NATIVE PERENNIAL FORBS																																	
Heterotheca villosa var. foliosa	0.00	2.50	0.00	0.00	0.00																												
Leucelene ericoides	0.00	2.50	0.00	0.00	0.00																												
Penstemon breviculus	0.00	2.50	0.00	0.00	0.00																												
Penstemon palmeri	0.00	2.50	0.00	0.00	0.00																												
Ratibida columnaris	0.00	2.50	0.00	0.00	0.00																												
Sphaeralcea coccinea	0.00	45.00	0.00	0.00	0.00					P				P									P								P		
Sphaeralcea parvifolia	0.00	2.50	0.00	0.00	0.00																												
TOTAL NATIVE PERENNIAL FORBS	0.00	45.00	0.00	0.00	0.00					P				P									P								P		
INTRODUCED PERENNIAL FORBS																																	
Astragalus cicer	0.03	2.50	0.08	0.03	0.08																												
TOTAL INTRO. PERENNIAL FORBS	0.03	2.50	0.08	0.03	0.08																												

PLANT SPECIES	Percent Foliar Cover																																
	36		37		38		39		40																								
	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd																							
NATIVE ANNUAL & BIENNIAL FORBS																																	
Amaranthus retroflexus																																	
Chenopodium berlandieri																																	
Chenopodium fremontii																																	
Chenopodium graveolens																																	
Chenopodium leptophyllum																																	
Conyza canadensis																																	
Dyssodia papposa							P																										
Erigeron divergens																																	
Euphorbia glyptosperma			P						P																								
Lappula redowskii	P		1																														
Machaeranthera canescens																																	
Machaeranthera tanacetifolia																																	
Portulaca oleracea					P		P		P																								
Verbesina encelioides																																	
Viguiera annua																																	
TOTAL NATIVE ANN. & BIEN. FORBS	P		1		P		P		P																								
INTRODUCED ANNUAL & BIENNIAL FORBS																																	
Amaranthus albus																																	
Amaranthus graecizans																																	
Chenopodium album	P																																
Kochia scoparia	1		P																														
Polygonum aviculare																																	
Salsola iberica			3																														
TOTAL INTRO. ANN. & BIEN. FORBS	1		3																														
NATIVE ANNUAL GRASSES																																	
Bouteloua barbata									P																								
Bouteloua simplex																																	
Monroa squarrosa																																	
TOTAL NATIVE ANNUAL GRASSES									P																								
NATIVE PERENNIAL FORBS																																	
Heterotheca villosa var. foliosa																																	
Leucelene ericoides																																	
Penstemon breviculus																																	
Penstemon palmeri																																	
Ratibida columnaris																																	
Sphaeralcea coccinea			P		P																												
Sphaeralcea parvifolia																																	
TOTAL NATIVE PERENNIAL FORBS			P		P																												
INTRODUCED PERENNIAL FORBS																																	
Astragalus cicer																																	
TOTAL INTRO. PERENNIAL FORBS																																	

J16 Phase III Shrubland Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.15	15.00	0.48	0.15	0.46		1			P			1												
Agropyron smithii	0.10	50.00	0.32	0.10	0.31		P		P	1	P		P		P	1			P			P	P		P
Agropyron spicatum	0.00	5.00	0.00	0.00	0.00																				
Agropyron trachycaulum	0.03	5.00	0.08	0.03	0.08											1									
Hordeum jubatum	0.00	2.50	0.00	0.00	0.00																				
Oryzopsis hymenoides	0.08	20.00	0.24	0.08	0.23	1	P			P			2												
TOTAL NATIVE PERENNIAL GRASSES (c)	0.35	57.50	1.12	0.35	1.08	1	1		P	1	P		3		P	2			P			P	P		P
NATIVE PERENNIAL GRASSES (warm)																									
Aristida purpurea	0.00	2.50	0.00	0.00	0.00																				
Bouteloua curtipendula	0.38	12.50	1.20	0.43	1.31								P			10 2							1		
Bouteloua gracilis	2.68	85.00	8.57	2.78	8.53	1	P	P	P	2	P	1	4		2 1	18 1	P 1	1	6	P		4	2		5
Buchloe dactyloides	0.00	15.00	0.00	0.00	0.00				P							P			P			P			P
Hilaria jamesii	3.10	80.00	9.93	3.18	9.75	P	2	1	6	1	P	P			10	P	3	1	2	1		7	5		7
Sporobolus airoides	3.85	90.00	12.33	3.98	12.21	1	P	30 3	P		1	8	P	2	3	2	P	2	3	P		1	2	1	12
Sporobolus cryptandrus	0.05	30.00	0.16	0.05	0.15					P	1		P		P			P			P				P
TOTAL NATIVE PERENNIAL GRASSES (w)	10.05	100.00	32.19	10.40	31.95	2	2	31 3	6	3	2	9	4	2	15 1	30 3	3 1	4	11	1	P	12	10	1	24
INTRODUCED PERENNIAL GRASSES (cool)																									
Elymus junceus	16.68	100.00	53.40	17.48	53.69	19 1	25	10 1	21	19	27	9	21	35 2	15 1	10 1	23 1	15	15	23 5	37	13 2	17 1	17 1	8
TOTAL INTRO. PERENNIAL GRASSES (c)	16.68	100.00	53.40	17.48	53.69	19 1	25	10 1	21	19	27	9	21	35 2	15 1	10 1	23 1	15	15	23 5	37	13 2	17 1	17 1	8
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.03	20.00	0.08	0.03	0.08		1			P									P						
Chrysothamnus greenei	0.00	2.50	0.00	0.00	0.00								P												
Gutierrezia sarothrae	0.08	22.50	0.24	0.08	0.23	P										P						P			
Senecio douglasii var. longilobus	0.00	2.50	0.00	0.00	0.00											P									
TOTAL NATIVE SUBSHRUBS	0.10	40.00	0.32	0.10	0.31	P	1			P			P			P			P			P			
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.33	35.00	1.04	0.43	1.31		1 1								P			1 1				3		6 2	
TOTAL INTRO. SUBSHRUBS	0.33	35.00	1.04	0.43	1.31		1 1								P			1 1				3		6 2	
NATIVE SHRUBS																									
Atriplex canescens	3.05	100.00	9.77	3.13	9.60	P	P	15	P	8	8	4 1	2	4 1	6	3	5	7 1	2	3	4	2	1	2	2
Atriplex confertifolia	0.00	12.50	0.00	0.00	0.00		P			P				P								P			
Chrysothamnus nauseosus	0.08	27.50	0.24	0.08	0.23	P							P			P		1				P			
TOTAL NATIVE SHRUBS	3.13	100.00	10.01	3.20	9.83	P	P	15	P	8	8	4 1	2	4 1	6	3	5	8 1	2	3	4	2	1	2	2
SUCCULENTS																									
Opuntia macrorhiza	0.00	2.50	0.00	0.00	0.00	P																			
Opuntia phaeacantha	0.00	2.50	0.00	0.00	0.00								P												
TOTAL SUCCULENTS	0.00	5.00	0.00	0.00	0.00	P							P												
Standing dead	3.60	92.50		3.60		2	5	5	2	5		5	3	10	6	14	1	7	5	5	2	7	1	3	
Litter	9.85	100.00		9.85		11	10	7	16	3	14	11	5	9	7	7	10	4	7	10	7	8	14	15	6
Bare ground	46.85	100.00		46.85		35	33	24	49	57	43	54	60	34	43	33	51	59	58	50	43	47	50	32	56
Rock	8.48	97.50		8.48		30	22	8	6	4	5	8	2	5	5		6	2	2	8	6	8	7	24	4
TOTALS	100.00		100.00	101.33	100.00	100 1	100 1	100 4	100 0	100 0	100 0	100 1	100 0	100 3	100 2	100 4	100 2	100 2	100 0	100 5	100 0	100 2	100 1	100 3	100 0
TOTAL VEGETATION COVER	31.23	s=(10.11)		32.55	s=(10.59)	22 1	30 1	56 4	27 0	31 0	38 0	22 1	30 0	42 3	39 2	46 4	32 2	28 2	28 0	27 5	42 0	30 2	28 1	26 3	34 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	53.15	s=(11.86)		54.48	s=(12.59)	65 1	67 1	76 4	51 0	43 0	57 0	46 1	40 0	66 3	57 2	67 4	49 2	41 2	42 0	50 5	57 0	53 2	50 1	68 3	44 0
Allowable Vegetation Cover	**31.23**	**s=(10.11)**				**22.0**	**30.0**	**56.0**	**27.0**	**31.0**	**38.0**	**22.0**	**30.0**	**42.0**	**39.0**	**46.0**	**32.0**	**28.0**	**28.0**	**27.0**	**42.0**	**30.0**	**28.0**	**26.0**	**34.0**
SPECIES DENSITY (# of species/100 sq.m.)	10.98	s=(3.58)				11	12	5	9	11	12	8	16	9	15	23	10	14	10	10	12	13	9	6	10

J16 Phase III Shrubland Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.15	15.00	0.48	0.15	0.46				1						2					1					
Agropyron smithii	0.10	50.00	0.32	0.10	0.31		P			P	P		P		1		P		P	1			P		
Agropyron spicatum	0.00	5.00	0.00	0.00	0.00					P										P					
Agropyron trachycaulum	0.03	5.00	0.08	0.03	0.08		P																		
Hordeum jubatum	0.00	2.50	0.00	0.00	0.00														P						
Oryzopsis hymenoides	0.08	20.00	0.24	0.08	0.23	P	P			P													P		
TOTAL NATIVE PERENNIAL GRASSES (c)	0.35	57.50	1.12	0.35	1.08	P	P		1	P	P		P		3		P		P	2			P		
NATIVE PERENNIAL GRASSES (warm)																									
Aristida purpurea	0.00	2.50	0.00	0.00	0.00															P					
Bouteloua curtipendula	0.38	12.50	1.20	0.43	1.31		1		3																
Bouteloua gracilis	2.68	85.00	8.57	2.78	8.53	2	2 1	1	2	P	P	11	3	P	8		3			13	P	P	P	14	2
Buchloe dactyloides	0.00	15.00	0.00	0.00	0.00		P																		
Hilaria jamesii	3.10	80.00	9.93	3.18	9.75	3	2	P	4	P	2	21	2 1	3	5		9			6 1		1	P	13	7 1
Sporobolus airoides	3.85	90.00	12.33	3.98	12.21	4	P	2	2		P 1	8	7	18		4	8	3 1	4	6	6	P	P	8	6
Sporobolus cryptandrus	0.05	30.00	0.16	0.05	0.15										P		P		1	P		P			
TOTAL NATIVE PERENNIAL GRASSES (w)	10.05	100.00	32.19	10.40	31.95	9	5 1	3	11	P	2 1	40	12 1	21	13	4	20	3 1	5	25 1	6	1	P	35	15 1
INTRODUCED PERENNIAL GRASSES (cool)																									
Elymus junceus	16.68	100.00	53.40	17.48	53.69	21 1	20 1	18 1	21	11 1	22 1	10	15 4	6 1	13 1	9	18	21 1	2	4 1	8	16	19	11	23 3
TOTAL INTRO. PERENNIAL GRASSES (c)	16.68	100.00	53.40	17.48	53.69	21 1	20 1	18 1	21	11 1	22 1	10	15 4	6 1	13 1	9	18	21 1	2	4 1	8	16	19	11	23 3
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.03	20.00	0.08	0.03	0.08	P	P		P				P				P								
Chrysothamnus greenei	0.00	2.50	0.00	0.00	0.00																				
Gutierrezia sarothrae	0.08	22.50	0.24	0.08	0.23		P		P		P				P				1	2					
Senecio douglasii var. longilobus	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE SUBSHRUBS	0.10	40.00	0.32	0.10	0.31	P	P		P		P		P		P		P		1	2					
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.33	35.00	1.04	0.43	1.31	P		1	P				P		P	P	P				P	1			
TOTAL INTRO. SUBSHRUBS	0.33	35.00	1.04	0.43	1.31	P		1	P				P		P	P	P				P	1			
NATIVE SHRUBS																									
Atriplex canescens	3.05	100.00	9.77	3.13	9.60	1	1	1	1	1	4	3	2	7	5	1	2	4	P	2	1	2	1	2	3
Atriplex confertifolia	0.00	12.50	0.00	0.00	0.00		P																		
Chrysothamnus nauseosus	0.08	27.50	0.24	0.08	0.23		1	P		P	P		P						1						
TOTAL NATIVE SHRUBS	3.13	100.00	10.01	3.20	9.83	1	2	1	1	1	4	3	2	7	5	1	2	4	1	2	1	2	1	2	3
SUCCULENTS																									
Opuntia macrorhiza	0.00	2.50	0.00	0.00	0.00																				
Opuntia phaeacantha	0.00	2.50	0.00	0.00	0.00																				
TOTAL SUCCULENTS	0.00	5.00	0.00	0.00	0.00																				
Standing dead	3.60	92.50		3.60		2	6	1	2	2	2	1	6	6	2	1		3	3	6	2	3	3	2	3
Litter	9.85	100.00		9.85		9	11	4	12	13	8	20	16	16	9	13	7	15	3	13	5	5	8	13	13
Bare ground	46.85	100.00		46.85		48	50	68	51	58	35	24	40	42	51	49	51	43	80	44	48	57	61	34	29
Rock	8.48	97.50		8.48		10	6	3	1	12	21	2	9	2	4	23	1	11	5	2	29	11	8	3	14
TOTALS	100.00		100.00	101.33	100.00	100 1	100 2	100 1	100 0	100 1	100 2	100 0	100 5	100 1	100 1	100 0	100 0	100 2	100 0	100 2	100 0	100 0	100 0	100 0	100 4
TOTAL VEGETATION COVER	31.23	s=(10.11)		32.55	s=(10.59)	31 1	27 2	24 1	34 0	15 1	34 2	53 0	29 5	34 1	34 1	14 0	41 0	28 2	9 0	35 2	16 0	24 0	20 0	48 0	41 4
GROUND COVER (Veg+Litter+St.Dead+Rock)	53.15	s=(11.86)		54.48	s=(12.59)	52 1	50 2	32 1	49 0	42 1	65 2	76 0	60 5	58 1	49 1	51 0	49 0	57 2	20 0	56 2	52 0	43 0	39 0	66 0	71 4
Allowable Vegetation Cover	**31.23**	**s=(10.11)**				**31.0**	**27.0**	**24.0**	**34.0**	**15.0**	**34.0**	**53.0**	**29.0**	**34.0**	**34.0**	**14.0**	**41.0**	**28.0**	**9.0**	**35.0**	**16.0**	**24.0**	**20.0**	**48.0**	**41.0**
SPECIES DENSITY (# of species/100 sq.m.)	10.98	s=(3.58)				12	15	11	14	13	17	8	12	5	11	6	15	7	11	13	8	12	9	7	8

J7 Sagebrush Reference Area Cover Data – Fall 2022

| PLANT SPECIES | AVERAGE COVER (%) | FREQUENCY (%) | RELATIVE VEGETATION COVER (%) | AVERAGE COVER-ALL (%) | RELATIVE VEGETATION COVER-ALL (%) | Percent Foliar Cover | | |

J7 Sagebrush Reference Area Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE SHRUBS																							
Artemisia tridentata	3.39	100.00	12.90	3.44	12.63	4	2	P	9	4	4 1	1	3	6	P	2	5	P	10	2	2	2	5
Atriplex canescens	0.56	33.33	2.11	0.56	2.04			1		P	3					5		1		P			
TOTAL NATIVE SHRUBS	3.94	100.00	15.01	4.00	14.66	4	2	1	9	4	7 1	1	3	6	P	7	5	1	10	2	2	2	5
SUCCULENTS																							
Coryphantha vivipara	0.00	27.78	0.00	0.00	0.00	P		P									P	P					P
Opuntia phaeacantha	0.00	33.33	0.00	0.00	0.00	P		P			P	P					P					P	
Opuntia whipplei	0.00	11.11	0.00	0.00	0.00							P											P
TOTAL SUCCULENTS	0.00	44.44	0.00	0.00	0.00	P		P			P	P					P	P				P	P
BRYOPHYTES																							
Moss spp.	0.39	72.22	1.48	0.39	1.43	P	P		P	P	1	P	2	3		P			P		1	P	P
TOTAL BRYOPHYTES	0.39	72.22	1.48	0.39	1.43	P	P		P	P	1	P	2	3		P			P		1	P	P
LICHEN/FUNGUS																							
Lichen spp.	0.28	88.89	1.06	0.28	1.02	P	1	1	P	P		P	P	P	P	P	P	P	1		P	P	2
TOTAL LICHEN	0.28	88.89	1.06	0.28	1.02	P	1	1	P	P		P	P	P	P	P	P	P	1		P	P	2
Standing dead	12.22	100.00		12.22		16	11	16	5	16	12	17	8	14	10	12	11	6	10	17	16	13	10
Litter	14.50	100.00		14.50		11	13	15	21	15	24	11	13	16	15	9	10	20	13	10	16	16	13
Bare ground	45.17	100.00		45.17		39	43	46	47	35	42	44	43	38	49	54	59	46	44	45	32	54	53
Rock	1.56	38.89		1.56		1	9		2	5	1		3	7									
TOTALS	100.00		98.52	101.00	98.57	100 0	100 0	100 3	100 1	100 0	100 2	100 4	100 0	100 0	100 0	100 0	100 0	100 1	100 2	100 1	100 4	100 0	100 0
TOTAL VEGETATION COVER	26.28	s=(5.09)		27.28	s=(5.67)	33 0	23 0	22 3	25 1	29 0	21 2	28 4	33 0	25 0	26 0	25 0	20 0	28 1	32 2	28 1	36 4	17 0	22 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	54.83	s=(6.93)		55.83	s=(7.56)	61 0	57 0	54 3	53 1	65 0	58 2	56 4	57 0	62 0	51 0	46 0	41 0	54 1	56 2	55 1	68 4	46 0	47 0
Allowable Vegetation Cover	**26.28**	**s=(5.09)**				**33.0**	**23.0**	**22.0**	**25.0**	**29.0**	**21.0**	**28.0**	**33.0**	**25.0**	**26.0**	**25.0**	**20.0**	**28.0**	**32.0**	**28.0**	**36.0**	**17.0**	**22.0**
SPECIES DENSITY (# of species/100 sq.m.)	13.44	s=(1.69)				13	13	14	11	11	14	13	12	13	14	12	16	15	13	12	13	16	17

N7/8 Sagebrush Reference Area Cover Data – Fall 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																							
						1		2		3		4		5		6		7		8		9		10		11		12		13	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																													
Amaranthus retroflexus	0.00	16.67	0.00	0.00	0.00							P								P					P					
Chenopodium graveolens	0.28	77.78	1.03	0.28	1.00	P		P				P		P		P		P		2		P			P			P		
Chenopodium leptophyllum	0.00	27.78	0.00	0.00	0.00	P						P										P			P			P		
Euphorbia glyptosperma	0.56	94.44	2.05	0.56	2.00	3		P		P		P		P		1		P				P		P		P		2		P	
Gilia aggregata	0.00	11.11	0.00	0.00	0.00	P																									
Lappula redowskii	0.06	38.89	0.21	0.06	0.20	P						P				P		P						1				P			
Lupinus brevicaulis	0.00	11.11	0.00	0.00	0.00													P										P			
Machaeranthera canescens	0.00	16.67	0.00	0.00	0.00			P																P				P			
Solanum triflorum	0.00	11.11	0.00	0.00	0.00																			P				P			
Viguiera annua	0.00	22.22	0.00	0.00	0.00			P												P		P		P							
TOTAL NATIVE ANN. & BIEN. FORBS	0.89	100.00	3.29	0.89	3.21	3		P		P		P		P		1		P		2		P		P		1		2		3	
INTRODUCED ANNUAL & BIENNIAL FORBS																													
Amaranthus albus	0.00	5.56	0.00	0.00	0.00			P																							
Chenopodium album	0.00	5.56	0.00	0.00	0.00															P											
Portulaca oleracea	0.44	55.56	1.64	0.56	2.00			2	1					P				P		1		P				2				2	1
TOTAL INTRO. ANN. & BIEN. FORBS	0.44	55.56	1.64	0.56	2.00			2	1					P				P		1		P				2				2	1
NATIVE ANNUAL GRASSES																													
Monroa squarrosa	0.00	5.56	0.00	0.00	0.00															P											
TOTAL NATIVE ANNUAL GRASSES	0.00	5.56	0.00	0.00	0.00															P											
INTRODUCED ANNUAL GRASSES																													
Bromus tectorum	0.00	5.56	0.00	0.00	0.00													P													
TOTAL INTRODUCED ANNUAL GRASSES	0.00	5.56	0.00	0.00	0.00													P													
NATIVE PERENNIAL FORBS																													
Arabis fendleri	0.06	27.78	0.21	0.06	0.20	P														P		P									
Astragalus calycosus var. scaposus	0.00	55.56	0.00	0.00	0.00							P		P						P		P		P				P		P	
Astragalus newberryi	0.00	5.56	0.00	0.00	0.00																			P							
Astragalus wingatanus	0.00	44.44	0.00	0.00	0.00	P						P				P						P								P	
Cryptantha flavoculata	0.06	16.67	0.21	0.06	0.20									P						1		P									
Eriogonum umbellatum	0.00	5.56	0.00	0.00	0.00																									P	
Gaillardia aristata	0.00	5.56	0.00	0.00	0.00																									P	
Lesquerella intermedia	0.00	11.11	0.00	0.00	0.00															P		P									
Leucelene ericoides	0.39	100.00	1.44	0.44	1.60	P		P		P		P		P		P		P		1		P		1		1		P		P	
Mirabilis linearis	0.00	11.11	0.00	0.00	0.00																	P				P					
Mirabilis multiflora	0.00	5.56	0.00	0.00	0.00					P																					
Mirabilis oxybaphoides	0.17	55.56	0.62	0.17	0.60			P				P		P						P		1				2				P	
Phlox longifolia	0.06	11.11	0.21	0.06	0.20															P		1									
Psilostrophe sparsiflora	0.06	27.78	0.21	0.06	0.20									P						1		P									
Sphaeralcea coccinea	0.28	100.00	1.03	0.33	1.20	P		P		P		P		P		3		P		P		P		1		P		P		P	
Stanleya pinnata	0.06	33.33	0.21	0.06	0.20			P		P				1								P		P		P					
TOTAL NATIVE PERENNIAL FORBS	1.11	100.00	4.11	1.22	4.41	P		P		P		P		1		3		P		3		2		1		3		1		P	
NATIVE PERENNIAL GRASSES (cool)																													
Oryzopsis hymenoides	0.78	100.00	2.87	0.78	2.81	P		4		P		P		1		P		1		P		P		1		1		P		P	
Sitanion hystrix	1.33	88.89	4.93	1.39	5.01			4		1		P		1				3		P		P		2		4		1		1	
Stipa comata	0.00	11.11	0.00	0.00	0.00													P				P									
TOTAL NATIVE PERENNIAL GRASSES (c)	2.11	100.00	7.80	2.17	7.82	P		8		1		P		2		P		4		P		P		3		5		1		1	

PLANT SPECIES	Percent Foliar Cover																													
	14		15		16		17		18																					
	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd																				
NATIVE ANNUAL & BIENNIAL FORBS																														
Amaranthus retroflexus																														
Chenopodium graveolens	3		P		P		P																							
Chenopodium leptophyllum																														
Euphorbia glyptosperma	P		1		P		1		1																					
Gilia aggregata					P																									
Lappula redowskii							P																							
Lupinus brevicaulis																														
Machaeranthera canescens																														
Solanum triflorum																														
Viguiera annua																														
TOTAL NATIVE ANN. & BIEN. FORBS	3		1		P		1		1																					
INTRODUCED ANNUAL & BIENNIAL FORBS																														
Amaranthus albus																														
Chenopodium album																														
Portulaca oleracea	P						P		1																					
TOTAL INTRO. ANN. & BIEN. FORBS	P						P		1																					
NATIVE ANNUAL GRASSES																														
Monroa squarrosa																														
TOTAL NATIVE ANNUAL GRASSES																														
INTRODUCED ANNUAL GRASSES																														
Bromus tectorum																														
TOTAL INTRODUCED ANNUAL GRASSES																														
NATIVE PERENNIAL FORBS																														
Arabis fendleri			P				1																							
Astragalus calycosus var. scaposus	P				P		P																							
Astragalus newberryi																														
Astragalus wingatanus	P		P				P		P																					
Cryptantha flavoculata																														
Eriogonum umbellatum	P																													
Gaillardia aristata	P																													
Lesquerella intermedia																														
Leucelene ericoides	P		1		1		P	1	1																					
Mirabilis linearis																														
Mirabilis multiflora																														
Mirabilis oxybaphoides	P				P				P																					
Phlox longifolia																														
Psilostrophe sparsiflora							P		P																					
Sphaeralcea coccinea	P		P		P		P		1																					
Stanleya pinnata																														
TOTAL NATIVE PERENNIAL FORBS	P		1		1		1	1	2																					
NATIVE PERENNIAL GRASSES (cool)																														
Oryzopsis hymenoides	P		1		1		1		2																					
Sitanion hystrix	2		P		1		3		2																					
Stipa comata																														
TOTAL NATIVE PERENNIAL GRASSES (c)	2		P		2		4		4																					

N7/8 Sagebrush Reference Area Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	5.06	100.00	18.69	5.06	18.24	3	13	3	P	7	10	10	2	3	1	8	10	5	4	3	5	3	1
Hilaria jamesii	4.72	83.33	17.45	4.89	17.64	12 1		9 1		3	5 1	6	1	14	15		3	P	1	7	1	5	3
Sporobolus cryptandrus	0.11	50.00	0.41	0.11	0.40	P	1	1			P	P	P			P		P		P			
TOTAL NATIVE PERENNIAL GRASSES (w)	9.89	100.00	36.55	10.06	36.27	15 1	14	13 1	P	10	15 1	16	3	17	16	8	13	5	5	10	6	8	4
NATIVE SUBSHRUBS																							
Ceratoides lanata	0.00	5.56	0.00	0.00	0.00							P											
Chrysothamnus greenei	1.72	88.89	6.37	1.72	6.21	2	P	1	2	P	2	4	P	1	1		2	9	1	2		1	3
Gutierrezia sarothrae	1.00	94.44	3.70	1.11	4.01	1	3	P	P 1	1	1	P	3	P	P	P	1	P	1	1	2 1		4
TOTAL NATIVE SUBSHRUBS	2.72	100.00	10.06	2.83	10.22	3	3	1	2 1	1	3	4	3	1	1	P	3	9	2	3	2 1	1	7
NATIVE SHRUBS																							
Artemisia tridentata	3.83	94.44	14.17	3.89	14.03	10		1	2	3	8	1	2	8	1	11	2	4	2 1	1	11	2	P
Atriplex canescens	2.06	72.22	7.60	2.06	7.41	1	9	4	2	3	2	1	P		2	6		3			2		2
Chrysothamnus nauseosus	0.06	16.67	0.21	0.06	0.20	P					P										1		
Ephedra viridis	0.00	11.11	0.00	0.00	0.00				P		P												
Lycium pallidum	0.11	22.22	0.41	0.11	0.40		P	2					P			P							
Tetradymia canescens	0.00	27.78	0.00	0.00	0.00			P					P							P		P	P
TOTAL NATIVE SHRUBS	6.06	100.00	22.38	6.11	22.04	11	9	7	4	6	10	2	2	8	3	17	2	7	2 1	1	14	2	2
NATIVE TREES																							
Juniperus osteosperma	0.28	22.22	1.03	0.28	1.00	P													1		2	2	
Pinus edulis	3.33	94.44	12.32	3.33	12.02	8	1	3	3	2	7		P	5	1	P	4	5	10	3	5	2	1
TOTAL NATIVE TREES	3.61	94.44	13.35	3.61	13.03	8	1	3	3	2	7		P	5	1	P	4	5	11	3	7	4	1
SUCCULENTS																							
Coryphantha vivipara	0.00	16.67	0.00	0.00	0.00		P						P						P				
Echinocereus triglochidiatus var. melanacanthus	0.00	5.56	0.00	0.00	0.00			P															
Opuntia macrorhiza	0.00	5.56	0.00	0.00	0.00						P												
Opuntia phaeacantha	0.00	16.67	0.00	0.00	0.00	P		P													P		
Opuntia whipplei	0.00	11.11	0.00	0.00	0.00	P											P						
Sclerocactus whipplei	0.00	11.11	0.00	0.00	0.00	P									P								
TOTAL SUCCULENTS	0.00	50.00	0.00	0.00	0.00	P	P	P			P		P		P		P		P		P		
BRYOPHYTES																							
Moss spp.	0.22	55.56	0.82	0.28	1.00	1			P		P	P	P	P		P	1 1	1	1				
TOTAL BRYOPHYTES	0.22	55.56	0.82	0.28	1.00	1			P		P	P	P	P		P	1 1	1	1				
LICHEN/FUNGUS																							
Lichen spp.	0.00	11.11	0.00	0.00	0.00		P														P		
TOTAL LICHEN	0.00	11.11	0.00	0.00	0.00		P														P		
Standing dead	6.28	100.00		6.28		6	14	4	6	4	2	7	3	3	5	14	4	6	5	7	7	11	5
Litter	18.72	100.00		18.72		23	13	19	13	23	20	12	36	17	14	11	18	15	32	21	23	13	14
Bare ground	30.22	100.00		30.22		22	7	30	44	38	26	52	26	17	30	26	32	42	23	32	19	42	36
Rock	17.72	100.00		17.72		8	29	22	28	13	13	3	21	30	26	13	20	5	12	21	19	13	23
TOTALS	100.00		99.18	100.67	99.00	100 1	100 1	100 1	100 1	100 0	100 1	100 0	100 0	100 0	100 1	100 1	100 1	100 1	100 1	100 0	100 1	100 1	100 0
TOTAL VEGETATION COVER	27.06	s=(8.61)		27.72	s=(8.8)	41 1	37 1	25 1	9 1	22 0	39 1	26 0	14 0	33 0	25 1	36 1	26 1	32 1	28 1	19 0	32 1	21 1	22 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	69.78	s=(10.99)		70.44	s=(11.11)	78 1	93 1	70 1	56 1	62 0	74 1	48 0	74 0	83 0	70 1	74 1	68 1	58 1	77 1	68 0	81 1	58 1	64 0
Allowable Vegetation Cover	**27.06**	**s=(8.61)**				**41.0**	**37.0**	**25.0**	**9.0**	**22.0**	**39.0**	**26.0**	**14.0**	**33.0**	**25.0**	**36.0**	**26.0**	**32.0**	**28.0**	**19.0**	**32.0**	**21.0**	**22.0**
SPECIES DENSITY (# of species/100 sq.m.)	19.72	s=(3.8)				23	20	19	19	19	18	19	28	26	16	24	12	22	20	16	18	19	17

N14 Sagebrush Reference Area Cover Data – Fall 2022

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																					
						1		2		3		4		5		6		7		8		9		10		11		12	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																											
Amaranthus retroflexus	0.00	5.56	0.00	0.00	0.00									P													
Chenopodium graveolens	0.00	33.33	0.00	0.00	0.00					P		P		P								P					
Chenopodium leptophyllum	0.00	11.11	0.00	0.00	0.00																						
Conyza canadensis	0.00	5.56	0.00	0.00	0.00									P													
Euphorbia glyptosperma	0.17	77.78	0.36	0.17	0.34			P		P				P		1		1		P		1		P		P	
Lappula redowskii	0.06	66.67	0.12	0.06	0.11	P						P		P		1		P		P				P			
Lupinus brevicaulis	0.00	16.67	0.00	0.00	0.00			P																			
Machaeranthera canescens	0.06	33.33	0.12	0.06	0.11	P								1								P				P	
Oenothera albicaulis	0.00	5.56	0.00	0.00	0.00																						
Solanum triflorum	0.00	5.56	0.00	0.00	0.00																						
TOTAL NATIVE ANN. & BIEN. FORBS	0.28	100.00	0.60	0.28	0.57	P		P		P		P		1		2		1		P		1		P		P	
INTRODUCED ANNUAL & BIENNIAL FORBS																											
Portulaca oleracea	0.50	83.33	1.09	0.50	1.02	1		P		1		2		P		1		P		P				2		P	
Salsola iberica	0.00	27.78	0.00	0.00	0.00							P				P		P				P					
TOTAL INTRO. ANN. & BIEN. FORBS	0.50	88.89	1.09	0.50	1.02	1		P		1		2		P		1		P		P		P		2		P	
NATIVE PERENNIAL FORBS																											
Gaillardia aristata	0.28	22.22	0.60	0.33	0.68					2		1				P											
Leucelene ericoides	0.22	83.33	0.48	0.22	0.45			P		1		1				P		P		P		P		P		P	
Sphaeralcea coccinea	0.22	94.44	0.48	0.22	0.45	P		P		1		P		P		P		P		P		1		P		P	
TOTAL NATIVE PERENNIAL FORBS	0.72	100.00	1.57	0.78	1.59	P		P		4		2		P		P		P		P		1		1		P	
NATIVE PERENNIAL GRASSES (cool)																											
Agropyron smithii	0.00	5.56	0.00	0.00	0.00									P													
Oryzopsis hymenoides	0.00	5.56	0.00	0.00	0.00			P																			
Sitanion hystrix	1.11	88.89	2.42	1.17	2.38	P		1		4		P		P				2		1	1			3		1		P	
Stipa comata	0.00	5.56	0.00	0.00	0.00																						
TOTAL NATIVE PERENNIAL GRASSES (c)	1.11	88.89	2.42	1.17	2.38	P		1		4		P		P				2		1	1			3		1		P	
NATIVE PERENNIAL GRASSES (warm)																											
Bouteloua gracilis	25.78	100.00	56.11	28.17	57.48	26	1	26	1	22	5	27		47	9	26	2	19	3	27	2	18		19	1	26	7	25	1
Hilaria jamesii	0.11	5.56	0.24	0.11	0.23			2																			
TOTAL NATIVE PERENNIAL GRASSES (w)	25.89	100.00	56.35	28.28	57.71	26	1	28	1	22	5	27		47	9	26	2	19	3	27	2	18		19	1	26	7	25	1
NATIVE SUBSHRUBS																											
Chrysothamnus greenei	0.33	77.78	0.73	0.33	0.68	P				2		1		2		P		1		P		P		P		P	
Gutierrezia sarothrae	0.11	44.44	0.24	0.22	0.45			P						P	2									P			
TOTAL NATIVE SUBSHRUBS	0.44	100.00	0.97	0.56	1.13	P		P		2		1		2	2	P		1		P		P		P		P	
NATIVE SHRUBS																											
Artemisia tridentata	14.61	100.00	31.80	14.72	30.05	10		9	1	22		16		26		16		14		13		15		7		17	
Atriplex canescens	0.06	11.11	0.12	0.06	0.11									P													
Chrysothamnus nauseosus	0.06	5.56	0.12	0.06	0.11									1													
TOTAL NATIVE SHRUBS	14.72	100.00	32.04	14.83	30.27	10		9	1	22		16		27		16		14		13		15		7		17	

PLANT SPECIES	Percent Foliar Cover																											
	13		14		15		16		17		18																	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd																
NATIVE ANNUAL & BIENNIAL FORBS																												
Amaranthus retroflexus																												
Chenopodium graveolens			P				P																					
Chenopodium leptophyllum	P		P																									
Conyza canadensis																												
Euphorbia glyptosperma	P				P		P				P																	
Lappula redowskii	P		P		P		P																					
Lupinus brevicaulis							P		P																			
Machaeranthera canescens					P						P																	
Oenothera albicaulis									P																			
Solanum triflorum											P																	
TOTAL NATIVE ANN. & BIEN. FORBS	P		P		P		P		P		P																	
INTRODUCED ANNUAL & BIENNIAL FORBS																												
Portulaca oleracea	2		P		P		P																					
Salsola iberica			P																									
TOTAL INTRO. ANN. & BIEN. FORBS	2		P		P		P																					
NATIVE PERENNIAL FORBS																												
Gaillardia aristata					2	1																						
Leucelene ericoides	1		1		P		P		P																			
Sphaeralcea coccinea	P		1		P		P				P																	
TOTAL NATIVE PERENNIAL FORBS	1		2		2	1	P		P		P																	
NATIVE PERENNIAL GRASSES (cool)																												
Agropyron smithii																												
Oryzopsis hymenoides																												
Sitanion hystrix	P		1		P		1		1		5																	
Stipa comata			P																									
TOTAL NATIVE PERENNIAL GRASSES (c)	P		1		P		1		1		5																	
NATIVE PERENNIAL GRASSES (warm)																												
Bouteloua gracilis	25	1	27	4	32	2	23	5	28		23		23															
Hilaria jamesii																												
TOTAL NATIVE PERENNIAL GRASSES (w)	25	1	27	4	32	2	23	5	28		23		23															
NATIVE SUBSHRUBS																												
Chrysothamnus greenei	P				P		P				P																	
Gutierrezia sarothrae	P		P				P		P		2																	
TOTAL NATIVE SUBSHRUBS	P		P		P		P		P		2																	
NATIVE SHRUBS																												
Artemisia tridentata	18		10		20		11	1	12		11																	
Atriplex canescens											1																	
Chrysothamnus nauseosus																												
TOTAL NATIVE SHRUBS	18		10		20		11	1	12		12																	

N14 Sagebrush Reference Area Cover Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE TREES																							
Juniperus osteosperma	0.00	11.11	0.00	0.00	0.00														P				P
Pinus edulis	1.61	88.89	3.51	1.67	3.40	2	P	1	2			5	P	5	1	P 1	1	2	4	1	3	2	P
TOTAL NATIVE TREES	1.61	88.89	3.51	1.67	3.40	2	P	1	2			5	P	5	1	P 1	1	2	4	1	3	2	P
SUCCULENTS																							
Coryphantha vivipara	0.06	38.89	0.12	0.06	0.11		P		P		1				P		P			P	P		
Opuntia phaeacantha	0.06	50.00	0.12	0.06	0.11		P				P	P	P		P	P	P	1	P				
TOTAL SUCCULENTS	0.11	66.67	0.24	0.11	0.23		P		P		1	P	P		P	P	P	1	P	P	P		
BRYOPHYTES																							
Moss spp.	0.56	83.33	1.21	0.83	1.70	1	1	P	1		P 2	2 1	1	2	P	P		1 2	1		P	P	P
TOTAL BRYOPHYTES	0.56	83.33	1.21	0.83	1.70	1	1	P	1		P 2	2 1	1	2	P	P		1 2	1		P	P	P
LICHEN/FUNGUS																							
Lichen spp.	0.83	100.00	1.81	1.00	2.04	2	P 1	P	P	P	P 1	P	1	P	4	2 1	P	1	P	2	P	2	1
TOTAL LICHEN	0.83	100.00	1.81	1.00	2.04	2	P 1	P	P	P	P 1	P	1	P	4	2 1	P	1	P	2	P	2	1
Standing dead	8.89	100.00		8.89		9	13	10	7	11	9	8	8	4	6	9	9	10	2	10	12	11	12
Litter	15.00	100.00		15.00		19	3	13	15	7	17	18	20	13	14	14	23	11	17	22	15	13	16
Bare ground	29.17	100.00		29.17		30	45	20	26	5	28	30	28	41	43	31	26	26	31	20	30	36	29
Rock	0.17	16.67		0.17				1	1				1										
TOTALS	100.00		98.79	103.22	98.30	100 1	100 3	100 5	100 0	100 11	100 5	100 4	100 3	100 0	100 1	100 9	100 1	100 6	100 2	100 6	100 1	100 0	100 0
TOTAL VEGETATION COVER	45.94	s=(9.51)		49.00	s=(11.95)	40 1	39 2	56 5	51 0	77 11	46 4	44 4	42 3	42 0	33 1	44 8	42 1	52 6	50 2	46 6	43 1	38 0	42 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	70.83	s=(9.15)		74.06	s=(11.44)	70 1	55 3	80 5	74 0	95 11	72 5	70 4	72 3	59 0	57 1	69 9	74 1	74 6	69 2	80 6	70 1	64 0	71 0
Allowable Vegetation Cover	**45.94**	**s=(9.51)**				**40.0**	**39.0**	**56.0**	**51.0**	**77.0**	**46.0**	**44.0**	**42.0**	**42.0**	**33.0**	**44.0**	**42.0**	**52.0**	**50.0**	**46.0**	**43.0**	**38.0**	**42.0**
SPECIES DENSITY (# of species/100 sq.m.)	11.28	s=(1.84)				8	13	10	12	15	11	11	10	10	12	11	10	11	14	12	13	8	12

J16 Phase III Grassland Production Data – Fall 2022

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
NATIVE ANNUAL & BIENNIAL FORBS																							
Chenopodium leptophyllum	0.07	1.28	2.50														8.6						
Euphorbia glyptosperma	0.26	4.55	30.00								0.3	0.6		0.3	3.9						3.2		
Euphorbia serrula	0.04	0.73	2.50																				
Lappula redowskii	0.03	0.61	10.00										2.2						0.1			T	
TOTAL NATIVE ANN. & BIEN. FORBS	0.40	7.17	42.50	-	-	-	-	-	-	-	0.3	0.6	2.2	0.3	3.9	-	8.6	-	0.1	-	3.2	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Kochia scoparia	0.31	5.53	2.50																				
Portulaca oleracea	0.46	8.18	10.00																		11		
Salsola iberica	0.00	0.03	2.50																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.77	13.74	12.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.0	-	-
NATIVE PERENNIAL FORBS																							
Baileya pleniradiata	0.00	0.03	2.50																		0.2		
Sphaeralcea coccinea	0.00	0.03	5.00						0.1														
TOTAL NATIVE PERENNIAL FORBS	0.00	0.06	7.50	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.01	0.25	2.50						1.7														
Agropyron smithii	0.07	1.2	7.50		0.3				3.5														
TOTAL NATIVE PERENNIAL GRASSES (c)	0.08	1.46	7.50	-	0.3	-	-	-	5.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua curtipendula	0.13	2.38	2.50						16														
Bouteloua gracilis	2.36	42.1	37.50			12.7	9.9	1.9	11.1				26.4	52.9		1.4					43.6		
Buchloe dactyloides	0.02	0.27	2.50						1.8														
Hilaria jamesii	4.15	74.1	40.00			7.5					10.4	12.4		92.5	20.9		8	45.7					19.3
Sporobolus airoides	9.75	173.9	60.00	116.7		19.1		64.3	1.2			94.1	61.1	20.1	3.1	87.3	72				50.1		81.2
Sporobolus cryptandrus	0.00	0.03	2.50																				
TOTAL NATIVE PERENNIAL GRASSES (w)	16.41	292.77	72.50	116.7	-	39.3	9.9	66.2	30.1	-	10.4	106.5	87.5	165.5	24.0	88.7	80.0	45.7	-	-	93.7	-	100.5
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	8.76	156.31	80.00		19.6		26.5		5.9	32.1	9.2	38.6	11.3		38			54.3	49.1	40.5	24	77.9	95.1
TOTAL INTRO. PERENNIAL GRASSES (c)	8.76	156.31	80.00	-	19.6	-	26.5	-	5.9	32.1	9.2	38.6	11.3	-	38.0	-	-	54.3	49.1	40.5	24.0	77.9	95.1
NATIVE SUBSHRUBS																							
Gutierrezia sarothrae	0.00	0.04	2.50						0.3														
TOTAL NATIVE SUBSHRUBS	0.00	0.04	2.50	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	1.38	24.69	25.00		10.7	7.2					62.1		18.9					17.5	7.8		8.2		24.7
TOTAL INTRO. SUBSHRUBS	1.38	24.69	25.00	-	10.7	7.2	-	-	-	-	62.1	-	18.9	-	-	-	-	17.5	7.8	-	8.2	-	24.7
NATIVE SHRUBS																							
Atriplex canescens	2.29	40.87	30.00	54.7	18.1	25.1								5.2	77.9							14.1	11.6
TOTAL NATIVE SHRUBS	2.29	40.87	30.00	54.7	18.1	25.1	-	-	-	-	-	-	-	5.2	77.9	-	-	-	-	-	-	14.1	11.6
TOTAL PRODUCTION	30.11	537.1	100.00	171.4	48.7	71.6	36.4	66.2	41.6	32.1	82.0	145.7	119.9	171.0	143.8	88.7	88.6	117.5	57.0	40.5	140.3	92.0	231.9
Standard Deviation	16.07	286.62																					
ALLOWABLE PRODUCTION (lbs/acre)	537.10	(s=286.62)		1019.3	289.6	425.8	216.5	393.7	247.4	190.9	487.6	866.4	713.0	1016.9	855.1	527.5	526.9	698.7	339.0	240.8	834.3	547.1	1379.0
SPECIES DENSITY (# of species/1.5 sq.m.)	3.63	(s=1.78)		2.0	4.0	5.0	2.0	2.0	9.0	1.0	4.0	4.0	5.0	5.0	5.0	2.0	3.0	3.0	3.0	1.0	7.0	3.0	5.0

Noxious Production	0.00

J16 Phase III Grassland Production Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
NATIVE ANNUAL & BIENNIAL FORBS																							
Chenopodium leptophyllum	0.07	1.28	2.50																				
Euphorbia glyptosperma	0.26	4.55	30.00			0.6				2.5		0.3			6.5	0.2	10.9						1.3
Euphorbia serrula	0.04	0.73	2.50																		4.9		
Lappula redowskii	0.03	0.61	10.00															0.7			1.1		
TOTAL NATIVE ANN. & BIEN. FORBS	0.40	7.17	42.50	-	-	0.6	-	-	-	2.5	-	0.3	-	-	6.5	0.2	10.9	0.7	-	-	6.0	-	1.3
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Kochia scoparia	0.31	5.53	2.50							37.2													
Portulaca oleracea	0.46	8.18	10.00			19.1											1						23.9
Salsola iberica	0.00	0.03	2.50			0.2																	
TOTAL INTRO. ANN. & BIEN. FORBS	0.77	13.74	12.50	-	-	19.3	-	-	-	37.2	-	-	-	-	-	-	1.0	-	-	-	-	-	23.9
NATIVE PERENNIAL FORBS																							
Baileya pleniradiata	0.00	0.03	2.50																				
Sphaeralcea coccinea	0.00	0.03	5.00			0.1																	
TOTAL NATIVE PERENNIAL FORBS	0.00	0.06	7.50	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.01	0.25	2.50																				
Agropyron smithii	0.07	1.2	7.50							4.3													
TOTAL NATIVE PERENNIAL GRASSES (c)	0.08	1.46	7.50	-	-	-	-	-	-	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua curtipendula	0.13	2.38	2.50																				
Bouteloua gracilis	2.36	42.1	37.50		12			2.6				20.5			51.9				6.6	24.2	5.5		
Buchloe dactyloides	0.02	0.27	2.50																				
Hilaria jamesii	4.15	74.1	40.00	4.2	37.8			25.6	23.8				87.4			6			90.6			6.3	
Sporobolus airoides	9.75	173.9	60.00	62.7	67.5	10.9		20.9	36.1				43.1		26.6	23.8			30.2	57	19.9	100.7	
Sporobolus cryptandrus	0.00	0.03	2.50														0.2						
TOTAL NATIVE PERENNIAL GRASSES (w)	16.41	292.77	72.50	66.9	117.3	10.9	-	49.1	59.9	-	-	20.5	130.5	-	78.5	29.8	0.2	-	127.4	81.2	25.4	107.0	-
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	8.76	156.31	80.00	7.6		24.2	27.3	5.8	35.9	77.2	18.3	63.6	10.8	19.6	37.1	41.6	39.5	10.6	7.5	3.2	52.5		47
TOTAL INTRO. PERENNIAL GRASSES (c)	8.76	156.31	80.00	7.6	-	24.2	27.3	5.8	35.9	77.2	18.3	63.6	10.8	19.6	37.1	41.6	39.5	10.6	7.5	3.2	52.5	-	47.0
NATIVE SUBSHRUBS																							
Gutierrezia sarothrae	0.00	0.04	2.50																				
TOTAL NATIVE SUBSHRUBS	0.00	0.04	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	1.38	24.69	25.00																	3.5			5.5
TOTAL INTRO. SUBSHRUBS	1.38	24.69	25.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.5	-	-	5.5
NATIVE SHRUBS																							
Atriplex canescens	2.29	40.87	30.00			12.6				6.6		25.4				17.7							5.9
TOTAL NATIVE SHRUBS	2.29	40.87	30.00	-	-	12.6	-	-	-	6.6	-	25.4	-	-	-	17.7	-	-	-	-	-	-	5.9
TOTAL PRODUCTION	30.11	537.1	100.00	74.5	117.3	67.7	27.3	54.9	95.8	127.8	18.3	109.8	141.3	19.6	122.1	89.3	51.6	11.3	134.9	87.9	83.9	107.0	83.6
Standard Deviation	16.07	286.62																					
ALLOWABLE PRODUCTION (lbs/acre)	537.10	(s=286.62)		443.0	697.5	402.6	162.3	326.5	569.7	760.0	108.8	652.9	840.3	116.6	726.1	531.0	306.9	67.2	802.2	522.7	498.9	636.3	497.1
SPECIES DENSITY (# of species/1.5 sq.m.)	3.63	(s=1.78)		3.0	3.0	7.0	1.0	4.0	3.0	5.0	1.0	4.0	3.0	1.0	4.0	5.0	4.0	2.0	4.0	4.0	5.0	2.0	5.0

Noxious Production	0.00

J16 Phase III Shrubland Production Data – Fall 2022

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
NATIVE ANNUAL & BIENNIAL FORBS																							
Chenopodium graveolens	0.00	0.01	2.50	0.1																			
Chenopodium leptophyllum	0.00	0.07	2.50																				
Descurainia pinnata	0.00	0	0.00						T														
Dyssodia papposa	0.01	0.1	2.50																				
Euphorbia glyptosperma	0.29	5.2	30.00	T					5.6		0.3				0.9	1.3							
Lappula redowskii	0.01	0.16	7.50						0.1						0.7								
Viguiera annua	0.00	0.07	2.50																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.32	5.63	35.00	0.1	-	-	-	-	5.7	-	0.3	-	-	-	1.6	1.3	-	-	-	-	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Kochia scoparia	0.13	2.39	2.50																				
Portulaca oleracea	0.10	1.78	17.50								7.9	0.4							0.8				
Salsola iberica	0.97	17.25	10.00																				
TOTAL INTRO. ANN. & BIEN. FORBS	1.20	21.42	25.00	-	-	-	-	-	-	-	7.9	0.4	-	-	-	-	-	-	0.8	-	-	-	-
NATIVE ANNUAL GRASSES																							
Bouteloua barbata	0.00	0.07	2.50						0.5														
Monroa squarrosa	0.00	0.06	5.00												0.3								
TOTAL NATIVE ANNUAL GRASSES	0.01	0.13	7.50	-	-	-	-	-	0.5	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea coccinea	0.01	0.21	7.50									0.9											
TOTAL NATIVE PERENNIAL FORBS	0.01	0.21	7.50	-	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.03	0.45	7.50					1						0.8									
Agropyron smithii	0.09	1.59	7.50																		0.6		
TOTAL NATIVE PERENNIAL GRASSES (c)	0.11	2.04	12.50	-	-	-	-	1.0	-	-	-	-	-	0.8	-	-	-	-	-	-	0.6	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua curtipendula	0.02	0.34	2.50											2.3									
Bouteloua gracilis	2.76	49.22	40.00			0.8			8.4					51.3	0.8	16.6	8.2			2.7	0.6		18.3
Hilaria jamesii	3.31	59.02	37.50		2.5	21.1	10.7						42.4			85.8	14.2				1.2		55.9
Sporobolus airoides	1.79	31.92	37.50			20.5				7.5							4.5			1.7	22.4		36.7
Sporobolus cryptandrus	0.19	3.43	5.00																				
TOTAL NATIVE PERENNIAL GRASSES (w)	8.07	143.94	70.00	-	2.5	42.4	10.7	-	8.4	7.5	-	-	42.4	53.6	0.8	102.4	26.9	-	-	4.4	24.2	-	110.9
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	11.92	212.68	97.50	126	73.4	32.9	28	17.9	30.2	20.5	46.2	41.9	53.3	21.2	35.5	25.4	11.4	45.3	70.9	57.5	25.2	28.6	
TOTAL INTRO. PERENNIAL GRASSES (c)	11.92	212.68	97.50	126.0	73.4	32.9	28.0	17.9	30.2	20.5	46.2	41.9	53.3	21.2	35.5	25.4	11.4	45.3	70.9	57.5	25.2	28.6	-
NATIVE SUBSHRUBS																							
Ceratoides lanata	0.02	0.4	2.50																				
Gutierrezia sarothrae	0.00	0.04	2.50																				
TOTAL NATIVE SUBSHRUBS	0.03	0.45	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	0.29	5.2	12.50																			0.1	
TOTAL INTRO. SUBSHRUBS	0.29	5.2	12.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-
NATIVE SHRUBS																							
Atriplex canescens	4.52	80.64	50.00			78.6		56.6	T	2.8		25.5	47.3		92.9	78.5	3	T	1.9	13.8		6.7	9
Chrysothamnus nauseosus	0.50	8.89	2.50											59.8									
TOTAL NATIVE SHRUBS	5.02	89.53	52.50	-	-	78.6	-	56.6	-	2.8	-	25.5	47.3	59.8	92.9	78.5	3.0	-	1.9	13.8	-	6.7	9.0
TOTAL PRODUCTION	26.98	481.23	100.00	126.1	75.9	153.9	38.7	75.5	44.8	30.8	54.4	68.7	143.0	135.4	131.1	207.6	41.3	45.3	73.6	75.7	50.0	35.4	119.9
Standard Deviation	15.51	276.63																					
ALLOWABLE PRODUCTION (lbs/acre)	481.23	(s=276.63)		749.9	451.4	915.2	230.1	449.0	266.4	183.2	323.5	408.5	850.4	805.2	779.6	1234.5	245.6	269.4	437.7	450.2	297.3	210.5	713.0
SPECIES DENSITY (# of species/1.5 sq.m.)	4.10	(s=1.72)		3.0	2.0	5.0	2.0	3.0	6.0	3.0	3.0	4.0	3.0	5.0	6.0	5.0	5.0	2.0	3.0	4.0	5.0	3.0	4.0

Noxious Production	0.00

J16 Phase III Shrubland Production Data – Fall 2022 (continued)

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
NATIVE ANNUAL & BIENNIAL FORBS																							
Chenopodium graveolens	0.00	0.01	2.50																				
Chenopodium leptophyllum	0.00	0.07	2.50																	0.5			
Descurainia pinnata	0.00	0	0.00																				
Dyssodia papposa	0.01	0.1	2.50																			0.7	
Euphorbia glyptosperma	0.29	5.2	30.00	0.2		0.8	3.3	0.7			0.1				5.2		0.2			16.4			
Lappula redowskii	0.01	0.16	7.50						T											0.3			
Viguiera annua	0.00	0.07	2.50								0.5												
TOTAL NATIVE ANN. & BIEN. FORBS	0.32	5.63	35.00	0.2	-	0.8	3.3	0.7	-	-	0.6	-	-	-	5.2	-	0.2	-	-	17.2	-	0.7	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Kochia scoparia	0.13	2.39	2.50																	16.1			
Portulaca oleracea	0.10	1.78	17.50					0.6	0.5		0.9					0.9							
Salsola iberica	0.97	17.25	10.00	1				0.9						37.4						76.7			
TOTAL INTRO. ANN. & BIEN. FORBS	1.20	21.42	25.00	1.0	-	-	-	1.5	0.5	-	0.9	-	-	37.4	-	0.9	-	-	-	92.8	-	-	-
NATIVE ANNUAL GRASSES																							
Bouteloua barbata	0.00	0.07	2.50																				
Monroa squarrosa	0.00	0.06	5.00			T	0.1																
TOTAL NATIVE ANNUAL GRASSES	0.01	0.13	7.50	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea coccinea	0.01	0.21	7.50			0.2		0.3															
TOTAL NATIVE PERENNIAL FORBS	0.01	0.21	7.50	-	-	0.2	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.03	0.45	7.50															1.2					
Agropyron smithii	0.09	1.59	7.50															6.9		3.2			
TOTAL NATIVE PERENNIAL GRASSES (c)	0.11	2.04	12.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1	-	3.2	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua curtipendula	0.02	0.34	2.50																				
Bouteloua gracilis	2.76	49.22	40.00	5.2	47					32	12.8		13.9					69.1				43.4	
Hilaria jamesii	3.31	59.02	37.50		1.7		4		27.1	27.8			26.6									14.5	61.5
Sporobolus airoides	1.79	31.92	37.50			12.7	4.5			29.2	33.6	8.2			8.3		1.5	8				15.4	
Sporobolus cryptandrus	0.19	3.43	5.00														21.6			1.5			
TOTAL NATIVE PERENNIAL GRASSES (w)	8.07	143.94	70.00	5.2	48.7	12.7	8.5	-	27.1	89.0	46.4	8.2	40.5	-	8.3	-	23.1	77.1	-	1.5	-	73.3	61.5
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	11.92	212.68	97.50	99.6	21.3	32.3	51	15.5	48.2	33.1	72.8	11.3	18.7	14.5	57.4	25.2	8.2	12.2	3.8	19.2	25.7	26.9	42.4
TOTAL INTRO. PERENNIAL GRASSES (c)	11.92	212.68	97.50	99.6	21.3	32.3	51.0	15.5	48.2	33.1	72.8	11.3	18.7	14.5	57.4	25.2	8.2	12.2	3.8	19.2	25.7	26.9	42.4
NATIVE SUBSHRUBS																							
Ceratoides lanata	0.02	0.4	2.50								2.7												
Gutierrezia sarothrae	0.00	0.04	2.50										0.3										
TOTAL NATIVE SUBSHRUBS	0.03	0.45	5.00	-	-	-	-	-	-	-	2.7	-	0.3	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	0.29	5.2	12.50			22.9					1.4			1.2	9.4								
TOTAL INTRO. SUBSHRUBS	0.29	5.2	12.50	-	-	22.9	-	-	-	-	1.4	-	-	1.2	9.4	-	-	-	-	-	-	-	-
NATIVE SHRUBS																							
Atriplex canescens	4.52	80.64	50.00				4.9	9.9		9.4	62.1	14.5	6.6		0.1	18.3							
Chrysothamnus nauseosus	0.50	8.89	2.50																				
TOTAL NATIVE SHRUBS	5.02	89.53	52.50	-	-	-	4.9	9.9	-	9.4	62.1	14.5	6.6	-	0.1	18.3	-	-	-	-	-	-	-
TOTAL PRODUCTION	26.98	481.23	100.00	106.0	70.0	68.9	67.8	27.9	75.8	131.5	186.9	34.0	66.1	53.1	80.4	44.4	31.5	97.4	3.8	133.9	25.7	100.9	103.9
Standard Deviation	15.51	276.63																					
ALLOWABLE PRODUCTION (lbs/acre)	481.23	(s=276.63)		630.4	416.3	409.7	403.2	165.9	450.8	782.0	1111.4	202.2	393.1	315.8	478.1	264.0	187.3	579.2	22.6	796.3	152.8	600.0	617.9
SPECIES DENSITY (# of species/1.5 sq.m.)	4.10	(s=1.72)		4.0	3.0	6.0	6.0	6.0	4.0	5.0	9.0	3.0	5.0	3.0	5.0	3.0	4.0	5.0	1.0	8.0	1.0	5.0	2.0

Noxious Production	0.00

J16 Phase III Grassland Shrub Density Data – Fall 2022

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.03	1.01	2.50																				
Ceratoides lanata	(21-50cm)	0.05	2.02	5.00							1									1				
Chrysothamnus greenei	(0-20cm)	0.05	2.02	2.50																				
Gutierrezia sarothrae	(0-20cm)	1.28	51.60	7.50						24												1		
Gutierrezia sarothrae	(21-50cm)	0.18	7.08	2.50						7														
TOTAL NATIVE SUBSHRUBS		1.58	63.74	15.00						31	1									1		1		
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	13.63	551.38	42.50		97	42					3		51		44	4		30	71	16	19		8
Kochia prostrata	(21-50cm)	8.28	334.88	52.50		12	30		8			14		12		17	10		69	15	6	40		1
Kochia prostrata	(>50cm)	0.18	7.08	12.50		2			2										1			1		
TOTAL INTRO. SUBSHRUBS		22.08	893.34	55.00		111	72		10			17		63		61	14		100	86	22	60		9
NATIVE SHRUBS																								
Atriplex canescens	(0-20cm)	2.15	87.01	57.50	1	4		1				9			1	2	4		2				1	1
Atriplex canescens	(21-50cm)	4.73	191.21	80.00	10	14		4	1		2	6	13		7	2	8	4	2		1	3	8	9
Atriplex canescens	(>50cm)	3.65	147.71	72.50	4	5					5	7	4			3	1	1	7			1	12	3
Atriplex confertifolia	(0-20cm)	0.03	1.01	2.50		1																		
TOTAL NATIVE SHRUBS		10.55	426.94	85.00	15	24		5	1		7	22	17		8	7	13	5	11		1	4	21	13
TOTAL DENSITY (stems/100 sq. m.)		34.20	(s=35.16)	100.00	15	135	72	5	11	31	8	39	17	63	8	68	27	5	111	87	23	65	21	22
TOTAL DENSITY (stems/acre)		1384.02	(s=1422.87)		607	5463	2914	202	445	1255	324	1578	688	2550	324	2752	1093	202	4492	3521	931	2630	850	890
SPECIES DENSITY (# of species/100 sq.m.)		1.60	(s=0.67)		1	3	1	1	2	1	2	2	1	1	1	2	2	1	2	2	2	3	1	2

J16 Phase III Grassland Shrub Density Data – Fall 2022 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.03	1.01	2.50												1								
Ceratoides lanata	(21-50cm)	0.05	2.02	5.00																				
Chrysothamnus greenei	(0-20cm)	0.05	2.02	2.50			2																	
Gutierrezia sarothrae	(0-20cm)	1.28	51.60	7.50			26																	
Gutierrezia sarothrae	(21-50cm)	0.18	7.08	2.50																				
TOTAL NATIVE SUBSHRUBS		1.58	63.74	15.00			28									1								
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	13.63	551.38	42.50		10									21	12					97		1	19
Kochia prostrata	(21-50cm)	8.28	334.88	52.50		18					3		1		8	20		3			13	7		24
Kochia prostrata	(>50cm)	0.18	7.08	12.50		1																		
TOTAL INTRO. SUBSHRUBS		22.08	893.34	55.00		29					3		1		29	32		3			110	7	1	43
NATIVE SHRUBS																								
Atriplex canescens	(0-20cm)	2.15	87.01	57.50	1		7	2		1		2	6	1		2	1	1	1				7	28
Atriplex canescens	(21-50cm)	4.73	191.21	80.00	2	1	2	6	1	4	2	6	16	3		1	2	4	1				18	26
Atriplex canescens	(>50cm)	3.65	147.71	72.50	2	1	5	3	2	1	9	9	6	2		11	8	4		2		2	13	13
Atriplex confertifolia	(0-20cm)	0.03	1.01	2.50																				
TOTAL NATIVE SHRUBS		10.55	426.94	85.00	5	2	14	11	3	6	11	17	28	6		14	11	9	2	2		2	38	67
TOTAL DENSITY (stems/100 sq. m.)		34.20	(s=35.16)	100.00	5	31	42	11	3	6	14	17	29	6	29	47	11	12	2	2	110	9	39	110
TOTAL DENSITY (stems/acre)		1384.02	(s=1422.87)		202	1255	1700	445	121	243	567	688	1174	243	1174	1902	445	486	81	81	4452	364	1578	4452
SPECIES DENSITY (# of species/100 sq.m.)		1.60	(s=0.67)		1	2	3	1	1	1	2	1	2	1	1	3	1	2	1	1	1	2	2	2

J16 Phase III Shrubland Shrub Density Data – Fall 2022

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.23	9.11	12.50		3			1															
Ceratoides lanata	(21-50cm)	0.38	15.18	17.50		7												1						
Chrysothamnus greenei	(21-50cm)	0.03	1.01	2.50								1												
Gutierrezia sarothrae	(0-20cm)	2.23	90.04	20.00	9										25						2			
Gutierrezia sarothrae	(21-50cm)	0.13	5.06	7.50											1									
Senecio douglasii var. longilobus	(0-20cm)	0.03	1.01	2.50											1									
Senecio douglasii var. longilobus	(>50cm)	0.03	1.01	2.50											1									
TOTAL NATIVE SUBSHRUBS		3.03	122.42	40.00	9	10			1			1			28			1			2			
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	3.68	148.72	30.00		32								1			36				3		8	
Kochia prostrata	(21-50cm)	4.03	162.89	35.00		5								2			51				22		22	
Kochia prostrata	(>50cm)	0.25	10.12	10.00																	3		3	
TOTAL INTRO. SUBSHRUBS		7.95	321.73	35.00		37								3			87				28		33	
NATIVE SHRUBS																								
Atriplex canescens	(0-20cm)	7.95	321.73	87.50	2			1	3	75	8	1	10	8	2	14	3	24	8	16		2	3	26
Atriplex canescens	(21-50cm)	12.33	498.78	100.00	6	1	11	3	5	18	37	2	8	22	8	18	12	30	3	15	2	10	12	20
Atriplex canescens	(>50cm)	11.60	469.44	100.00	12	5	57	2	8	23	12	10	19	19	15	17	23	7	9	13	9	10	10	5
Atriplex confertifolia	(0-20cm)	0.08	3.04	5.00		1																		
Atriplex confertifolia	(21-50cm)	0.13	5.06	7.50					2				1								2			
Chrysothamnus nauseosus	(0-20cm)	0.18	7.08	12.50	1																2			
Chrysothamnus nauseosus	(21-50cm)	0.63	25.29	20.00											4		1				1			
Chrysothamnus nauseosus	(>50cm)	0.85	34.40	25.00								1			5		3				2			
TOTAL NATIVE SHRUBS		33.73	1364.80	100.00	21	7	68	6	18	116	57	14	38	49	34	49	42	61	20	44	18	22	25	51
TOTAL DENSITY (stems/100 sq. m.)		44.70	(s=27.93)	100.00	30	54	68	6	19	116	57	15	38	52	62	49	129	62	20	44	48	22	58	51
TOTAL DENSITY (stems/acre)		1808.94	(s=1130.23)		1214	2185	2752	243	769	4694	2307	607	1538	2104	2509	1983	5220	2509	809	1781	1942	890	2347	2064
SPECIES DENSITY (# of species/100 sq.m.)		2.23	(s=1.21)		3	4	1	1	3	1	1	3	2	2	4	1	3	2	1	1	5	1	2	1

J16 Phase III Shrubland Shrub Density Data – Fall 2022 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.23	9.11	12.50				1				3				1								
Ceratoides lanata	(21-50cm)	0.38	15.18	17.50	1	1		1				2				2								
Chrysothamnus greenei	(21-50cm)	0.03	1.01	2.50																				
Gutierrezia sarothrae	(0-20cm)	2.23	90.04	20.00		1		1		19				9					23					
Gutierrezia sarothrae	(21-50cm)	0.13	5.06	7.50														1	3					
Senecio douglasii var. longilobus	(0-20cm)	0.03	1.01	2.50																				
Senecio douglasii var. longilobus	(>50cm)	0.03	1.01	2.50																				
TOTAL NATIVE SUBSHRUBS		3.03	122.42	40.00	1	2		3		19		5		9		3		1	26					
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	3.68	148.72	30.00			44	5				3			3	3				3	6			
Kochia prostrata	(21-50cm)	4.03	162.89	35.00	1		29	6				5		2	3	3				2	8			
Kochia prostrata	(>50cm)	0.25	10.12	10.00			2					2												
TOTAL INTRO. SUBSHRUBS		7.95	321.73	35.00	1		75	11				10		2	6	6				5	14			
NATIVE SHRUBS																								
Atriplex canescens	(0-20cm)	7.95	321.73	87.50	5	1	1	2	8	1	1	5	29	8	11	10	9	3	11	1	2			4
Atriplex canescens	(21-50cm)	12.33	498.78	100.00	10	10	4	10	8	4	12	18	55	24	10	3	29	2	24	5	7	2	10	3
Atriplex canescens	(>50cm)	11.60	469.44	100.00	15	8	4	6	8	8	8	8	20	17	9	8	15	1	7	5	14	4	4	10
Atriplex confertifolia	(0-20cm)	0.08	3.04	5.00		2																		
Atriplex confertifolia	(21-50cm)	0.13	5.06	7.50																				
Chrysothamnus nauseosus	(0-20cm)	0.18	7.08	12.50		1			2									1						
Chrysothamnus nauseosus	(21-50cm)	0.63	25.29	20.00		5	1		4	5								4						
Chrysothamnus nauseosus	(>50cm)	0.85	34.40	25.00		5	1		2	2		2						11						
TOTAL NATIVE SHRUBS		33.73	1364.80	100.00	30	32	11	18	32	20	21	33	104	49	30	21	53	22	42	11	23	6	14	17
TOTAL DENSITY (stems/100 sq. m.)		44.70	(s=27.93)	100.00	32	34	86	32	32	39	21	48	104	60	36	30	53	23	68	16	37	6	14	17
TOTAL DENSITY (stems/acre)		1808.94	(s=1130.23)		1295	1376	3480	1295	1295	1578	850	1942	4209	2428	1457	1214	2145	931	2752	647	1497	243	567	688
SPECIES DENSITY (# of species/100 sq.m.)		2.23	(s=1.21)		3	5	3	4	2	3	1	4	1	3	2	3	1	3	2	2	2	1	1	1

J16 Phase III Woodland Tree Density Data – Fall 2022

PLANT SPECIES	SIZE	TREE DENSITY (census)	TREE DENSITY (#/acre)
NATIVE TREES			
Pinus edulis	(0-20cm)	3	3.50
Pinus edulis	(21-50cm)	24	28.02
Pinus edulis	(21-50cm)	56	65.38
Quercus gambelii	(0-20cm)	1	1.17
TOTAL NATIVE TREES		84	98.07
TOTAL DENSITY		84	98.07
SPECIES DENSITY		2	

Attachment 3: N14/J16 Raw Data – Spring 2023

N14/J16 Phase III Grassland Cover Data – Spring 2023

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Conyza canadensis	0.00	0.00	0.00	0.00	0.00																				
Descurainia pinnata	0.00	2.50	0.00	0.00	0.00															P					
Lappula redowskii	0.03	2.50	0.14	0.03	0.12																				
Lupinus brevicaulis	0.03	30.00	0.14	0.08	0.36			P							P					P	P	P 1	P 1		
Machaeranthera canescens	0.03	2.50	0.14	0.03	0.12																				
Mentzelia albicaulis	0.00	2.50	0.00	0.00	0.00										P										
Solanum triflorum	0.00	2.50	0.00	0.00	0.00																P				
TOTAL NATIVE ANN. & BIEN. FORBS	0.08	32.50	0.42	0.13	0.60			P							P					P	P	P 1	P 1		
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Erodium cicutarium	0.00	2.50	0.00	0.00	0.00															P					
Kochia scoparia	0.00	12.50	0.00	0.05	0.24													P 1		P		P 1			
Ranunculus testiculatus	0.00	5.00	0.00	0.00	0.00	P															P				
Salsola iberica	0.03	2.50	0.14	0.03	0.12			1																	
Tragopogon dubius	0.03	7.50	0.14	0.05	0.24									P 1										P	
TOTAL INTRO. ANN. & BIEN. FORBS	0.05	27.50	0.28	0.13	0.60	P		1						P 1				P 1		P	P	P 1		P	
NATIVE PERENNIAL FORBS																									
Astragalus calycosus var. scaposus	0.00	2.50	0.00	0.00	0.00												P								
Leucelene ericoides	0.00	2.50	0.00	0.00	0.00												P								
Ratibida columnaris	0.00	5.00	0.00	0.00	0.00																				
Sphaeralcea coccinea	0.00	22.50	0.00	0.03	0.12			P									P		P 1		P			P	
Virgulus ericoides	0.03	2.50	0.14	0.03	0.12															1					
TOTAL NATIVE PERENNIAL FORBS	0.03	25.00	0.14	0.05	0.24			P									P		P 1	1	P			P	
INTRODUCED PERENNIAL FORBS																									
Scorzonera laciniata	0.00	5.00	0.00	0.00	0.00																				
TOTAL INTRO. PERENNIAL FORBS	0.00	5.00	0.00	0.00	0.00																				
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.23	10.00	1.26	0.25	1.21	P								3 1	3		3								
Agropyron smithii	0.38	32.50	2.11	0.48	2.29	2		2	1					P 1	2	5 1	1	P 1	P 1	P				P	
Oryzopsis hymenoides	0.00	5.00	0.00	0.00	0.00																			P	
TOTAL NATIVE PERENNIAL GRASSES (c)	0.60	32.50	3.37	0.73	3.50	2		2	1					3 2	5	5 1	4	P 1	P 1	P				P	
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua curtipendula	0.00	2.50	0.00	0.00	0.00																			P	
Bouteloua gracilis	0.60	70.00	3.37	0.98	4.71	P	1	2	P 1		2 2			P 1	P		P		P 1	P	2 1		P 1	P	3
Buchloe dactyloides	0.03	7.50	0.14	0.03	0.12	P															1				
Hilaria jamesii	0.83	70.00	4.63	1.50	7.25	P	1	P 1	P 1	P 1	P 2		P 1					P 1	P 1	P	P 1	P 1	1 1		1 3
Sporobolus airoides	1.18	72.50	6.60	1.50	7.25	P	1	P		1	2			P 1				P 1	P 1	P	1 1		2 1	P	1 1
Sporobolus cryptandrus	0.08	15.00	0.42	0.08	0.36															2	P			P	
TOTAL NATIVE PERENNIAL GRASSES (w)	2.70	92.50	15.17	4.08	19.69	P	3	2 1	P 2	1 1	4 4		P 1	P 2	P		P	P 2	P 3	2	4 3	P 1	3 3	P	5 4
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron elongatum	0.00	2.50	0.00	0.00	0.00															P					
Elymus junceus	12.35	95.00	69.38	12.88	62.20	17 2	13 3	8	14	20 1	8 1	28 2	21 1	7 1	4	10 1	9 1	20 1	13 1	22 1	23 1	7 1	20 1	7	
TOTAL INTRO. PERENNIAL GRASSES (c)	12.35	95.00	69.38	12.88	62.20	17 2	13 3	8	14	20 1	8 1	28 2	21 1	7 1	4	10 1	9 1	20 1	13 1	22 1	23 1	7 1	20 1	7	

N14/J16 Phase III Grassland Cover Data – Spring 2023 (continued)

| PLANT SPECIES | AVERAGE COVER (%) | FREQUENCY (%) | RELATIVE VEGETATION COVER (%) | AVERAGE COVER-ALL (%) | RELATIVE VEGETATION COVER-ALL (%) | Percent Foliar Cover | | |

N14/J16 Phase III Grassland Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.10	17.50	0.56	0.13	0.60	P		P											P 1						
Chrysothamnus greenei	0.00	2.50	0.00	0.00	0.00																			P	
Gutierrezia sarothrae	0.00	15.00	0.00	0.08	0.36									P 1	P	P 1		P 1		P				P	
Senecio douglasii var. longilobus	0.00	2.50	0.00	0.00	0.00															P					
TOTAL NATIVE SUBSHRUBS	0.10	32.50	0.56	0.20	0.97	P		P						P 1	P	P 1		P 1	P 1	P				P	
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.83	45.00	4.63	1.20	5.80	P		P						2 1				P 1	P 1					P	
TOTAL INTRO. SUBSHRUBS	0.83	45.00	4.63	1.20	5.80	P		P						2 1				P 1	P 1					P	
NATIVE SHRUBS																									
Artemisia tridentata	0.05	5.00	0.28	0.05	0.24			P																	
Atriplex canescens	1.00	77.50	5.62	1.20	5.80	2	7	P		2	1	3	5	P 1	1 1	P 1	1	P 1	1 1		P	P 1	P 1	P	
Atriplex confertifolia	0.03	7.50	0.14	0.05	0.24					1												P 1			
Chrysothamnus nauseosus	0.00	17.50	0.00	0.03	0.12									P 1	P		P			P				P	
TOTAL NATIVE SHRUBS	1.08	80.00	6.04	1.33	6.40	2	7	P		3	1	3	5	P 2	1 1	P 1	1	P 1	1 1	P	P	P 2	P 1	P	
SUCCULENTS																									
Opuntia phaeacantha	0.00	5.00	0.00	0.00	0.00												P								
TOTAL SUCCULENTS	0.00	5.00	0.00	0.00	0.00												P								
BRYOPHYTES																									
Moss spp.	0.00	0.00	0.00	0.00	0.00																				
TOTAL BRYOPHYTES	0.00	0.00	0.00	0.00	0.00																				
Standing dead	8.70	100.00		8.70		2	5	10	11	8	18	2	6	8	4	6	6	4	4	3	9	4	3	10	42
Litter	17.03	100.00		17.03		21	12	9	26	19	19	17	20	15	21	19	14	23	12	20	21	4	18	13	11
Bare ground	50.00	100.00		50.00		53	50	55	34	37	31	34	33	58	65	54	59	52	67	45	40	63	53	68	41
Rock	6.48	100.00		6.48		3	10	13	14	12	19	16	15	7	0	6	7	1	3	7	3	22	3	2	1
TOTALS	100.00		100.00	102.90	100.00	100 2	100 3	100 1	100 2	100 2	100 5	100 2	100 2	100 10	100 1	100 4	100 1	100 8	100 9	100 1	100 4	100 6	100 6	100 0	100 4
TOTAL VEGETATION COVER	17.80	s=(6.93)		20.70	s=(7.35)	21 2	23 3	13 1	15 2	24 2	13 5	31 2	26 2	12 10	10 1	15 4	14 1	20 8	14 9	25 1	27 4	7 6	23 6	7 0	5 4
GROUND COVER (Veg+Litter+St.Dead+Rock)	50.00	s=(9.78)		52.90	s=(9.93)	47 2	50 3	45 1	66 2	63 2	69 5	66 2	67 2	42 10	35 1	46 4	41 1	48 8	33 9	55 1	60 4	37 6	47 6	32 0	59 4
Allowable Vegetation Cover	**17.80**	**s=(6.93)**				**21.0**	**23.0**	**13.0**	**15.0**	**24.0**	**13.0**	**31.0**	**26.0**	**12.0**	**10.0**	**15.0**	**14.0**	**20.0**	**14.0**	**25.0**	**27.0**	**7.0**	**23.0**	**7.0**	**5.0**
SPECIES DENSITY (# of species/100 sq.m.)	6.90	s=(3.73)				11	5	12	4	5	5	2	3	10	9	4	10	8	9	15	11	6	6	14	3

N14/J16 Phase III Grassland Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.10	17.50	0.56	0.13	0.60							3	1		P	P									
Chrysothamnus greenei	0.00	2.50	0.00	0.00	0.00																				
Gutierrezia sarothrae	0.00	15.00	0.00	0.08	0.36																				
Senecio douglasii var. longilobus	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE SUBSHRUBS	0.10	32.50	0.56	0.20	0.97							3	1		P	P									
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.83	45.00	4.63	1.20	5.80	4 1		P 1	15 3	1	P	P	5 2		1	P			2 2				1		2 3
TOTAL INTRO. SUBSHRUBS	0.83	45.00	4.63	1.20	5.80	4 1		P 1	15 3	1	P	P	5 2		1	P			2 2				1		2 3
NATIVE SHRUBS																									
Artemisia tridentata	0.05	5.00	0.28	0.05	0.24										2										
Atriplex canescens	1.00	77.50	5.62	1.20	5.80	4 1		1			1	P	1	1	P	P			P	2	1	3	1		2
Atriplex confertifolia	0.03	7.50	0.14	0.05	0.24						P														
Chrysothamnus nauseosus	0.00	17.50	0.00	0.03	0.12														P	P					
TOTAL NATIVE SHRUBS	1.08	80.00	6.04	1.33	6.40	4 1		1			1	P	1	1	2	P			P	2	1	3	1		2
SUCCULENTS																									
Opuntia phaeacantha	0.00	5.00	0.00	0.00	0.00															P					
TOTAL SUCCULENTS	0.00	5.00	0.00	0.00	0.00															P					
BRYOPHYTES																									
Moss spp.	0.00	0.00	0.00	0.00	0.00																				
TOTAL BRYOPHYTES	0.00	0.00	0.00	0.00	0.00																				
Standing dead	8.70	100.00		8.70		0	2	4	7	24	9	13	15	21	9	20	9	5	4	3	6	5	10	4	13
Litter	17.03	100.00		17.03		26	21	11	15	15	14	18	14	9	13	13	10	17	24	18	20	26	27	22	14
Bare ground	50.00	100.00		50.00		34	53	64	47	53	53	44	47	56	51	57	52	55	51	58	58	39	42	47	47
Rock	6.48	100.00		6.48		8	13	8	2	2	6	0	2	1	6	1	11	8	0	5	0	5	4	6	7
TOTALS	100.00		100.00	102.90	100.00	100 2	100 2	100 3	100 5	100 1	100 0	100 0	100 2	100 1	100 0	100 0	100 6	100 1	100 3	100 0	100 3	100 2	100 2	100 2	100 8
TOTAL VEGETATION COVER	17.80	s=(6.93)		20.70	s=(7.35)	32 2	11 2	13 3	29 5	6 1	18 0	25 0	22 2	13 1	21 0	9 0	18 6	15 1	21 3	16 0	16 3	25 2	17 2	21 2	19 8
GROUND COVER (Veg+Litter+St.Dead+Rock)	50.00	s=(9.78)		52.90	s=(9.93)	66 2	47 2	36 3	53 5	47 1	47 0	56 0	53 2	44 1	49 0	43 0	48 6	45 1	49 3	42 0	42 3	61 2	58 2	53 2	53 8
Allowable Vegetation Cover	**17.80**	**s=(6.93)**				**32.0**	**11.0**	**13.0**	**29.0**	**6.0**	**18.0**	**25.0**	**22.0**	**13.0**	**21.0**	**9.0**	**18.0**	**15.0**	**21.0**	**16.0**	**16.0**	**25.0**	**17.0**	**21.0**	**19.0**
SPECIES DENSITY (# of species/100 sq.m.)	6.90	s=(3.73)				3	2	5	4	4	12	9	6	5	11	9	3	2	12	13	4	5	7	2	6

N14/J16 Phase III Shrubland Cover Data – Spring 2023

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Descurainia richardsonii	0.00	5.00	0.00	0.00	0.00		P																P		
Lappula redowskii	0.03	22.50	0.14	0.05	0.23		P			P												P	P	P	1
Lupinus brevicaulis	0.00	2.50	0.00	0.00	0.00																	P			
Machaeranthera canescens	0.00	7.50	0.00	0.03	0.11																	P			
Phacelia crenulata	0.00	2.50	0.00	0.00	0.00					P															
Phacelia ivesiana	0.00	2.50	0.00	0.00	0.00		P																		
Townsendia annua	0.00	2.50	0.00	0.00	0.00																			P	
TOTAL NATIVE ANN. & BIEN. FORBS	0.03	27.50	0.14	0.08	0.34		P			P												P	P	P	1
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Alyssum minus	0.00	2.50	0.00	0.00	0.00																	P			
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	2.50	0.00	0.00	0.00																	P			
NATIVE ANNUAL GRASSES																									
Festuca octoflora	0.00	2.50	0.00	0.00	0.00																	P			
TOTAL NATIVE ANNUAL GRASSES	0.00	2.50	0.00	0.00	0.00																	P			
INTRODUCED ANNUAL GRASSES																									
Bromus tectorum	0.40	15.00	2.18	0.45	2.06	P 1	P 1															P			
TOTAL INTRODUCED ANNUAL GRASSES	0.40	15.00	2.18	0.45	2.06	P 1	P 1															P			
NATIVE PERENNIAL FORBS																									
Astragalus calycosus var. scaposus	0.00	2.50	0.00	0.00	0.00					P															
Astragalus wingatanus	0.00	7.50	0.00	0.03	0.11					P															
Cymopterus purpurascens	0.00	2.50	0.00	0.00	0.00					P															
Cymopterus purpureus	0.00	2.50	0.00	0.00	0.00					P															
Erigeron concinnus	0.00	2.50	0.00	0.00	0.00																	P			
Leucelene ericoides	0.00	5.00	0.00	0.00	0.00					P															
Penstemon palmeri	0.00	2.50	0.00	0.00	0.00																				
Phlox longifolia	0.00	2.50	0.00	0.00	0.00					P															
Sphaeralcea coccinea	0.00	20.00	0.00	0.03	0.11		P	P		P											P				P
TOTAL NATIVE PERENNIAL FORBS	0.00	27.50	0.00	0.05	0.23		P	P		P											P	P			P
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.03	10.00	0.14	0.05	0.23			P																	
Agropyron smithii	0.13	35.00	0.68	0.20	0.92		P	P					P 1		1							P	P		
Festuca arizonica	0.00	5.00	0.00	0.03	0.11																				
Oryzopsis hymenoides	0.05	5.00	0.27	0.05	0.23					P			2												
Sitanion hystrix	0.03	5.00	0.14	0.03	0.11					P															
Stipa comata	0.10	2.50	0.54	0.10	0.46																				
TOTAL NATIVE PERENNIAL GRASSES (c)	0.33	37.50	1.77	0.45	2.06		P	P		P			2 1		1							P	P		
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua curtipendula	0.03	5.00	0.14	0.03	0.11																				
Bouteloua gracilis	0.38	57.50	2.04	0.58	2.64		P 1	1		P 1	1					1 1	1	1		P		P	P	1 1	P
Buchloe dactyloides	0.00	12.50	0.00	0.03	0.11		P																	P	
Hilaria jamesii	0.58	75.00	3.13	1.33	6.08	P 1	P 1	P	P 1	P					1	3 2	P 3	2 1		1	1	P 1	3 1	5 4	1 1
Sporobolus airoides	0.63	65.00	3.40	0.98	4.47	2	P 1	P					1		1	2	P 1			3	1 1	1	P	5 2	P 1
Sporobolus cryptandrus	0.05	15.00	0.27	0.05	0.23		P	P															1	P	
TOTAL NATIVE PERENNIAL GRASSES (w)	1.65	82.50	8.98	2.98	13.65	2 1	P 3	1	P 1	P 1	1		1		2	6 3	1 4	3 1		4	2 1	1 1	4 1	11 7	1 2

N14/J16 Phase III Shrubland Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Descurainia richardsonii	0.00	5.00	0.00	0.00	0.00																				
Lappula redowskii	0.03	22.50	0.14	0.05	0.23					P 1		P	P												
Lupinus brevicaulis	0.00	2.50	0.00	0.00	0.00																				
Machaeranthera canescens	0.00	7.50	0.00	0.03	0.11																P				P 1
Phacelia crenulata	0.00	2.50	0.00	0.00	0.00																				
Phacelia ivesiana	0.00	2.50	0.00	0.00	0.00																				
Townsendia annua	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.03	27.50	0.14	0.08	0.34					P 1		P	P								P				P 1
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Alyssum minus	0.00	2.50	0.00	0.00	0.00																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	2.50	0.00	0.00	0.00																				
NATIVE ANNUAL GRASSES																									
Festuca octoflora	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE ANNUAL GRASSES	0.00	2.50	0.00	0.00	0.00																				
INTRODUCED ANNUAL GRASSES																									
Bromus tectorum	0.40	15.00	2.18	0.45	2.06								P				1							15	
TOTAL INTRODUCED ANNUAL GRASSES	0.40	15.00	2.18	0.45	2.06								P				1							15	
NATIVE PERENNIAL FORBS																									
Astragalus calycosus var. scaposus	0.00	2.50	0.00	0.00	0.00																				
Astragalus wingatanus	0.00	7.50	0.00	0.03	0.11																P				P 1
Cymopterus purpurascens	0.00	2.50	0.00	0.00	0.00																				
Cymopterus purpureus	0.00	2.50	0.00	0.00	0.00																				
Erigeron concinnus	0.00	2.50	0.00	0.00	0.00																				
Leucelene ericoides	0.00	5.00	0.00	0.00	0.00							P													
Penstemon palmeri	0.00	2.50	0.00	0.00	0.00							P													
Phlox longifolia	0.00	2.50	0.00	0.00	0.00																				
Sphaeralcea coccinea	0.00	20.00	0.00	0.03	0.11			P				P				P 1									
TOTAL NATIVE PERENNIAL FORBS	0.00	27.50	0.00	0.05	0.23			P				P				P 1					P				P 1
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.03	10.00	0.14	0.05	0.23							P									P				1 1
Agropyron smithii	0.13	35.00	0.68	0.20	0.92							1				P 1		1			P	P	P	P	2 1
Festuca arizonica	0.00	5.00	0.00	0.03	0.11																P				P 1
Oryzopsis hymenoides	0.05	5.00	0.27	0.05	0.23																				
Sitanion hystrix	0.03	5.00	0.14	0.03	0.11																			1	
Stipa comata	0.10	2.50	0.54	0.10	0.46																			4	
TOTAL NATIVE PERENNIAL GRASSES (c)	0.33	37.50	1.77	0.45	2.06							1				P 1		1			P	P	P	5	3 3
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua curtipendula	0.03	5.00	0.14	0.03	0.11							P												1	
Bouteloua gracilis	0.38	57.50	2.04	0.58	2.64	3 1	1 1	1				3	P					1			P	P	P	P 1	P 1
Buchloe dactyloides	0.00	12.50	0.00	0.03	0.11										P 1	P						P			
Hilaria jamesii	0.58	75.00	3.13	1.33	6.08	1 2	1 1	P	P 1	P 1		P	P		P 1	P 1	1				P	P	P	3 6	P 1
Sporobolus airoides	0.63	65.00	3.40	0.98	4.47		1 1	3	P 1	2 1		P	P		P 1	P					2 3	P	P	P	1 1
Sporobolus cryptandrus	0.05	15.00	0.27	0.05	0.23	1																P			
TOTAL NATIVE PERENNIAL GRASSES (w)	1.65	82.50	8.98	2.98	13.65	5 3	3 3	4	P 2	2 2		3	P		P 3	P 1	1	1			2 3	P	P	4 7	1 3

N14/J16 Phase III Shrubland Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron intermedium	0.00	2.50	0.00	0.00	0.00																				
Elymus junceus	11.78	97.50	64.08	12.75	58.49	5	10 1	3	15 2	6	11	12	10 1	18 1	8 1	11	8 1	16 3	19 2	5		19	16	2	7
TOTAL INTRO. PERENNIAL GRASSES (c)	11.78	97.50	64.08	12.75	58.49	5	10 1	3	15 2	6	11	12	10 1	18 1	8 1	11	8 1	16 3	19 2	5		19	16	2	7
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.00	7.50	0.00	0.08	0.34		P 1																		
Chrysothamnus greenei	0.00	7.50	0.00	0.03	0.11					P															
Gutierrezia sarothrae	0.03	25.00	0.14	0.08	0.34			P		P												P			
TOTAL NATIVE SUBSHRUBS	0.03	30.00	0.14	0.18	0.80		P 1	P		P												P			
INTRODUCED SUBSHRUBS																									
Kochia prostrata	1.75	47.50	9.52	2.20	10.09		4 1	16 2		6 1	1 2	5 1					1 2						P 1		9 2
TOTAL INTRO. SUBSHRUBS	1.75	47.50	9.52	2.20	10.09		4 1	16 2		6 1	1 2	5 1					1 2						P 1		9 2
NATIVE SHRUBS																									
Artemisia tridentata	0.00	5.00	0.00	0.00	0.00			P		P															
Atriplex canescens	2.25	87.50	12.24	2.43	11.12		1 1	P	2	P			2	2	1	3		5	2 1	1	1	3	2	2	2
Atriplex confertifolia	0.03	7.50	0.14	0.03	0.11		P																		
Chrysothamnus nauseosus	0.15	15.00	0.82	0.18	0.80						1														
Cowania mexicana	0.00	5.00	0.00	0.03	0.11																				
TOTAL NATIVE SHRUBS	2.43	90.00	13.20	2.65	12.16		1 1	P	2	P	1		2	2	1	3		5	2 1	1	1	3	2	2	2
NATIVE TREES																									
Pinus edulis	0.00	2.50	0.00	0.00	0.00					P															
TOTAL NATIVE TREES	0.00	2.50	0.00	0.00	0.00					P															
SUCCULENTS																									
Echinocereus triglochidiatus var. melanacanthus	0.00	2.50	0.00	0.00	0.00																				
Opuntia phaeacantha	0.00	5.00	0.00	0.03	0.11																			P	
TOTAL SUCCULENTS	0.00	7.50	0.00	0.03	0.11																			P	
Standing dead	10.15	97.50		10.15		5	6	10	14	7	4	10	7	5	5	4	7	5	2	22	44	4	9	30	6
Litter	17.43	100.00		17.43		11	14	10	19	16	18	11	17	30	21	19	14	13	27	9	22	24	16	17	21
Bare ground	45.85	100.00		45.85		73	57	50	47	34	43	56	45	32	48	43	63	38	47	55	31	46	44	34	47
Rock	8.20	95.00		8.20		4	8	10	3	31	21	6	16	13	14	14	6	20	3	4		3	9	4	6
TOTALS	100.00		100.00	103.43	100.00	100 2	100 8	100 2	100 3	100 2	100 2	100 1	100 2	100 1	100 1	100 3	100 7	100 4	100 3	100 0	100 1	100 1	100 2	100 7	100 4
TOTAL VEGETATION COVER	18.38	s=(7.05)		21.80	s=(8.39)	7 2	15 8	20 2	17 3	12 2	14 2	17 1	15 2	20 1	12 1	20 3	10 7	24 4	21 3	10 0	3 1	23 1	22 2	15 7	20 4
GROUND COVER (Veg+Litter+St.Dead+Rock)	54.15	s=(12.83)		57.58	s=(13.87)	27 2	43 8	50 2	53 3	66 2	57 2	44 1	55 2	68 1	52 1	57 3	37 7	62 4	53 3	45 0	69 1	54 1	56 2	66 7	53 4
Allowable Vegetation Cover	**18.38**	**s=(7.05)**				**7.0**	**15.0**	**20.0**	**17.0**	**12.0**	**14.0**	**17.0**	**15.0**	**20.0**	**12.0**	**20.0**	**10.0**	**24.0**	**21.0**	**10.0**	**3.0**	**23.0**	**22.0**	**15.0**	**20.0**
SPECIES DENSITY (# of species/100 sq.m.)	7.23	s=(4.73)				4	16	12	3	20	4	2	5	2	5	5	5	4	2	6	3	14	10	10	8

N14/J16 Phase III Shrubland Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron intermedium	0.00	2.50	0.00	0.00	0.00							P													
Elymus junceus	11.78	97.50	64.08	12.75	58.49	11 1	17 1	14	15 1	10 1	20 1	7	13	7 1	28 1	10 1	21 3	10 2	18 2	10 1	20 4	13 2	15 4	P	11 1
TOTAL INTRO. PERENNIAL GRASSES (c)	11.78	97.50	64.08	12.75	58.49	11 1	17 1	14	15 1	10 1	20 1	7	13	7 1	28 1	10 1	21 3	10 2	18 2	10 1	20 4	13 2	15 4	P	11 1
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.00	7.50	0.00	0.08	0.34					P 1						P 1									
Chrysothamnus greenei	0.00	7.50	0.00	0.03	0.11																P				P 1
Gutierrezia sarothrae	0.03	25.00	0.14	0.08	0.34							P	P			P 1		1			P	P			P 1
TOTAL NATIVE SUBSHRUBS	0.03	30.00	0.14	0.18	0.80					P 1		P	P			P 2		1			P	P			P 2
INTRODUCED SUBSHRUBS																									
Kochia prostrata	1.75	47.50	9.52	2.20	10.09			1	P 1	P 1	1				P 1					19 2	P	P	1	P	6 1
TOTAL INTRO. SUBSHRUBS	1.75	47.50	9.52	2.20	10.09			1	P 1	P 1	1				P 1					19 2	P	P	1	P	6 1
NATIVE SHRUBS																									
Artemisia tridentata	0.00	5.00	0.00	0.00	0.00																				
Atriplex canescens	2.25	87.50	12.24	2.43	11.12	3	4	5	2 1	1 1	3	P	P	2	4 1	2 1	2	1	1		9	7	6	9	P 1
Atriplex confertifolia	0.03	7.50	0.14	0.03	0.11																	1	P		
Chrysothamnus nauseosus	0.15	15.00	0.82	0.18	0.80							P									P		P	3	2 1
Cowania mexicana	0.00	5.00	0.00	0.03	0.11																P				P 1
TOTAL NATIVE SHRUBS	2.43	90.00	13.20	2.65	12.16	3	4	5	2 1	1 1	3	P	P	2	4 1	2 1	2	1	1		9	8	6	12	2 3
NATIVE TREES																									
Pinus edulis	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE TREES	0.00	2.50	0.00	0.00	0.00																				
SUCCULENTS																									
Echinocereus triglochidiatus var. melanacanthus	0.00	2.50	0.00	0.00	0.00							P													
Opuntia phaeacantha	0.00	5.00	0.00	0.03	0.11											P 1									
TOTAL SUCCULENTS	0.00	7.50	0.00	0.03	0.11							P				P 1									
Standing dead	10.15	97.50		10.15		7	8	9	6	6	10	13	14	23	4	7	10	17	5	3	20		5	23	10
Litter	17.43	100.00		17.43		25	18	16	13	12	14	14	15	12	12	20	13	11	23	17	27	23	25	14	24
Bare ground	45.85	100.00		45.85		45	45	47	58	66	49	58	54	56	43	58	45	55	51	40	20	47	32	1	31
Rock	8.20	95.00		8.20		4	5	4	6	3	3	4	4		9	3	7	3	2	11	2	9	16	26	12
TOTALS	100.00		100.00	103.43	100.00	100 4	100 4	100 0	100 5	100 7	100 1	100 0	100 0	100 1	100 6	100 8	100 3	100 2	100 2	100 3	100 7	100 2	100 4	100 7	100 15
TOTAL VEGETATION COVER	18.38	s=(7.05)		21.80	s=(8.39)	19 4	24 4	24 0	17 5	13 7	24 1	11 0	13 0	9 1	32 6	12 8	25 3	14 2	19 2	29 3	31 7	21 2	22 4	36 7	23 15
GROUND COVER (Veg+Litter+St.Dead+Rock)	54.15	s=(12.83)		57.58	s=(13.87)	55 4	55 4	53 0	42 5	34 7	51 1	42 0	46 0	44 1	57 6	42 8	55 3	45 2	49 2	60 3	80 7	53 2	68 4	99 7	69 15
Allowable Vegetation Cover	**18.38**	**s=(7.05)**				**19.0**	**24.0**	**24.0**	**17.0**	**13.0**	**24.0**	**11.0**	**13.0**	**9.0**	**32.0**	**12.0**	**25.0**	**14.0**	**19.0**	**29.0**	**31.0**	**21.0**	**22.0**	**36.0**	**23.0**
SPECIES DENSITY (# of species/100 sq.m.)	7.23	s=(4.73)				5	5	7	5	7	3	16	8	2	6	10	4	5	2	2	15	11	9	12	15

J7 Sagebrush Reference Area Cover Data – Spring 2023

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																									
						1		2		3		4		5		6		7		8		9		10		11		12		13		14		15	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																																	
Cryptantha minima	0.00	20.00	0.00	0.07	0.34									P				P				P	1										
Descurainia richardsonii	0.07	86.67	0.40	0.07	0.34	P		P				P		P		P		P				P		P		P		P		P		P	
Gilia pumila	0.00	6.67	0.00	0.00	0.00																									P			
Lappula redowskii	0.00	46.67	0.00	0.00	0.00			P				P		P				P		P				P						P			
Lupinus brevicaulis	0.00	33.33	0.00	0.00	0.00									P		P								P		P				P			
Oenothera albicaulis	0.00	33.33	0.00	0.00	0.00	P								P								P		P			P						
Plantago patagonica	0.07	20.00	0.40	0.07	0.34					P				P				1															
Solanum triflorum	0.00	6.67	0.00	0.00	0.00																	P											
Townsendia annua	0.87	100.00	5.24	0.87	4.47	3		1		P		2		4		P		2		P		1		P		P		P		P		P	
TOTAL NATIVE ANN. & BIEN. FORBS	1.00	100.00	6.05	1.07	5.50	3		1		P		2		4		P		3		P		1	1	P		P		P		1		P	
NATIVE ANNUAL GRASSES																																	
Festuca octoflora	0.07	46.67	0.40	0.07	0.34							P		P				P		P		P		P						1			
TOTAL NATIVE ANNUAL GRASSES	0.07	46.67	0.40	0.07	0.34							P		P				P		P		P		P						1			
NATIVE PERENNIAL FORBS																																	
Calochortus nuttallii	0.00	20.00	0.00	0.00	0.00	P		P																						P			
Cymopterus purpurascens	0.07	80.00	0.40	0.07	0.34	P		P		P		P		P		P				1		P		P		P			P	P			
Delphinium scaposum	0.07	40.00	0.40	0.07	0.34	P				P						P								P						P		1	
Leucelene ericoides	0.00	26.67	0.00	0.00	0.00	P				P																				P		P	
Sphaeralcea coccinea	0.00	46.67	0.00	0.00	0.00					P		P										P		P					P	P		P	
TOTAL NATIVE PERENNIAL FORBS	0.13	86.67	0.81	0.13	0.69	P		P		P		P		P		P				1		P		P		P			P	P		1	
NATIVE PERENNIAL GRASSES (cool)																																	
Oryzopsis hymenoides	0.07	20.00	0.40	0.07	0.34											P														1			
Sitanion hystrix	3.73	100.00	22.58	5.13	26.46	5	1	4		2		3		2	1	3	1	5	1	5	2	2	4	7	3	5	1	7	1	2	2	P	1	4	3
TOTAL NATIVE PERENNIAL GRASSES (c)	3.80	100.00	22.98	5.20	26.80	5	1	4		2		3		2	1	3	1	5	1	5	2	2	4	7	3	5	1	7	1	2	2	1	1	4	3
NATIVE PERENNIAL GRASSES (warm)																																	
Bouteloua gracilis	1.73	100.00	10.48	2.40	12.37	1		1		1	1	2		1		2	1	4		P		1		2	3	4	1	2	1	2	2	1	1	2	
Hilaria jamesii	1.00	80.00	6.05	1.27	6.53							2		1		P		1	1	6	2	5	1	P		P		P		P		P		P	
Muhlenbergia torreyi	0.00	6.67	0.00	0.00	0.00							P																					
Sporobolus cryptandrus	0.00	6.67	0.00	0.00	0.00																									P			
TOTAL NATIVE PERENNIAL GRASSES (w)	2.73	100.00	16.53	3.67	18.90	1		1		1	1	4		2		2	1	5	1	6	2	6	1	2	3	4	1	2	1	2	2	1	1	2	
NATIVE SUBSHRUBS																																	
Ceratoides lanata	0.47	66.67	2.82	0.47	2.41	1		P		P		P				1								P				3		P		2		P	
Chrysothamnus greenei	2.67	100.00	16.13	2.87	14.78	1		5		4		P		P		7		P		P		P		1		P		2		7	2	8		5	1
Gutierrezia sarothrae	0.07	6.67	0.40	0.07	0.34																	1											
TOTAL NATIVE SUBSHRUBS	3.20	100.00	19.35	3.40	17.53	2		5		4		P		P		8		P		P		1		1		P		5		7	2	10		5	1
INTRODUCED SUBSHRUBS																																	
Kochia prostrata	0.00	6.67	0.00	0.00	0.00													P															
TOTAL INTRO. SUBSHRUBS	0.00	6.67	0.00	0.00	0.00													P															
NATIVE SHRUBS																																	
Artemisia tridentata	4.33	100.00	26.21	4.53	23.37	5		5		8		7		2		4		3		2		3		2		7		3	1	4		4	1	6	1
Atriplex canescens	1.27	73.33	7.66	1.27	6.53	2				P				1		1		1		2		6		1				1		3				1	
TOTAL NATIVE SHRUBS	5.60	100.00	33.87	5.80	29.90	7		5		8		7		3		5		4		4		9		3		7		4	1	7		4	1	7	1

J7 Sagebrush Reference Area Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
SUCCULENTS																				
Coryphantha vivipara	0.00	40.00	0.00	0.00	0.00			P				P			P	P	P			P
Opuntia phaeacantha	0.00	6.67	0.00	0.00	0.00												P			
Opuntia whipplei	0.00	6.67	0.00	0.07	0.34										P 1					
TOTAL SUCCULENTS	0.00	40.00	0.00	0.07	0.34			P				P			P 1	P	P			P
LICHEN/FUNGUS																				
Lichen spp.	0.40	100.00	2.42	0.40	2.06	1	1	P	P	P	1	P	P	1	P	P	P	1	P	1
TOTAL LICHEN	0.40	100.00	2.42	0.40	2.06	1	1	P	P	P	1	P	P	1	P	P	P	1	P	1
Standing dead	13.53	100.00		13.53		7	13	8	10	15	7	9	22	20	20	12	21	14	13	12
Litter	27.40	100.00		27.40		23	25	35	33	33	21	35	34	20	36	35	21	19	17	24
Bare ground	41.33	100.00		41.33		46	45	42	41	41	52	39	28	40	31	37	39	43	53	43
Rock	0.80	33.33		0.80		5					1						1	4		1
TOTALS	100.00		100.00	102.87	100.00	100 1	100 0	100 1	100 0	100 1	100 2	100 2	100 4	100 6	100 7	100 2	100 3	100 6	100 3	100 5
TOTAL VEGETATION COVER	16.53	s=(2.26)		19.40	s=(3.58)	18 1	16 0	15 1	16 0	11 1	18 2	17 2	16 4	19 6	13 7	16 2	18 3	19 6	17 3	19 5
GROUND COVER (Veg+Litter+St.Dead+Rock)	58.67	s=(6.59)		61.53	s=(7.69)	54 1	55 0	58 1	59 0	59 1	48 2	61 2	72 4	60 6	69 7	63 2	61 3	57 6	47 3	57 5
Allowable Vegetation Cover	**16.53**	**s=(2.26)**				**18.0**	**16.0**	**15.0**	**16.0**	**11.0**	**18.0**	**17.0**	**16.0**	**19.0**	**13.0**	**16.0**	**18.0**	**19.0**	**17.0**	**19.0**
SPECIES DENSITY (# of species/100 sq.m.)	13.33	s=(2.47)				13	10	13	13	15	13	14	10	15	18	10	12	13	18	13

N7/8 Sagebrush Reference Area Cover Data – Spring 2023

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																				
Cryptantha minima	0.00	6.67	0.00	0.07	0.29				P 1											
Descurainia pinnata	0.00	6.67	0.00	0.07	0.29											P 1				
Gilia aggregata	0.00	13.33	0.00	0.07	0.29				P							P 1				
Gilia pumila	0.00	6.67	0.00	0.00	0.00						P									
Lappula redowskii	0.47	60.00	2.42	0.60	2.59	P			P	P	P 1	3	P		3	P 1			1	
Lupinus brevicaulis	0.20	40.00	1.04	0.20	0.86	1	2		P		P		P			P				
Solanum triflorum	0.00	6.67	0.00	0.00	0.00								P							
TOTAL NATIVE ANN. & BIEN. FORBS	0.67	66.67	3.46	1.00	4.31	1	2		P 1	P	P 1	3	P		3	P 3			1	
INTRODUCED ANNUAL & BIENNIAL FORBS																				
Kochia scoparia	0.00	13.33	0.00	0.00	0.00											P		P		
Salsola iberica	0.00	13.33	0.00	0.00	0.00												P		P	
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	26.67	0.00	0.00	0.00											P	P	P	P	
NATIVE ANNUAL GRASSES																				
Festuca octoflora	0.00	6.67	0.00	0.00	0.00							P								
TOTAL NATIVE ANNUAL GRASSES	0.00	6.67	0.00	0.00	0.00							P								
INTRODUCED ANNUAL GRASSES																				
Bromus tectorum	0.33	13.33	1.73	0.33	1.44				5									P		
TOTAL INTRODUCED ANNUAL GRASSES	0.33	13.33	1.73	0.33	1.44				5									P		
NATIVE PERENNIAL FORBS																				
Allium macropetalum	0.00	40.00	0.00	0.07	0.29				P	P	P	P	P			P 1				
Astragalus calycosus var. scaposus	0.00	46.67	0.00	0.07	0.29				P	P		P				P 1	P		P	P
Astragalus newberryi	0.00	6.67	0.00	0.00	0.00						P									
Astragalus wingatanus	0.07	26.67	0.35	0.13	0.57	P				1	P					P 1				
Cryptantha flavoculata	0.07	20.00	0.35	0.13	0.57	P										P 1				1
Cymopterus purpurascens	0.13	40.00	0.69	0.20	0.86				P	P	P	P				1 1	1			
Cymopterus purpureus	0.07	20.00	0.35	0.13	0.57	1						P				P 1				
Delphinium scaposum	0.00	13.33	0.00	0.00	0.00				P				P							
Lesquerella intermedia	0.00	6.67	0.00	0.07	0.29											P 1				
Leucelene ericoides	0.40	53.33	2.08	0.47	2.01	1		1	P	2	1		P	1		P 1				
Penstemon linarioides	0.00	6.67	0.00	0.00	0.00															P
Penstemon palmeri	0.00	6.67	0.00	0.00	0.00															P
Phlox longifolia	0.00	26.67	0.00	0.00	0.00	P				P	P		P							
Sphaeralcea coccinea	0.27	66.67	1.38	0.47	2.01	P	2 1		P	P	1	P				P 1	1		P 1	P
Stanleya pinnata	0.00	6.67	0.00	0.00	0.00	P														
Trifolium gymnocarpon	0.00	6.67	0.00	0.00	0.00						P									
TOTAL NATIVE PERENNIAL FORBS	1.00	86.67	5.19	1.73	7.47	2	2 1	1	P	3	2	P	P	1		1 9	2		P 1	1
INTRODUCED PERENNIAL FORBS																				
Onobrychis viciifolia	0.00	13.33	0.00	0.00	0.00													P		P
TOTAL INTRO. PERENNIAL FORBS	0.00	13.33	0.00	0.00	0.00													P		P

N7/8 Sagebrush Reference Area Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (cool)																				
Agropyron dasystachyum	0.00	26.67	0.00	0.00	0.00												P	P	P	P
Agropyron smithii	0.00	40.00	0.00	0.00	0.00							P				P	P	P	P	P
Agropyron spicatum	0.00	6.67	0.00	0.00	0.00													P		
Agropyron trachycaulum	0.00	6.67	0.00	0.00	0.00														P	
Oryzopsis hymenoides	0.67	66.67	3.46	0.80	3.45	1			2 1	P	5	P	1			P 1		P	1	P
Sitanion hystrix	0.87	86.67	4.50	1.20	5.17	P	2 1		1	P	3	P	P	1	P 1	P 1	3 1	P 1		3
Stipa comata	0.00	6.67	0.00	0.00	0.00															P
TOTAL NATIVE PERENNIAL GRASSES (c)	1.53	93.33	7.96	2.00	8.62	1	2 1		3 1	P	8	P	1	1	P 1	P 2	3 1	P 1	1	3
NATIVE PERENNIAL GRASSES (warm)																				
Aristida purpurea	0.00	6.67	0.00	0.00	0.00															P
Bouteloua gracilis	1.33	86.67	6.92	2.20	9.48	P	3		5 2	3 1	P 1	P	1 1		P 3	1 1	4	P 1	2 3	1
Buchloe dactyloides	0.00	6.67	0.00	0.00	0.00												P			
Hilaria jamesii	0.87	73.33	4.50	1.47	6.32	P	2 3		1 1	2	P		1 1	2 2		P		2 1	P	3 1
Sporobolus airoides	0.00	13.33	0.00	0.00	0.00											P			P	
Sporobolus cryptandrus	0.00	26.67	0.00	0.00	0.00						P	P				P			P	
TOTAL NATIVE PERENNIAL GRASSES (w)	2.20	93.33	11.42	3.67	15.80	P	5 3		6 3	5 1	P 1	P	2 2	2 2	P 3	1 1	4	2 2	2 3	4 1
INTRODUCED PERENNIAL GRASSES (cool)																				
Agropyron intermedium	0.00	13.33	0.00	0.00	0.00												P			P
Elymus junceus	0.00	46.67	0.00	0.07	0.29					P	P					P 1	P	P	P	P
TOTAL INTRO. PERENNIAL GRASSES (c)	0.00	46.67	0.00	0.07	0.29					P	P					P 1	P	P	P	P
NATIVE SUBSHRUBS																				
Artemisia frigida	0.00	6.67	0.00	0.00	0.00															P
Ceratoides lanata	0.00	20.00	0.00	0.00	0.00								P			P			P	
Chrysothamnus greenei	1.87	93.33	9.69	2.07	8.91	3	1	5	P	3 1	2	P	7	3	2	P 1	1	P 1	1	
Eriogonum microthecum	0.00	6.67	0.00	0.00	0.00							P								
Gutierrezia sarothrae	1.13	73.33	5.88	1.40	6.03	2			1 1	1	P	2	P	2	1 2	P 1			4	4
TOTAL NATIVE SUBSHRUBS	3.00	100.00	15.57	3.47	14.94	5	1	5	1 1	4 1	2	2	7	5	3 2	P 2	1	P 1	5	4
INTRODUCED SUBSHRUBS																				
Kochia prostrata	0.00	6.67	0.00	0.00	0.00											P				
TOTAL INTRO. SUBSHRUBS	0.00	6.67	0.00	0.00	0.00											P				
NATIVE SHRUBS																				
Artemisia tridentata	6.73	93.33	34.95	6.93	29.89	8	4	12 1	8	4	6	8	1		10	6 1	8 1	11	8	7
Atriplex canescens	1.73	86.67	9.00	1.80	7.76	1			5	P	1	2	1	6	4	2 1	P	2	1	1
Atriplex confertifolia	0.00	20.00	0.00	0.00	0.00													P	P	P
Chrysothamnus nauseosus	0.00	20.00	0.00	0.00	0.00								P						P	P
Cowania mexicana	0.00	6.67	0.00	0.00	0.00															P
Ephedra viridis	0.00	6.67	0.00	0.00	0.00	P														
Lycium pallidum	0.00	13.33	0.00	0.00	0.00								P							P
Tetradymia canescens	0.00	6.67	0.00	0.00	0.00							P								
TOTAL NATIVE SHRUBS	8.47	100.00	43.94	8.73	37.64	9	4	12 1	13	4	7	10	2	6	14	8 2	8 1	13	9	8
NATIVE TREES																				
Juniperus osteosperma	0.27	26.67	1.38	0.33	1.44	2							P		1	1 1				
Pinus edulis	1.47	80.00	7.61	1.53	6.61	2	1	5	1	P	4	1	1		5	1 1		1		P
TOTAL NATIVE TREES	1.73	80.00	9.00	1.87	8.05	4	1	5	1	P	4	1	1		6	2 2		1		P

N7/8 Sagebrush Reference Area Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
SUCCULENTS																				
Coryphantha vivipara	0.00	6.67	0.00	0.00	0.00							P								
Opuntia fragilis var. fragilis	0.00	6.67	0.00	0.00	0.00	P														
Opuntia phaeacantha	0.00	6.67	0.00	0.00	0.00						P									
Opuntia polyacantha	0.00	6.67	0.00	0.00	0.00								P							
Sclerocactus parviflorus	0.07	6.67	0.35	0.07	0.29	1														
Sclerocactus whipplei	0.07	6.67	0.35	0.07	0.29		1													
TOTAL SUCCULENTS	0.13	33.33	0.69	0.13	0.57	1	1				P	P	P							
BRYOPHYTES																				
Moss spp.	0.20	33.33	1.04	0.20	0.86	1				P	P			1				1		
TOTAL BRYOPHYTES	0.20	33.33	1.04	0.20	0.86	1				P	P			1				1		
LICHEN/FUNGUS																				
Lichen spp.	0.00	6.67	0.00	0.00	0.00				P											
TOTAL LICHEN	0.00	6.67	0.00	0.00	0.00				P											
Standing dead	13.73	100.00		93.33		6	23	3	17	23	11	12	11	13	15	7	23	22	7	13
Litter	20.93	100.00		20.93		22	28	22	22	6	27	24	10	16	30	21	12	18	29	27
Bare ground	27.33	100.00		27.33		26	4	26	10	42	18	40	41	47	19	47	44	35	6	5
Rock	18.73	100.00		18.73		22	27	26	22	13	21	8	25	8	10	13	3	8	40	35
TOTALS	100.00	1206.67	98.96	183.53	99.14	100 0	100 5	100 1	100 6	100 2	100 2	100 0	100 2	100 2	100 6	100 22	100 2	100 4	100 4	100 1
TOTAL VEGETATION COVER	19.27	s=(4.82)		23.20	s=(6.17)	24 0	18 5	23 1	29 6	16 2	23 2	16 0	13 2	16 2	26 6	12 22	18 2	17 4	18 4	20 1
GROUND COVER (Veg+Litter+St.Dead+Rock)	72.67	s=(16.11)		76.60	s=(16.14)	74 0	96 5	74 1	90 6	58 2	82 2	60 0	59 2	53 2	81 6	53 22	56 2	65 4	94 4	95 1
Allowable Vegetation Cover	**19.27**	**s=(4.82)**				**24.0**	**18.0**	**23.0**	**29.0**	**16.0**	**23.0**	**16.0**	**13.0**	**16.0**	**26.0**	**12.0**	**18.0**	**17.0**	**18.0**	**20.0**
SPECIES DENSITY (# of species/100 sq.m.)	17.13	s=(7.4)				22	9	4	20	18	23	20	21	6	9	30	14	16	20	25

N14 Sagebrush Reference Area Cover Data – Spring 2023

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																				
Descurainia pinnata	0.00	33.33	0.00	0.00	0.00	P		P		P		P			P					
Gilia pumila	0.00	26.67	0.00	0.00	0.00		P		P									P		P
Lappula redowskii	0.27	93.33	1.25	0.27	1.15	P	P	P	1	3	P	P	P	P	P	P	P	P		P
Lupinus brevicaulis	0.00	13.33	0.00	0.00	0.00				P										P	
Machaeranthera canescens	0.00	33.33	0.00	0.00	0.00	P							P		P			P	P	
Oenothera albicaulis	0.00	26.67	0.00	0.00	0.00				P							P			P	P
TOTAL NATIVE ANN. & BIEN. FORBS	0.27	100.00	1.25	0.27	1.15	P	P	P	1	3	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL FORBS																				
Allium macropetalum	0.00	73.33	0.00	0.00	0.00	P	P	P	P	P		P		P		P	P	P	P	
Arabis fendleri	0.00	73.33	0.00	0.00	0.00	P	P		P	P		P	P	P			P	P	P	P
Cymopterus purpurascens	0.00	100.00	0.00	0.07	0.29	P	P	P	P	P	P	P	P	P	P 1	P	P	P	P	P
Leucelene ericoides	0.07	100.00	0.31	0.07	0.29	P	P	P	P	P	P	P	P	P	P	1	P	P	P	P
Phlox longifolia	0.00	6.67	0.00	0.00	0.00					P										
Sphaeralcea coccinea	0.00	86.67	0.00	0.00	0.00	P	P	P	P		P	P	P	P	P	P		P	P	P
Townsendia exscapa	0.00	20.00	0.00	0.00	0.00										P				P	P
TOTAL NATIVE PERENNIAL FORBS	0.07	100.00	0.31	0.13	0.57	P	P	P	P	P	P	P	P	P	P 1	1	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)																				
Oryzopsis hymenoides	0.00	33.33	0.00	0.00	0.00								P	P		P	P		P	
Sitanion hystrix	1.93	100.00	9.06	2.40	10.32	2	3	1 1	5 1	6	P 1	P	2	2 1	2	P 1	1	2 2	2	1
TOTAL NATIVE PERENNIAL GRASSES (c)	1.93	100.00	9.06	2.40	10.32	2	3	1 1	5 1	6	P 1	P	2	2 1	2	P 1	1	2 2	2	1
NATIVE PERENNIAL GRASSES (warm)																				
Bouteloua gracilis	4.20	100.00	19.69	5.47	23.50	4 2	4	4	2	5	6 3	5 1	4	4 1	6 3	2	5 2	4 5	6	2 2
Hilaria jamesii	0.00	6.67	0.00	0.00	0.00														P	
Sporobolus cryptandrus	0.00	26.67	0.00	0.00	0.00	P		P				P	P							
TOTAL NATIVE PERENNIAL GRASSES (w)	4.20	100.00	19.69	5.47	23.50	4 2	4	4	2	5	6 3	5 1	4	4 1	6 3	2	5 2	4 5	6	2 2
INTRODUCED PERENNIAL GRASSES (cool)																				
Elymus junceus	0.00	6.67	0.00	0.00	0.00				P											
TOTAL INTRO. PERENNIAL GRASSES (c)	0.00	6.67	0.00	0.00	0.00				P											
NATIVE SUBSHRUBS																				
Chrysothamnus greenei	0.33	80.00	1.56	0.33	1.43	P		1	P	2		1	P		1	P	P	P	P	P
Gutierrezia sarothrae	0.27	100.00	1.25	0.27	1.15	P	P	P	P	P	1	P	1	P	P	P	1	P	P	1
TOTAL NATIVE SUBSHRUBS	0.60	100.00	2.81	0.60	2.58	P	P	1	P	2	1	1	1	P	1	P	1	P	P	1
NATIVE SHRUBS																				
Artemisia tridentata	13.13	100.00	61.56	13.20	56.73	16	13	14	11 1	17	11	15	16	12	11	21	10	14	8	8
Atriplex canescens	0.13	13.33	0.63	0.13	0.57						1			1						
Chrysothamnus nauseosus	0.07	6.67	0.31	0.07	0.29								1							
TOTAL NATIVE SHRUBS	13.33	100.00	62.50	13.40	57.59	16	13	14	11 1	17	12	15	17	13	11	21	10	14	8	8
NATIVE TREES																				
Pinus edulis	0.73	93.33	3.44	0.73	3.15	1	P	P	1		1	1	1	1	1	2	P	P	2	P
TOTAL NATIVE TREES	0.73	93.33	3.44	0.73	3.15	1	P	P	1		1	1	1	1	1	2	P	P	2	P

N14 Sagebrush Reference Area Cover Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
SUCCULENTS																				
Coryphantha vivipara	0.00	33.33	0.00	0.00	0.00					P			P			P			P	P
Opuntia phaeacantha	0.00	33.33	0.00	0.00	0.00				P		P	P	P		P					
Sclerocactus parviflorus	0.00	6.67	0.00	0.00	0.00			P												
TOTAL SUCCULENTS	0.00	66.67	0.00	0.00	0.00			P	P	P	P	P	P		P	P			P	P
BRYOPHYTES																				
Moss spp.	0.20	100.00	0.94	0.27	1.15	1	P	P	1	1	P	P	P	P	P	P	P	P 1	P	P
TOTAL BRYOPHYTES	0.20	100.00	0.94	0.27	1.15	1	P	P	1	1	P	P	P	P	P	P	P	P 1	P	P
LICHEN/FUNGUS																				
Lichen spp.	0.47	86.67	2.19	0.47	2.01	P	1	1	1	1	P	P	P		1		P	P	1	1
TOTAL LICHEN	0.47	86.67	2.19	0.47	2.01	P	1	1	1	1	P	P	P		1		P	P	1	1
Standing dead	27.27	100.00		27.27		31	28	28	28	26	39	27	30	24	22	17	23	33	23	30
Litter	11.53	100.00		11.53		16	9	5	19	4	19	7	8	12	15	13	12	11	16	7
Bare ground	39.33	100.00		39.33		29	42	46	31	35	21	44	37	44	41	44	48	36	42	50
Rock	0.07	6.67		0.07							1									
TOTALS	100.00		99.06	101.93	98.85	100 2	100 0	100 1	100 2	100 0	100 4	100 1	100 0	100 2	100 4	100 1	100 2	100 8	100 0	100 2
TOTAL VEGETATION COVER	21.33	s=(4.85)		23.27	s=(4.74)	24 2	20 0	20 1	21 2	34 0	20 4	22 1	25 0	20 2	21 4	26 1	17 2	20 8	18 0	12 2
GROUND COVER (Veg+Litter+St.Dead+Rock)	60.67	s=(7.85)		62.60	s=(8.7)	71 2	58 0	54 1	69 2	65 0	79 4	56 1	63 0	56 2	59 4	56 1	52 2	64 8	58 0	50 2
Allowable Vegetation Cover	**21.33**	**s=(4.85)**				**24.0**	**20.0**	**20.0**	**21.0**	**34.0**	**20.0**	**22.0**	**25.0**	**20.0**	**21.0**	**26.0**	**17.0**	**20.0**	**18.0**	**12.0**
SPECIES DENSITY (# of species/100 sq.m.)	14.27	s=(1.98)				15	12	14	17	13	11	15	17	13	14	14	12	14	18	15

N14/J16 Phase III Grassland Production Data – Spring 2023

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
NATIVE ANNUAL & BIENNIAL FORBS																							
Lappula redowskii	0.09	1.68	15.00																1.4	3.4			
Lupinus brevicaulus	0.00	0	0.00																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.09	1.68	15.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	3.4	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Tragopogon dubius	0.01	0.12	2.50																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.01	0.12	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE ANNUAL GRASSES																							
Festuca octoflora	0.01	0.21	2.50																				
TOTAL NATIVE ANNUAL GRASSES	0.01	0.21	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.00	0.01	2.50																				
TOTAL INTRODUCED ANNUAL GRASSES	0.00	0.01	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea parvifolia	0.00	0.06	2.50																				
TOTAL NATIVE PERENNIAL FORBS	0.00	0.06	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED PERENNIAL FORBS																							
Taraxacum officinale	0.00	0	0.00																				
TOTAL INTRODUCED PERENNIAL FORBS	0.00	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.25	4.53	10.00									1.7	25.1	1.6	2.1								
Agropyron smithii	0.43	7.75	22.50	6.2		1.1						6.1	28.6		0.3	8.3						0.6	
TOTAL NATIVE PERENNIAL GRASSES (c)	0.69	12.28	25.00	6.2	-	1.1	-	-	-	-	-	7.8	53.7	1.6	2.4	8.3	-	-	-	-	-	0.6	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	0.42	7.51	42.50	0.7		1.3	T				4.1								2.6			2.1	3.9
Buchloe dactyloides	0.00	0.04	2.50																				
Hilaria jamesii	0.67	11.91	27.50				10.4				1.1												34.1
Sporobolus airoides	1.65	29.35	37.50									16.6						2.8	7.6			2.4	0.2
Sporobolus cryptandrus	0.01	0.21	7.50			0.5																	
TOTAL NATIVE PERENNIAL GRASSES (w)	2.75	49.02	62.50	0.7	-	1.8	10.4	-	-	-	5.2	16.6	-	-	-	-	-	2.8	10.2	-	-	4.5	38.2
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	16.89	301.35	100.00	78.4	56.7	20.8	19.7	55.2	29.5	65	15.3	8.3	17.4	21.6	25.3	23	81.6	44.7	48.1	81.3	135	24.6	4.7
TOTAL INTRO. PERENNIAL GRASSES (c)	16.89	301.35	100.00	78.4	56.7	20.8	19.7	55.2	29.5	65.0	15.3	8.3	17.4	21.6	25.3	23.0	81.6	44.7	48.1	81.3	135.0	24.6	4.7
INTRODUCED SUBSHRUBS																							
Kochia prostrata	0.44	7.79	12.50																				
TOTAL INTRO. SUBSHRUBS	0.44	7.79	12.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE SHRUBS																							
Atriplex canescens	0.40	7.05	20.00			0.3	6.1			7.1													
TOTAL NATIVE SHRUBS	0.40	7.05	20.00	-	-	0.3	6.1	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL PRODUCTION	21.28	379.56	100.00	85.3	56.7	24.0	36.2	55.2	29.5	72.1	20.5	32.7	71.1	23.2	27.7	31.3	81.6	47.5	59.7	84.7	135.0	29.7	42.9
Standard Deviation	13.95	248.87																					
ALLOWABLE PRODUCTION (lbs/acre)	379.56	(s=248.87)		507.3	337.2	142.7	215.3	328.3	175.4	428.8	121.9	194.5	422.8	138.0	164.7	186.1	485.3	282.5	355.0	503.7	802.8	176.6	255.1
SPECIES DENSITY (# of species/1.5 sq.m.)	3.18	(s=1.38)		3.0	1.0	5.0	4.0	1.0	1.0	2.0	3.0	4.0	3.0	2.0	3.0	2.0	1.0	2.0	4.0	2.0	1.0	4.0	4.0

Noxious Production	0.00

N14/J16 Phase III Grassland Production Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
NATIVE ANNUAL & BIENNIAL FORBS																							
Lappula redowskii	0.09	1.68	15.00				4.8		0.1								1.3	0.3			T		
Lupinus brevicaulus	0.00	0	0.00				T																
TOTAL NATIVE ANN. & BIEN. FORBS	0.09	1.68	15.00	-	-	-	4.8	-	0.1	-	-	-	-	-	-	-	1.3	0.3	-	-	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Tragopogon dubius	0.01	0.12	2.50																		0.8		
TOTAL INTRO. ANN. & BIEN. FORBS	0.01	0.12	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-
NATIVE ANNUAL GRASSES																							
Festuca octoflora	0.01	0.21	2.50					1.4															
TOTAL NATIVE ANNUAL GRASSES	0.01	0.21	2.50	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.00	0.01	2.50				0.1																
TOTAL INTRODUCED ANNUAL GRASSES	0.00	0.01	2.50	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea parvifolia	0.00	0.06	2.50							0.4													
TOTAL NATIVE PERENNIAL FORBS	0.00	0.06	2.50	-	-	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED PERENNIAL FORBS																							
Taraxacum officinale	0.00	0	0.00																	T			
TOTAL INTRODUCED PERENNIAL FORBS	0.00	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.25	4.53	10.00																				
Agropyron smithii	0.43	7.75	22.50						0.8										0.1				
TOTAL NATIVE PERENNIAL GRASSES (c)	0.69	12.28	25.00	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	0.42	7.51	42.50			3.7	3	6.7		8.8	6.1					0.6	0.6			0.4	0.2	1.7	4
Buchloe dactyloides	0.00	0.04	2.50																0.3				
Hilaria jamesii	0.67	11.91	27.50			4.6		1.3				11.1		2	1.9					2.1	1.1	10.4	
Sporobolus airoides	1.65	29.35	37.50		0.8			38.2			2.6	42.3		12.2	7.6		16.7		9.1	24			14.3
Sporobolus cryptandrus	0.01	0.21	7.50							0.7				T								0.2	
TOTAL NATIVE PERENNIAL GRASSES (w)	2.75	49.02	62.50	-	0.8	8.3	3.0	46.2	-	9.5	8.7	53.4	-	14.2	9.5	0.6	17.3	-	9.4	26.5	1.3	12.3	18.3
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	16.89	301.35	100.00	137.4	175.6	38.9	43	3.1	36.8	70.1	197.8	31.1	51.3	5.6	69.2	81.6	14.5	35	43.4	49.1	31.3	26.6	29.4
TOTAL INTRO. PERENNIAL GRASSES (c)	16.89	301.35	100.00	137.4	175.6	38.9	43.0	3.1	36.8	70.1	197.8	31.1	51.3	5.6	69.2	81.6	14.5	35.0	43.4	49.1	31.3	26.6	29.4
INTRODUCED SUBSHRUBS																							
Kochia prostrata	0.44	7.79	12.50	6.1			29.5				4.2						8.6						4
TOTAL INTRO. SUBSHRUBS	0.44	7.79	12.50	6.1	-	-	29.5	-	-	-	4.2	-	-	-	-	-	8.6	-	-	-	-	-	4.0
NATIVE SHRUBS																							
Atriplex canescens	0.40	7.05	20.00	4.9					1.8			9.4				6.5					11.3		
TOTAL NATIVE SHRUBS	0.40	7.05	20.00	4.9	-	-	-	-	1.8	-	-	9.4	-	-	-	6.5	-	-	-	-	11.3	-	-
TOTAL PRODUCTION	21.28	379.56	100.00	148.4	176.4	47.2	80.4	50.7	39.5	80.0	210.7	93.9	51.3	19.8	78.7	88.7	41.7	35.3	52.9	75.6	44.7	38.9	51.7
Standard Deviation	13.95	248.87																					
ALLOWABLE PRODUCTION (lbs/acre)	379.56	(s=248.87)		882.5	1049.0	280.7	478.1	301.5	234.9	475.7	1253.0	558.4	305.1	117.7	468.0	527.5	248.0	209.9	314.6	449.6	265.8	231.3	307.4
SPECIES DENSITY (# of species/1.5 sq.m.)	3.18	(s=1.38)		3.0	2.0	3.0	6.0	4.0	4.0	4.0	4.0	4.0	1.0	4.0	3.0	3.0	5.0	2.0	4.0	5.0	6.0	4.0	4.0

Noxious Production	0.00

N14/J16 Phase III Shrubland Production Data – Spring 2023

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
NATIVE ANNUAL & BIENNIAL FORBS																							
Descurainia pinnata	0.01	0.19	2.50								1.3												
Lappula redowskii	0.02	0.43	15.00												0.1					0.1			0.9
Lupinus brevicaulus	0.00	0.03	2.50																				
Townsendia annua	0.00	0.01	2.50																		0.1		
TOTAL NATIVE ANN. & BIEN. FORBS	0.04	0.67	22.50	-	-	-	-	-	-	-	1.3	-	-	-	0.1	-	-	-	-	0.1	0.1	-	0.9
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Sisymbrium altissimum	0.00	0.01	2.50																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	0.01	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE ANNUAL GRASSES																							
Festuca octoflora	0.00	0.03	2.50																			0.2	
TOTAL NATIVE ANNUAL GRASSES	0.00	0.03	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.23	4.1	7.50																				
TOTAL INTRODUCED ANNUAL GRASSES	0.23	4.1	7.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea coccinea	0.00	0.04	2.50																				0.3
TOTAL NATIVE PERENNIAL FORBS	0.00	0.04	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron smithii	0.13	2.26	12.50																			0.5	
Oryzopsis hymenoides	0.03	0.48	2.50																				
TOTAL NATIVE PERENNIAL GRASSES (c)	0.15	2.74	12.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	0.34	6.04	37.50	1.9									0.9		0.3				9.2			5.3	
Buchloe dactyloides	0.02	0.42	2.50																				
Hilaria jamesii	1.06	18.93	42.50	1.5			6.2							2.9	0.2	3.4			4.9	T	2.9	8.3	23.5
Sporobolus airoides	0.88	15.67	30.00					4.7	0.6						7.4			9.4	15.2			7.6	
Sporobolus cryptandrus	0.03	0.49	17.50												0.3		0.1				0.1		
TOTAL NATIVE PERENNIAL GRASSES (w)	2.33	41.54	77.50	3.4	-	-	6.2	4.7	0.6	-	-	-	0.9	2.9	8.2	3.4	0.1	9.4	29.3	-	3.0	21.2	23.5
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	14.84	264.76	90.00		14.6	23.9	43.3	14.9	26.3	26.2	47.2	60.1	32.6	29.8	5.3	25.2	74.2	12.9		67.6	35		40.3
TOTAL INTRO. PERENNIAL GRASSES (c)	14.84	264.76	90.00	-	14.6	23.9	43.3	14.9	26.3	26.2	47.2	60.1	32.6	29.8	5.3	25.2	74.2	12.9	-	67.6	35.0	-	40.3
NATIVE SUBSHRUBS																							
Ceratoides lanata	0.00	0.04	2.50			0.3																	
TOTAL NATIVE SUBSHRUBS	0.00	0.04	2.50	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	1.63	29.03	20.00		47.3	33.9		23.6	6.3	34.1													11.1
TOTAL INTRO. SUBSHRUBS	1.63	29.03	20.00	-	47.3	33.9	-	23.6	6.3	34.1	-	-	-	-	-	-	-	-	-	-	-	-	11.1
NATIVE SHRUBS																							
Atriplex canescens	1.57	27.93	40.00			23				0.9	21.6				0.3	2.2	7.7	30.9		6.5			
TOTAL NATIVE SHRUBS	1.57	27.93	40.00	-	-	23.0	-	-	-	0.9	21.6	-	-	-	0.3	2.2	7.7	30.9	-	6.5	-	-	-
TOTAL PRODUCTION	20.79	370.91	100.00	3.4	61.9	81.1	49.5	43.2	33.2	61.2	70.1	60.1	33.5	32.7	13.9	30.8	82.0	53.2	29.3	74.2	38.1	21.9	76.1
Standard Deviation	12.39	221.09																					
ALLOWABLE PRODUCTION (lbs/acre)	370.91	(s=221.08)		20.2	368.1	482.3	294.4	256.9	197.4	363.9	416.9	357.4	199.2	194.5	82.7	183.2	487.6	316.4	174.2	441.2	226.6	130.2	452.5
SPECIES DENSITY (# of species/1.5 sq.m.)	3.38	(s=1.46)		2.0	2.0	4.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0	2.0	7.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	5.0

Noxious Production	0.00

N14/J16 Phase III Shrubland Production Data – Spring 2023 (continued)

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
NATIVE ANNUAL & BIENNIAL FORBS																							
Descurainia pinnata	0.01	0.19	2.50																				
Lappula redowskii	0.02	0.43	15.00		0.7						0.9				0.2								
Lupinus brevicaulus	0.00	0.03	2.50											0.2									
Townsendia annua	0.00	0.01	2.50																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.04	0.67	22.50	-	0.7	-	-	-	-	-	0.9	-	-	0.2	0.2	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Sisymbrium altissimum	0.00	0.01	2.50																			0.1	
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	0.01	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-
NATIVE ANNUAL GRASSES																							
Festuca octoflora	0.00	0.03	2.50																				
TOTAL NATIVE ANNUAL GRASSES	0.00	0.03	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.23	4.1	7.50								1.5											24.2	1.9
TOTAL INTRODUCED ANNUAL GRASSES	0.23	4.1	7.50	-	-	-	-	-	-	-	1.5	-	-	-	-	-	-	-	-	-	-	24.2	1.9
NATIVE PERENNIAL FORBS																							
Sphaeralcea coccinea	0.00	0.04	2.50																				
TOTAL NATIVE PERENNIAL FORBS	0.00	0.04	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron smithii	0.13	2.26	12.50							3.9				2.1	1	7.7							
Oryzopsis hymenoides	0.03	0.48	2.50												3.2								
TOTAL NATIVE PERENNIAL GRASSES (c)	0.15	2.74	12.50	-	-	-	-	-	-	3.9	-	-	-	2.1	4.2	7.7	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	0.34	6.04	37.50	3.4	1.3			0.1		1.6	5.8	1.7			1	0.7		0.1				7.3	
Buchloe dactyloides	0.02	0.42	2.50		2.8																	T	
Hilaria jamesii	1.06	18.93	42.50		3.4		11.2	11				2.9		2.1		4						13.7	25.2
Sporobolus airoides	0.88	15.67	30.00		14	15.3					0.8					7.7			21		1.7		
Sporobolus cryptandrus	0.03	0.49	17.50	1.7	0.8								0.1		0.2								
TOTAL NATIVE PERENNIAL GRASSES (w)	2.33	41.54	77.50	5.1	22.3	15.3	11.2	11.1	-	1.6	6.6	4.6	0.1	2.1	1.2	12.4	-	0.1	21.0	-	1.7	21.0	25.2
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	14.84	264.76	90.00	63	52.5	185.5	70.7	71.7	69.5	60.6	69.5	23.6	64.8	31.1	42	24.2	163.2	49.8	59.6	28.5	71.3		0.4
TOTAL INTRO. PERENNIAL GRASSES (c)	14.84	264.76	90.00	63.0	52.5	185.5	70.7	71.7	69.5	60.6	69.5	23.6	64.8	31.1	42.0	24.2	163.2	49.8	59.6	28.5	71.3	-	0.4
NATIVE SUBSHRUBS																							
Ceratoides lanata	0.00	0.04	2.50																				
TOTAL NATIVE SUBSHRUBS	0.00	0.04	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	1.63	29.03	20.00						22.4									16.6					
TOTAL INTRO. SUBSHRUBS	1.63	29.03	20.00	-	-	-	-	-	22.4	-	-	-	-	-	-	-	-	16.6	-	-	-	-	-
NATIVE SHRUBS																							
Atriplex canescens	1.57	27.93	40.00				14.8		7	3.2		2.5			33.4		3.3		19.8				10.8
TOTAL NATIVE SHRUBS	1.57	27.93	40.00	-	-	-	14.8	-	7.0	3.2	-	2.5	-	-	33.4	-	3.3	-	19.8	-	-	-	10.8
TOTAL PRODUCTION	20.79	370.91	100.00	68.1	75.5	200.8	96.7	82.8	98.9	69.3	78.5	30.7	64.9	35.5	81.0	44.3	166.5	66.5	100.4	28.5	73.0	45.3	38.3
Standard Deviation	12.39	221.09																					
ALLOWABLE PRODUCTION (lbs/acre)	370.91	(s=221.08)		405.0	449.0	1194.1	575.0	492.4	588.1	412.1	466.8	182.6	385.9	211.1	481.7	263.4	990.1	395.5	597.1	169.5	434.1	269.4	227.8
SPECIES DENSITY (# of species/1.5 sq.m.)	3.38	(s=1.46)		3.0	7.0	2.0	3.0	3.0	3.0	4.0	5.0	4.0	2.0	4.0	7.0	5.0	2.0	3.0	3.0	1.0	2.0	5.0	4.0

Noxious Production	0.00

N14/J16 Phase III Grassland Shrub Density Data – Spring 2023

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.05	2.02	5.00							1													
Ceratoides lanata	(21-50cm)	0.25	10.12	17.50	1													2						
Ceratoides lanata	(>50cm)	0.03	1.01	2.50								1												
Chrysothamnus greenei	(0-20cm)	0.03	1.01	2.50																			1	
Chrysothamnus greenei	(21-50cm)	0.13	5.06	5.00			4																1	
Gutierrezia sarothrae	(0-20cm)	2.68	108.25	15.00									62	40	1		1		1				2	
Gutierrezia sarothrae	(21-50cm)	0.05	2.02	5.00											1	1								
Senecio douglasii var. longilobus	(0-20cm)	0.05	2.02	2.50															2					
TOTAL NATIVE SUBSHRUBS		3.25	131.52	45.00	1		4				1	1	62	40	2	1	1	2	3				4	
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	258.35	10455.05	55.00	11	1			10	4	3	2	46				7	4					1	
Kochia prostrata	(21-50cm)	1.10	44.52	27.50						4			2				1	1						
TOTAL INTRO. SUBSHRUBS		259.45	10499.57	55.00	11	1			10	8	3	2	48				8	5					1	
NATIVE SHRUBS																								
Artemisia tridentata	(>50cm)	0.03	1.01	2.50																				
Atriplex canescens	(0-20cm)	1.28	51.60	47.50	1	1	1	2	4	1	9			1							2			
Atriplex canescens	(21-50cm)	6.18	249.89	85.00	10	19	2	5	14	7	15	4	4	2	1	2	1	5			5	6	1	3
Atriplex canescens	(>50cm)	4.33	175.03	70.00	5	22	4	15	16	2	12	14	1	3	1	4	2	5		6				
Atriplex confertifolia	(0-20cm)	0.20	8.09	7.50					5			2									1			
Atriplex confertifolia	(21-50cm)	0.38	15.18	15.00				1	9		1	2									1			
Chrysothamnus nauseosus	(0-20cm)	0.10	4.05	10.00			1									1			1				1	
Chrysothamnus nauseosus	(21-50cm)	0.40	16.19	17.50			1						2			5			1				5	
Chrysothamnus nauseosus	(>50cm)	0.08	3.04	5.00										1					2					
TOTAL NATIVE SHRUBS		12.95	524.07	95.00	16	42	9	23	48	10	37	22	7	7	2	12	3	10	4	6	9	6	7	3
TOTAL DENSITY (stems/100 sq. m.)		275.65	(s=986.04)	100.00	28	43	13	23	58	18	41	25	117	47	4	13	12	17	7	6	9	6	12	3
TOTAL DENSITY (stems/acre)		11155.16	(s=39903.72)		1133	1740	526	931	2347	728	1659	1012	4735	1902	162	526	486	688	283	243	364	243	486	121
SPECIES DENSITY (# of species/100 sq.m.)		2.35	(s=1.05)		3	2	3	2	3	2	4	4	4	3	2	3	3	3	3	1	2	1	5	1

N14/J16 Phase III Grassland Shrub Density Data – Spring 2023 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																		
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.05	2.02	5.00							1													
Ceratoides lanata	(21-50cm)	0.25	10.12	17.50								1		2		1					2		1	
Ceratoides lanata	(>50cm)	0.03	1.01	2.50																				
Chrysothamnus greenei	(0-20cm)	0.03	1.01	2.50																				
Chrysothamnus greenei	(21-50cm)	0.13	5.06	5.00																				
Gutierrezia sarothrae	(0-20cm)	2.68	108.25	15.00																				
Gutierrezia sarothrae	(21-50cm)	0.05	2.02	5.00																				
Senecio douglasii var. longilobus	(0-20cm)	0.05	2.02	2.50																				
TOTAL NATIVE SUBSHRUBS		3.25	131.52	45.00							1	1		2		1					2		1	
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	258.35	10455.05	55.00	659		3	3590	24	22	43	163		106		2		5220				30		383
Kochia prostrata	(21-50cm)	1.10	44.52	27.50	12		3	6						8		1		5				1		
TOTAL INTRO. SUBSHRUBS		259.45	10499.57	55.00	671		6	3596	24	22	43	163		114		3		5225				31		383
NATIVE SHRUBS																								
Artemisia tridentata	(>50cm)	0.03	1.01	2.50										1										
Atriplex canescens	(0-20cm)	1.28	51.60	47.50	6	1							2	1	1				1	1	4	11		1
Atriplex canescens	(21-50cm)	6.18	249.89	85.00	11	2	1	1		1	3	2	16		7	2	9		4		36	39	4	3
Atriplex canescens	(>50cm)	4.33	175.03	70.00	8	2	2			2	5		2		1		3		6	1	12	16	1	
Atriplex confertifolia	(0-20cm)	0.20	8.09	7.50																				
Atriplex confertifolia	(21-50cm)	0.38	15.18	15.00						1														
Chrysothamnus nauseosus	(0-20cm)	0.10	4.05	10.00																				
Chrysothamnus nauseosus	(21-50cm)	0.40	16.19	17.50															1		1			
Chrysothamnus nauseosus	(>50cm)	0.08	3.04	5.00																				
TOTAL NATIVE SHRUBS		12.95	524.07	95.00	25	5	3	1		4	8	2	20	2	9	2	12		12	2	53	66	5	4
TOTAL DENSITY (stems/100 sq. m.)		275.65	(s=986.04)	100.00	696	5	9	3597	24	26	52	166	20	118	9	6	12	5225	12	2	55	97	6	387
TOTAL DENSITY (stems/acre)		11155.16	(s=39903.72)		28166	202	364	145565	971	1052	2104	6718	809	4775	364	243	486	211448	486	81	2226	3925	243	15661
SPECIES DENSITY (# of species/100 sq.m.)		2.35	(s=1.05)		2	1	2	2	1	3	3	3	1	4	1	3	1	1	2	1	3	2	2	2

N14/J16 Phase III Shrubland Shrub Density Data – Spring 2023

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.13	5.06	10.00						1	1						1							
Ceratoides lanata	(21-50cm)	0.30	12.14	20.00		1	2				1											2		
Chrysothamnus greenei	(21-50cm)	0.03	1.01	2.50																				
Gutierrezia sarothrae	(0-20cm)	2.88	116.35	27.50					1			24	1				1	7		3			26	
Gutierrezia sarothrae	(21-50cm)	0.03	1.01	2.50								1												
Senecio douglasii var. longilobus	(0-20cm)	0.03	1.01	2.50								1												
TOTAL NATIVE SUBSHRUBS		3.38	136.58	47.50		1	2		1	1	2	26	1				2	7		3		2	26	
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	284.78	11524.43	45.00		333	549	20	274	143	260			1		24						275		174
Kochia prostrata	(21-50cm)	4.55	184.13	25.00			30				13			1								3		67
Kochia prostrata	(>50cm)	0.03	1.01	2.50																				
TOTAL INTRO. SUBSHRUBS		289.35	11709.58	45.00		333	579	20	274	143	273			2		24						278		241
NATIVE SHRUBS																								
Artemisia tridentata	(21-50cm)	0.03	1.01	2.50																				
Atriplex canescens	(0-20cm)	2.70	109.27	67.50	4		1					1	2	1	5	1	7	3	16		3	2	2	3
Atriplex canescens	(21-50cm)	12.73	514.96	95.00	9	2	5	14	4	11	10	7	8	5	8	11	7	9	106	17	17	3		7
Atriplex canescens	(>50cm)	10.00	404.69	95.00	1		2	6	1	2	3	9	14	9	8	12	12	22	9	5	16	8	4	10
Atriplex confertifolia	(0-20cm)	0.30	12.14	10.00				2		1														
Atriplex confertifolia	(21-50cm)	0.33	13.15	10.00				1		1							1							
Chrysothamnus nauseosus	(21-50cm)	0.20	8.09	7.50						2														
Chrysothamnus nauseosus	(>50cm)	0.43	17.20	7.50																				
Cowania mexicana	(>50cm)	0.03	1.01	2.50																				
TOTAL NATIVE SHRUBS		26.73	1081.52	97.50	14	2	8	23	5	17	13	17	24	15	21	24	27	34	131	22	36	13	6	20
TOTAL DENSITY (stems/100 sq. m.)		319.45	(s=1421.07)	100.00	14	336	589	43	280	161	288	43	25	17	21	48	29	41	131	25	36	293	32	261
TOTAL DENSITY (stems/acre)		12927.68	(s=57508.85)		567	13597	23836	1740	11331	6515	11655	1740	1012	688	850	1942	1174	1659	5301	1012	1457	11857	1295	10562
SPECIES DENSITY (# of species/100 sq.m.)		2.30	(s=1.04)		1	3	3	3	3	5	3	3	2	2	1	2	4	2	1	2	1	3	2	2

N14/J16 Phase III Shrubland Shrub Density Data – Spring 2023 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.13	5.06	10.00						2														
Ceratoides lanata	(21-50cm)	0.30	12.14	20.00					1	3					1		1							
Chrysothamnus greenei	(21-50cm)	0.03	1.01	2.50																				1
Gutierrezia sarothrae	(0-20cm)	2.88	116.35	27.50							4	1			1		46							
Gutierrezia sarothrae	(21-50cm)	0.03	1.01	2.50																				
Senecio douglasii var. longilobus	(0-20cm)	0.03	1.01	2.50																				
TOTAL NATIVE SUBSHRUBS		3.38	136.58	47.50					1	5	4	1			2		47							1
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	284.78	11524.43	45.00			29	10	1	123				4					9010			3		158
Kochia prostrata	(21-50cm)	4.55	184.13	25.00					3	12									40			4		9
Kochia prostrata	(>50cm)	0.03	1.01	2.50															1					
TOTAL INTRO. SUBSHRUBS		289.35	11709.58	45.00			29	10	4	135				4					9051			7		167
NATIVE SHRUBS																								
Artemisia tridentata	(21-50cm)	0.03	1.01	2.50													1							
Atriplex canescens	(0-20cm)	2.70	109.27	67.50	1	2	2	2	10			5				2	8	4		4	7	9		1
Atriplex canescens	(21-50cm)	12.73	514.96	95.00	12	12	15	20	22	6	9	8	14	16	6	6	8	33		19	14	20	8	1
Atriplex canescens	(>50cm)	10.00	404.69	95.00	13	19	13	9	4	5	7	7	12	9	7	17	8	8		47	13	20	24	5
Atriplex confertifolia	(0-20cm)	0.30	12.14	10.00		1															8			
Atriplex confertifolia	(21-50cm)	0.33	13.15	10.00																	10			
Chrysothamnus nauseosus	(21-50cm)	0.20	8.09	7.50							3													3
Chrysothamnus nauseosus	(>50cm)	0.43	17.20	7.50							1												10	6
Cowania mexicana	(>50cm)	0.03	1.01	2.50																				1
TOTAL NATIVE SHRUBS		26.73	1081.52	97.50	26	34	30	31	36	11	20	20	26	25	13	25	25	45		70	52	49	42	17
TOTAL DENSITY (stems/100 sq. m.)		319.45	(s=1421.07)	100.00	26	34	59	41	41	151	24	21	26	29	15	25	72	45	9051	70	52	56	42	185
TOTAL DENSITY (stems/acre)		12927.68	(s=57508.85)		1052	1376	2388	1659	1659	6111	971	850	1052	1174	607	1012	2914	1821	366281	2833	2104	2266	1700	7487
SPECIES DENSITY (# of species/100 sq.m.)		2.30	(s=1.04)		1	2	2	2	3	3	3	2	1	2	3	1	4	1	2	1	2	2	2	5

N14/J16 Phase III Woodland Shrub Density Data – Spring 2023

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	16.33	660.65	47.50	169	2	94		58	79	39		1		17	6		54			5			6
Artemisia frigida	(21-50cm)	1.68	67.78	27.50	11	3	12			25	8					1								
Ceratoides lanata	(>50cm)	0.03	1.01	2.50													1							
Chrysothamnus greenei	(0-20cm)	0.08	3.04	2.50																				
Chrysothamnus greenei	(21-50cm)	0.18	7.08	15.00											1	1								
Chrysothamnus greenei	(>50cm)	0.03	1.01	2.50																				
Eriogonum jamesii	(0-20cm)	0.03	1.01	2.50		1																		
Gutierrezia sarothrae	(0-20cm)	14.38	581.74	47.50	16	107	1	48	47	19	29	29	13	50	40	14		21	50					
Gutierrezia sarothrae	(21-50cm)	0.75	30.35	20.00		1		3			1	3				1		2						
TOTAL NATIVE SUBSHRUBS		33.45	1353.67	77.50	196	114	107	51	105	123	77	32	14	50	58	23	1	77	50		5			6
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	29.10	1177.64	42.50	7				3								8	30	271	46			188	1
Kochia prostrata	(21-50cm)	3.80	153.78	37.50						1								1	9	19			20	
TOTAL INTRO. SUBSHRUBS		32.90	1331.42	47.50	7				3	1							8	31	280	65			208	1
NATIVE SHRUBS																								
Artemisia tridentata	(0-20cm)	24.28	982.37	70.00	5	8	14	8	5	8	5	4		7	2	1	132	175			10	12		6
Artemisia tridentata	(21-50cm)	20.75	839.72	75.00	14	21	12	8	10	2	14	8	9	19	6	7	19	44			22	55		26
Artemisia tridentata	(>50cm)	10.10	408.73	72.50	13	34	30	35	40	25	27	33	3	7	5	1	3	12			3	8		8
Atriplex canescens	(0-20cm)	0.43	17.20	22.50	2			2		1		2			1			2						
Atriplex canescens	(21-50cm)	1.15	46.54	60.00	5	1	2	3	2	3	2	1		1				1		2	1		1	
Atriplex canescens	(>50cm)	4.48	181.10	72.50	9	14	22	10	8	12	6	44	4	4	2		2	1	2	2		1	2	
Chrysothamnus nauseosus	(0-20cm)	3.50	141.64	57.50									4	2	21	2	21	26	1			2		1
Chrysothamnus nauseosus	(21-50cm)	24.30	983.39	85.00		1					1		39	22	15	18	35	56	26	22	48	25	23	15
Chrysothamnus nauseosus	(>50cm)	13.43	543.29	90.00		3		1			2	1	27	9	3	11	6	34	8	14	12	20	12	15
Cowania mexicana	(0-20cm)	0.63	25.29	25.00		2		1					3				3	3						
Cowania mexicana	(21-50cm)	3.50	141.64	62.50	10	1	6	4	2	10	11		26	3	1		2	4			1	1		2
Cowania mexicana	(>50cm)	1.68	67.78	32.50	7				2	4	7	1	1	2		1								
Ephedra viridis	(21-50cm)	0.13	5.06	12.50														1						1
Ephedra viridis	(>50cm)	0.28	11.13	17.50			4								1		1	2						
Fallugia paradoxa	(21-50cm)	0.05	2.02	2.50									2											
Lycium pallidum	(0-20cm)	0.13	5.06	5.00				4			1													
Lycium pallidum	(21-50cm)	0.13	5.06	7.50	2			2			1													
Lycium pallidum	(>50cm)	0.10	4.05	2.50		4																		
Purshia tridentata	(0-20cm)	0.18	7.08	10.00				2			2	1												
Purshia tridentata	(21-50cm)	0.18	7.08	12.50	1	1	1	1			3													
Yucca angustissima	(21-50cm)	0.03	1.01	2.50			1																	
Yucca glauca	(21-50cm)	0.05	2.02	5.00										1	1									
TOTAL NATIVE SHRUBS		109.43	4428.27	100.00	68	90	92	81	69	65	82	95	118	77	58	41	224	361	37	40	97	124	38	74
TOTAL DENSITY (stems/100 sq. m.)		175.78	(s=115.22)	100.00	271	204	199	132	177	189	159	127	132	127	116	64	233	469	367	105	102	124	246	81
TOTAL DENSITY (stems/acre)		7113.36	(s=4662.64)		10967	8256	8053	5342	7163	7649	6435	5140	5342	5140	4694	2590	9429	18980	14852	4249	4128	5018	9955	3278
SPECIES DENSITY (# of species/100 sq.m.)		5.48	(s=1.91)		8	9	8	7	6	6	8	6	7	6	9	6	7	8	4	3	5	4	3	6

N14/J16 Phase III Woodland Shrub Density Data – Spring 2023 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38	W39	W40
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	16.33	660.65	47.50			1		1		1	5					21					15	79	
Artemisia frigida	(21-50cm)	1.68	67.78	27.50							1			1			1					2	2	
Ceratoides lanata	(>50cm)	0.03	1.01	2.50																				
Chrysothamnus greenei	(0-20cm)	0.08	3.04	2.50															3					
Chrysothamnus greenei	(21-50cm)	0.18	7.08	15.00				1			2								1					1
Chrysothamnus greenei	(>50cm)	0.03	1.01	2.50														1						
Eriogonum jamesii	(0-20cm)	0.03	1.01	2.50																				
Gutierrezia sarothrae	(0-20cm)	14.38	581.74	47.50	42			1									8		33	7				
Gutierrezia sarothrae	(21-50cm)	0.75	30.35	20.00															15	4				
TOTAL NATIVE SUBSHRUBS		33.45	1353.67	77.50	42		1	2	1		4	5		1			30	1	52	11		17	81	1
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	29.10	1177.64	42.50	36			44			4		153		12					83	104		16	158
Kochia prostrata	(21-50cm)	3.80	153.78	37.50	17			4			3		12		1		1			41	12		2	9
TOTAL INTRO. SUBSHRUBS		32.90	1331.42	47.50	53			48			7		165		13		1			124	116		18	167
NATIVE SHRUBS																								
Artemisia tridentata	(0-20cm)	24.28	982.37	70.00		52	15		11	8	3	1		12		39	18	23				43	344	
Artemisia tridentata	(21-50cm)	20.75	839.72	75.00		78	60		27	27	6	18		14		73	36	53	1			60	81	
Artemisia tridentata	(>50cm)	10.10	408.73	72.50		13	5		3	11	1			6		23	13	28	2			2	10	
Atriplex canescens	(0-20cm)	0.43	17.20	22.50															5				1	1
Atriplex canescens	(21-50cm)	1.15	46.54	60.00	2			2				1	2	1	2			1	7	1	1			1
Atriplex canescens	(>50cm)	4.48	181.10	72.50	3			4				1	1	2	2	3	6		3		1		3	5
Chrysothamnus nauseosus	(0-20cm)	3.50	141.64	57.50	3	5	5	1		2	6	1		3		3	2	1	1			5	22	
Chrysothamnus nauseosus	(21-50cm)	24.30	983.39	85.00	38	24	39	19	39	35	45	32	8	50	35	19	3	26	1	28	32	54	96	3
Chrysothamnus nauseosus	(>50cm)	13.43	543.29	90.00	17	20	17	15	28	28	12	20	17	17	26	7	11	16	1	25	11	25	40	6
Cowania mexicana	(0-20cm)	0.63	25.29	25.00					1		1						1		9				1	
Cowania mexicana	(21-50cm)	3.50	141.64	62.50			2	1	1		4	3		2		1	1		37				4	
Cowania mexicana	(>50cm)	1.68	67.78	32.50	1		4					2							34					1
Ephedra viridis	(21-50cm)	0.13	5.06	12.50										1					1			1		
Ephedra viridis	(>50cm)	0.28	11.13	17.50														1	1				1	
Fallugia paradoxa	(21-50cm)	0.05	2.02	2.50																				
Lycium pallidum	(0-20cm)	0.13	5.06	5.00																				
Lycium pallidum	(21-50cm)	0.13	5.06	7.50																				
Lycium pallidum	(>50cm)	0.10	4.05	2.50																				
Purshia tridentata	(0-20cm)	0.18	7.08	10.00															2					
Purshia tridentata	(21-50cm)	0.18	7.08	12.50																				
Yucca angustissima	(21-50cm)	0.03	1.01	2.50																				
Yucca glauca	(21-50cm)	0.05	2.02	5.00																				
TOTAL NATIVE SHRUBS		109.43	4428.27	100.00	64	192	147	42	110	111	78	79	28	108	65	168	91	149	105	54	45	190	603	17
TOTAL DENSITY (stems/100 sq. m.)		175.78	(s=115.22)	100.00	159	192	148	92	111	111	89	84	193	109	78	168	122	150	157	189	161	207	702	185
TOTAL DENSITY (stems/acre)		7113.36	(s=4662.64)		6435	7770	5989	3723	4492	4492	3602	3399	7810	4411	3157	6799	4937	6070	6354	7649	6515	8377	28409	7487
SPECIES DENSITY (# of species/100 sq.m.)		5.48	(s=1.91)		5	2	4	6	4	2	6	5	3	6	3	4	7	5	8	4	3	4	7	5

N14/J16 Phase III Woodland Tree Density Data – Spring 2023

		AVERAGE DENSITY		FREQUENCY	Trees per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
NATIVE TREES																								
Juniperus osteosperma	(0-20cm)	0.03	1.01	2.50							1													
Juniperus osteosperma	(21-50cm)	0.08	3.04	7.50																				1
Juniperus osteosperma	(>50cm)	0.48	19.22	30.00		2			2						1	1					1	2		
Pinus edulis	(0-20cm)	0.15	6.07	12.50													1	2						
Pinus edulis	(21-50cm)	0.35	14.16	17.50													2	6						
Pinus edulis	(>50cm)	0.83	33.39	40.00		5	1	3	1	3		1	2	1	3	3		1				1		
TOTAL NATIVE TREES		1.90	76.89	65.00		7	1	3	3	3	1	1	2	1	4	4	3	9			1	3		1
TOTAL DENSITY (stems/100 sq. m.)		1.90	(s=2.3)	65.00	0	7	1	3	3	3	1	1	2	1	4	4	3	9	0	0	1	3	0	1
TOTAL DENSITY (stems/acre)		76.89	(s=92.92)		0	283	40	121	121	121	40	40	81	40	162	162	121	364	0	0	40	121	0	40
SPECIES DENSITY (# of species/100 sq.m.)		0.93	(s=0.8)		0	2	1	1	2	1	1	1	1	1	2	2	1	1	0	0	1	2	0	1

N14/J16 Phase III Woodland Tree Density Data – Spring 2023 (continued)

		AVERAGE DENSITY		FREQUENCY	Trees per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38	W39	W40
NATIVE TREES																								
Juniperus osteosperma	(0-20cm)	0.03	1.01	2.50																				
Juniperus osteosperma	(21-50cm)	0.08	3.04	7.50		1	1																	
Juniperus osteosperma	(>50cm)	0.48	19.22	30.00								2		2		1	1		1			3		
Pinus edulis	(0-20cm)	0.15	6.07	12.50															1			1	1	
Pinus edulis	(21-50cm)	0.35	14.16	17.50								1		1			1					2	1	
Pinus edulis	(>50cm)	0.83	33.39	40.00	2		1												2			3		
TOTAL NATIVE TREES		1.90	76.89	65.00	2	1	2					3		3		1	2		4			9	2	
TOTAL DENSITY (stems/100 sq. m.)		1.90	(s=2.3)	65.00	2	1	2	0	0	0	0	3	0	3	0	1	2	0	4	0	0	9	2	0
TOTAL DENSITY (stems/acre)		76.89	(s=92.92)		81	40	81	0	0	0	0	121	0	121	0	40	81	0	162	0	0	364	81	0
SPECIES DENSITY (# of species/100 sq.m.)		0.93	(s=0.8)		1	1	2	0	0	0	0	2	0	2	0	1	2	0	2	0	0	2	1	0

Attachment 4: N14/J16 Raw Data – Fall 2024

N14/J16 Phase III Grassland Cover Data – Fall 2024

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Bahia dissecta	0.00	2.50	0.00	0.00	0.00									P											
Chenopodium leptophyllum	0.00	2.50	0.00	0.00	0.00			P																	
Chenopodium spp.	0.03	2.50	0.09	0.03	0.08		1																		
Conyza canadensis	0.00	2.50	0.00	0.00	0.00												P								
Cordylanthus wrightii	0.00	2.50	0.00	0.00	0.00																			P	
Descurainia pinnata	0.00	2.50	0.00	0.00	0.00		P																		
Dyssodia papposa	0.00	2.50	0.00	0.00	0.00														P						
Euphorbia glyptosperma	0.00	20.00	0.00	0.00	0.00			P					P	P			P		P	P					
Lappula redowskii	0.00	5.00	0.00	0.00	0.00		P																		
Machaeranthera canescens	0.00	10.00	0.00	0.00	0.00			P											P		P				
TOTAL NATIVE ANN. & BIEN. FORBS	0.03	27.50	0.09	0.03	0.08		1	P					P	P			P		P	P	P			P	
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Halogeton glomeratus	0.03	2.50	0.09	0.03	0.08		1																		
Kochia scoparia	0.00	7.50	0.00	0.00	0.00																	P	P		
Lactuca serriola	0.00	2.50	0.00	0.00	0.00																				
Polygonum aviculare	0.00	5.00	0.00	0.00	0.00			P											P						
Portulaca oleracea	0.00	5.00	0.00	0.00	0.00								P												
Salsola iberica	0.00	10.00	0.00	0.00	0.00																				P
TOTAL INTRO. ANN. & BIEN. FORBS	0.03	27.50	0.09	0.03	0.08		1	P					P						P			P	P		P
NATIVE ANNUAL GRASSES																									
Monroa squarrosa	0.00	2.50	0.00	0.00	0.00			P																	
TOTAL NATIVE ANNUAL GRASSES	0.00	2.50	0.00	0.00	0.00			P																	
INTRODUCED ANNUAL GRASSES																									
Bromus tectorum	0.00	7.50	0.00	0.00	0.00																				
TOTAL INTRODUCED ANNUAL GRASSES	0.00	7.50	0.00	0.00	0.00																				
NATIVE PERENNIAL FORBS																									
Erigeron concinnus	0.00	2.50	0.00	0.00	0.00											P									
Leucelene ericoides	0.00	5.00	0.00	0.00	0.00									P							P				
Sphaeralcea coccinea	0.00	35.00	0.00	0.00	0.00							P		P	P	P	P	P	P		P				
TOTAL NATIVE PERENNIAL FORBS	0.00	35.00	0.00	0.00	0.00							P		P	P	P	P	P	P		P				
INTRODUCED PERENNIAL FORBS																									
Rumex crispus	0.00	2.50	0.00	0.00	0.00											P									
Sanguisorba minor	0.00	2.50	0.00	0.00	0.00												P								
TOTAL INTRO. PERENNIAL FORBS	0.00	5.00	0.00	0.00	0.00											P	P								
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.50	30.00	1.70	0.50	1.60	P	1				P		1	3	1	P	10		4	P					
Agropyron smithii	0.75	42.50	2.56	0.78	2.48	P 1								1	1	1	9	P	4		2				P
Agropyron spicatum	0.00	7.50	0.00	0.00	0.00									P	P		P								
Hordeum jubatum	0.10	5.00	0.34	0.10	0.32											P			4						
Oryzopsis hymenoides	0.03	10.00	0.09	0.03	0.08							P													
TOTAL NATIVE PERENNIAL GRASSES (c)	1.38	60.00	4.68	1.40	4.49	P 1	1				P	P	1	4	2	1	19	P	12	P	2				P

N14/J16 Phase III Grassland Cover Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																									
Bahia dissecta	0.00	2.50	0.00	0.00	0.00																				
Chenopodium leptophyllum	0.00	2.50	0.00	0.00	0.00																				
Chenopodium spp.	0.03	2.50	0.09	0.03	0.08																				
Conyza canadensis	0.00	2.50	0.00	0.00	0.00																				
Cordylanthus wrightii	0.00	2.50	0.00	0.00	0.00																				
Descurainia pinnata	0.00	2.50	0.00	0.00	0.00																				
Dyssodia papposa	0.00	2.50	0.00	0.00	0.00																				
Euphorbia glyptosperma	0.00	20.00	0.00	0.00	0.00																P				P
Lappula redowskii	0.00	5.00	0.00	0.00	0.00																P				
Machaeranthera canescens	0.00	10.00	0.00	0.00	0.00																P				
TOTAL NATIVE ANN. & BIEN. FORBS	0.03	27.50	0.09	0.03	0.08																P				P
INTRODUCED ANNUAL & BIENNIAL FORBS																									
Halogeton glomeratus	0.03	2.50	0.09	0.03	0.08																				
Kochia scoparia	0.00	7.50	0.00	0.00	0.00																		P		
Lactuca serriola	0.00	2.50	0.00	0.00	0.00																		P		
Polygonum aviculare	0.00	5.00	0.00	0.00	0.00																				
Portulaca oleracea	0.00	5.00	0.00	0.00	0.00	P																			
Salsola iberica	0.00	10.00	0.00	0.00	0.00																P		P		P
TOTAL INTRO. ANN. & BIEN. FORBS	0.03	27.50	0.09	0.03	0.08	P															P		P		P
NATIVE ANNUAL GRASSES																									
Monroa squarrosa	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE ANNUAL GRASSES	0.00	2.50	0.00	0.00	0.00																				
INTRODUCED ANNUAL GRASSES																									
Bromus tectorum	0.00	7.50	0.00	0.00	0.00				P												P				P
TOTAL INTRODUCED ANNUAL GRASSES	0.00	7.50	0.00	0.00	0.00				P												P				P
NATIVE PERENNIAL FORBS																									
Erigeron concinnus	0.00	2.50	0.00	0.00	0.00																				
Leucelene ericoides	0.00	5.00	0.00	0.00	0.00																				
Sphaeralcea coccinea	0.00	35.00	0.00	0.00	0.00		P	P				P					P				P	P			
TOTAL NATIVE PERENNIAL FORBS	0.00	35.00	0.00	0.00	0.00		P	P				P					P				P	P			
INTRODUCED PERENNIAL FORBS																									
Rumex crispus	0.00	2.50	0.00	0.00	0.00																				
Sanguisorba minor	0.00	2.50	0.00	0.00	0.00																				
TOTAL INTRO. PERENNIAL FORBS	0.00	5.00	0.00	0.00	0.00																				
NATIVE PERENNIAL GRASSES (cool)																									
Agropyron dasystachyum	0.50	30.00	1.70	0.50	1.60			P																	P
Agropyron smithii	0.75	42.50	2.56	0.78	2.48								P				1	P			P	P	P	10	1
Agropyron spicatum	0.00	7.50	0.00	0.00	0.00																				
Hordeum jubatum	0.10	5.00	0.34	0.10	0.32																				
Oryzopsis hymenoides	0.03	10.00	0.09	0.03	0.08		1														P	P			
TOTAL NATIVE PERENNIAL GRASSES (c)	1.38	60.00	4.68	1.40	4.49		1	P					P				1	P			P	P	P	10	1

N14/J16 Phase III Grassland Cover Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua gracilis	1.90	70.00	6.47	2.05	6.57	5		4	1	2 1		7 3		P	P			P				2		3	5
Buchloe dactyloides	0.00	7.50	0.00	0.00	0.00																				
Hilaria jamesii	2.38	70.00	8.09	2.70	8.65	2	1	9	5 1	4 1	2	9 1			P		P		P	2		2		P	2
Sporobolus airoides	5.70	80.00	19.42	5.95	19.07	5	P	6 2	3	7	3	6		P	3			2		P		1	P	1	29 5
Sporobolus cryptandrus	0.08	32.50	0.26	0.08	0.24	P						1	P	P		P	P		P						
TOTAL NATIVE PERENNIAL GRASSES (w)	10.05	92.50	34.24	10.78	34.54	12	1	19 2	9 1	13 2	5	23 4	P	P	3	P	P	2	P	2		5	P	4	36 5
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron desertorum	0.00	2.50	0.00	0.00	0.00																				
Agropyron intermedium	0.00	2.50	0.00	0.00	0.00																				
Elymus junceus	12.98	100.00	44.21	14.03	44.95	23 2	6 3	18 5	19 2	19 1	14 2	11 4	40 1	12	14	7	7	12	7	27 2	7	9	11	33 2	P
TOTAL INTRO. PERENNIAL GRASSES (c)	12.98	100.00	44.21	14.03	44.95	23 2	6 3	18 5	19 2	19 1	14 2	11 4	40 1	12	14	7	7	12	7	27 2	7	9	11	33 2	P
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.00	17.50	0.00	0.00	0.00	P		P										P							
Chrysothamnus greenei	0.03	2.50	0.09	0.03	0.08																1				
Gutierrezia sarothrae	0.03	25.00	0.09	0.03	0.08									P	P	P	1		P		P				
Senecio douglasii var. longilobus	0.00	2.50	0.00	0.00	0.00														P						
TOTAL NATIVE SUBSHRUBS	0.05	40.00	0.17	0.05	0.16	P		P						P	P	P	1	P	P		1				
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.93	40.00	3.15	0.93	2.96	1	1	6	2		P	2		P	1			P							
TOTAL INTRO. SUBSHRUBS	0.93	40.00	3.15	0.93	2.96	1	1	6	2		P	2		P	1			P							
NATIVE SHRUBS																									
Atriplex canescens	3.85	85.00	13.12	3.95	12.66	1	12	14 1	7	6	12	14	2 1	1	1	11 1		7	6	5	P		4	2	2
Atriplex confertifolia	0.00	2.50	0.00	0.00	0.00										P										
Chrysothamnus nauseosus	0.05	10.00	0.17	0.05	0.16									1							1				
TOTAL NATIVE SHRUBS	3.90	85.00	13.29	4.00	12.82	1	12	14 1	7	6	12	14	2 1	2	1	11 1		7	6	5	1		4	2	2
SUCCULENTS																									
Opuntia macrorhiza	0.00	2.50	0.00	0.00	0.00																				
Opuntia phaeacantha	0.03	2.50	0.09	0.03	0.08										1										
TOTAL SUCCULENTS	0.03	5.00	0.09	0.03	0.08										1										
BRYOPHYTES																									
Moss spp.	0.00	2.50	0.00	0.00	0.00				P																
TOTAL BRYOPHYTES	0.00	2.50	0.00	0.00	0.00				P																
Standing dead	6.60	100.00		6.60		5	5	6	3	3	2	5	1	9	5	6	10	9	3	8	6	10	4	2	8
Litter	14.38	100.00		14.38		11	16	8	9	12	9	6	7	20	14	33	19	17	7	20	13	13	8	14	6
Bare ground	44.68	100.00		44.68		41	38	27	35	37	49	27	48	51	55	42	44	53	64	35	68	53	65	43	33
Rock	5.00	90.00		5.00		6	18	2	16	10	9	12	1	2	4				1	3	2	10	8	2	15
TOTALS	100.00		100.00	101.90	100.16	100 3	100 3	100 8	100 3	100 3	100 2	100 8	100 2	100 0	100 0	100 1	100 0	100 0	100 0	100 2	100 0	100 0	100 0	100 2	100 5
TOTAL VEGETATION COVER	29.35	s=(14.47)		31.20	s=(16.43)	37 3	23 3	57 8	37 3	38 3	31 2	50 8	43 2	18 0	22 0	19 1	27 0	21 0	25 0	34 2	11 0	14 0	15 0	39 2	38 5
GROUND COVER (Veg+Litter+St.Dead+Rock)	55.33	s=(13.3)		57.17	s=(15.12)	59 3	62 3	73 8	65 3	63 3	51 2	73 8	52 2	49 0	45 0	58 1	56 0	47 0	36 0	65 2	32 0	47 0	35 0	57 2	67 5
Allowable Vegetation Cover	**29.33**	**s=(14.47)**				**37.0**	**23.0**	**57.0**	**37.0**	**38.0**	**31.0**	**50.0**	**43.0**	**18.0**	**22.0**	**19.0**	**27.0**	**21.0**	**25.0**	**34.0**	**11.0**	**14.0**	**15.0**	**39.0**	**38.0**
SPECIES DENSITY (# of species/100 sq.m.)	7.95	s=(3.46)				10	10	12	7	5	6	9	6	15	13	10	11	8	14	6	9	5	4	6	7

N14/J16 Phase III Grassland Cover Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua gracilis	1.90	70.00	6.47	2.05	6.57		P	P	5 1	1	1	1	29 1	3	3	2	P	2			P	P	P	P	P
Buchloe dactyloides	0.00	7.50	0.00	0.00	0.00													P			P	P			
Hilaria jamesii	2.38	70.00	8.09	2.70	8.65		P	1	15 5	P		15	6 5			P	P	2			9	2	3	4	P
Sporobolus airoides	5.70	80.00	19.42	5.95	19.07		6		29	1	6	17 1	12 1	14	49 1	3	P	3	P		3	9	6	3	1
Sporobolus cryptandrus	0.08	32.50	0.26	0.08	0.24					P						P					1	1		P	P
TOTAL NATIVE PERENNIAL GRASSES (w)	10.05	92.50	34.24	10.78	34.54		6	1	49 6	2	7	33 1	47 7	17	52 1	5	P	7	P		13	12	9	7	1
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron desertorum	0.00	2.50	0.00	0.00	0.00																		P		
Agropyron intermedium	0.00	2.50	0.00	0.00	0.00						P														
Elymus junceus	12.98	100.00	44.21	14.03	44.95	12	1	35 3	3 2	7	1	1	1	1	9 1	30 2	4	3	33 4	10	5 1	7 2	12	18 3	30
TOTAL INTRO. PERENNIAL GRASSES (c)	12.98	100.00	44.21	14.03	44.95	12	1	35 3	3 2	7	1	1	1	1	9 1	30 2	4	3	33 4	10	5 1	7 2	12	18 3	30
NATIVE SUBSHRUBS																									
Ceratoides lanata	0.00	17.50	0.00	0.00	0.00			P									P		P			P			
Chrysothamnus greenei	0.03	2.50	0.09	0.03	0.08																				
Gutierrezia sarothrae	0.03	25.00	0.09	0.03	0.08													P				P		P	P
Senecio douglasii var. longilobus	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE SUBSHRUBS	0.05	40.00	0.17	0.05	0.16			P									P	P	P			P		P	P
INTRODUCED SUBSHRUBS																									
Kochia prostrata	0.93	40.00	3.15	0.93	2.96		3	P			9			3	3	5									1
TOTAL INTRO. SUBSHRUBS	0.93	40.00	3.15	0.93	2.96		3	P			9			3	3	5									1
NATIVE SHRUBS																									
Atriplex canescens	3.85	85.00	13.12	3.95	12.66	1		10	2	1		P	1	P		1	P		3	3	6	14	5	P 1	P
Atriplex confertifolia	0.00	2.50	0.00	0.00	0.00																				
Chrysothamnus nauseosus	0.05	10.00	0.17	0.05	0.16																P				P
TOTAL NATIVE SHRUBS	3.90	85.00	13.29	4.00	12.82	1		10	2	1		P	1	P		1	P		3	3	6	14	5	P 1	P
SUCCULENTS																									
Opuntia macrorhiza	0.00	2.50	0.00	0.00	0.00																P				
Opuntia phaeacantha	0.03	2.50	0.09	0.03	0.08																				
TOTAL SUCCULENTS	0.03	5.00	0.09	0.03	0.08																P				
BRYOPHYTES																									
Moss spp.	0.00	2.50	0.00	0.00	0.00																				
TOTAL BRYOPHYTES	0.00	2.50	0.00	0.00	0.00																				
Standing dead	6.60	100.00		6.60		11	8	9	6	4	8	4	12	10	2	7	11	13	8	4	8	9	10	4	6
Litter	14.38	100.00		14.38		25	12	20	8	22	9	29	9	19	5	20	12	13	14	18	22	14	16	15	11
Bare ground	44.68	100.00		44.68		51	61	22	28	62	56	29	27	49	23	22	64	63	41	62	44	38	44	44	49
Rock	5.00	90.00		5.00			8	3	4	2	10	4	3	1	6	10	8	1	1	3	2	6	4	2	1
TOTALS	100.00		100.00	101.90	100.16	100 0	100 0	100 3	100 8	100 0	100 0	100 1	100 7	100 0	100 2	100 2	100 0	100 0	100 4	100 0	100 1	100 2	100 0	100 4	100 0
TOTAL VEGETATION COVER	29.35	s=(14.47)		31.20	s=(16.43)	13 0	11 0	46 3	54 8	10 0	17 0	34 1	49 7	21 0	64 2	41 2	5 0	10 0	36 4	13 0	24 1	33 2	26 0	35 4	33 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	55.33	s=(13.3)		57.17	s=(15.12)	49 0	39 0	78 3	72 8	38 0	44 0	71 1	73 7	51 0	77 2	78 2	36 0	37 0	59 4	38 0	56 1	62 2	56 0	56 4	51 0
Allowable Vegetation Cover	**29.33**	**s=(14.47)**				**13.0**	**11.0**	**46.0**	**54.0**	**10.0**	**17.0**	**34.0**	**49.0**	**21.0**	**64.0**	**41.0**	**5.0**	**10.0**	**36.0**	**13.0**	**24.0**	**33.0**	**26.0**	**35.0**	**33.0**
SPECIES DENSITY (# of species/100 sq.m.)	7.95	s=(3.46)				3	7	8	6	6	5	6	6	5	4	7	8	7	4	2	17	12	10	8	14

N14/J16 Phase III Shrubland Cover Data – Fall 2024

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																											
						S1		S2		S3		S4		S5		S6		S7		S8		S9		S10		S11		S12		S13		S14		S15		S16		S17		S18		S19		S20	
						1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
NATIVE ANNUAL & BIENNIAL FORBS																																											
Bahia dissecta	0.00	2.50	0.00	0.00	0.00																							P														
Chenopodium leptophyllum	0.00	2.50	0.00	0.00	0.00																																						
Conyza canadensis	0.00	2.50	0.00	0.00	0.00																																					P	
Euphorbia glyptosperma	0.00	5.00	0.00	0.00	0.00			P																		P																
Helianthus annuus	0.00	2.50	0.00	0.00	0.00																																						
Lappula redowskii	0.00	5.00	0.00	0.00	0.00																													P								
Linum puberulum	0.00	2.50	0.00	0.00	0.00																																						
Machaeranthera canescens	0.00	15.00	0.00	0.00	0.00									P								P																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	30.00	0.00	0.00	0.00			P						P								P				P		P					P								P	
INTRODUCED ANNUAL & BIENNIAL FORBS																																										
Melilotus officinalis	0.00	2.50	0.00	0.00	0.00																							P														
Polygonum aviculare	0.00	2.50	0.00	0.00	0.00																																					P	
Portulaca oleracea	0.00	5.00	0.00	0.00	0.00																																					P	
Salsola iberica	0.00	2.50	0.00	0.00	0.00																																						
Tragopogon dubius	0.00	7.50	0.00	0.00	0.00																	P																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	17.50	0.00	0.00	0.00																	P						P														P	
INTRODUCED ANNUAL GRASSES																																											
Bromus tectorum	0.05	7.50	0.17	0.05	0.17																							P														
TOTAL INTRODUCED ANNUAL GRASSES	0.05	7.50	0.17	0.05	0.17																							P														
NATIVE PERENNIAL FORBS																																											
Astragalus preussii	0.00	2.50	0.00	0.00	0.00																																						
Astragalus wingatanus	0.00	2.50	0.00	0.00	0.00																																						
Leucelene ericoides	0.00	2.50	0.00	0.00	0.00																																						
Penstemon eatonii	0.00	2.50	0.00	0.00	0.00																																						
Penstemon palmeri	0.00	5.00	0.00	0.00	0.00																																						
Ratibida columnaris	0.03	2.50	0.09	0.03	0.08																																						
Sphaeralcea coccinea	0.00	20.00	0.00	0.00	0.00													P								P																P	
TOTAL NATIVE PERENNIAL FORBS	0.03	25.00	0.09	0.03	0.08													P								P																P	
INTRODUCED PERENNIAL FORBS																																											
Onobrychis viciifolia	0.00	2.50	0.00	0.03	0.08																																						
Rumex crispus	0.00	2.50	0.00	0.00	0.00																																						P	
TOTAL INTRO. PERENNIAL FORBS	0.00	5.00	0.00	0.03	0.08																																						P	
NATIVE PERENNIAL GRASSES (cool)																																											
Agropyron dasystachyum	0.35	30.00	1.21	0.40	1.32					P				1								2	1			4				1		P										
Agropyron smithii	0.28	52.50	0.95	0.30	0.99			P		P		P		1				P				1		P				P		P		P		P		1				P		P	
Agropyron spicatum	0.03	2.50	0.09	0.03	0.08									1																													
Hordeum jubatum	0.10	2.50	0.35	0.10	0.33																																					4	
Oryzopsis hymenoides	0.10	20.00	0.35	0.10	0.33									P								1				P																	
Sitanion hystrix	0.00	2.50	0.00	0.00	0.00																																						
Stipa comata	0.03	5.00	0.09	0.03	0.08																																						
TOTAL NATIVE PERENNIAL GRASSES (c)	0.88	65.00	3.02	0.95	3.14			P		P		P		3				P				4	1	P		4		P		1		P				1				P		4	

N14/J16 Phase III Shrubland Cover Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover																					
						S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																											
Bahia dissecta	0.00	2.50	0.00	0.00	0.00																						
Chenopodium leptophyllum	0.00	2.50	0.00	0.00	0.00																						P
Conyza canadensis	0.00	2.50	0.00	0.00	0.00																						
Euphorbia glyptosperma	0.00	5.00	0.00	0.00	0.00																						
Helianthus annuus	0.00	2.50	0.00	0.00	0.00																P						
Lappula redowskii	0.00	5.00	0.00	0.00	0.00																		P				
Linum puberulum	0.00	2.50	0.00	0.00	0.00															P							
Machaeranthera canescens	0.00	15.00	0.00	0.00	0.00			P												P	P						P
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	30.00	0.00	0.00	0.00			P												P	P		P				P
INTRODUCED ANNUAL & BIENNIAL FORBS																											
Melilotus officinalis	0.00	2.50	0.00	0.00	0.00																						
Polygonum aviculare	0.00	2.50	0.00	0.00	0.00																						
Portulaca oleracea	0.00	5.00	0.00	0.00	0.00																						P
Salsola iberica	0.00	2.50	0.00	0.00	0.00																P						
Tragopogon dubius	0.00	7.50	0.00	0.00	0.00			P	P																		
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	17.50	0.00	0.00	0.00			P	P												P						P
INTRODUCED ANNUAL GRASSES																											
Bromus tectorum	0.05	7.50	0.17	0.05	0.17																2						P
TOTAL INTRODUCED ANNUAL GRASSES	0.05	7.50	0.17	0.05	0.17																2						P
NATIVE PERENNIAL FORBS																											
Astragalus preussii	0.00	2.50	0.00	0.00	0.00															P							
Astragalus wingatanus	0.00	2.50	0.00	0.00	0.00															P							
Leucelene ericoides	0.00	2.50	0.00	0.00	0.00															P							
Penstemon eatonii	0.00	2.50	0.00	0.00	0.00															P							
Penstemon palmeri	0.00	5.00	0.00	0.00	0.00				P											P							
Ratibida columnaris	0.03	2.50	0.09	0.03	0.08															1							
Sphaeralcea coccinea	0.00	20.00	0.00	0.00	0.00		P	P				P						P					P				
TOTAL NATIVE PERENNIAL FORBS	0.03	25.00	0.09	0.03	0.08		P	P	P			P						P		1			P				
INTRODUCED PERENNIAL FORBS																											
Onobrychis viciifolia	0.00	2.50	0.00	0.03	0.08															P 1							
Rumex crispus	0.00	2.50	0.00	0.00	0.00																						
TOTAL INTRO. PERENNIAL FORBS	0.00	5.00	0.00	0.03	0.08															P 1							
NATIVE PERENNIAL GRASSES (cool)																											
Agropyron dasystachyum	0.35	30.00	1.21	0.40	1.32			1 1	4	P				P				1		P							
Agropyron smithii	0.28	52.50	0.95	0.30	0.99	P		1 1	2					P	P					5			P				
Agropyron spicatum	0.03	2.50	0.09	0.03	0.08																						
Hordeum jubatum	0.10	2.50	0.35	0.10	0.33																						
Oryzopsis hymenoides	0.10	20.00	0.35	0.10	0.33			1	P											P	P			2			
Sitanion hystrix	0.00	2.50	0.00	0.00	0.00																P						
Stipa comata	0.03	5.00	0.09	0.03	0.08															P	1						
TOTAL NATIVE PERENNIAL GRASSES (c)	0.88	65.00	3.02	0.95	3.14	P		3 2	6	P				P	P			1		5	1		P	2			

N14/J16 Phase III Shrubland Cover Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua curtipendula	0.20	15.00	0.69	0.23	0.74					P									1						
Bouteloua gracilis	2.35	85.00	8.11	2.58	8.50	P	P	1	P	7	1	5 1	1	4	2 1	10	P	16 6	P	P	12	1	1	2	1
Buchloe dactyloides	0.08	22.50	0.26	0.08	0.25			1		P		1		1				P			P				
Hilaria jamesii	2.28	75.00	7.85	2.85	9.41	3	P	2 1	P	3 2	P	1 1		13 2	3	3 1	2	27 6	P	4 1	7 6	1	4	5	1
Sporobolus airoides	2.85	85.00	9.84	2.98	9.82	4	6	1	1	3	P 1	7		1	P	5	7	P	1	21 3	14 1	1	P	18	1
Sporobolus cryptandrus	0.18	22.50	0.60	0.18	0.58					P				6			P				P	P			P
TOTAL NATIVE PERENNIAL GRASSES (w)	7.93	97.50	27.35	8.88	29.30	7	6	5 1	1	13 2	1 1	14 2	1	25 2	5 1	18 1	9	43 12	2	25 4	33 7	3	5	25	3
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron desertorum	0.00	2.50	0.00	0.00	0.00		P																		
Bromus inermis	0.00	2.50	0.00	0.00	0.00																				
Elymus junceus	11.40	97.50	39.34	12.88	42.51	5	7	12 2	9 1	7 1	6	12 1	17 7	4 1	20 5	7 2	25 7	3 1	7	9 2	6 1	1	7	5	5
TOTAL INTRO. PERENNIAL GRASSES (c)	11.40	97.50	39.34	12.88	42.51	5	7	12 2	9 1	7 1	6	12 1	17 7	4 1	20 5	7 2	25 7	3 1	7	9 2	6 1	1	7	5	5
NATIVE SUBSHRUBS																									
Artemisia frigida	0.03	2.50	0.09	0.03	0.08																				
Ceratoides lanata	0.00	17.50	0.00	0.00	0.00	P	P		P						P										
Chrysothamnus greenei	0.00	2.50	0.00	0.00	0.00									P											
Gutierrezia sarothrae	0.18	47.50	0.60	0.18	0.58		P						P	P		1	P	2	P		P		P	P	1
Senecio douglasii var. longilobus	0.00	7.50	0.00	0.00	0.00									P											
TOTAL NATIVE SUBSHRUBS	0.20	65.00	0.69	0.20	0.66	P	P		P				P	P	P	1	P	2	P		P		P	P	1
INTRODUCED SUBSHRUBS																									
Kochia prostrata	2.58	52.50	8.89	2.88	9.49	P	25 3	15	9 1	6 1	14 1	15 5		P				2					4		
TOTAL INTRO. SUBSHRUBS	2.58	52.50	8.89	2.88	9.49	P	25 3	15	9 1	6 1	14 1	15 5		P				2					4		
NATIVE SHRUBS																									
Atriplex canescens	5.43	100.00	18.72	5.48	18.08	11	1	6	5	7	4	1	10	6	12	6	8	10 1	3	8	5	1	3	2	1
Atriplex confertifolia	0.03	12.50	0.09	0.03	0.08	P							P	P	P										
Chrysothamnus nauseosus	0.48	20.00	1.64	0.48	1.57	P													P						
Lycium pallidum	0.00	2.50	0.00	0.00	0.00																				
Sarcobatus vermiculatus	0.00	2.50	0.00	0.00	0.00														P						
TOTAL NATIVE SHRUBS	5.93	100.00	20.45	5.98	19.73	11	1	6	5	7	4	1	10	6	12	6	8	10 1	3	8	5	1	3	2	1
SUCCULENTS																									
Opuntia macrorhiza	0.00	5.00	0.00	0.00	0.00											P									
TOTAL SUCCULENTS	0.00	5.00	0.00	0.00	0.00											P									
Standing dead	8.08	97.50	27.87	8.08	26.66	13	1	4	7	9	6	5	9	3	7		6	3	8	6	17	9	14	14	11
Litter	14.80	100.00	51.08	14.80	48.87	25	9	21	13	12	9	12	14	9	14	9	10	6	17	11	21	15	16	16	7
Bare ground	39.83	97.50	137.45	39.83	131.50	37	15	30	36	36	53	41	18	38	30	40	38	18	57	34	17	65	51	36	67
Rock	8.33	87.50	28.73	8.33	27.49	2	36	7	20	7	7		31	11	12	15	4	12	6	7	1	5		2	1
TOTALS	100.00		100.00	102.88	105.17	100 0	100 3	100 3	100 2	100 4	100 2	100 8	100 7	100 4	100 6	100 3	100 7	100 14	100 0	100 6	100 8	100 0	100 0	100 0	100 0
TOTAL VEGETATION COVER	28.98	s=(13.15)		30.29	s=(15.72)	23 0	39 3	38 3	24 2	36 4	25 2	42 8	28 7	39 4	37 6	36 3	42 7	61 14	12 0	42 6	44 8	6 0	19 0	32 0	14 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	60.18	s=(17.43)		60.29	s=(19.43)	63 0	85 3	70 3	64 2	64 4	47 2	59 8	82 7	62 4	70 6	60 3	62 7	82 14	43 0	66 6	83 8	35 0	49 0	64 0	33 0
Allowable Vegetation Cover	**28.98**	**s=(13.15)**				**23.0**	**39.0**	**38.0**	**24.0**	**36.0**	**25.0**	**42.0**	**28.0**	**39.0**	**37.0**	**36.0**	**42.0**	**61.0**	**12.0**	**42.0**	**44.0**	**6.0**	**19.0**	**32.0**	**14.0**
SPECIES DENSITY (# of species/100 sq.m.)	9.03	s=(3.95)				9	11	9	8	14	6	9	5	17	8	9	10	13	11	5	10	7	7	7	14

N14/J16 Phase III Shrubland Cover Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE PERENNIAL GRASSES (warm)																									
Bouteloua curtipendula	0.20	15.00	0.69	0.23	0.74			3	4 1					P							P				
Bouteloua gracilis	2.35	85.00	8.11	2.58	8.50			10	8 1	P	P		1	4	1	P	1	1	P	1	2				1
Buchloe dactyloides	0.08	22.50	0.26	0.08	0.25			P		P								P							
Hilaria jamesii	2.28	75.00	7.85	2.85	9.41	1				P		P	2	3	P		P		1	1	4 3		P		
Sporobolus airoides	2.85	85.00	9.84	2.98	9.82	P		2	1	P		P	8	2		2	P	2	3	1		1		P	1
Sporobolus cryptandrus	0.18	22.50	0.60	0.18	0.58	1															P		P		
TOTAL NATIVE PERENNIAL GRASSES (w)	7.93	97.50	27.35	8.88	29.30	2		15	13 2	P	P	P	11	9	1	2	1	3	4	3	6 3	1	P	P	2
INTRODUCED PERENNIAL GRASSES (cool)																									
Agropyron desertorum	0.00	2.50	0.00	0.00	0.00																				
Bromus inermis	0.00	2.50	0.00	0.00	0.00				P																
Elymus junceus	11.40	97.50	39.34	12.88	42.51	4	10	11 3	15 3	9	6	14 1	22 2	3	14	8	11	18 3	9 2	2 1		35 3	23 2	29 5	39 3
TOTAL INTRO. PERENNIAL GRASSES (c)	11.40	97.50	39.34	12.88	42.51	4	10	11 3	15 3	9	6	14 1	22 2	3	14	8	11	18 3	9 2	2 1		35 3	23 2	29 5	39 3
NATIVE SUBSHRUBS																									
Artemisia frigida	0.03	2.50	0.09	0.03	0.08																		1		
Ceratoides lanata	0.00	17.50	0.00	0.00	0.00												P	P	P						
Chrysothamnus greenei	0.00	2.50	0.00	0.00	0.00																				
Gutierrezia sarothrae	0.18	47.50	0.60	0.18	0.58			P	1		P				P					P			1	P	1
Senecio douglasii var. longilobus	0.00	7.50	0.00	0.00	0.00				P												P				
TOTAL NATIVE SUBSHRUBS	0.20	65.00	0.69	0.20	0.66			P	1		P				P		P	P	P	P	P		2	P	1
INTRODUCED SUBSHRUBS																									
Kochia prostrata	2.58	52.50	8.89	2.88	9.49			P				P			P		P	P	2	9 1		P	P	P	2
TOTAL INTRO. SUBSHRUBS	2.58	52.50	8.89	2.88	9.49			P				P			P		P	P	2	9 1		P	P	P	2
NATIVE SHRUBS																									
Atriplex canescens	5.43	100.00	18.72	5.48	18.08	4	5	4	3	5	9	5	3	1	3	5	2	11	P	4	8 1	12	9	10	4
Atriplex confertifolia	0.03	12.50	0.09	0.03	0.08																	1			
Chrysothamnus nauseosus	0.48	20.00	1.64	0.48	1.57			P	2											9	6			1	1
Lycium pallidum	0.00	2.50	0.00	0.00	0.00																P				
Sarcobatus vermiculatus	0.00	2.50	0.00	0.00	0.00																				
TOTAL NATIVE SHRUBS	5.93	100.00	20.45	5.98	19.73	4	5	4	5	5	9	5	3	1	3	5	2	11	P	13	14 1	13	9	11	5
SUCCULENTS																									
Opuntia macrorhiza	0.00	5.00	0.00	0.00	0.00				P																
TOTAL SUCCULENTS	0.00	5.00	0.00	0.00	0.00				P																
Standing dead	8.08	97.50	27.87	8.08	26.66	9	12	11	11	12	3	10	6	15	10	12	8	4	7	8	7	10	8	7	1
Litter	14.80	100.00	51.08	14.80	48.87	11	20	10	10	18	18	21	29	12	20	11	13	9	18	21	26	15	10	18	16
Bare ground	39.83	97.50	137.45	39.83	131.50	69	51	46	38	53	59	44	26	59	47	62	65	50	57	5		20	37	17	31
Rock	8.33	87.50	28.73	8.33	27.49	1	2		1	3	5	6	3	1	5			4	3	33	44	6	11	16	3
TOTALS	100.00		100.00	102.88	105.17	100 0	100 0	100 5	100 5	100 0	100 0	100 1	100 2	100 0	100 0	100 0	100 0	100 3	100 2	100 3	100 4	100 3	100 2	100 5	100 3
TOTAL VEGETATION COVER	28.98	s=(13.15)		30.29	s=(15.72)	10 0	15 0	33 5	40 5	14 0	15 0	19 1	36 2	13 0	18 0	15 0	14 0	33 3	15 2	33 3	23 4	49 3	34 2	42 5	49 3
GROUND COVER (Veg+Litter+St.Dead+Rock)	60.18	s=(17.43)		60.29	s=(19.43)	31 0	49 0	54 5	62 5	47 0	41 0	56 1	74 2	41 0	53 0	38 0	35 0	50 3	43 2	95 3	100 4	80 3	63 2	83 5	69 3
Allowable Vegetation Cover	**28.98**	**s=(13.15)**				**10.0**	**15.0**	**33.0**	**40.0**	**14.0**	**15.0**	**19.0**	**36.0**	**13.0**	**18.0**	**15.0**	**14.0**	**33.0**	**15.0**	**33.0**	**23.0**	**49.0**	**34.0**	**42.0**	**49.0**
SPECIES DENSITY (# of species/100 sq.m.)	9.03	s=(3.95)				6	3	15	15	7	4	6	5	8	7	4	7	9	7	21	15	5	10	7	11

J7 Sagebrush Reference Area Cover Data – Fall 2024

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover														
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																				
Chenopodium leptophyllum	0.00	20.00	0.00	0.00	0.00		P			P	P									
Cordylanthus wrightii	0.00	6.67	0.00	0.00	0.00		P													
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	20.00	0.00	0.00	0.00		P			P	P									
INTRODUCED ANNUAL & BIENNIAL FORBS																				
Portulaca oleracea	0.00	60.00	0.00	0.00	0.00			P		P	P			P		P	P	P	P	P
Salsola iberica	0.00	26.67	0.00	0.00	0.00									P		P	P		P	
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	60.00	0.00	0.00	0.00			P		P	P			P		P	P	P	P	P
NATIVE ANNUAL GRASSES																				
Monroa squarrosa	0.00	6.67	0.00	0.00	0.00												P			
TOTAL NATIVE ANNUAL GRASSES	0.00	6.67	0.00	0.00	0.00												P			
NATIVE PERENNIAL FORBS																				
Leucelene ericoides	0.00	73.33	0.00	0.00	0.00	P	P		P		P		P	P	P		P	P	P	P
Sphaeralcea coccinea	0.00	73.33	0.00	0.00	0.00	P	P	P		P	P	P	P	P	P		P	P		
Stephanomeria exigua	0.00	6.67	0.00	0.00	0.00											P				
TOTAL NATIVE PERENNIAL FORBS	0.00	100.00	0.00	0.00	0.00	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)																				
Oryzopsis hymenoides	0.33	66.67	1.39	0.33	1.26	P	P	P				1	4		P		P	P	P	P
Sitanion hystrix	4.60	100.00	19.11	5.67	21.41	10 4	6	1	5	4	7	1 2	1 5	2 1	2	6	8 2	3	8 1	5 1
Stipa comata	0.20	33.33	0.83	0.20	0.76							P	1		P		P	2		
TOTAL NATIVE PERENNIAL GRASSES (c)	5.13	100.00	21.33	6.20	23.43	10 4	6	1	5	4	7	2 2	6 5	2 1	2	6	8 2	5	8 1	5 1
NATIVE PERENNIAL GRASSES (warm)																				
Bouteloua gracilis	6.67	100.00	27.70	7.13	26.95	5 1	3	6	10 2	11	14	5	6 1	8 2	2	7 1	7	6	5	5
Hilaria jamesii	1.33	93.33	5.54	1.80	6.80	P 1	2	P	1 2	3	P 1	1	P	1 2	1	6 1	P		1	4
Muhlenbergia torreyi	0.00	20.00	0.00	0.00	0.00				P		P					P				
Sporobolus cryptandrus	0.13	60.00	0.55	0.13	0.50	P		P	P		1	P	1			P	P	P		
TOTAL NATIVE PERENNIAL GRASSES (w)	8.13	100.00	33.80	9.07	34.26	5 2	5	6	11 4	14	15 1	6	7 1	9 4	3	13 2	7	6	6	9
NATIVE SUBSHRUBS																				
Ceratoides lanata	1.20	53.33	4.99	1.20	4.53	1	P					1	5	3	6		P	2		
Chrysothamnus greenei	4.40	100.00	18.28	4.67	17.63	7	10 1	6	1	2	2 1	7	4 1	2	4	1	1	10 1	7	2
Eriogonum corymbosum	0.07	6.67	0.28	0.07	0.25		1													
Eriogonum microthecum	0.00	6.67	0.00	0.00	0.00		P													
Gutierrezia sarothrae	0.27	93.33	1.11	0.27	1.01	P	1	P	P	P	P	1	P	P	P		P	1	P	1
Senecio douglasii var. longilobus	0.00	6.67	0.00	0.00	0.00														P	
TOTAL NATIVE SUBSHRUBS	5.93	100.00	24.65	6.20	23.43	8	12 1	6	1	2	2 1	9	9 1	5	10	1	1	13 1	7	3
INTRODUCED SUBSHRUBS																				
Kochia prostrata	0.00	6.67	0.00	0.00	0.00					P										
TOTAL INTRO. SUBSHRUBS	0.00	6.67	0.00	0.00	0.00					P										

J7 Sagebrush Reference Area Cover Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE SHRUBS																				
Artemisia tridentata	3.47	100.00	14.40	3.60	13.60	6	3 1	2	4	2	2	7	2	4	1	3	P	5	6 1	5
Atriplex canescens	1.33	86.67	5.54	1.33	5.04	5	1	2	1	1	2	P	1	1	2	1	1	2		
TOTAL NATIVE SHRUBS	4.80	100.00	19.94	4.93	18.64	11	4 1	4	5	3	4	7	3	5	3	4	1	7	6 1	5
SUCCULENTS																				
Coryphantha vivipara	0.00	33.33	0.00	0.00	0.00	P				P	P		P			P				
Opuntia phaeacantha	0.07	26.67	0.28	0.07	0.25							P		1	P	P				
Opuntia whipplei	0.00	6.67	0.00	0.00	0.00					P										
TOTAL SUCCULENTS	0.07	53.33	0.28	0.07	0.25	P				P	P	P	P	1	P	P				
LICHEN/FUNGUS																				
Lichen spp.	0.53	100.00	2.22	0.53	2.02	1	1	2	2	P	P	P	P	P	P	P	P	P	2	P
TOTAL LICHEN	0.53	100.00	2.22	0.53	2.02	1	1	2	2	P	P	P	P	P	P	P	P	P	2	P
Standing dead	7.20	100.00		7.20		8	3	4	8	11	11	4	11	9	4	9	5	5	6	10
Litter	20.33	100.00		20.33		13	19	27	19	28	23	22	20	21	20	19	12	20	22	20
Bare ground	46.13	100.00		46.13		38	46	50	49	38	38	49	42	44	54	48	63	42	43	48
Rock	1.73	53.33		1.73		6	4					1	2	4	4		3	2		
TOTALS	100.00		100.00	102.40	100.00	100 6	100 2	100 0	100 4	100 0	100 2	100 2	100 7	100 5	100 0	100 2	100 2	100 1	100 2	100 1
TOTAL VEGETATION COVER	24.07	s=(4.86)		26.47	s=(6.05)	34 6	27 2	17 0	22 4	23 0	28 2	24 2	25 7	22 5	18 0	24 2	17 2	31 1	27 2	22 1
GROUND COVER (Veg+Litter+St.Dead+Rock)	53.87	s=(6.72)		56.27	s=(7.63)	62 6	54 2	50 0	51 4	62 0	62 2	51 2	58 7	56 5	46 0	52 2	37 2	58 1	57 2	52 1
Allowable Vegetation Cover	**24.07**	**s=(4.86)**				**34.0**	**27.0**	**17.0**	**22.0**	**23.0**	**28.0**	**24.0**	**25.0**	**22.0**	**18.0**	**24.0**	**17.0**	**31.0**	**27.0**	**22.0**
SPECIES DENSITY (# of species/100 sq.m.)	13.73	s=(1.83)				14	16	12	11	14	15	14	15	14	14	14	17	14	12	10

N7/8 Sagebrush Reference Area Cover Data – Fall 2024

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																				
Gilia aggregata	0.00	13.33	0.00	0.00	0.00												P			
Lappula redowskii	0.00	26.67	0.00	0.00	0.00			P					P		P					
Machaeranthera canescens	0.00	26.67	0.00	0.00	0.00	P									P	P				
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	46.67	0.00	0.00	0.00	P		P					P		P	P	P			
INTRODUCED ANNUAL GRASSES																				
Bromus tectorum	0.07	13.33	0.38	0.07	0.38		1													
TOTAL INTRODUCED ANNUAL GRASSES	0.07	13.33	0.38	0.07	0.38		1													
NATIVE PERENNIAL FORBS																				
Arabis fendleri	0.00	26.67	0.00	0.00	0.00											P		P	P	
Astragalus calycosus var. scaposus	0.00	33.33	0.00	0.00	0.00	P					P				P			P		
Astragalus wingatanus	0.00	40.00	0.00	0.00	0.00			P	P								P	P		P
Euphorbia fendleri	0.00	20.00	0.00	0.00	0.00													P		P
Haplopappus acaulis	0.00	13.33	0.00	0.00	0.00							P								
Lesquerella intermedia	0.00	20.00	0.00	0.00	0.00	P										P				
Leucelene ericoides	0.20	100.00	1.15	0.20	1.15	P	P	P	P	P	1	2	P	P	P		P	P	P	P
Mirabilis linearis	0.00	13.33	0.00	0.00	0.00			P												
Mirabilis multiflora	0.00	13.33	0.00	0.00	0.00														P	
Penstemon linarioides	0.00	13.33	0.00	0.00	0.00											P				
Psilostrophe sparsiflora	0.00	20.00	0.00	0.00	0.00											P		P		
Sphaeralcea coccinea	0.20	100.00	1.15	0.27	1.53	P	P	P 1	P	P	P	P	1	1		P	P	P	1	P
Stanleya pinnata	0.00	13.33	0.00	0.00	0.00														P	
TOTAL NATIVE PERENNIAL FORBS	0.40	106.67	2.31	0.47	2.68	P	P	P 1	P	P	1	2	1	1	P	P	P	P	1	P
INTRODUCED PERENNIAL FORBS																				
Onobrychis viciifolia	0.00	20.00	0.00	0.00	0.00													P		P
TOTAL INTRO. PERENNIAL FORBS	0.00	20.00	0.00	0.00	0.00													P		P
NATIVE PERENNIAL GRASSES (cool)																				
Oryzopsis hymenoides	0.47	106.67	2.69	0.47	2.68	P	P	1	P	P	P	P	1	P	P	1	1	1	P	2
Sitanion hystrix	0.73	100.00	4.23	0.73	4.21	P	1	2	P	1		1	P	P	P	1	4	P	P	1
Stipa comata	0.00	13.33	0.00	0.00	0.00									P						
TOTAL NATIVE PERENNIAL GRASSES (c)	1.20	106.67	6.92	1.20	6.90	P	1	3	P	1	P	1	1	P	P	2	5	1	P	3
NATIVE PERENNIAL GRASSES (warm)																				
Bouteloua gracilis	2.20	106.67	12.69	2.20	12.64	1	4	3	P	1	1	7	P	3	P	4	5	P	P	4
Hilaria jamesii	1.13	93.33	6.54	1.13	6.51	P		P	2	P	3	P	1	2		4	P	1	3	1
TOTAL NATIVE PERENNIAL GRASSES (w)	3.33	106.67	19.23	3.33	19.16	1	4	3	2	1	4	7	1	5	P	8	5	1	3	5
NATIVE SUBSHRUBS																				
Ceratoides lanata	0.07	26.67	0.38	0.07	0.38		P	P												1
Chrysothamnus greenei	1.13	100.00	6.54	1.13	6.51	3		1	2	P	1	P	P	2	P	2	1	2	1	2
Gutierrezia sarothrae	2.93	106.67	16.92	2.93	16.86	2	P	2	5	P	5	6	5	P	3	5	3	4	4	P
Senecio douglasii var. longilobus	0.00	13.33	0.00	0.00	0.00							P								
TOTAL NATIVE SUBSHRUBS	4.13	106.67	23.85	4.13	23.75	5	P	3	7	P	6	6	5	2	3	7	4	6	5	3

N7/8 Sagebrush Reference Area Cover Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE SHRUBS																				
Artemisia tridentata	4.67	106.67	26.92	4.67	26.82	5	7	10	5	11	P	6	2	1	3	2	4	3	7	4
Atriplex canescens	1.60	106.67	9.23	1.60	9.20	4	3	3	P	P	3	1	P	1	2	P	1	P	5	1
Tetradymia canescens	0.00	20.00	0.00	0.00	0.00									P				P		
TOTAL NATIVE SHRUBS	6.27	106.67	36.15	6.27	36.02	9	10	13	5	11	3	7	2	2	5	2	5	3	12	5
NATIVE TREES																				
Juniperus osteosperma	0.20	20.00	1.15	0.20	1.15												1		2	
Pinus edulis	1.67	93.33	9.62	1.67	9.58		2		2	3	P	1	5	3	2	2	1	2	1	1
TOTAL NATIVE TREES	1.87	93.33	10.77	1.87	10.73		2		2	3	P	1	5	3	2	2	2	2	3	1
SUCCULENTS																				
Coryphantha vivipara	0.00	13.33	0.00	0.00	0.00								P							
Opuntia macrorhiza	0.00	13.33	0.00	0.00	0.00									P						
Opuntia phaeacantha	0.07	26.67	0.38	0.07	0.38					1	P						P			
Opuntia polyacantha	0.00	20.00	0.00	0.00	0.00					P			P							
Sclerocactus parviflorus	0.00	20.00	0.00	0.00	0.00												P			P
	0.00	6.67	0.00	0.00	0.00															
TOTAL SUCCULENTS	0.07	46.67	0.38	0.07	0.38					1	P		P	P			P			P
LICHEN/FUNGUS																				
Lichen spp.	0.00	33.33	0.00	0.00	0.00		P		P			P			P					
TOTAL LICHEN	0.00	33.33	0.00	0.00	0.00		P		P			P			P					
Standing dead	10.07	106.67		10.07		9	11	19	7	13	8	10	5	11	15	8	13	8	5	9
Litter	18.67	106.67		18.67		17	19	16	29	21	17	15	28	17	26	17	15	13	16	14
Bare ground	38.13	106.67		38.13		48	21	38	40	44	23	23	44	49	40	27	46	45	32	52
Rock	15.80	106.67		15.80		11	31	5	8	5	38	28	8	10	9	27	5	21	23	8
TOTALS	100.00		100.00	100.07	100.00	100 0	100 0	100 1	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0
TOTAL VEGETATION COVER	17.33	s=(5.97)		17.40	s=(4.34)	15 0	18 0	22 1	16 0	17 0	14 0	24 0	15 0	13 0	10 0	21 0	21 0	13 0	24 0	17 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	61.87	s=(18.43)		61.93	s=(10.37)	52 0	79 0	62 1	60 0	56 0	77 0	77 0	56 0	51 0	60 0	73 0	54 0	55 0	68 0	48 0
Allowable Vegetation Cover	**17.33**	**s=(5.97)**				**15.0**	**18.0**	**22.0**	**16.0**	**17.0**	**14.0**	**24.0**	**15.0**	**13.0**	**10.0**	**21.0**	**21.0**	**13.0**	**24.0**	**17.0**
SPECIES DENSITY (# of species/100 sq.m.)	14.13	s=(3.87)				13	12	14	13	13	12	14	14	14	13	15	16	18	15	16

N14 Sagebrush Reference Area Cover Data – Fall 2024

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)	Percent Foliar Cover 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd	1st 2nd
NATIVE ANNUAL & BIENNIAL FORBS																				
Machaeranthera canescens	0.00	40.00	0.00	0.00	0.00			P	P					P	P		P		P	
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	40.00	0.00	0.00	0.00			P	P					P	P		P		P	
NATIVE PERENNIAL FORBS																				
Arabis fendleri	0.00	6.67	0.00	0.00	0.00											P				
Leucelene ericoides	0.00	86.67	0.00	0.00	0.00	P	P		P	P	P	P	P		P	P	P	P	P	P
Sphaeralcea coccinea	0.00	60.00	0.00	0.00	0.00	P			P	P	P		P		P	P			P	P
TOTAL NATIVE PERENNIAL FORBS	0.00	86.67	0.00	0.00	0.00	P	P		P	P	P	P	P		P	P	P	P	P	P
NATIVE PERENNIAL GRASSES (cool)																				
Oryzopsis hymenoides	0.07	40.00	0.21	0.07	0.20	P				P	1	P				P				P
Sitanion hystrix	2.40	100.00	7.69	3.13	9.33	1	3	3	2	2 1	3 2	3	6 2	4 2	P	P	4 1	1	3 3	1
Stipa comata	0.00	6.67	0.00	0.00	0.00											P				
TOTAL NATIVE PERENNIAL GRASSES (c)	2.47	100.00	7.91	3.20	9.52	1	3	3	2	2 1	4 2	3	6 2	4 2	P	P	4 1	1	3 3	1
NATIVE PERENNIAL GRASSES (warm)																				
Bouteloua gracilis	12.40	100.00	39.74	13.87	41.27	10	15 4	14 4	15	10 1	11 2	12 3	14 4	10 1	13	12	13	15	9 3	13
Hilaria jamesii	0.00	6.67	0.00	0.00	0.00											P				
Sporobolus cryptandrus	0.00	6.67	0.00	0.00	0.00								P							
TOTAL NATIVE PERENNIAL GRASSES (w)	12.40	100.00	39.74	13.87	41.27	10	15 4	14 4	15	10 1	11 2	12 3	14 4	10 1	13	12	13	15	9 3	13
NATIVE SUBSHRUBS																				
Chrysothamnus greenei	0.00	46.67	0.00	0.00	0.00	P		P		P	P		P				P	P		
Gutierrezia sarothrae	0.93	100.00	2.99	1.00	2.98	2	P	P 1	1	2	1	1	P	P	P	2	P	2	1	2
TOTAL NATIVE SUBSHRUBS	0.93	100.00	2.99	1.00	2.98	2	P	P 1	1	2	1	1	P	P	P	2	P	2	1	2
NATIVE SHRUBS																				
Artemisia tridentata	13.27	100.00	42.52	13.40	39.88	8	20	12	4 1	14	21 1	9	16	20	14	10	12	9	19	11
Atriplex canescens	0.13	20.00	0.43	0.13	0.40	1		1											P	
TOTAL NATIVE SHRUBS	13.40	100.00	42.95	13.53	40.28	9	20	13	4 1	14	21 1	9	16	20	14	10	12	9	19	11
NATIVE TREES																				
Pinus edulis	2.00	93.33	6.41	2.00	5.95	5	P	3	4	5	2	2	4	P	P	1	P		1	3
TOTAL NATIVE TREES	2.00	93.33	6.41	2.00	5.95	5	P	3	4	5	2	2	4	P	P	1	P		1	3
SUCCULENTS																				
Coryphantha vivipara	0.00	26.67	0.00	0.00	0.00		P			P				P		P				
Opuntia phaeacantha	0.00	40.00	0.00	0.00	0.00	P				P			P		P		P		P	
Sclerocactus parviflorus	0.00	6.67	0.00	0.00	0.00				P											
TOTAL SUCCULENTS	0.00	66.67	0.00	0.00	0.00	P	P		P	P			P	P	P	P	P		P	
LICHEN/FUNGUS																				
Lichen spp.	0.53	93.33	1.71	0.53	1.59		1	3	P	2	1	P	1	P	P	P	P	P	P	P
TOTAL LICHEN	0.53	93.33	1.71	0.53	1.59		1	3	P	2	1	P	1	P	P	P	P	P	P	P
Standing dead	13.33	100.00		13.33		9	16	17	14	9	11	18	12	8	13	19	13	11	20	10
Litter	20.20	100.00		20.20		13	18	21	13	23	23	27	25	27	17	18	21	25	17	15
Bare ground	34.67	100.00		34.67		51	27	26	47	33	26	28	22	31	42	38	37	37	30	45
Rock	0.07	6.67		0.07											1					
TOTALS	100.00		100.00	102.40	100.00	100 0	100 4	100 5	100 1	100 2	100 5	100 3	100 6	100 3	100 0	100 0	100 1	100 0	100 6	100 0
TOTAL VEGETATION COVER	31.20	s=(4.96)		33.60	s=(6.98)	27 0	38 4	33 5	26 1	33 2	39 5	27 3	40 6	34 3	27 0	25 0	29 1	27 0	33 6	30 0
GROUND COVER (Veg+Litter+St.Dead+Rock)	65.33	s=(8.67)		67.73	s=(10.73)	49 0	73 4	74 5	53 1	67 2	74 5	72 3	78 6	69 3	58 0	62 0	63 1	63 0	70 6	55 0
Allowable Vegetation Cover	**31.20**	**s=(4.96)**				**27.0**	**38.0**	**33.0**	**26.0**	**33.0**	**39.0**	**27.0**	**40.0**	**34.0**	**27.0**	**25.0**	**29.0**	**27.0**	**33.0**	**30.0**
SPECIES DENSITY (# of species/100 sq.m.)	9.80	s=(1.66)				11	8	9	10	12	10	8	11	8	10	13	10	7	11	9

N14/J16 Phase III Grassland Production Data – Fall 2024

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
NATIVE ANNUAL & BIENNIAL FORBS																							
Euphorbia glyptosperma	0.00	0.03	2.50												0.2		T						
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	0.03	2.50	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Portulaca oleracea	0.00	0.07	2.50																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	0.07	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea coccinea	0.00	0.04	5.00													0.2	0.1						
TOTAL NATIVE PERENNIAL FORBS	0.00	0.04	5.00	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.32	5.66	15.00						1.2			2.1		6.2	23.6		1.5						
Agropyron smithii	0.16	2.93	17.50	0.3								5.6		3.7	3.8		1		3.9				
Agropyron spicatum	0.09	1.53	5.00									6.3			4								
Hordeum jubatum	0.31	5.52	2.50														37.1						
Oryzopsis hymenoides	0.03	0.46	2.50															3.1					
TOTAL NATIVE PERENNIAL GRASSES (c)	0.90	16.1	22.50	0.3	-	-	-	-	1.2	-	-	14.0	-	9.9	31.4	-	39.6	3.1	3.9	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	1.27	22.58	42.50	7.4		5.9				30.4		0.4	0.2									7	11.6
Hilaria jamesii	1.43	25.53	27.50			17.3				1.4										37.6			
Sporobolus airoides	4.61	82.29	42.50	16.7		41.5	2			17.9						38.9						0.4	101.1
Sporobolus cryptandrus	0.28	4.94	17.50							22.2													
TOTAL NATIVE PERENNIAL GRASSES (w)	7.59	135.33	65.00	24.1	-	64.7	2.0	-	-	71.9	-	0.4	0.2	-	-	38.9	-	-	-	37.6	-	7.4	112.7
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	14.12	251.81	90.00	55.4	60.2	59.5	74.8	16.3	70.7	42.3	104.2	32.5	26	33.9	39.4	86	13	74.2	40.6		41.5	76.6	
TOTAL INTRO. PERENNIAL GRASSES (c)	14.12	251.81	90.00	55.4	60.2	59.5	74.8	16.3	70.7	42.3	104.2	32.5	26.0	33.9	39.4	86.0	13.0	74.2	40.6	-	41.5	76.6	-
NATIVE SUBSHRUBS																							
Gutierrezia sarothrae	0.00	0.06	2.50											0.4									
TOTAL NATIVE SUBSHRUBS	0.00	0.06	2.50	-	-	-	-	-	-	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	1.43	25.48	22.50	1.1		14.5							1										
TOTAL INTRO. SUBSHRUBS	1.43	25.48	22.50	1.1	-	14.5	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-
NATIVE SHRUBS																							
Atriplex canescens	6.11	108.93	32.50		62.4	124	0.7	55	13.7	133.2		102	44.2			75.7							
TOTAL NATIVE SHRUBS	6.11	108.93	32.50	-	62.4	124.0	0.7	55.0	13.7	133.2	-	102.0	44.2	-	-	75.7	-	-	-	-	-	-	-
TOTAL PRODUCTION	30.15	537.86	100.00	80.9	122.6	262.7	77.5	71.3	85.6	247.4	104.2	148.9	71.4	44.2	71.0	200.8	52.7	77.3	44.5	37.6	41.5	84.0	112.7
Standard Deviation	18.60	331.75																					
ALLOWABLE PRODUCTION (lbs/acre)	537.86	(s=331.75)		481.1	729.1	1562.2	460.9	424.0	509.0	1471.2	619.6	885.5	424.6	262.8	422.2	1194.1	313.4	459.7	264.6	223.6	246.8	499.5	670.2
SPECIES DENSITY (# of species/1.5 sq.m.)	3.33	(s=1.54)		5.0	2.0	6.0	3.0	2.0	3.0	6.0	1.0	6.0	4.0	4.0	5.0	4.0	6.0	2.0	2.0	1.0	1.0	3.0	2.0

Noxious Production	0.00	**To calculate Allowable Production (per permit):**
Annual Production	0.01	Subtract average pduction of noxious species (AZ & NN)
Excess Annual Production	0.00	If average annual production is greater than 10%, substract the average excess

N14/J16 Phase III Grassland Production Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
NATIVE ANNUAL & BIENNIAL FORBS																							
Euphorbia glyptosperma	0.00	0.03	2.50																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	0.03	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Portulaca oleracea	0.00	0.07	2.50	0.5																			
TOTAL INTRO. ANN. & BIEN. FORBS	0.00	0.07	2.50	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea coccinea	0.00	0.04	5.00																				
TOTAL NATIVE PERENNIAL FORBS	0.00	0.04	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.32	5.66	15.00																3.5				
Agropyron smithii	0.16	2.93	17.50																1.4				
Agropyron spicatum	0.09	1.53	5.00																				
Hordeum jubatum	0.31	5.52	2.50																				
Oryzopsis hymenoides	0.03	0.46	2.50																				
TOTAL NATIVE PERENNIAL GRASSES (c)	0.90	16.1	22.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua gracilis	1.27	22.58	42.50			9.5	5.8	4.6	7.4		34.4	0.4	19	5						0.6	2.3		
Hilaria jamesii	1.43	25.53	27.50				11.2			25.6	23.6			1.9		17.9			30.1	1.5		3.6	
Sporobolus airoides	4.61	82.29	42.50				11.7		0.5	39.9	49.5	50.2	117.1			42.2				14.8	5.2		3.9
Sporobolus cryptandrus	0.28	4.94	17.50					0.9						2.1			0.7		3.1			2.8	1.4
TOTAL NATIVE PERENNIAL GRASSES (w)	7.59	135.33	65.00	-	-	9.5	28.7	5.5	7.9	65.5	107.5	50.6	136.1	9.0	-	60.1	0.7	-	33.2	16.9	7.5	6.4	5.3
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	14.12	251.81	90.00	62.4	41.5	49.4	3.6	21	12.9			34.9	47	40.5	48.4	25	76.8	36.6	3.9	57.3	43.5	65.4	76.6
TOTAL INTRO. PERENNIAL GRASSES (c)	14.12	251.81	90.00	62.4	41.5	49.4	3.6	21.0	12.9	-	-	34.9	47.0	40.5	48.4	25.0	76.8	36.6	3.9	57.3	43.5	65.4	76.6
NATIVE SUBSHRUBS																							
Gutierrezia sarothrae	0.00	0.06	2.50																				
TOTAL NATIVE SUBSHRUBS	0.00	0.06	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	1.43	25.48	22.50		8.4				45.1	1.5		29.9		57.5									12.4
TOTAL INTRO. SUBSHRUBS	1.43	25.48	22.50	-	8.4	-	-	-	45.1	1.5	-	29.9	-	57.5	-	-	-	-	-	-	-	-	12.4
NATIVE SHRUBS																							
Atriplex canescens	6.11	108.93	32.50				10.1											2.2	3.7	105.8			
TOTAL NATIVE SHRUBS	6.11	108.93	32.50	-	-	-	10.1	-	-	-	-	-	-	-	-	-	-	2.2	3.7	105.8	-	-	-
TOTAL PRODUCTION	30.15	537.86	100.00	62.9	49.9	58.9	42.4	26.5	65.9	67.0	107.5	115.4	183.1	107.0	48.4	85.1	77.5	38.8	45.7	180.0	51.0	71.8	94.3
Standard Deviation	18.60	331.75																					
ALLOWABLE PRODUCTION (lbs/acre)	537.86	(s=331.75)		374.1	296.7	350.3	252.1	157.6	391.9	398.4	639.3	686.3	1088.8	636.3	287.8	506.1	460.9	230.7	271.8	1070.4	303.3	427.0	560.8
SPECIES DENSITY (# of species/1.5 sq.m.)	3.33	(s=1.54)		2.0	2.0	2.0	5.0	3.0	4.0	3.0	3.0	4.0	3.0	5.0	1.0	3.0	2.0	2.0	6.0	5.0	3.0	3.0	4.0

Noxious Production	0.00	**To calculate Allowable Production (per permit):**
Annual Production	0.01	Subtract average pduction of noxious species (AZ & NN)
Excess Annual Production	0.00	If average annual production is greater than 10%, substract the average excess

N14/J16 Phase III Shrubland Production Data – Fall 2024

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
NATIVE ANNUAL & BIENNIAL FORBS																							
Conyza canadensis	0.00	0.03	2.50																				0.2
Euphorbia glyptosperma	0.00	0	2.50		T																		
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	0.03	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Amaranthus graecizans	0.00	0.06	2.50																				0.4
Salsola iberica	0.90	16	2.50																				
Tragopogon dubius	0.03	0.46	2.50																				
TOTAL INTRO. ANN. & BIEN. FORBS	0.93	16.52	7.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.12	2.17	2.50																				
TOTAL INTRODUCED ANNUAL GRASSES	0.12	2.17	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea coccinea	0.00	0.06	2.50																				0.4
TOTAL NATIVE PERENNIAL FORBS	0.00	0.06	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
INTRODUCED PERENNIAL FORBS																							
Rumex crispus	0.01	0.13	2.50																				0.9
TOTAL INTRODUCED PERENNIAL FORBS	0.01	0.13	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.09	1.65	5.00														2.6						
Agropyron smithii	0.29	5.13	12.50					1.9		23.7													
Hordeum jubatum	0.12	2.13	2.50																				14.3
TOTAL NATIVE PERENNIAL GRASSES (c)	0.50	8.91	20.00	-	-	-	-	1.9	-	23.7	-	-	-	-	-	-	2.6	-	-	-	-	-	14.3
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua curtipendula	0.33	5.95	7.50					9.3															
Bouteloua gracilis	1.15	20.53	35.00			20.7		5.4		3.7		1.3		9.7		47.8	9.2		21.6	0.3			
Buchloe dactyloides	0.04	0.74	2.50													5							
Hilaria jamesii	3.45	61.46	37.50	17.8				55.6		5.9				18.6		69.9	0.9	22.2	84.5		4.9		
Sporobolus airoides	2.31	41.21	30.00		5.7	39.9											1.8	67.7			4.3	84.6	
Sporobolus cryptandrus	0.11	1.93	7.50									3.8		7.9									
TOTAL NATIVE PERENNIAL GRASSES (w)	7.39	131.82	67.50	17.8	5.7	60.6	-	70.3	-	9.6	-	5.1	-	36.2	-	122.7	11.9	89.9	106.1	0.3	9.2	84.6	-
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	15.39	274.56	95.00	66.2	17	18.9	18.3	16.3	63.5	24.4	70.4	19.6	79.4	18.5	152.3		50	30.4	4.9	41.2	49.1	16.6	24
TOTAL INTRO. PERENNIAL GRASSES (c)	15.39	274.56	95.00	66.2	17.0	18.9	18.3	16.3	63.5	24.4	70.4	19.6	79.4	18.5	152.3	-	50.0	30.4	4.9	41.2	49.1	16.6	24.0
NATIVE SUBSHRUBS																							
Gutierrezia sarothrae	0.03	0.52	5.00													1							
TOTAL NATIVE SUBSHRUBS	0.03	0.52	5.00	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	3.39	60.42	20.00		112.3	73.9	14.4	107.9	19.1	69.9											5.3		3.6
TOTAL INTRO. SUBSHRUBS	3.39	60.42	20.00	-	112.3	73.9	14.4	107.9	19.1	69.9	-	-	-	-	-	-	-	-	-	-	5.3	-	3.6
NATIVE SHRUBS																							
Atriplex canescens	9.82	175.25	85.00	13.7	9.2		4.2	6.8	9.8		9.3	180.2	160.3	66.2	45.6	28.9	20.3	43.1	22.8		0.5	1	16.1
Chrysothamnus nauseosus	0.01	0.1	2.50																				
TOTAL NATIVE SHRUBS	9.83	175.35	85.00	13.7	9.2	-	4.2	6.8	9.8	-	9.3	180.2	160.3	66.2	45.6	28.9	20.3	43.1	22.8	-	0.5	1.0	16.1
TOTAL PRODUCTION	37.58	670.49	100.00	97.7	144.2	153.4	36.9	203.2	92.4	127.6	79.7	204.9	239.7	120.9	197.9	152.6	84.8	163.4	133.8	41.5	64.1	102.2	59.9
Standard Deviation	19.80	353.23																					
ALLOWABLE PRODUCTION (lbs/acre)	670.49	(s=353.23)		581.0	857.5	912.2	219.4	1208.4	549.5	758.8	474.0	1218.5	1425.4	719.0	1176.9	907.5	504.3	971.7	795.7	246.8	381.2	607.8	356.2
SPECIES DENSITY (# of species/1.5 sq.m.)	3.68	(s=1.58)		3.0	5.0	4.0	3.0	7.0	3.0	5.0	2.0	4.0	2.0	5.0	2.0	5.0	6.0	4.0	4.0	2.0	5.0	3.0	8.0

Noxious Production	0.00
Annual Production	1.05
Excess Annual Production	0.00

To calculate Allowable Production (per permit):
Subtract average pduction of noxious species (AZ & NN)
If average annual production is greater than 10%, substract the average excess

N14/J16 Phase III Shrubland Production Data – Fall 2024 (continued)

PLANT SPECIES	AVERAGE PRODUCTION (g/0.5 sq. m.)	(lbs/acre)	FREQUENCY %	Production (g/1.5 sq m) S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
NATIVE ANNUAL & BIENNIAL FORBS																							
Conyza canadensis	0.00	0.03	2.50																				
Euphorbia glyptosperma	0.00	0	2.50																				
TOTAL NATIVE ANN. & BIEN. FORBS	0.00	0.03	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED ANNUAL & BIENNIAL FORBS																							
Amaranthus graecizans	0.00	0.06	2.50																				
Salsola iberica	0.90	16	2.50															107.6					
Tragopogon dubius	0.03	0.46	2.50				3.1																
TOTAL INTRO. ANN. & BIEN. FORBS	0.93	16.52	7.50	-	-	-	3.1	-	-	-	-	-	-	-	-	-	-	107.6	-	-	-	-	-
INTRODUCED ANNUAL GRASSES																							
Bromus tectorum	0.12	2.17	2.50																14.6				
TOTAL INTRODUCED ANNUAL GRASSES	0.12	2.17	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.6	-	-	-	-
NATIVE PERENNIAL FORBS																							
Sphaeralcea coccinea	0.00	0.06	2.50																				
TOTAL NATIVE PERENNIAL FORBS	0.00	0.06	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED PERENNIAL FORBS																							
Rumex crispus	0.01	0.13	2.50																				
TOTAL INTRODUCED PERENNIAL FORBS	0.01	0.13	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (cool)																							
Agropyron dasystachyum	0.09	1.65	5.00													8.5							
Agropyron smithii	0.29	5.13	12.50	2.7		3	3.2																
Hordeum jubatum	0.12	2.13	2.50																				
TOTAL NATIVE PERENNIAL GRASSES (c)	0.50	8.91	20.00	2.7	-	3.0	3.2	-	-	-	-	-	-	-	-	8.5	-	-	-	-	-	-	-
NATIVE PERENNIAL GRASSES (warm)																							
Bouteloua curtipendula	0.33	5.95	7.50			0.3	30.4																
Bouteloua gracilis	1.15	20.53	35.00			0.6	9.3		0.2			6.6					1.7						
Buchloe dactyloides	0.04	0.74	2.50																				
Hilaria jamesii	3.45	61.46	37.50	1.4				4.6			0.4	80.5	1.3						44.9				
Sporobolus airoides	2.31	41.21	30.00	6.1				17.2			24.7			17.9		3.4							3.9
Sporobolus cryptandrus	0.11	1.93	7.50	1.3																			
TOTAL NATIVE PERENNIAL GRASSES (w)	7.39	131.82	67.50	8.8	-	0.9	39.7	21.8	0.2	-	25.1	87.1	1.3	17.9	-	3.4	1.7	-	44.9	-	-	-	3.9
INTRODUCED PERENNIAL GRASSES (cool)																							
Elymus junceus	15.39	274.56	95.00	20	73.1	20.8	22.2	50.5	24.7	16.4	58.2	3.7	98.1	141.6	45.4	60.3	73.5	44.5		90.2	54	116.4	52.2
TOTAL INTRO. PERENNIAL GRASSES (c)	15.39	274.56	95.00	20.0	73.1	20.8	22.2	50.5	24.7	16.4	58.2	3.7	98.1	141.6	45.4	60.3	73.5	44.5	-	90.2	54.0	116.4	52.2
NATIVE SUBSHRUBS																							
Gutierrezia sarothrae	0.03	0.52	5.00				2.5																
TOTAL NATIVE SUBSHRUBS	0.03	0.52	5.00	-	-	-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INTRODUCED SUBSHRUBS																							
Kochia prostrata	3.39	60.42	20.00																				
TOTAL INTRO. SUBSHRUBS	3.39	60.42	20.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NATIVE SHRUBS																							
Atriplex canescens	9.82	175.25	85.00	0.9	2.2	61		3.4		0.3	8.7	18.6	1.2	6.4		41.5	8.2	111	17.5	109.9	105.3	3.8	40.9
Chrysothamnus nauseosus	0.01	0.1	2.50																0.7				
TOTAL NATIVE SHRUBS	9.83	175.35	85.00	0.9	2.2	61.0	-	3.4	-	0.3	8.7	18.6	1.2	6.4	-	41.5	8.2	111.0	18.2	109.9	105.3	3.8	40.9
TOTAL PRODUCTION	37.58	670.49	100.00	32.4	75.3	85.7	70.7	75.7	24.9	16.7	92.0	109.4	100.6	165.9	45.4	113.7	83.4	263.1	77.7	200.1	159.3	120.2	97.0
Standard Deviation	19.80	353.23																					
ALLOWABLE PRODUCTION (lbs/acre)	670.49	(s=353.23)		192.7	447.8	509.6	420.4	450.2	148.1	99.3	547.1	650.6	598.2	986.6	270.0	676.1	496.0	1564.6	462.1	1189.9	947.3	714.8	576.8
SPECIES DENSITY (# of species/1.5 sq.m.)	3.68	(s=1.58)		6.0	2.0	5.0	6.0	4.0	2.0	2.0	4.0	4.0	3.0	3.0	1.0	4.0	3.0	3.0	4.0	2.0	2.0	2.0	3.0

Noxious Production	0.00
Annual Production	1.05
Excess Annual Production	0.00

To calculate Allowable Production (per permit):
Subtract average pduction of noxious species (AZ & NN)
If average annual production is greater than 10%, substract the average excess

N14/J16 Phase III Grassland Shrub Density Data – Fall 2024

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	G18	G19	G20
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.05	2.02	5.00			1	1																
Ceratoides lanata	(21-50cm)	0.20	8.09	12.50	3		2	1																
Ceratoides lanata	(>50cm)	0.13	5.06	10.00	2												1							
Chrysothamnus greenei	(0-20cm)	0.03	1.01	2.50																1				
Chrysothamnus greenei	(21-50cm)	0.05	2.02	2.50																2				
Gutierrezia sarothrae	(0-20cm)	3.13	126.46	22.50									10	1	83	11		16		1				
Gutierrezia sarothrae	(21-50cm)	1.53	61.71	15.00									11		40	6							1	
Senecio douglasii var. longilobus	(>50cm)	0.03	1.01	2.50														1						
TOTAL NATIVE SUBSHRUBS		5.13	207.40	45.00	5		3	2					21	1	123	17	1	17		4			1	
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	5.68	229.66	30.00		12	38	2		1				12			2							
Kochia prostrata	(21-50cm)	9.73	393.56	37.50	5	8	65	12		3			5	10			6							
Kochia prostrata	(>50cm)	0.78	31.36	17.50	10	1					2		7	4										
TOTAL INTRO. SUBSHRUBS		16.18	654.58	40.00	15	21	103	14		4	2		12	26			8							
NATIVE SHRUBS																								
Atriplex canescens	(0-20cm)	1.10	44.52	42.50		7	3	1		5		1	1	3	1		2		8	1		2		
Atriplex canescens	(21-50cm)	6.18	249.89	80.00	3	23	5	3	12	21	8	9	3	14	3		10	8	17	4		1	3	4
Atriplex canescens	(>50cm)	13.28	537.22	80.00	8	40	27	19	10	16	22	3	4	7	25		19	9	10	6		7	1	6
Atriplex confertifolia	(21-50cm)	0.18	7.08	5.00				6						1										
Chrysothamnus nauseosus	(0-20cm)	0.03	1.01	2.50																				
Chrysothamnus nauseosus	(21-50cm)	0.30	12.14	12.50									1					5		4				
Chrysothamnus nauseosus	(>50cm)	0.20	8.09	10.00									2							3				
TOTAL NATIVE SHRUBS		21.25	859.96	85.00	11	70	35	29	22	42	30	13	11	25	29		31	22	35	18		10	4	10
TOTAL DENSITY (stems/100 sq. m.)		42.55	(s=41.46)	97.50	31	91	141	45	22	46	32	13	44	52	152	17	40	39	35	22	0	10	5	10
TOTAL DENSITY (stems/acre)		1721.94	(s=1677.72)		1255	3683	5706	1821	890	1862	1295	526	1781	2104	6151	688	1619	1578	1416	890	0	405	202	405
SPECIES DENSITY (# of species/100 sq.m.)		1.98	(s=1.14)		3	2	3	4	1	2	2	1	4	4	2	1	3	4	1	4	0	1	2	1

N14/J16 Phase III Grassland Shrub Density Data – Fall 2024 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G31	G32	G33	G34	G35	G36	G37	G38	G39	G40
NATIVE SUBSHRUBS																								
Ceratoides lanata	(0-20cm)	0.05	2.02	5.00																				
Ceratoides lanata	(21-50cm)	0.20	8.09	12.50												1					1			
Ceratoides lanata	(>50cm)	0.13	5.06	10.00			1											1						
Chrysothamnus greenei	(0-20cm)	0.03	1.01	2.50																				
Chrysothamnus greenei	(21-50cm)	0.05	2.02	2.50																				
Gutierrezia sarothrae	(0-20cm)	3.13	126.46	22.50													1				1		1	
Gutierrezia sarothrae	(21-50cm)	1.53	61.71	15.00																	2			1
Senecio douglasii var. longilobus	(>50cm)	0.03	1.01	2.50																				
TOTAL NATIVE SUBSHRUBS		5.13	207.40	45.00			1									1	1	1			4		1	1
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	5.68	229.66	30.00		53				59			18	16	4									10
Kochia prostrata	(21-50cm)	9.73	393.56	37.50		13	3			84			38	45	78									14
Kochia prostrata	(>50cm)	0.78	31.36	17.50						4				3										
TOTAL INTRO. SUBSHRUBS		16.18	654.58	40.00		66	3			147			56	64	82									24
NATIVE SHRUBS																								
Atriplex canescens	(0-20cm)	1.10	44.52	42.50							2	1								2	1			3
Atriplex canescens	(21-50cm)	6.18	249.89	80.00	2		10	4	10		6	3	1		3	2			12		21	10	5	7
Atriplex canescens	(>50cm)	13.28	537.22	80.00	4		28	11	20			2			8	4		2	16	9	115	40	31	2
Atriplex confertifolia	(21-50cm)	0.18	7.08	5.00																				
Chrysothamnus nauseosus	(0-20cm)	0.03	1.01	2.50																1				
Chrysothamnus nauseosus	(21-50cm)	0.30	12.14	12.50																1				1
Chrysothamnus nauseosus	(>50cm)	0.20	8.09	10.00																			1	2
TOTAL NATIVE SHRUBS		21.25	859.96	85.00	6		38	15	30		8	6	1		11	6		2	28	13	137	50	37	15
TOTAL DENSITY (stems/100 sq. m.)		42.55	(s=41.46)	97.50	6	66	42	15	30	147	8	6	57	64	93	7	1	3	28	13	141	50	38	40
TOTAL DENSITY (stems/acre)		1721.94	(s=1677.72)		243	2671	1700	607	1214	5949	324	243	2307	2590	3764	283	40	121	1133	526	5706	2023	1538	1619
SPECIES DENSITY (# of species/100 sq.m.)		1.98	(s=1.14)		1	1	3	1	1	1	1	1	2	1	2	2	1	2	1	2	3	1	3	4

N14/J16 Phase III Shrubland Shrub Density Data – Fall 2024

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	0.03	1.01	2.50																				
Artemisia frigida	(21-50cm)	0.10	4.05	2.50																				
Artemisia frigida	(>50cm)	0.05	2.02	2.50																				
Ceratoides lanata	(21-50cm)	0.33	13.15	17.50	3	1		3						1										
Ceratoides lanata	(>50cm)	0.03	1.01	2.50																				
Chrysothamnus greenei	(21-50cm)	0.03	1.01	2.50									1											
Gutierrezia sarothrae	(0-20cm)	3.45	139.62	40.00		13						1	1		5		62	5		1		1	1	3
Gutierrezia sarothrae	(21-50cm)	2.25	91.05	27.50		12						3	1			1	29						2	
Senecio douglasii var. longilobus	(0-20cm)	0.03	1.01	2.50																				
Senecio douglasii var. longilobus	(21-50cm)	0.08	3.04	5.00																				
TOTAL NATIVE SUBSHRUBS		6.35	256.98	65.00	3	26		3				4	3	1	5	1	91	5		1		1	3	3
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	17.30	700.11	30.00		246	210	20	7	49	68		5									25		
Kochia prostrata	(21-50cm)	22.80	922.68	47.50		334	70	68	18	114	147		2				3					49		
Kochia prostrata	(>50cm)	8.25	333.87	25.00		27	59	55	25	58	46						2							
TOTAL INTRO. SUBSHRUBS		48.35	1956.65	50.00		607	339	143	50	221	261		7				5					74		
NATIVE SHRUBS																								
Artemisia tridentata	(>50cm)	0.00	0.00	2.50																				
Atriplex canescens	(0-20cm)	1.45	58.68	57.50	3							1	2	3	13	1	1	1	4		3	2	2	1
Atriplex canescens	(21-50cm)	8.65	350.05	97.50	10	3	2	5	7	6	2	4	6	10	13	6	17	25	40	7	1	3	3	5
Atriplex canescens	(>50cm)	16.95	685.94	100.00	39	3	25	14	18	21	4	28	11	16	30	17	25	5	30	19	12	22	2	10
Atriplex confertifolia	(0-20cm)	0.10	4.05	7.50	2								1	1										
Atriplex confertifolia	(21-50cm)	0.33	13.15	15.00	1			2				2		4		2								
Atriplex confertifolia	(>50cm)	0.05	2.02	5.00				1						1										
Chrysothamnus nauseosus	(0-20cm)	0.23	9.11	10.00																				
Chrysothamnus nauseosus	(21-50cm)	0.35	14.16	15.00														1						
Chrysothamnus nauseosus	(>50cm)	0.90	36.42	15.00	1		1																	
Lycium pallidum	(21-50cm)	0.03	1.01	2.50																				
Sarcobatus vermiculatus	(21-50cm)	0.03	1.01	2.50														1						
TOTAL NATIVE SHRUBS		29.05	1175.61	100.00	56	6	28	22	25	27	6	35	20	35	56	26	43	33	74	26	16	27	7	16
TOTAL DENSITY (stems/100 sq. m.)		83.75	(s=117.91)	100.00	59	639	367	168	75	248	267	39	30	36	61	27	139	38	74	27	16	102	10	19
TOTAL DENSITY (stems/acre)		3389.24	(s=4771.51)		2388	25859	14852	6799	3035	10036	10805	1578	1214	1457	2469	1093	5625	1538	2995	1093	647	4128	405	769
SPECIES DENSITY (# of species/100 sq.m.)		2.75	(s=1.21)		4	4	3	4	2	2	2	3	5	3	2	3	3	4	1	2	1	3	2	2

N14/J16 Phase III Shrubland Shrub Density Data – Fall 2024 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																				
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	0.03	1.01	2.50																		1		
Artemisia frigida	(21-50cm)	0.10	4.05	2.50																		4		
Artemisia frigida	(>50cm)	0.05	2.02	2.50																		2		
Ceratoides lanata	(21-50cm)	0.33	13.15	17.50												3	1	1						
Ceratoides lanata	(>50cm)	0.03	1.01	2.50												1								
Chrysothamnus greenei	(21-50cm)	0.03	1.01	2.50																				
Gutierrezia sarothrae	(0-20cm)	3.45	139.62	40.00			17	17		1				3								3		4
Gutierrezia sarothrae	(21-50cm)	2.25	91.05	27.50			19	19						2					1				1	
Senecio douglasii var. longilobus	(0-20cm)	0.03	1.01	2.50				1																
Senecio douglasii var. longilobus	(21-50cm)	0.08	3.04	5.00				2												1				
TOTAL NATIVE SUBSHRUBS		6.35	256.98	65.00			36	39		1				5		4	1	1	1	1		10	1	4
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	17.30	700.11	30.00													1	6	37					18
Kochia prostrata	(21-50cm)	22.80	922.68	47.50			8				2			2		1		28	46		1	4	1	14
Kochia prostrata	(>50cm)	8.25	333.87	25.00															53			1		4
TOTAL INTRO. SUBSHRUBS		48.35	1956.65	50.00			8				2			2		1	1	34	136		1	5	1	36
NATIVE SHRUBS																								
Artemisia tridentata	(>50cm)	0.00	0.00	2.50																		0		
Atriplex canescens	(0-20cm)	1.45	58.68	57.50		6				1	2		2	2	2		2	1				1		2
Atriplex canescens	(21-50cm)	8.65	350.05	97.50	5	17	2	2	3	6	24	7	9	15	17	7	7	11	1	3	13	10		12
Atriplex canescens	(>50cm)	16.95	685.94	100.00	11	21	8	8	20	23	27	6	10	22	18	15	15	5	2	39	24	34	9	10
Atriplex confertifolia	(0-20cm)	0.10	4.05	7.50																				
Atriplex confertifolia	(21-50cm)	0.33	13.15	15.00																	2			
Atriplex confertifolia	(>50cm)	0.05	2.02	5.00																				
Chrysothamnus nauseosus	(0-20cm)	0.23	9.11	10.00			1	1											2	5				
Chrysothamnus nauseosus	(21-50cm)	0.35	14.16	15.00			3	3									1		4					2
Chrysothamnus nauseosus	(>50cm)	0.90	36.42	15.00															25	7			1	1
Lycium pallidum	(21-50cm)	0.03	1.01	2.50																1				
Sarcobatus vermiculatus	(21-50cm)	0.03	1.01	2.50																				
TOTAL NATIVE SHRUBS		29.05	1175.61	100.00	16	44	14	14	23	30	53	13	21	39	37	22	25	17	34	55	39	45	10	27
TOTAL DENSITY (stems/100 sq. m.)		83.75	(s=117.91)	100.00	16	44	58	53	23	31	55	13	21	46	37	27	27	52	171	56	40	60	12	67
TOTAL DENSITY (stems/acre)		3389.24	(s=4771.51)		647	1781	2347	2145	931	1255	2226	526	850	1862	1497	1093	1093	2104	6920	2266	1619	2428	486	2711
SPECIES DENSITY (# of species/100 sq.m.)		2.75	(s=1.21)		1	1	4	4	1	2	2	1	1	3	1	3	4	3	4	4	3	5	4	4

N14/J16 Phase III Woodland Shrub Density Data – Fall 2024

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	13.15	532.16	67.50				2	14	20	118	22	10	24	80	54	22	14	8		6	18		6
Artemisia frigida	(21-50cm)	8.95	362.19	55.00		2			24	22	132	10	16	4	28	12	8	8				2	6	12
Artemisia frigida	(>50cm)	0.70	28.33	12.50																			4	
Ceratoides lanata	(>50cm)	0.05	2.02	2.50																2				
Chrysothamnus greenei	(0-20cm)	0.15	6.07	5.00															4				2	
Chrysothamnus greenei	(21-50cm)	0.50	20.23	25.00	4					2						2		2					2	
Gutierrezia sarothrae	(0-20cm)	50.43	2040.63	50.00	44	202	118	168	316	244	78	202	182		64	2	202	10	122	2				
Gutierrezia sarothrae	(21-50cm)	21.45	868.05	60.00	56	108	96	22	76	78	114	64	104		34		16	2	10		2			32
Gutierrezia sarothrae	(>50cm)	0.10	4.05	5.00			2				2													
Senecio douglasii var. longilobus	(0-20cm)	0.03	1.01	2.50																				
Senecio douglasii var. longilobus	(21-50cm)	0.10	4.05	5.00										1	3									
TOTAL NATIVE SUBSHRUBS		95.60	3868.79	97.50	104	312	216	192	430	366	444	298	312	29	209	70	248	36	144	4	8	20	14	50
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	13.53	547.34	35.00											10		22			4	10	16		
Kochia prostrata	(21-50cm)	9.28	375.35	37.50			2								8		14			16	18	14		
Kochia prostrata	(>50cm)	11.18	452.24	27.50													4				14			
TOTAL INTRO. SUBSHRUBS		33.98	1374.92	42.50			2								18		40			20	42	30		
NATIVE SHRUBS																								
Artemisia tridentata	(0-20cm)	38.95	1576.25	70.00	6	46	20	28	2			12	6		18	4	10	14	20	146	284	416	16	12
Artemisia tridentata	(21-50cm)	41.10	1663.26	80.00	16	44	60	90	14	10	4	54	90	2	10	26	30	28	42	40	144	118	34	28
Artemisia tridentata	(>50cm)	24.75	1001.60	82.50	50	50	46	48	26	14	8	46	78	4	14	38	12	38	8	14	22	46	10	40
Atriplex canescens	(0-20cm)	0.70	28.33	12.50	4	2	6				8		8											
Atriplex canescens	(21-50cm)	2.00	80.94	40.00	8	8	12	8	2	2	14	4	10			2	2							
Atriplex canescens	(>50cm)	7.68	310.60	60.00	38	24	20	18	30	42	28	10	30		8	8		4			6	2		
Atriplex confertifolia	(0-20cm)	0.05	2.02	2.50					2															
Chrysothamnus nauseosus	(0-20cm)	1.63	65.76	37.50						2		2			2		4			4	14	10		
Chrysothamnus nauseosus	(21-50cm)	21.03	850.85	95.00			2	2	4	24	4	22	12	30	50	4	24	2	28	34	92	64	14	6
Chrysothamnus nauseosus	(>50cm)	59.30	2399.79	97.50	4	4	8		12	24	4	4	2	104	140	12	64	42	48	30	74	152	42	118
Chrysothamnus viscidiflorus	(>50cm)	0.03	1.01	2.50																				
Cowania mexicana	(0-20cm)	1.45	58.68	20.00			2		2	4		2			8		36			2	2			
Cowania mexicana	(21-50cm)	11.00	445.15	62.50	54	14	14	6	18	52	114	32	4	2	22	4	40	6	6	14	12		2	2
Cowania mexicana	(>50cm)	4.15	167.94	55.00	56	2	2		6	6	36			2	2	2	6	4	4				2	8
Ephedra viridis	(0-20cm)	0.05	2.02	2.50										2										
Ephedra viridis	(21-50cm)	0.25	10.12	10.00										4				2						
Ephedra viridis	(>50cm)	0.45	18.21	15.00		4			2											2	4	4		
Fallugia paradoxa	(0-20cm)	0.63	25.29	15.00															10					7
Fallugia paradoxa	(21-50cm)	0.70	28.33	15.00											1		2		13					2
Fallugia paradoxa	(>50cm)	0.55	22.26	12.50															16					2
Lycium pallidum	(0-20cm)	0.20	8.09	2.50				8																
Lycium pallidum	(21-50cm)	0.20	8.09	5.00				6		2														
Lycium pallidum	(>50cm)	0.28	11.13	5.00				10																
Purshia tridentata	(0-20cm)	0.40	16.19	17.50	2	2	2	2			4	2	2											
Purshia tridentata	(21-50cm)	1.70	68.80	25.00	6	6		8	8	6	12	10	4		6						2			
Purshia tridentata	(>50cm)	0.05	2.02	2.50							2													
Rhus trilobata	(21-50cm)	0.03	1.01	2.50																				
Rhus trilobata	(>50cm)	0.03	1.01	2.50																				1
Shepherdia rotundifolia	(>50cm)	0.03	1.01	2.50																				
Yucca angustissima	(21-50cm)	0.18	7.08	10.00					1						3		2					1		
Yucca angustissima	(>50cm)	0.03	1.01	2.50											1									
TOTAL NATIVE SHRUBS		219.53	8883.86	100.00	244	206	194	234	129	188	238	200	246	150	285	100	232	140	195	286	656	813	120	226
TOTAL DENSITY (stems/100 sq. m.)		349.10	(s=179.29)	100.00	348	518	412	426	559	554	682	498	558	179	512	170	520	176	339	310	706	863	134	276
TOTAL DENSITY (stems/acre)		14127.57	(s=7255.46)		14083	20963	16673	17240	22622	22420	27600	20153	22581	7244	20720	6880	21044	7122	13719	12545	28571	34924	5423	11169
SPECIES DENSITY (# of species/100 sq.m.)		6.45	(s=1.81)		7	8	7	8	10	9	7	7	7	6	11	7	9	8	7	7	9	7	5	7

N14/J16 Phase III Woodland Shrub Density Data – Fall 2024 (continued)

		AVERAGE DENSITY		FREQUENCY	Shrubs per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38	W39	W40
NATIVE SUBSHRUBS																								
Artemisia frigida	(0-20cm)	13.15	532.16	67.50			44			10	2		2	6	14	6	4		2	2		14	2	
Artemisia frigida	(21-50cm)	8.95	362.19	55.00			4			24			4	4	16	2	2					16		
Artemisia frigida	(>50cm)	0.70	28.33	12.50			8							2	8							6		
Ceratoides lanata	(>50cm)	0.05	2.02	2.50																				
Chrysothamnus greenei	(0-20cm)	0.15	6.07	5.00																				
Chrysothamnus greenei	(21-50cm)	0.50	20.23	25.00		1			2		2	1	2											
Gutierrezia sarothrae	(0-20cm)	50.43	2040.63	50.00		31									14			8			6	2		
Gutierrezia sarothrae	(21-50cm)	21.45	868.05	60.00	13	5			2					2	10			5			4	2		1
Gutierrezia sarothrae	(>50cm)	0.10	4.05	5.00																				
Senecio douglasii var. longilobus	(0-20cm)	0.03	1.01	2.50																	1			
Senecio douglasii var. longilobus	(21-50cm)	0.10	4.05	5.00																				
TOTAL NATIVE SUBSHRUBS		95.60	3868.79	97.50	13	37	56		4	34	4	1	8	14	62	8	6	13	2	2	11	40	2	1
INTRODUCED SUBSHRUBS																								
Kochia prostrata	(0-20cm)	13.53	547.34	35.00	86	19			90			67					18	12			124		26	37
Kochia prostrata	(21-50cm)	9.28	375.35	37.50	31	5			32			78						6	2		75		24	46
Kochia prostrata	(>50cm)	11.18	452.24	27.50	99	5	2		46			102						9			39		74	53
TOTAL INTRO. SUBSHRUBS		33.98	1374.92	42.50	216	29	2		168			247					18	27	2		238		124	136
NATIVE SHRUBS																								
Artemisia tridentata	(0-20cm)	38.95	1576.25	70.00			36	42		130	80		12	74	22	18	6		38	40				
Artemisia tridentata	(21-50cm)	41.10	1663.26	80.00			44	52		120	100		16	136	58	42	20		58	100			14	
Artemisia tridentata	(>50cm)	24.75	1001.60	82.50			24	22		34	66		16	72	40	12	16		26	40		6	4	
Atriplex canescens	(0-20cm)	0.70	28.33	12.50																				
Atriplex canescens	(21-50cm)	2.00	80.94	40.00	2										2			1					2	1
Atriplex canescens	(>50cm)	7.68	310.60	60.00	5		4		4	4		4				2					2	4	8	2
Atriplex confertifolia	(0-20cm)	0.05	2.02	2.50																				
Chrysothamnus nauseosus	(0-20cm)	1.63	65.76	37.50	3	2				6				2				5	2		5			2
Chrysothamnus nauseosus	(21-50cm)	21.03	850.85	95.00	1	17	14	52	10	70	16	5	22	18	10	18	8	14	28	30	22	36	28	4
Chrysothamnus nauseosus	(>50cm)	59.30	2399.79	97.50	57	73	64	102	72	192	32	32	136	34	68	60	96	51	50	48	50	80	162	25
Chrysothamnus viscidiflorus	(>50cm)	0.03	1.01	2.50															1					
Cowania mexicana	(0-20cm)	1.45	58.68	20.00																				
Cowania mexicana	(21-50cm)	11.00	445.15	62.50		1	8	4								4					1	4		
Cowania mexicana	(>50cm)	4.15	167.94	55.00		3		2		6	2		10	2		2					1			
Ephedra viridis	(0-20cm)	0.05	2.02	2.50																				
Ephedra viridis	(21-50cm)	0.25	10.12	10.00				2							2									
Ephedra viridis	(>50cm)	0.45	18.21	15.00									2											
Fallugia paradoxa	(0-20cm)	0.63	25.29	15.00			1			1			3									3		
Fallugia paradoxa	(21-50cm)	0.70	28.33	15.00			8															2		
Fallugia paradoxa	(>50cm)	0.55	22.26	12.50			2			1				1										
Lycium pallidum	(0-20cm)	0.20	8.09	2.50																				
Lycium pallidum	(21-50cm)	0.20	8.09	5.00																				
Lycium pallidum	(>50cm)	0.28	11.13	5.00																1				
Purshia tridentata	(0-20cm)	0.40	16.19	17.50																				
Purshia tridentata	(21-50cm)	1.70	68.80	25.00																				
Purshia tridentata	(>50cm)	0.05	2.02	2.50																				
Rhus trilobata	(21-50cm)	0.03	1.01	2.50																		1		
Rhus trilobata	(>50cm)	0.03	1.01	2.50																				
Shepherdia rotundifolia	(>50cm)	0.03	1.01	2.50																		1		
Yucca angustissima	(21-50cm)	0.18	7.08	10.00																				
Yucca angustissima	(>50cm)	0.03	1.01	2.50																				
TOTAL NATIVE SHRUBS		219.53	8883.86	100.00	68	96	205	278	86	564	296	41	217	339	202	158	146	71	203	259	81	137	218	34
TOTAL DENSITY (stems/100 sq. m.)		349.10	(s=179.29)	100.00	297	162	263	278	258	598	300	289	225	353	264	166	170	111	207	261	330	177	344	171
TOTAL DENSITY (stems/acre)		14127.57	(s=7255.46)		12019	6556	10643	11250	10441	24200	12141	11695	9105	14285	10684	6718	6880	4492	8377	10562	13355	7163	13921	6920
SPECIES DENSITY (# of species/100 sq.m.)		6.45	(s=1.81)		4	5	7	4	5	6	5	4	7	6	6	5	4	4	5	4	6	9	5	4

N14/J16 Phase III Woodland Tree Density Data – Fall 2024

		AVERAGE DENSITY		FREQUENCY	Trees per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
NATIVE TREES																								
Juniperus osteosperma	(21-50cm)	0.03	1.01	2.50																				
Juniperus osteosperma	(>50cm)	0.48	19.22	32.50			1	1	1				1			1								
Pinus edulis	(0-20cm)	0.08	3.04	7.50							1													
Pinus edulis	(21-50cm)	0.25	10.12	12.50				1														6		
Pinus edulis	(>50cm)	1.08	43.50	52.50	2	1		1				2		3	3	3	1	2	4	1	4	1		2
Quercus gambelii	(0-20cm)	0.03	1.01	2.50																		1		
TOTAL NATIVE TREES		1.93	77.90	75.00	2	1	1	3	1		1	2	1	3	3	4	1	2	4	1	4	8		2
TOTAL DENSITY (stems/100 sq. m.)		1.93	(s=1.98)	75.00	2	1	1	3	1	0	1	2	1	3	3	4	1	2	4	1	4	8	0	2
TOTAL DENSITY (stems/acre)		77.90	(s=80.1)		81	40	40	121	40	0	40	81	40	121	121	162	40	81	162	40	162	324	0	81
SPECIES DENSITY (# of species/100 sq.m.)		0.98	(s=0.7)		1	1	1	2	1	0	1	1	1	1	1	2	1	1	1	1	1	2	0	1

N14/J16 Phase III Woodland Tree Density Data – Fall 2024 (continued)

		AVERAGE DENSITY		FREQUENCY	Trees per 100 sq.m.																			
PLANT SPECIES	SIZE	(#/100sq.m.)	(#/acre)	(%)	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38	W39	W40
NATIVE TREES																								
Juniperus osteosperma	(21-50cm)	0.03	1.01	2.50			1																	
Juniperus osteosperma	(>50cm)	0.48	19.22	32.50			1	1		5	2		2	1					1	1				
Pinus edulis	(0-20cm)	0.08	3.04	7.50									1	1										
Pinus edulis	(21-50cm)	0.25	10.12	12.50							1					1					1			
Pinus edulis	(>50cm)	1.08	43.50	52.50		2	2	1		3			2								2		1	
Quercus gambelii	(0-20cm)	0.03	1.01	2.50																				
TOTAL NATIVE TREES		1.93	77.90	75.00		2	4	2		8	3		5	2		1			1	1	3		1	
TOTAL DENSITY (stems/100 sq. m.)		1.93	(s=1.98)	75.00	0	2	4	2	0	8	3	0	5	2	0	1	0	0	1	1	3	0	1	0
TOTAL DENSITY (stems/acre)		77.90	(s=80.1)		0	81	162	81	0	324	121	0	202	81	0	40	0	0	40	40	121	0	40	0
SPECIES DENSITY (# of species/100 sq.m.)		0.98	(s=0.7)		0	1	2	2	0	2	2	0	2	2	0	1	0	0	1	1	1	0	1	0

EXHIBIT F

Protection of the Hydrologic Balance

The bond release procedure guidelines for permanent program lands (OSMRE, 2017) describe hydrologic documentation required to be submitted as part of Phase III bond release applications. Specifically, the guidelines require documentation as to whether surface or subsurface water pollution is occurring, the probability of future occurrence, and the estimated cost of abating pollution if it is occurring or predicted to occur. Hydrologic demonstrations (Protection of the Hydrologic Balance - PHB) were developed and submitted in previous Termination of Jurisdiction (TOJ) applications, formally named Reclamation Liability Release Applications (RLRA) for Interim Program Lands located at the Kayenta Mine. A recent TOJ application that included 2,981 acres of reclaimed parcels associated with the J1, N6, N14 and J16 interim program reclaimed parcels was submitted to OSMRE on August 26, 2019. The PHB demonstrations were organized to address whether Peabody Western Coal Company's (PWCC) mining and reclamation plans resulted in minimizing impacts to the hydrologic balance within and adjacent to the reclaimed parcels and permit boundary and included analyses of both groundwater and surface water quantity and quality. Of note, the application included appreciable acres of interim reclaimed parcels within both the N14 and J16 coal resource areas (CRA's). That PHB along with other required documentation were deemed sufficient for the Office of Surface Mining Reclamation and Enforcement (OSM) to terminate jurisdiction on several thousand acres of reclaimed interim program lands at the Kayenta Mine on January 31, 2023. Accordingly, the following sections are organized similarly to PHBs submitted in previous TOJ applications. Components of ground and surface water quantity and quality that have been monitored in the vicinity of the J16 and N14 Phase III reclaimed parcels and summaries of findings provided in the previous TOJ PHB including those related to water quality and pollution, are provided in the following sections. No pollution of surface or subsurface sources of water has been found within or adjacent to the J16 and N14 Phase III reclaimed parcels for this bond release application as shown on Maps 1 and 2 in Exhibit B.

Ground Water Quantity

Ground Water Flow, Levels, and Gradients. Ground Water flow directions, flow gradients, and average water levels in Wepo and alluvial monitoring wells from 1980 through 1985 are presented in Chapter 15, Hydrologic Description in Volume 10 of the Permit Application Package (PAP) for Permit AZ-0001F and are further discussed in recent Annual Hydrology Reports (e.g., PWCC, 2024). Water level contours of the Wepo and alluvial aquifers are depicted on Drawings 85610, 85611, and 85620 in Volume 23 of the PAP. In some locations, the Wepo water level contours on the potentiometric surface maps "V" in an upstream direction in the vicinity of the alluvial washes, indicating the Wepo aquifer discharges to the alluvial aquifers. As such, any mining activities

that intercept the Wepo aquifer can potentially affect the downgradient alluvial aquifers. However, mining that occurred within the J16 and N14 CRAs was adequately distant from alluvial washes to have caused negligible impacts to downgradient alluvial aquifers. The following sub-sections summarize findings regarding changes in ground water flow, levels and gradients in the Wepo aquifer below and proximate to the J16 and N14 discussed in the August 2019 TOJ application. Water level changes in wells associated with both parcels are provided in recent Annual Hydrology Reports (AHR) for the Kayenta Mine.

J16 CRA. The majority of mining within the J16 CRA occurred between 1982 and 1995. Backfilling and grading in J16 was completed in about 2001. Minimal changes to the Wepo aquifer gradients in the vicinity of J16 have occurred over the lengthy period of monitoring in proximate Wepo wells. After more than 2 decades, negligible changes have occurred in the flow direction, gradient and overall quantity of groundwater in the Wepo aquifer downgradient of J16. In addition, minimal impacts have occurred to alluvial groundwater in Moenkopi and Reed Valley Washes below and adjacent to the J16 CRA because of mining and reclamation activities.

N14 CRA. Mining within the N14 CRA commenced in 1982 in the western area along its southern edge and generally progressed north after initial box cuts were completed and longer pits were developed. Final reclamation activities (backfilling and grading) in N14 were completed as of about 2003. Minimal changes in gradients occurred during mining and reclamation activities. Flow directions have maintained a southern direction across N14. Combined with minimal changes to the potentiometric surface and flow directions, minimal changes have occurred to the quantity of groundwater in the Wepo aquifer in the vicinity of the N14 CRA. Impacts from mining in N14 west of Moenkopi Wash on groundwater quantity in the alluvium along Moenkopi Wash were minimal as discussed under the J16 CRA demonstrations.

Infiltration and Recharge. Black Mesa is a recharge deficit area (evapotranspiration exceeds precipitation). At the Peabody leasehold, the mean annual evaporation is 45 inches. Between the months of May and October, monthly evaporation ranges from 2.7 to 11.5 inches, while average monthly precipitation only ranges from 0.35 to 1.7 inches. The monthly recharge deficit is quite significant even without considering transpiration losses. Considering the measurable depths to ground water in the Wepo formation, the potential for recharge via infiltration through the undisturbed soil, rock units, and spoil is negligible, except in areas of extensive burn and fracturing.

Minimal groundwater was encountered during mining of both the J16 and N14 CRAs. Accordingly, no appreciable re-saturation of regraded spoils has been observed in either parcel. Recharge to the

alluvial aquifer occurs via horizontal flow from the Wepo aquifer, as well as infiltration through the channel beds and banks (channel transmission losses) during runoff events.

Spring Flow. Natural springs 151 and 162 are located northwest of the J16 CRA (see Drawing 93500). Both springs emanate from shallow deposits of scoria and are sustained by localized recharge. The relatively consistent record of low flow throughout the year at spring 151 indicates periodic contributions from shallow clinker beds nearby provide the flow source, not the deeper Wepo formation that was mined to the east at J16. The flow measurements collected at natural springs 151 and 162 do not indicate mining and final reclamation of the J16 pit has impacted either spring. Two natural springs were found north of the N14 pit in 1980, springs 97 (see Drawing 85600) and 111 (see Drawing 93500). Spring 97 was in the northwest corner of the N14 CRA and exhibited low flow rates until it was mined out in 1984. Two additional springs located upgradient of N14 to the north were monitored for flow at the request of OSMRE in 1999; Goat Spring #2 and Hogan Spring (see Drawing 85600). Mining activities in the N14 CRA had no effect on flow at spring 111 or the two other natural springs near spring 111 to the north of N14.

Ground Water Quality

J16 CRA. The 2023 AHR (PWCC, 2024) provides an assessment of the potential to use Wepo and alluvial aquifer water to provide livestock drinking water based on a comparison of water quality data collected at all currently monitored Wepo and alluvial wells. All alluvial wells and Wepo wells used to assess suitability for the J16 CRA meet applicable livestock drinking water standards (NNEPA, 2008) except for fluoride at well 62R, which is upgradient of J16. Mining activities associated with the J16 CRA has not impacted the use potential of the Wepo or alluvial aquifers adjacent to or downgradient of J16 to support the intended postmining land use of livestock grazing.

N14 CRA. As mentioned above, the 2023 AHR provides an assessment of the potential to use Wepo and alluvial aquifer water to provide livestock drinking water based on a comparison of water quality data collected at all currently monitored Wepo and alluvial wells. Based on this assessment, water quality measured in all wells analyzed in the vicinity of the N14 CRA is suitable for livestock drinking water. Mining activities associated with the N14 CRA have not impacted the use potential of the Wepo or alluvial aquifer in the vicinity to support the intended postmining land use of livestock grazing.

Surface Water Quantity

J16 CRA. Attachment 3-5b in the approved 2019 TOJ application contains an EASI model report for two ponds (J16-E and J16-F) that drain reclaimed areas situated adjacent to or lie within the J16 reclaimed parcels. The results indicate no difference in average annual runoff (0.42 inches) generated from reclaimed hill slopes and low-order channels established above both ponds compared to pre-mining conditions. Reclamation methods including BMPs (e.g., vegetative cover) utilized in the J16 TOJ parcel were similar to those evaluated in the J16E and J16F EASI model.

N14 CRA. Attachment 3-5c in the approved 2019 TOJ application contains an EASI model report for most of the N14 CRA. The model includes all TOJ parcels located within the boundary of the N14 CRA. The results indicate little difference in average annual runoff between pre-mining and post-mining (reclaimed) conditions. Runoff generated from hill slopes and low-order channels established in the N14 CRA, including the TOJ parcel, will average about 0.42 inches per year. Ponds N14-G and N14-H are proposed to be left in the post-mining landscape within N14 to serve as viable sources of water for supporting the post-mining land use of livestock grazing as discussed further in this document. No small depressions or internally draining permanent impoundments were created within the reclaimed N14 CRA.

Surface Water Quality

Both analytical and graphical techniques were used to evaluate surface water quality impacts to runoff within and downstream of the J16 and N14 CRAs in the approved August 2019 TOJ application. PWCC initiated a Small Watershed Study (SWS) monitoring program on Black Mesa in 1985, and details regarding study objectives and monitoring associated with the study are provided in Attachment 4 in Chapter 16, Hydrologic Monitoring Program in the PAP. Several small watersheds located within reclaimed areas were instrumented with supercritical flow flumes, and water quality data collected at these sites are discussed in the approved August 2019 TOJ application. In addition, water quality data collected at long-term monitoring sites established along the main channels near the southwestern extent of the leasehold are also discussed (SW25 and SW26, see Drawing No. 93500).

Few NPDES discharges from sediment ponds associated with the J16 or N14 CRAs have occurred over the period of record. One discharge that lasted for only 11 hours due to precipitation occurred from Pond J16-F in August 2013. The rates and volumes of the few NPDES discharges that have occurred from other sediment ponds located upstream of the main channel monitoring sites are several orders of magnitude lower than the runoff events in which water quality samples were collected at these downstream sites. These NPDES discharges were either completely infiltrated

along the main sand bed channels before reaching the lower sites, or significantly diluted due the magnitudes of runoff in which they mixed as they flowed downstream. Consequently, water quality collected at the two downstream main-channel monitoring sites is considered representative of naturally occurring runoff.

Water quality data collected at the SWS flumes were compared to livestock watering standards established by the Navajo Nation EPA for surface water (NNEPA, 2008). Table 3.6 in the approved August 2019 TOJ application shows the results of these comparisons, and excepting total recoverable copper, lead and vanadium at select sites, all water quality collected in runoff at the SWS met livestock watering standards. Based on the comparisons, runoff from reclaimed areas monitored as part of the SWS program is suitable for livestock drinking water, which is the primary land use proposed for the reclaimed areas at the Kayenta Complex. Runoff from reclaimed areas established on mined lands at the Kayenta Complex will have no significant impact on receiving stream water quality, including runoff from areas associated with the J16 or N14 CRAs.

Baseflow Quantity and Quality

Monitoring of flow and water quality has been conducted at temporary baseflow monitoring site SW2A since 2004. Site SW2A is located on Moenkopi Wash downgradient of the J16 and N14 parcels (see Drawing No. 93500-AHR, PWCC, 2024). Recent monitoring data suggests the reach continues to exhibit baseflow from time to time well after final reclamation activities were completed in the N14 and J16 CRAs, and suggests mining and reclamation activities in both CRAs has had negligible effects on baseflow discharge along this reach of Moenkopi Wash.

The magnitudes of means and ranges of parameters measured at baseflow site SW2A are comparable to those measured in alluvial monitoring wells established near or upstream (background) along Moenkopi Wash. Water quality collected in temporary baseflow monitoring site SW2A meets livestock watering standards. Mining in the J16 and N14 CRAs have had negligible impacts on stream baseflow water quality in Moenkopi Wash downstream of both mining areas.

Sediment Yields

J16 Sediment Yield Model. EASI model results provided in Attachment 3-5b of the approved August 2019 TOJ application are presented as average annual values, and sediment yield results are expressed as tons per acre. The model predicts average annual sediment yield of 1.14 tons/acre/year for the combined post-mining watersheds above Ponds J16-E and J16-F, well below the predicted pre-mining sediment yield for both watersheds of 2.28 tons/acre/year. The results

also indicate runoff from the reclaimed J16 Phase III parcels will not contribute additional solids to receiving stream flows above established background levels.

N14 Sediment Yield Model. EASI model results provided in Attachment 3-5c of the approved August 2019 TOJ application for the N14 CRA are presented as average annual values, and sediment yield results are expressed as tons per acre. The model results for the N14 TOJ parcel show 1.39 tons/acre/year for average annual sediment yield, approximately twenty-nine percent less than the pre-mining sediment yield of 1.95 tons/acre/year. The results also indicate runoff from the reclaimed N14 Phase III parcels will not contribute additional solids to receiving stream flows above established background levels.

Permanent Impoundments

Two permanent impoundments designated Pond N14-G and N14-H exist within the N14 reclaimed area subject to this Phase III application (see Maps 1 and 2 in Exhibit B). No permanent impoundments exist within the J16 reclaimed area parcels included in this Phase III application.

Water Levels and Water Persistence. Pond N14-G was constructed in 1982 and has been monitored for water persistence for decades as part of monthly MSHA pond inspections through 2023. Maximum water levels observed in Pond N14-G from 2003 through 2023 ranged from 5.3 feet in 2021 to 15.7 feet in 2003 (see Table F.3a). Table F.3a also presents annual maximum water volumes estimated for Pond N14-G over the same 21-year period and ranged from 19.5 acre-feet in 2006 to 86.8 acre-feet in 2013. The as-built storage capacity for N14-G is 185.0 acre-feet and remains at 175.2 acre-feet as of July 2024. Water in Pond N14-G has been persistent for about 40 years following construction. Water persistence is largely dependent on precipitation, although a portion may originate from shallow groundwater from upgradient sources.

Pond N14-H was constructed in 1985 and has been monitored for water persistence for decades as part of monthly MSHA pond inspections through 2023. Maximum water levels observed in Pond N14-H from 2003 through 2023 ranged from 1.4 feet in 2021 to 14.7 feet in 2003 (see Table F.3b). Table F.3b also presents annual maximum water volumes estimated for Pond N14-H over the same 21-year period and ranged from 5.2 acre-feet in 2021 to 68.4 acre-feet in 2004. The as-built storage capacity for N14-H is 227.4 acre-feet and remains at 208.5 acre-feet as of July 2020. Like Pond N14-G, water in Pond N14-H has been persistent for more than 30 years following construction, although the pond has experienced dry conditions for short periods over its life of operation. Water persistence is largely dependent on precipitation, although a portion may originate from shallow groundwater from upgradient sources.

Access Safety and Stability. Slopes leading to Ponds N14-G and N14-H are moderate (see approved 2019 TOJ application, Map 2.2.B, Tab 2) and should provide safe access for the livestock which will be using the area.

N14-G Water Quality. Monitoring of water quality in Pond N14-G was conducted from 1989 through 1991, 2000 through 2006, and from 2019 through 2024 (see Appendix F.1). Table F.1 lists the concentration means and ranges for the chemical constituents measured in samples collected from Pond N14-G for comparison purposes. Table F.1 shows average values of Ca, Mg, SO_4 and TDS are higher than rainfall runoff yet lower than baseflow average values measured at site SW2A. Values of NO_3 and Se are both lower compared to reclaimed area runoff. Maximum values of Ca, Mg, SO_4 and TDS are higher than maximum values in reclaimed area runoff, rainfall runoff at the main channel sites and baseflow site SW2A. The high maximum values are indicative of the effects of evaporation and transpiration on pond water quality during periods of low precipitation from time to time. Wetter periods and increased runoff tend to dilute the concentrations of the constituents in N14-G pond water.

Appendix F.2 presents trilinear diagrams of percent milliequivalents for major ions and TDS measured in Pond N14-G over its monitoring history. Nine different water types have been observed at N14-G and are typified by mixed cations dominated by the SO_4 anion. The most common water type is MgCaSO4. TDS data collected in Pond N14-G shows no apparent trend other than concentrations lower than 2,000 mg/L after 2002.

Water quality data collected at Pond N14-G were compared to livestock watering standards established by the Navajo Nation EPA for surface water (NNEPA, 2008) for determining the suitability of water in the impoundment to support livestock grazing. Table F.2 shows the results of these comparisons, and indicates water monitored in Pond N14-G met all livestock watering standards except for thirteen out of twenty-one measurements of field pH, and six out of twenty-four measurements of pH at 25 Degrees Centigrade (laboratory derived values). High values of pH can be influenced by low water levels coupled with algal growth or prolonged icing over of the pond surface. Based on the comparisons, water monitored in Pond N14-G is suitable for livestock drinking water and will support the postmining land use of livestock grazing. Also, there is no potential for diminution of the water quality of adjacent landowners as the pond water quality is of similar quality to baseflow measured downstream at site SW2A. And, due to significantly higher discharge rates during rainfall runoff in the downstream main channels, occasional discharges from Pond N14-G will be appreciably diluted within relatively short distances.

N14-H Water Quality. Monitoring of water quality in Pond N14-H was conducted from 1989 through 1991, 1995, 2000 through 2006, and from 2019 through 2024 (see Appendix F.1). Table F.1 also lists the concentration means and ranges for the chemical constituents measured in samples collected from Pond N14-H and shows average values of all parameters are lower than rainfall runoff and the baseflow average values measured at site SW2A. Average values of HCO_3 in Pond N14-H are comparable to reclaimed area runoff, and its NO_3 average is lower than all other sites shown on Table F.1.

Appendix F.2 presents trilinear diagrams of percent milliequivalents for major ions and TDS measured in Pond N14-H over its monitoring history. Eleven different water types have been observed at N14-H and are typified by mixed cations dominated by the SO_4 anion. The most common water type is CaNaMgSO4. TDS data collected in Pond N14-G shows no apparent trend.

Water quality data collected at Pond N14-H were compared to livestock watering standards established by the Navajo Nation EPA for surface water (NNEPA, 2008) for determining the suitability of water in the impoundment to support livestock grazing. Table F.2 shows the results of these comparisons, and indicates water monitored in Pond N14-H met all livestock watering standards except for ten out of twenty-two measurements of field pH, and five out of twenty-three measurements of pH at 25 Degrees Centigrade (laboratory derived values). High values of pH can be influenced by low water levels coupled with algal growth or prolonged icing over of the pond surface. Based on the comparisons, water monitored in Pond N14-H is suitable for livestock drinking water and will support the postmining land use of livestock grazing. Also, there is no potential for diminution of the water quality of adjacent landowners as the pond water quality is of similar quality to baseflow measured downstream at site SW2A. And, due to significantly higher discharge rates during rainfall runoff in the downstream main channels, occasional discharges from Pond N14-H will be appreciably diluted within relatively short distances.

Diminution of Adjacent Water Quantity. Peabody believes sufficient information has been submitted and evaluated by OSMRE in Hydrology Reports, Permits, and other documents to demonstrate that Ponds N14-G and N14-H will not result in the diminution of the quantity of water utilized by adjacent or surrounding landowners. Chapter 17 (Protection of Hydrologic Balance) of the AZ-0001F Permit PAP presents detailed descriptions of pre-existing water sources within the leasehold, including those proximate to the J16 and N14 TOJ parcels. Drawing No. 85322 in Volume 20 of the PAP shows the locations of all pre-existing livestock and wildlife watering structures. No pre-existing structures were purported to exist within or adjacent to either the J16 or N14 Phase III parcels.

As mentioned above, Chapter 18 (Probable Hydrologic Consequences) of the PAP presents analyses of the potential impacts of the mining operation, including a section that discusses the effects of dams, sediment ponds, and permanent impoundments on downstream users. In this section of Chapter 18, an evaluation of drainage area associated with all permanent impoundments proposed to be left within the Moenkopi basin indicates the impoundments may restrict about 4.6 percent of the average annual runoff at the lower end of the basin. The internal impoundments may result in localized decreases in receiving stream runoff, but these will become less pronounced and unmeasurable further downstream, as lateral inflows from undisturbed basins will provide additional contributions to downstream runoff. Channel transmission losses, evapotranspiration, and other losses in the main channels further downstream along Moenkopi Wash would completely mask any runoff reductions from the smaller reclaimed areas on the leasehold. Water levels in alluvial wells adjacent and immediately downgradient in the alluvium from existing temporary sediment ponds show normal fluctuations in response to low and high stream flow years. There is no evidence of persistent diminished recharge to the alluvium from runoff, which would be potentially attributed to the loss of watershed area associated with either existing temporary sediment ponds or permanent impoundments. In addition, PWCC has no evidence that flood irrigation has been practiced along the reaches of Moenkopi Wash downstream of Ponds N14-G and N14-H. Monitoring of stream flows in the main channels within and just downstream of the leasehold for three decades has shown extremely high sediment concentrations, which would preclude flood irrigation practices due to high maintenance costs. Based on the above summaries, PWCC maintains these impoundments will not result in the diminution of the quantity of water utilized by adjacent or surrounding landowners.

Pond Sediment Accumulations. Pond sediment accumulation monitoring has been conducted at Ponds N14-G and N14-H periodically from the mid-1980's through 2023. The original as-built capacity of Pond N14-G in 1982 was 185.0 ac-ft. The most recent capacity determined in July 2024 was 175.2 ac-ft. The original as-built capacity of Pond N14-H was 227.4 ac-ft., and the most recent capacity determined in July 2020 was 208.9 ac-ft. Based on periodic measurements of pond bottom elevations from 2004 through 2024, the average sediment accumulation rate in Pond N14-G was 0.67 ac-ft/year. Based on periodic measurements of pond bottom elevations from 2004 through 2020, the average sediment accumulation rate in Pond N14-H was 0.35 ac-ft/year. Based on pond bottom measurements collected over more than 15 years, sediment accumulation in both ponds is negligible.

References Cited

NNEPA, 2008. "Navajo Nation Surface Water Quality Standards." Navajo Nation Environmental Protection Agency, Water Quality Program, Window Rock, Arizona. [Revised and updated in May 2017 and March 2021 following triennial reviews.]

OSMRE, 2017. "Guideline to Bond Release Procedures for Permanent Program Lands".

Peabody Western Coal Company (PWCC), 2024. "2023 Annual Hydrology Report", May 2024.

Table F.1

Means and Concentration Ranges for Select Parameters Measured at

SWS Sites, Main Channel SW Sites and Permanent Impoundments N14-G and N14-H

M = mean R = range ; All values in mg/L except Se, which is in ug/L

		Ca	Mg	Na	SO_4	HCO_3	TDS	NO_3	Se
SWS Sites Concentration Means and Ranges (Reclaimed areas)									
FLUM227	M	26	6	3	40	88	120	0.67	1
	R	14-40	4-9	2-4	19-62	73-102	74-190	0.12-2.4	<1-1
FLUM228	M	7	6	2	41	127	129	0.28	N/A
	R	<5-7	2-10	<1-5	8-109	115-139	42-240	0.01-0.9	<1-<1
FLUM267	M	34	8	6	43	105	171	1.01	N/A
	R	23-48	3-11	4-10	21-64	71-134	100-200	0.22-2.1	<1-<1
FLUM268	M	28	4	1	35	77	35	0.30	<1
	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLUM277	M	41	8	3	68	85	188	0.75	6.5
	R	7-66	4-14	1-5	21-140	66-110	64-320	0.5-1.1	<1-11
Main Channel SW Sites Concentration Means and Ranges[1,2]									
SW25	M	162	96	140	910	194	1711	2.3	13.7
	R	23-491	4.5-557	5.4-780	17-4880	66-1240	200-7750	0.16-20	2-37
SW26	M	111	45	61	452	141	925	2.1	7.7
	R	18-505	5-278	14-283	50-2700	68-1410	190-3635	0.07-15	1-21
SW2A and Permanent Impoundments Concentration Means and Ranges[2]									
SW2A	M	442	474	418	3007	534	5233	6.65	1.3[3]
	R	394-546	332-589	308-563	2300-4450	173-884	4200-7070	.04-11.6	<1-<2
N14-G	M	184	159	127	1249	103	1915	0.2	N/A[4]
	R	24-446	9-607	5-542	55-4297	6-480	204-6532	<.02-1.1	<1-<2
N14-H	M	80	45	45	367	116	681	0.12	1.0
	R	16-183	9-182	6-192	25-1470	13-234	212-2310	.02-0.41	<1-<2

Notes: Mean Se values and ranges reported for SWS Sites are for the dissolved analytical form.

[1] Means and ranges provided for Main Channel SW Sites are from water samples collected in rainfall runoff only.

[2] Selenium means and ranges are derived from uncensored total analytical results.

[3] Only 3 out of 11 analytical values uncensored.

[4] All analytical values censored.

Table F.2 Comparisons of NNEPA Livestock Watering Standards (NNEPA, 2008) with Ponds N14-F and N14-H Water Quality Data

Analyte	Standard	No. Sites	Sites	Frequency	Exceedence Date Range	Exceedence Value Range	Exceedence Median
NAVAJO LIVESTOCK WATERING STANDARDS -- NNEPA (2008)							
Arsenic, Total	0.00 - 200.00	0	none				
Boron, Dissolved	0.00 - 5000.00	0	none				
Cadmium, Total	0.00 - 50.00	0	none				
Chromium, Total	0.00 - 1000.00	0	none				
Copper, Dissolved	0.00 - 500.00	0	none				
Field Ph	6.50 - 9.00	2	N14-G-P	13/0/0/21	09/15/00-05/02/24	9.16 - 10.53	9.89
			N14-H-P	10/0/0/22	10/17/95-05/02/24	9.13 - 10.59	9.56
Fluoride	0.00 - 2.00	0	none				
Lead, Total	0.00 - 100.00	0	none				
Nitrate Nitrogen_N	0.00 - 132.00	0	none				
NO3_NO2 Nitrogen_N	0.00 - 132.00	0	none				
Ph At 25 Deg. Cent.	6.50 - 9.00	2	N14-G-P	6/0/0/24	09/15/00-07/27/20	9.10 - 9.80	9.45
			N14-H-P	5/0/0/23	10/17/95-07/27/20	9.30 - 10.30	9.90
Selenium, Total	0.00 - 50.00	0	none				
Total Recoverable As	0.00 - 200.00	0	none				
Total Recoverable Cd	0.00 - 50.00	0	none				
Total Recoverable Cr	0.00 - 1000.00	0	none				
Total Recoverable Pb	0.00 - 100.00	0	none				
Total Recoverable Se	0.00 - 50.00	0	none				
Total Recoverable V	0.00 - 100.00	0	none				
Total Recoverable Zn	0.00 - 25.00	0	none				
Vanadium, Dissolved	0.00 - 100.00	0	none				
Vanadium, Total	0.00 - 100.00	0	none				
Zinc, Total	0.00 - 25.00	0	none				

Frequency = uncensored/between MDL&PQL/censored/no. samples, (B) = Between MDL&PQL range, (<) = Censored range

Table F.3a

Maximum Pond Water Depths and Volumes by Year

Pond N14-G

Year	Maximum Depth (feet)	Maximum Volume (acre-feet)
2003	15.7	63.0
2004	14.1	61.4
2005	11.0	42.5
2006	6.9	19.5
2007	7.7	23.6
2008	14.2	65.3
2009	11.2	36.5
2010	14.0	63.8
2011	12.0	56.8
2012	10.8	48.4
2013	15.6	86.8
2014	10.6	51.1
2015	12.2	64.2
2016	13.8	76.9
2017	10.4	63.1
2018	10.6	51.6
2019	13.7	77.7
2020	6.0	24.7
2021	5.3	21.8
2022	12.8	72.7
2023	9.5	47.0

Table F.3b

Maximum Pond Water Depths and Volumes by Year

Pond N14-H

Year	Maximum Depth (feet)	Maximum Volume (acre-feet)
2003	14.7	67.8
2004	13.2	68.4
2005	11.9	57.1
2006	7.6	29.8
2007	7.1	27.1
2008	10.6	48.1
2009	7.1	29.7
2010	7.5	32.3
2011	10.8	53.9
2012	9.2	41.7
2013	9.2	41.7
2014	7.1	29.4
2015	6.0	25.7
2016	10.7	56.2
2017	9.6	55.6
2018	6.5	19.2
2019	10.3	55.0
2020	4.3	17.9
2021	1.4	5.2
2022	9.5	49.6
2023	3.4	13.5

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/12/1989 11:36	12/04/1989 09:30	09/18/1990 09:40	06/11/1991 15:15	09/15/2000 08:42	01/26/2001 11:15	07/13/2001 08:32	01/21/2002 09:50	07/03/2002 15:02
Field Parameters										
Field Ph	S.U.					9.1600	9.5100	7.8200	10.5300	9.8900
Temperature	C					18.8000	3.6000	21.2000	3.6000	21.2000
Conductivity	UMHOS/CM					3640.0000	3300.0000	2470.0000	1797.0000	3170.0000
Field Salinity	0/00					1.9000	1.7000	1.3000	0.9000	1.7000
Laboratory Parameters										
Acidity	MG/L	0.0000	0.0000	0.0000	0.0000					
Alk As CaCO3, Ph 4.5	MG/L	202.0000	208.0000	102.0000	74.0000	51.0000	52.0000	56.0000	46.0000	32.0000
Alk, Bicarb As CaCO3	MG/L					46.0000	31.0000	56.0000	B 10.0000	32.0000
Alk, Carb As CaCO3	MG/L					B 5.0000	21.0000	< 2.0000	36.0000	< 2.0000
Alk, Hydrox As CaCO3	MG/L					< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000
Aluminum, Total	MG/L									
Aluminum, Dissolved	MG/L	< 0.0500	< 0.0500	< 0.0500	< 0.0500					
Antimony, Dissolved	UG/L	< 1.0000	< 1.0000	< 1.0000	< 1.0000					
Arsenic, Total	UG/L									
Arsenic, Dissolved	UG/L	< 1.0000	< 1.0000	1.0000	1.0000					
Barium, Dissolved	UG/L	40.0000	100.0000	50.0000	20.0000					
Boron, Total	UG/L	80.0000								
Boron, Dissolved	UG/L	70.0000	100.0000	170.0000	160.0000	150.0000	120.0000	B 80.0000	70.0000	120.0000
Cadmium, Total	UG/L									
Cadmium, Dissolved	UG/L	< 5.0000	< 5.0000	< 10.0000	< 5.0000					
Calcium, Total	MG/L	367.0000								
Calcium, Dissolved	MG/L	346.0000	383.0000	444.0000	446.0000	349.0000	346.0000	266.0000	213.0000	361.0000
C.O.D.	MG/L	45.0000	71.0000	90.0000	90.0000					
Chloride	MG/L	67.0000	74.0000	170.0000	185.0000	119.0000	111.0000	83.0000	47.0000	87.0000
Chromium, Total	UG/L									
Chromium, Dissolved	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000					
Conductivity	UMHOS/CM	4000.0000	4600.0000	6150.0000	5820.0000	3840.0000	3580.0000	2640.0000	1940.0000	3380.0000
Copper, Total	UG/L									
Copper, Dissolved	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000					
Fluoride	MG/L	0.7000	0.8000	0.7000	1.0000	1.1000	1.0000	0.9000	0.6000	1.0000
Hardness As CaCO3	MG/L	2567.0000	3094.0000	3599.0000	3571.0000	1990.0000	1930.0000	1360.0000	1000.0000	1890.0000
Iron, Total	MG/L		0.0900	7.2000	0.0500	B 0.0500	B 0.0800	0.6100	B 0.0400	B 0.0400
Iron, Dissolved	MG/L	0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0100	< 0.0200
Lead, Total	UG/L									
Lead, Dissolved	UG/L	< 20.0000	< 20.0000	< 20.0000	< 20.0000					
Magnesium, Total	MG/L	434.0000								
Magnesium, Dissolved	MG/L	415.0000	521.0000	607.0000	599.0000	272.0000	260.0000	169.0000	114.0000	240.0000
Manganese, Total	MG/L		0.0500	0.0400	0.1000	0.0900	B 0.0300	0.4700	0.0460	0.1600
Manganese, Dissolved	MG/L	0.0700	0.0500	0.0300	0.0400	B 0.0400	B 0.0200	0.2200	0.0310	0.0800
Mercury, Total	UG/L									
Mercury, Dissolved	UG/L	< 0.1000	< 0.1000	< 0.1000	< 0.1000					
Molybdenum, Dissolved	UG/L	< 50.0000	2.0000	< 1.0000	6.0000					

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/12/1989 11:36	12/04/1989 09:30	09/18/1990 09:40	06/11/1991 15:15	09/15/2000 08:42	01/26/2001 11:15	07/13/2001 08:32	01/21/2002 09:50	07/03/2002 15:02
Laboratory Parameters										
Nickel, Dissolved	UG/L	< 20.0000	< 20.0000	< 20.0000	< 20.0000					
Ammonia Nitrogen_N	MG/L	0.0800	0.2400	0.1900	0.3600					
Nitrate Nitrogen_N	MG/L	0.0300	0.0400	1.1000	0.0900	B 0.0500	B 0.0200	0.5700	B 0.0200	B 0.0500
Nitrite Nitrogen_N	MG/L	< 0.0100	0.0300	0.0300	< 0.0100	< 0.0100	< 0.0100	< 0.0200	< 0.0100	< 0.0100
NO3_NO2 Nitrogen_N	MG/L	0.0200	0.0700	1.1300	0.0900	B 0.0500	B 0.0200	0.5700	B 0.0200	B 0.0500
Ph At 25 Deg. Cent.	UNITS	7.9000	8.2000	8.5000	8.8000	9.3000	8.8000	7.2000	9.1000	7.7000
Phosphorus, Orthophos	MG/L	0.0060	0.0490	< 0.0050	< 0.0100					
Potassium, Total	MG/L	19.0000								
Potassium, Dissolved	MG/L	19.0000	24.0000	29.0000	29.0000	34.3000	32.3000	22.3000	18.6000	32.9000
Selenium, Total	UG/L									
Selenium, Dissolved	UG/L	< 1.0000	2.0000	< 1.0000	< 5.0000					
Silica, Total	MG/L	< 0.1000								
Silica, Dissolved	MG/L	< 0.1000	< 0.1000	3.4000	3.6000	< 0.4000	< 0.4000	3.6000	< 0.2000	2.1000
Silver, Dissolved	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000					
Sodium, Total	MG/L	300.0000								
Sodium, Dissolved	MG/L	279.0000	371.0000	479.0000	542.0000	246.0000	241.0000	145.0000	86.4000	196.0000
Solids, Dissolved	MG/L	4260.0000	4900.0000	6532.0000	6378.0000	3710.0000	3390.0000	2410.0000	1780.0000	3310.0000
Solids, Suspended	MG/L	< 2.0000	10.0000	36.0000	< 2.0000	< 5.0000	B 6.0000	B 12.0000	B 6.0000	B 6.0000
Sulfate	MG/L	2824.0000	3243.0000	4153.0000	4297.0000	2490.0000	2330.0000	1590.0000	1160.0000	2310.0000
Turbidity	NTU	1.8000								
Vanadium, Total	UG/L									
Vanadium, Dissolved	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000					
Zinc, Total	MG/L									
Zinc, Dissolved	MG/L	< 0.0100	< 0.0100	< 0.0100	0.0100					
Chromium_3	UG/L									
Chromium_6	UG/L									
Bicarbonate As HCO3	MG/L	246.0000	254.0000	110.0000	479.9641	56.0000	38.0000	69.0000	12.0000	39.0000
Carbonate As CO3	MG/L	0.0000	0.0000	7.0000	14.0000	B 3.0000	13.0000	< 2.0000	22.0000	< 2.0000
Hydroxide As OH	MG/L					< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000
Phosphate As PO4	MG/L		0.2000	< 0.1000	< 0.1000					
Cation_Anion Balance	%	-0.8700	2.9300	-0.1100	-0.4600	-4.8000	-2.9000	-3.9000	-4.5000	-4.5000
SAR	%		2.9300	3.5100	3.9900	2.4300	2.4100	1.7300	1.2000	1.9900
Solids, Diss. (Calc)	MG/L	4052.0000	4717.0000	5919.0000	6123.0000	3540.0000	3360.0000	2320.0000	1680.0000	3250.0000
Sum Of Anions	MEQ/L					56.7000	53.1000	36.9000	26.6000	51.6000
Sum Of Cations	MEQ/L					51.5000	50.1000	34.1000	24.3000	47.2000
Total Recoverable Al	MG/L	< 0.0500	< 0.0500	0.2500	< 0.0500	< 0.0600	B 0.0700	0.3800	< 0.0300	< 0.0600
Total Recoverable As	UG/L	1.0000	1.0000	1.0000	1.0000	B 1.0000	< 1.0000	B 2.0000	< 1.0000	< 1.0000
Total Recoverable Ba	UG/L	40.0000	100.0000	40.0000	20.0000					
Total Recoverable Cd	UG/L	< 5.0000	< 10.0000	< 5.0000	< 5.0000	< 6.0000	< 6.0000	< 6.0000	< 3.0000	< 6.0000
Total Recoverable Cr	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 20.0000	< 20.0000	< 20.0000	< 10.0000	< 20.0000
Total Recoverable Cu	UG/L	< 10.0000	10.0000	< 10.0000	< 10.0000	< 20.0000	< 20.0000	< 20.0000	< 10.0000	< 20.0000

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/12/1989 11:36	12/04/1989 09:30	09/18/1990 09:40	06/11/1991 15:15	09/15/2000 08:42	01/26/2001 11:15	07/13/2001 08:32	01/21/2002 09:50	07/03/2002 15:02
Laboratory Parameters										
Total Recoverable Fe	MG/L	0.0300	0.0700	0.2900	0.0500					
Total Recoverable Pb	UG/L	< 20.0000	< 20.0000	< 20.0000	< 20.0000	< 80.0000	< 80.0000	< 80.0000	< 40.0000	< 80.0000
Total Recoverable Mn	MG/L	0.0700	0.0500	0.0400	0.0700					
Total Recoverable Hg	UG/L	< 0.1000	< 0.1000	< 0.1000	< 0.1000	< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000
Total Recoverable Mo	UG/L	< 50.0000	2.0000	< 1.0000	6.0000					
Total Recoverable Ni	UG/L	< 20.0000	< 20.0000	< 20.0000	< 20.0000					
Total Recoverable Se	UG/L	< 1.0000	2.0000	< 1.0000	< 10.0000	< 1.0000	< 1.0000	B 1.0000	< 1.0000	< 1.0000
Total Recoverable Ag	UG/L	10.0000	< 10.0000	< 10.0000	< 10.0000					
Total Recoverable Zn	MG/L	< 0.0100	< 0.0100	< 0.0100	0.0100	< 0.0200	< 0.0200	< 0.0200	< 0.0100	< 0.0200
TDS Ratio	%	1.0500	1.0400	1.1000	1.0400	1.0500	1.0100	1.0400	1.0600	1.0200
Total Recoverable Sb	UG/L	< 1.0000	< 1.0000	< 10.0000	< 1.0000					
Total Recoverable V	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 5.0000	< 10.0000
Aluminum, Acid-soluble	mg/l									

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	01/17/2003 10:32	07/17/2003 12:10	01/09/2004 12:35	07/12/2004 11:45	01/14/2005 11:42	07/08/2005 11:00	01/13/2006 13:48	07/21/2006 13:10	04/04/2019 11:19
Field Parameters										
Field Ph	S.U.	9.7900	10.1600	9.3200	8.2900	8.1100	10.3300	8.8000	10.0200	8.7300
Temperature	C	3.6000	25.7000	3.7000	23.7000	7.0000	26.0000	2.6000	30.0000	10.2000
Conductivity	UMHOS/CM	1111.0000	1894.0000	566.0000	682.0000	844.0000	1058.0000	1096.0000	1410.0000	278.0000
Field Salinity	0/00	0.6000	1.0000	0.3000	0.3000	0.4000	0.5000	0.5000	0.7000	0.1000
Laboratory Parameters										
Acidity	MG/L									
Alk As CaCO3, Ph 4.5	MG/L	38.0000	31.0000	68.0000	80.0000	90.0000	48.0000	81.0000	50.0000	75.5000
Alk, Bicarb As CaCO3	MG/L	28.0000	B 5.0000	63.0000	80.0000	90.0000	14.0000	78.0000	23.0000	75.5000
Alk, Carb As CaCO3	MG/L	10.0000	26.0000	B 4.0000	< 2.0000	< 2.0000	34.0000	B 3.0000	27.0000	< 2.0000
Alk, Hydrox As CaCO3	MG/L	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000
Aluminum, Total	MG/L									1.9600
Aluminum, Dissolved	MG/L									B 0.0600
Antimony, Dissolved	UG/L									
Arsenic, Total	UG/L									1.9000
Arsenic, Dissolved	UG/L									B 0.8000
Barium, Dissolved	UG/L									
Boron, Total	UG/L									
Boron, Dissolved	UG/L	B 30.0000	B 90.0000	B 30.0000	60.0000	B 50.0000	60.0000	50.0000	90.0000	B 20.0000
Cadmium, Total	UG/L									B 0.1300
Cadmium, Dissolved	UG/L									< 0.0500
Calcium, Total	MG/L									
Calcium, Dissolved	MG/L	98.9000	204.0000	81.9000	87.5000	113.0000	105.0000	120.0000	123.0000	32.1000
C.O.D.	MG/L									
Chloride	MG/L	18.0000	45.0000	8.0000	10.0000	13.0000	17.0000	21.0000	31.0000	3.7000
Chromium, Total	UG/L									< 10.0000
Chromium, Dissolved	UG/L									< 10.0000
Conductivity	UMHOS/CM	811.0000	2060.0000	590.0000	730.0000	947.0000	1030.0000	1100.0000	1560.0000	277.0000
Copper, Total	UG/L									< 10.0000
Copper, Dissolved	UG/L									B 1.2000
Fluoride	MG/L	B 0.4000	0.8000	B 0.5000	0.6000	B 0.5000	0.6000	0.6000	1.0000	B 0.2600
Hardness As CaCO3	MG/L	429.0000	1040.0000	304.0000	372.0000	454.0000	498.0000	577.0000	675.0000	115.0000
Iron, Total	MG/L	0.0600	< 0.0100	0.3000	0.2000	B 0.2900	B 0.0400	B 0.0300	< 0.0200	2.0300
Iron, Dissolved	MG/L	< 0.0100	< 0.0200	0.1200	0.0900	B 0.0200	< 0.0200	< 0.0200	< 0.0200	0.0700
Lead, Total	UG/L									1.8000
Lead, Dissolved	UG/L									< 0.1000
Magnesium, Total	MG/L									
Magnesium, Dissolved	MG/L	44.3000	130.0000	24.2000	37.3000	41.8000	57.2000	67.3000	89.4000	8.5000
Manganese, Total	MG/L	0.0350	0.0470	0.0980	0.1410	B 0.0500	B 0.0290	B 0.0110	B 0.0100	0.1600
Manganese, Dissolved	MG/L	B 0.0250	< 0.0100	0.0780	0.1060	B 0.0110	B 0.0090	< 0.0050	B 0.0090	0.0970
Mercury, Total	UG/L				< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000
Mercury, Dissolved	UG/L									
Molybdenum, Dissolved	UG/L									
Nickel, Dissolved	UG/L									
Ammonia Nitrogen_N	MG/L									
Nitrate Nitrogen_N	MG/L	< 0.0200	< 0.0200	B 0.0900	< 0.0200	0.5200	B 0.0200	B 0.0300	< 0.0200	< 0.0200
Nitrite Nitrogen_N	MG/L	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	01/17/2003 10:32	07/17/2003 12:10	01/09/2004 12:35	07/12/2004 11:45	01/14/2005 11:42	07/08/2005 11:00	01/13/2006 13:48	07/21/2006 13:10	04/04/2019 11:19
Laboratory Parameters										
NO3_NO2 Nitrogen_N	MG/L	< 0.0200	< 0.0200	B 0.0900	< 0.0200	0.5200	B 0.0200	B 0.0300	< 0.0200	< 0.0200
Ph At 25 Deg. Cent.	UNITS	8.8000	9.4000	8.5000	7.3000	7.9000	9.8000	8.4000	9.5000	8.2000
Phosphorus, Orthophos	MG/L									
Potassium, Total	MG/L									
Potassium, Dissolved	MG/L	9.7000	26.5000	7.0000	12.8000	11.3000	13.4000	15.5000	24.5000	6.8000
Selenium, Total	UG/L									< 1.0000
Selenium, Dissolved	UG/L									
Silica, Total	MG/L									
Silica, Dissolved	MG/L	B 0.2000	0.7000	1.0000	1.5000	1.3000	B 0.2000	< 0.2000	< 0.2000	2.4000
Silver, Dissolved	UG/L									
Sodium, Total	MG/L									
Sodium, Dissolved	MG/L	34.8000	80.8000	14.5000	22.6000	26.4000	41.0000	42.9000	68.5000	5.3000
Solids, Dissolved	MG/L	690.0000	1810.0000	450.0000	560.0000	680.0000	780.0000	880.0000	1220.0000	204.0000
Solids, Suspended	MG/L	B 10.0000	B 6.0000	< 5.0000	B 6.0000	B 8.0000	< 5.0000	< 5.0000	< 5.0000	50.0000
Sulfate	MG/L	440.0000	1200.0000	260.0000	320.0000	400.0000	530.0000	510.0000	710.0000	54.7000
Turbidity	NTU									
Vanadium, Total	UG/L									< 5.0000
Vanadium, Dissolved	UG/L									< 5.0000
Zinc, Total	MG/L									< 0.0100
Zinc, Dissolved	MG/L		< 0.0100							< 0.0100
Chromium_3	UG/L									< 10.0000
Chromium_6	UG/L									< 5.0000
Bicarbonate As HCO3	MG/L	34.0000	B 6.0000	77.0000	98.0000	109.0000	17.0000	96.0000	28.0000	92.1000
Carbonate As CO3	MG/L	B 6.0000	16.0000	B 3.0000	< 2.0000	< 2.0000	20.0000	< 2.0000	B 16.0000	< 2.0000
Hydroxide As OH	MG/L	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000
Phosphate As PO4	MG/L									
Cation_Anion Balance	%	-0.5000	-3.8000	-0.7000	0.6000	-0.5000	-2.0000	3.0000	0.9000	< -1.8000
SAR	%	0.7300	1.1000	0.3600	0.5100	0.5400	0.8000	0.7800	1.1600	0.2200
Solids, Diss. (Calc)	MG/L	673.0000	1720.0000	439.0000	540.0000	664.0000	807.0000	827.0000	1090.0000	161.0000
Sum Of Anions	MEQ/L	10.5000	27.1000	7.0000	8.6000	10.6000	12.6000	13.0000	16.8000	2.8000
Sum Of Cations	MEQ/L	10.4000	25.1000	6.9000	8.7000	10.5000	12.1000	13.8000	17.1000	2.7000
Total Recoverable Al	MG/L	< 0.0300	B 0.0500	B 0.1000	B 0.0800	B 0.2700	< 0.0300	< 0.0300	< 0.0300	
Total Recoverable As	UG/L	B 1.0000	B 2.2000	0.8000	B 1.7000	< 1.0000	B 1.8000	B 1.3000	3.2000	
Total Recoverable Ba	UG/L									
Total Recoverable Cd	UG/L	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 10.0000	< 5.0000	< 5.0000	< 5.0000	
Total Recoverable Cr	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 20.0000	< 10.0000	< 10.0000	< 10.0000	
Total Recoverable Cu	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 20.0000	< 10.0000	< 10.0000	< 10.0000	
Total Recoverable Fe	MG/L									
Total Recoverable Pb	UG/L	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	
Total Recoverable Mn	MG/L									
Total Recoverable Hg	UG/L	< 0.2000	< 0.2000	< 0.2000						
Total Recoverable Mo	UG/L									
Total Recoverable Ni	UG/L									
Total Recoverable Se	UG/L	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	
Total Recoverable Ag	UG/L									

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	01/17/2003 10:32	07/17/2003 12:10	01/09/2004 12:35	07/12/2004 11:45	01/14/2005 11:42	07/08/2005 11:00	01/13/2006 13:48	07/21/2006 13:10	04/04/2019 11:19
Laboratory Parameters										
Total Recoverable Zn	MG/L	< 0.0100	< 0.0100	< 0.0100	< 0.0100	B 0.0900	< 0.0100	< 0.0100	< 0.0100	
TDS Ratio	%	1.0300	1.0500	1.0300	1.0400	1.0200	0.9700	1.0600	1.1200	1.2700
Total Recoverable Sb	UG/L									
Total Recoverable V	UG/L	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	
Aluminum, Acid-soluble	mg/l									

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	03/06/2020 14:20	07/27/2020 12:25	04/09/2021 15:52	10/22/2021 14:40	09/09/2022 11:45	01/13/2023 11:15	05/02/2024 12:03
Field Parameters								
Field Ph	S.U.	8.9200	10.4000	9.5200	9.8900	7.6800	8.8100	10.2200
Temperature	C	10.6000	25.7000	22.8000	12.8000	24.9000	4.0000	17.9000
Conductivity	UMHOS/CM	307.0000	364.0000	699.0000	572.0000	322.0000	338.0000	379.0000
Field Salinity	0/00	0.1000	0.2000	0.3000	0.3000	0.2000	0.2000	0.2000
Laboratory Parameters								
Acidity	MG/L							
Alk As CaCO3, Ph 4.5	MG/L	98.3000	96.2000	165.0000	44.9000	72.6000	82.8000	
Alk, Bicarb As CaCO3	MG/L	92.1000	45.1000	163.0000	39.9000	72.6000	82.8000	
Alk, Carb As CaCO3	MG/L	B 6.2000	51.1000	< 2.0000	B 5.0000	< 2.0000	< 2.0000	
Alk, Hydrox As CaCO3	MG/L	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	
Aluminum, Total	MG/L	0.4360	0.1420	0.5230	0.0241	0.3990		
Aluminum, Dissolved	MG/L	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	
Antimony, Dissolved	UG/L							
Arsenic, Total	UG/L	1.5000	6.3000	5.2700	1.1700	1.9900	B 0.7900	
Arsenic, Dissolved	UG/L	1.3000	6.8000	5.3700	1.2300	1.4000	B 0.6200	
Barium, Dissolved	UG/L							
Boron, Total	UG/L							
Boron, Dissolved	UG/L	B 40.0000	B 70.0000	138.0000	B 67.0000	< 30.0000	B 37.0000	
Cadmium, Total	UG/L	< 0.0500	B 0.0800	< 0.2500	< 0.0500	< 0.0500	< 0.0500	
Cadmium, Dissolved	UG/L	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	
Calcium, Total	MG/L							
Calcium, Dissolved	MG/L	32.4000	24.2000	58.9000	82.6000	43.2000	43.1000	
C.O.D.	MG/L							
Chloride	MG/L	5.9000	10.1000	33.5000	6.8100	3.6000	3.1400	
Chromium, Total	UG/L	< 10.0000	< 10.0000	< 20.0000	< 20.0000	< 20.0000	< 40.0000	
Chromium, Dissolved	UG/L	< 10.0000	< 10.0000	< 20.0000	< 20.0000	< 20.0000	< 20.0000	
Conductivity	UMHOS/CM	323.0000	361.0000	788.0000	678.0000	311.0000	338.0000	
Copper, Total	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 20.0000	
Copper, Dissolved	UG/L	< 0.8000	B 1.8000	< 0.8000	B 1.7600	B 1.2400	B 0.9400	
Fluoride	MG/L	0.5000	1.0000	1.5400	0.4700	0.3900	0.3600	
Hardness As CaCO3	MG/L	144.0000	130.0000	355.0000	317.0000	145.0000	145.0000	
Iron, Total	MG/L	0.3700	0.3800	0.5940	< 0.0600	0.8330	B 0.2140	
Iron, Dissolved	MG/L	< 0.0300	B 0.0700	< 0.0600	< 0.0600	< 0.0600	< 0.0600	
Lead, Total	UG/L	B 0.4000	B 0.5000	B 0.5300	< 0.1000	0.9600	B 0.2200	
Lead, Dissolved	UG/L	< 0.1000	B 0.3000	< 0.1000	< 0.1000	< 0.1000	< 0.1000	
Magnesium, Total	MG/L							
Magnesium, Dissolved	MG/L	15.4000	16.8000	50.5000	26.8000	9.0500	9.0600	
Manganese, Total	MG/L	0.0600	B 0.0200	0.2510	< 0.0100	0.1030	< 0.0200	
Manganese, Dissolved	MG/L	0.0600	< 0.0100	0.1620	< 0.0100	0.0800	B 0.0170	
Mercury, Total	UG/L	< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000	
Mercury, Dissolved	UG/L							
Molybdenum, Dissolved	UG/L							
Nickel, Dissolved	UG/L							
Ammonia Nitrogen_N	MG/L							
Nitrate Nitrogen_N	MG/L	< 0.0200	B 0.0400	< 0.0200	< 0.0200	0.1710	0.4060	
Nitrite Nitrogen_N	MG/L	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	B 0.0200	

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	03/06/2020 14:20	07/27/2020 12:25	04/09/2021 15:52	10/22/2021 14:40	09/09/2022 11:45	01/13/2023 11:15	05/02/2024 12:03
Laboratory Parameters								
NO3_NO2 Nitrogen_N	MG/L	< 0.0200	B 0.0400	< 0.0200	< 0.0200	0.1710	0.4260	
Ph At 25 Deg. Cent.	UNITS	8.6000	9.7000	8.3000	8.6000	7.6000	7.1000	
Phosphorus, Orthophos	MG/L							
Potassium, Total	MG/L							
Potassium, Dissolved	MG/L	12.2000	18.8000	31.9000	17.1000	7.8700	8.3400	
Selenium, Total	UG/L	< 1.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	
Selenium, Dissolved	UG/L							
Silica, Total	MG/L							
Silica, Dissolved	MG/L	< 0.2000	1.1000	B 0.7000	B 0.3000	6.4000	3.5000	
Silver, Dissolved	UG/L							
Sodium, Total	MG/L							
Sodium, Dissolved	MG/L	15.2000	21.9000	58.3000	16.1000	9.6100	5.2700	
Solids, Dissolved	MG/L	210.0000	272.0000	600.0000	484.0000	230.0000	218.0000	
Solids, Suspended	MG/L	B 8.0000	< 5.0000	B 16.0000	< 5.0000	< 5.0000	< 5.0000	
Sulfate	MG/L	77.2000	162.0000	400.0000	291.0000	153.0000	82.2000	
Turbidity	NTU							
Vanadium, Total	UG/L	< 5.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 20.0000	
Vanadium, Dissolved	UG/L	< 5.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	
Zinc, Total	MG/L	< 0.0100	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0400	
Zinc, Dissolved	MG/L	< 0.0100	< 0.0200	< 0.0200	< 0.0200	< 0.0200	B 0.0210	
Chromium_3	UG/L	< 10.0000	< 10.0000	< 20.0000	< 20.0000	< 20.0000	< 20.0000	
Chromium_6	UG/L	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	
Bicarbonate As HCO3	MG/L	112.0000	55.0000	199.0000	48.6000	88.6000	101.0000	
Carbonate As CO3	MG/L	B 3.7000	30.7000	< 2.0000	B 3.0000	< 2.0000	< 2.0000	
Hydroxide As OH	MG/L	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	
Phosphate As PO4	MG/L							
Cation_Anion Balance	%	1.3000	< -17.5000	< -8.3000	2.0000	< -15.7000	< -1.4000	
SAR	%	0.5600	0.8500	1.4000	0.4000	0.3500	0.1900	
Solids, Diss. (Calc)	MG/L	219.0000	315.0000	735.0000	469.0000	280.0000	206.0000	
Sum Of Anions	MEQ/L	3.8000	5.7000	13.0000	7.2000	4.8000	3.5000	
Sum Of Cations	MEQ/L	3.9000	4.0000	11.0000	7.5000	3.5000	3.4000	
Total Recoverable Al	MG/L							
Total Recoverable As	UG/L							
Total Recoverable Ba	UG/L							
Total Recoverable Cd	UG/L							
Total Recoverable Cr	UG/L							
Total Recoverable Cu	UG/L							
Total Recoverable Fe	MG/L							
Total Recoverable Pb	UG/L							
Total Recoverable Mn	MG/L							
Total Recoverable Hg	UG/L							
Total Recoverable Mo	UG/L							
Total Recoverable Ni	UG/L							
Total Recoverable Se	UG/L							
Total Recoverable Ag	UG/L							

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-G-P - PERM IMPOUND N14-G
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	03/06/2020 14:20	07/27/2020 12:25	04/09/2021 15:52	10/22/2021 14:40	09/09/2022 11:45	01/13/2023 11:15	05/02/2024 12:03
Laboratory Parameters								
Total Recoverable Zn	MG/L							
TDS Ratio	%	0.9600	0.8600	0.8200	1.0300	0.8200	1.0600	
Total Recoverable Sb	UG/L							
Total Recoverable V	UG/L							
Aluminum, Acid-soluble	mg/l						< 0.0500	

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/12/1989 09:33	09/18/1990 10:25	05/29/1991 09:00	10/17/1995 12:47	09/15/2000 10:49	01/26/2001 13:50	07/13/2001 10:55	01/23/2002 09:40	07/03/2002 15:15
Field Parameters										
Field Ph	S.U.				9.1500	9.7100	7.7600	7.9300	9.3400	10.5900
Temperature	C				16.9000	22.2000	2.4000	21.6000	2.5000	20.1000
Conductivity	UMHOS/CM				2625.0000	1132.0000	1293.0000	826.0000	926.0000	1126.0000
Field Salinity	0/00				1.0000	0.6000	0.6000	0.4000	0.5000	0.6000
Laboratory Parameters										
Acidity	MG/L	0.0000	0.0000		< 2.0000					
Alk As CaCO3, Ph 4.5	MG/L	56.0000	68.0000		55.0000	89.0000	169.0000	75.0000	105.0000	109.0000
Alk, Bicarb As CaCO3	MG/L				15.0000	59.0000	169.0000	75.0000	105.0000	10.0000
Alk, Carb As CaCO3	MG/L				40.0000	30.0000	< 2.0000	< 2.0000	< 2.0000	98.0000
Alk, Hydrox As CaCO3	MG/L				< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000
Aluminum, Total	MG/L									
Aluminum, Dissolved	MG/L	< 0.0500	< 0.0500		< 0.2000					
Antimony, Dissolved	UG/L	< 1.0000	< 1.0000		< 2.0000					
Arsenic, Total	UG/L				B 2.0000					
Arsenic, Dissolved	UG/L	1.0000	2.0000		B 4.0000					
Barium, Dissolved	UG/L	50.0000	90.0000		B 50.0000					
Boron, Total	UG/L	30.0000								
Boron, Dissolved	UG/L	30.0000	30.0000		B 80.0000	B 40.0000	50.0000	B 50.0000	90.0000	80.0000
Cadmium, Total	UG/L									
Cadmium, Dissolved	UG/L	< 5.0000	< 10.0000		< 20.0000					
Calcium, Total	MG/L	106.0000								
Calcium, Dissolved	MG/L	89.0000	104.0000		129.0000	48.7000	73.8000	83.5000	87.5000	72.5000
C.O.D.	MG/L	20.0000	70.0000		60.0000					
Chloride	MG/L	14.0000	18.0000		44.0000	26.0000	33.0000	16.0000	16.0000	28.0000
Chromium, Total	UG/L									
Chromium, Dissolved	UG/L	< 10.0000	< 10.0000		< 50.0000					
Conductivity	UMHOS/CM	972.0000	1030.0000		2660.0000	1180.0000	1400.0000	881.0000	995.0000	1230.0000
Copper, Total	UG/L									
Copper, Dissolved	UG/L	< 10.0000	< 10.0000		< 50.0000					
Fluoride	MG/L	0.6000	0.7000		0.7000	0.9000	0.8000	0.6000	0.5000	0.8000
Hardness As CaCO3	MG/L	440.0000	486.0000		1070.0000	436.0000	549.0000	363.0000	450.0000	471.0000
Iron, Total	MG/L		0.4000	0.0600	0.1100	B 0.0200	B 0.0800	0.2100	0.8900	0.1300
Iron, Dissolved	MG/L	< 0.0200	< 0.0200		< 0.0500	< 0.0100	0.0500	B 0.0300	0.3600	B 0.0200
Lead, Total	UG/L									
Lead, Dissolved	UG/L	< 20.0000	< 20.0000		< 100.0000					
Magnesium, Total	MG/L	58.0000								
Magnesium, Dissolved	MG/L	53.0000	55.0000		182.0000	76.5000	88.6000	37.6000	56.2000	70.6000
Manganese, Total	MG/L		0.0500		0.0350	B 0.0260	0.7300	0.0360	0.4020	0.1010
Manganese, Dissolved	MG/L	< 0.0100	0.0500		< 0.0300	B 0.0160	0.8880	0.0320	0.3330	0.0300
Mercury, Total	UG/L									
Mercury, Dissolved	UG/L	< 0.1000	< 0.1000		< 0.2000					
Molybdenum, Dissolved	UG/L	< 50.0000	< 1.0000		< 1.0000					

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/12/1989 09:33	09/18/1990 10:25	05/29/1991 09:00	10/17/1995 12:47	09/15/2000 10:49	01/26/2001 13:50	07/13/2001 10:55	01/23/2002 09:40	07/03/2002 15:15
Laboratory Parameters										
Nickel, Dissolved	UG/L	< 20.0000	< 20.0000		< 50.0000					
Ammonia Nitrogen_N	MG/L	0.0600	0.1000		B 0.0600					
Nitrate Nitrogen_N	MG/L	< 0.0200	< 0.0200		< 0.0200	B 0.0400	< 0.0200	0.3100	0.2800	B 0.0300
Nitrite Nitrogen_N	MG/L	< 0.0100	< 0.0100		< 0.0100	< 0.0100	< 0.0100	< 0.0200	< 0.0100	< 0.0100
NO3_NO2 Nitrogen_N	MG/L	< 0.0200	< 0.0200		< 0.0200	B 0.0400	< 0.0200	0.3100	0.2800	B 0.0300
Ph At 25 Deg. Cent.	UNITS	8.4000	6.8000		9.3000	9.9000	7.5000	7.3000	8.0000	9.3000
Phosphorus, Orthophos	MG/L	< 0.0050	< 0.0050		B 0.0070					
Potassium, Total	MG/L	12.0000								
Potassium, Dissolved	MG/L	12.0000	15.0000		27.0000	24.2000	31.0000	15.3000	19.6000	28.1000
Selenium, Total	UG/L				B 1.0000					
Selenium, Dissolved	UG/L	< 1.0000	< 1.0000		< 1.0000					
Silica, Total	MG/L	< 0.1000								
Silica, Dissolved	MG/L	< 0.1000	1.4000		< 1.0000	< 0.2000	B 0.4000	4.0000	2.2000	1.0000
Silver, Dissolved	UG/L	< 10.0000	< 10.0000		< 30.0000					
Sodium, Total	MG/L	51.0000								
Sodium, Dissolved	MG/L	47.0000	57.0000		192.0000	96.5000	114.0000	44.3000	52.2000	87.6000
Solids, Dissolved	MG/L	794.0000	784.0000		2310.0000	900.0000	1050.0000	660.0000	810.0000	930.0000
Solids, Suspended	MG/L	< 2.0000	8.0000		< 5.0000	< 5.0000	< 5.0000	B 6.0000	< 5.0000	B 6.0000
Sulfate	MG/L	504.0000	488.0000		1470.0000	550.0000	590.0000	380.0000	450.0000	550.0000
Turbidity	NTU	2.2000								
Vanadium, Total	UG/L									
Vanadium, Dissolved	UG/L	< 10.0000	< 10.0000		< 30.0000					
Zinc, Total	MG/L									
Zinc, Dissolved	MG/L	< 0.0100	< 0.0100		< 0.0500					
Chromium_3	UG/L									
Chromium_6	UG/L									
Bicarbonate As HCO3	MG/L	44.0000	83.0000		18.0000	71.0000	206.0000	91.0000	129.0000	13.0000
Carbonate As CO3	MG/L	12.0000	0.0000		24.0000	18.0000	< 2.0000	< 2.0000	< 2.0000	59.0000
Hydroxide As OH	MG/L				< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000
Phosphate As PO4	MG/L		< 0.1000		< 0.0300					
Cation_Anion Balance	%	-3.9500	2.0200		-4.3000	-1.8000	0.3000	-1.5000	-0.8000	-1.8000
SAR	%		1.1400		2.5800	2.0300	2.1400	1.0200	1.0800	1.7800
Solids, Diss. (Calc)	MG/L	749.0000	763.0000		2090.0000	888.0000	1030.0000	628.0000	749.0000	943.0000
Sum Of Anions	MEQ/L				33.2000	14.1000	16.7000	9.9000	12.0000	14.5000
Sum Of Cations	MEQ/L				30.5000	13.6000	16.8000	9.6000	11.8000	14.0000
Total Recoverable Al	MG/L	< 0.0500	0.5700		B 0.0700	< 0.0300	< 0.0300	B 0.1800	< 0.0300	B 0.0400
Total Recoverable As	UG/L	1.0000	2.0000		B 2.0000	B 3.0000	B 3.0000	B 2.0000	B 2.0000	B 3.0000
Total Recoverable Ba	UG/L	50.0000	80.0000		49.0000					
Total Recoverable Cd	UG/L	< 5.0000	< 5.0000		< 3.0000	< 3.0000	< 3.0000	< 3.0000	< 3.0000	< 3.0000
Total Recoverable Cr	UG/L	< 10.0000	< 10.0000		< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000
Total Recoverable Cu	UG/L	< 10.0000	< 10.0000		< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/12/1989 09:33	09/18/1990 10:25	05/29/1991 09:00	10/17/1995 12:47	09/15/2000 10:49	01/26/2001 13:50	07/13/2001 10:55	01/23/2002 09:40	07/03/2002 15:15
Laboratory Parameters										
Total Recoverable Fe	MG/L	< 0.0200	0.1200		0.0900					
Total Recoverable Pb	UG/L	< 20.0000	< 20.0000		< 20.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000
Total Recoverable Mn	MG/L	< 0.0100	0.0500		0.0300					
Total Recoverable Hg	UG/L	< 0.1000	< 0.1000		< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000
Total Recoverable Mo	UG/L	< 50.0000	1.0000		< 1.0000					
Total Recoverable Ni	UG/L	< 20.0000	< 20.0000		< 10.0000					
Total Recoverable Se	UG/L	< 1.0000	< 1.0000		< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000
Total Recoverable Ag	UG/L	< 10.0000	< 10.0000		< 5.0000					
Total Recoverable Zn	MG/L	< 0.0100	0.0100		B 0.0100	< 0.0100	B 0.0200	< 0.0100	< 0.0100	< 0.0100
TDS Ratio	%	1.0600	1.0300		1.1000	1.0100	1.0200	1.0500	1.0800	0.9900
Total Recoverable Sb	UG/L	< 1.0000	< 10.0000		< 2.0000					
Total Recoverable V	UG/L	< 10.0000	< 10.0000		< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000
Aluminum, Acid-soluble	mg/l									

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	01/17/2003 10:50	08/20/2003 11:18	12/04/2003 13:40	02/09/2004 12:30	07/19/2004 14:15	01/14/2005 11:57	07/08/2005 11:16	01/12/2006 11:20	07/27/2006 11:50
Field Parameters										
Field Ph	S.U.	9.4100	7.9100	8.8400	7.6200	8.2500	8.2200	8.8900	8.5200	10.5700
Temperature	C	6.4000	22.5000	7.0000	2.8000	27.9000	6.8000	23.4000	3.4000	25.7000
Conductivity	UMHOS/CM	1406.0000	977.0000	367.0000	397.0000	480.0000	574.0000	640.0000	722.0000	688.0000
Field Salinity	0/00	0.7000	0.5000	0.2000	0.2000	0.2000	0.3000	0.3000	0.4000	0.3000
Laboratory Parameters										
Acidity	MG/L									
Alk As CaCO3, Ph 4.5	MG/L	64.0000	100.0000	116.0000	102.0000	144.0000	178.0000	160.0000	185.0000	114.0000
Alk, Bicarb As CaCO3	MG/L	53.0000	100.0000	116.0000	102.0000	144.0000	178.0000	148.0000	174.0000	28.0000
Alk, Carb As CaCO3	MG/L	10.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	12.0000	B 11.0000	87.0000
Alk, Hydrox As CaCO3	MG/L	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000
Aluminum, Total	MG/L									
Aluminum, Dissolved	MG/L									
Antimony, Dissolved	UG/L									
Arsenic, Total	UG/L									
Arsenic, Dissolved	UG/L									
Barium, Dissolved	UG/L									
Boron, Total	UG/L									
Boron, Dissolved	UG/L	B 50.0000	60.0000	B 40.0000	B 40.0000	B 50.0000	B 50.0000	B 50.0000	50.0000	B 50.0000
Cadmium, Total	UG/L									
Cadmium, Dissolved	UG/L									
Calcium, Total	MG/L									
Calcium, Dissolved	MG/L	78.4000	124.0000	55.2000	63.0000	71.5000	87.4000	64.3000	70.8000	31.8000
C.O.D.	MG/L									
Chloride	MG/L	24.0000	24.0000	5.0000	6.0000	7.0000	7.0000	9.0000	12.0000	18.0000
Chromium, Total	UG/L									
Chromium, Dissolved	UG/L									
Conductivity	UMHOS/CM	854.0000	1050.0000	308.0000	456.0000	450.0000	638.0000	630.0000	768.0000	690.0000
Copper, Total	UG/L									
Copper, Dissolved	UG/L									
Fluoride	MG/L	B 0.4000	B 0.5000	B 0.4000	B 0.4000	B 0.5000	B 0.4000	B 0.4000	B 0.5000	0.7000
Hardness As CaCO3	MG/L	393.0000	474.0000	186.0000	213.0000	264.0000	314.0000	289.0000	332.0000	257.0000
Iron, Total	MG/L	B 0.0400	0.7300	1.2100	1.0500	0.1700	0.1700	0.3300	0.1400	0.1600
Iron, Dissolved	MG/L	< 0.0100	0.1600	0.7400	0.5800	B 0.0200	B 0.0100	0.1100	< 0.0200	< 0.0200
Lead, Total	UG/L									
Lead, Dissolved	UG/L									
Magnesium, Total	MG/L									
Magnesium, Dissolved	MG/L	47.9000	39.8000	11.6000	13.6000	20.7000	23.2000	31.3000	37.6000	43.3000
Manganese, Total	MG/L	0.1230	0.5190	0.0900	0.4810	0.0700	0.1740	0.1550	0.0880	0.0560
Manganese, Dissolved	MG/L	0.0990	0.5210	0.0780	0.4930	B 0.0070	0.1300	0.0650	B 0.0160	B 0.0220
Mercury, Total	UG/L					< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000
Mercury, Dissolved	UG/L									
Molybdenum, Dissolved	UG/L									
Nickel, Dissolved	UG/L									
Ammonia Nitrogen_N	MG/L									
Nitrate Nitrogen_N	MG/L	< 0.0200	0.4100	B 0.0800	B 0.0400	< 0.0200	B 0.0300	B 0.0200	< 0.0200	< 0.0200
Nitrite Nitrogen_N	MG/L	< 0.0100	0.0800	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	01/17/2003 10:50	08/20/2003 11:18	12/04/2003 13:40	02/09/2004 12:30	07/19/2004 14:15	01/14/2005 11:57	07/08/2005 11:16	01/12/2006 11:20	07/27/2006 11:50
Laboratory Parameters										
NO3_NO2 Nitrogen_N	MG/L	< 0.0200	0.4900	B 0.0800	B 0.0400	< 0.0200	B 0.0300	B 0.0200	< 0.0200	< 0.0200
Ph At 25 Deg. Cent.	UNITS	8.7000	7.5000	7.4000	7.4000	8.0000	8.1000	8.6000	8.5000	10.3000
Phosphorus, Orthophos	MG/L									
Potassium, Total	MG/L									
Potassium, Dissolved	MG/L	19.6000	20.5000	7.3000	8.3000	13.2000	12.4000	15.3000	18.8000	24.3000
Selenium, Total	UG/L									
Selenium, Dissolved	UG/L			< 1.0000						
Silica, Total	MG/L									
Silica, Dissolved	MG/L	< 0.2000	1.7000	5.6000	5.3000	3.1000	1.2000	1.7000	< 0.2000	B 0.3000
Silver, Dissolved	UG/L									
Sodium, Total	MG/L									
Sodium, Dissolved	MG/L	54.4000	45.5000	7.4000	8.2000	13.4000	14.6000	21.9000	28.9000	44.5000
Solids, Dissolved	MG/L	690.0000	820.0000	300.0000	320.0000	360.0000	430.0000	430.0000	500.0000	480.0000
Solids, Suspended	MG/L	< 5.0000	B 8.0000	B 6.0000	< 5.0000	B 14.0000	< 5.0000	< 5.0000	20.0000	< 5.0000
Sulfate	MG/L	430.0000	470.0000	110.0000	110.0000	130.0000	160.0000	180.0000	200.0000	210.0000
Turbidity	NTU									
Vanadium, Total	UG/L									
Vanadium, Dissolved	UG/L									
Zinc, Total	MG/L									
Zinc, Dissolved	MG/L									
Chromium_3	UG/L									
Chromium_6	UG/L									
Bicarbonate As HCO3	MG/L	65.0000	122.0000	142.0000	124.0000	176.0000	218.0000	180.0000	213.0000	34.0000
Carbonate As CO3	MG/L	B 6.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	B 7.0000	B 7.0000	52.0000
Hydroxide As OH	MG/L	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000
Phosphate As PO4	MG/L									
Cation_Anion Balance	%	-0.9000	-2.4000	-6.7000	4.3000	3.3000	0.7000	-0.7000	0.6000	3.4000
SAR	%	1.2100	0.9200	0.2300	0.2400	0.3600	0.3600	0.5600	0.6900	1.2200
Solids, Diss. (Calc)	MG/L	697.0000	789.0000	273.0000	277.0000	346.0000	413.0000	425.0000	484.0000	477.0000
Sum Of Anions	MEQ/L	11.0000	12.6000	4.8000	4.5000	5.8000	7.1000	7.2000	8.2000	7.2000
Sum Of Cations	MEQ/L	10.8000	12.0000	4.2000	4.9000	6.2000	7.2000	7.1000	8.3000	7.7000
Total Recoverable Al	MG/L	< 0.0300	0.6200	0.3800	0.2100	0.2100	B 0.1200	B 0.0700	B 0.0300	B 0.0500
Total Recoverable As	UG/L	B 1.0000	2.7200	1.6000	1.4000	B 2.0000	B 1.0000	B 2.4000	B 1.1000	6.3000
Total Recoverable Ba	UG/L									
Total Recoverable Cd	UG/L	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000
Total Recoverable Cr	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000
Total Recoverable Cu	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000
Total Recoverable Fe	MG/L									
Total Recoverable Pb	UG/L	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000	< 40.0000
Total Recoverable Mn	MG/L									
Total Recoverable Hg	UG/L	< 0.2000	< 0.2000	< 0.2000	< 0.2000					
Total Recoverable Mo	UG/L									
Total Recoverable Ni	UG/L									
Total Recoverable Se	UG/L	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000	< 1.0000
Total Recoverable Ag	UG/L									

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	01/17/2003 10:50	08/20/2003 11:18	12/04/2003 13:40	02/09/2004 12:30	07/19/2004 14:15	01/14/2005 11:57	07/08/2005 11:16	01/12/2006 11:20	07/27/2006 11:50
Laboratory Parameters										
Total Recoverable Zn	MG/L	< 0.0100	B 0.0300	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
TDS Ratio	%	0.9900	1.0400	1.1000	1.1600	1.0400	1.0400	1.0100	1.0300	1.0100
Total Recoverable Sb	UG/L									
Total Recoverable V	UG/L	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000
Aluminum, Acid-soluble	mg/l									

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/04/2019 13:20	01/09/2020 15:35	07/27/2020 12:45	09/16/2022 12:57	01/12/2023 16:20	09/21/2023 13:13	05/02/2024 13:07
Field Parameters								
Field Ph	S.U.	8.3500	8.4900	10.5300	7.5000	9.3800	9.1300	10.0000
Temperature	C	10.3000	1.4000	25.5000	22.2000	2.1000	18.2000	19.6000
Conductivity	UMHOS/CM	300.0000	410.0000	445.0000	485.0000	790.0000	1257.0000	1322.0000
Field Salinity	0/00	0.1000	0.2000	0.2000	0.3000	0.4000	0.6300	0.6600
Laboratory Parameters								
Acidity	MG/L							
Alk As CaCO3, Ph 4.5	MG/L	109.0000	191.0000	134.0000	139.0000	33.4000	86.4000	
Alk, Bicarb As CaCO3	MG/L	106.0000	191.0000	57.3000	139.0000	33.4000	86.4000	
Alk, Carb As CaCO3	MG/L	B 2.3000	< 2.0000	76.2000	< 2.0000	< 2.0000	< 2.0000	
Alk, Hydrox As CaCO3	MG/L	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	
Aluminum, Total	MG/L	0.2910	0.0270	0.3010	0.1540			
Aluminum, Dissolved	MG/L	B 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	B 0.0610	
Antimony, Dissolved	UG/L							
Arsenic, Total	UG/L	1.3000	2.1000	9.5000	1.9200	1.1600	1.1800	
Arsenic, Dissolved	UG/L	B 1.0000	B 0.4000	10.0000	1.7500	1.2100	1.2400	
Barium, Dissolved	UG/L							
Boron, Total	UG/L							
Boron, Dissolved	UG/L	B 30.0000	B 40.0000	< 20.0000	B 69.0000	B 59.0000	B 56.0000	
Cadmium, Total	UG/L	< 0.0500	< 0.0500	B 0.0700	< 0.0500	B 0.0770	B 0.0800	
Cadmium, Dissolved	UG/L	< 0.0500	< 0.0500	< 0.0500	< 0.0500	B 0.0810	B 0.0820	
Calcium, Total	MG/L							
Calcium, Dissolved	MG/L	33.2000	38.3000	16.2000	142.0000	95.0000	183.0000	
C.O.D.	MG/L							
Chloride	MG/L	7.6000	15.4000	34.9000	13.9000	10.3000	22.3000	
Chromium, Total	UG/L	< 10.0000	< 10.0000	< 10.0000	< 20.0000	< 20.0000	< 20.0000	
Chromium, Dissolved	UG/L	< 10.0000	< 10.0000	< 10.0000	< 20.0000	< 20.0000	< 20.0000	
Conductivity	UMHOS/CM	301.0000	412.0000	415.0000	932.0000	806.0000	1300.0000	
Copper, Total	UG/L	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	
Copper, Dissolved	UG/L	< 0.8000	< 0.8000	B 1.1000	< 0.8000	B 1.3900	B 1.8300	
Fluoride	MG/L	0.3500	0.5000	1.3000	0.3700	B 0.3300	0.5200	
Hardness As CaCO3	MG/L	120.0000	163.0000	95.0000	468.0000	352.0000	664.0000	
Iron, Total	MG/L	0.6800	1.3100	0.6000	1.0500	< 0.0600	0.3930	
Iron, Dissolved	MG/L	0.0800	B 0.0700	< 0.0600	< 0.0600	< 0.0600	B 0.0660	
Lead, Total	UG/L	0.6000	< 0.1000	0.7000	B 0.3200	< 0.1000	B 0.3700	
Lead, Dissolved	UG/L	< 0.1000	< 0.1000	B 0.2000	< 0.1000	< 0.1000	< 0.1000	
Magnesium, Total	MG/L							
Magnesium, Dissolved	MG/L	9.0000	16.4000	13.3000	27.5000	27.9000	50.4000	
Manganese, Total	MG/L	0.1700	1.3600	B 0.0400	0.1000	< 0.0100	0.0810	
Manganese, Dissolved	MG/L	0.1410	0.4000	< 0.0100	0.0900	B 0.0110	0.0610	
Mercury, Total	UG/L	< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000	< 0.2000	
Mercury, Dissolved	UG/L							
Molybdenum, Dissolved	UG/L							
Nickel, Dissolved	UG/L							
Ammonia Nitrogen_N	MG/L							
Nitrate Nitrogen_N	MG/L	< 0.0200	< 0.0200	< 0.0200	B 0.0670	B 0.0320	< 0.0200	
Nitrite Nitrogen_N	MG/L	< 0.0100	< 0.0100	< 0.0100	B 0.0110	< 0.0100	< 0.0100	

"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/04/2019 13:20	01/09/2020 15:35	07/27/2020 12:45	09/16/2022 12:57	01/12/2023 16:20	09/21/2023 13:13	05/02/2024 13:07
Laboratory Parameters								
NO3_NO2 Nitrogen_N	MG/L	< 0.0200	< 0.0200	< 0.0200	B 0.0780	B 0.0320	< 0.0200	
Ph At 25 Deg. Cent.	UNITS	8.3000	8.4000	9.9000	7.5000	6.5000	7.9000	
Phosphorus, Orthophos	MG/L							
Potassium, Total	MG/L							
Potassium, Dissolved	MG/L	12.6000	23.5000	36.4000	24.1000	24.0000	36.3000	
Selenium, Total	UG/L	< 1.0000	< 1.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	
Selenium, Dissolved	UG/L							
Silica, Total	MG/L							
Silica, Dissolved	MG/L	1.9000	B 0.4000	1.2000	5.6000	B 0.4000	B 0.9000	
Silver, Dissolved	UG/L							
Sodium, Total	MG/L							
Sodium, Dissolved	MG/L	6.4000	13.5000	30.8000	12.1000	12.3000	25.6000	
Solids, Dissolved	MG/L	212.0000	264.0000	316.0000	704.0000	592.0000	1000.0000	
Solids, Suspended	MG/L	< 5.0000	B 11.0000	B 11.0000	< 5.0000	< 5.0000	B 10.0000	
Sulfate	MG/L	33.7000	24.6000	35.2000	373.0000	372.0000	614.0000	
Turbidity	NTU							
Vanadium, Total	UG/L	< 5.0000	< 5.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	
Vanadium, Dissolved	UG/L	< 5.0000	< 5.0000	< 10.0000	< 10.0000	< 10.0000	< 10.0000	
Zinc, Total	MG/L	< 0.0100	< 0.0100	< 0.0200	< 0.0200	< 0.0200	< 0.0200	
Zinc, Dissolved	MG/L	< 0.0100	< 0.0100	< 0.0200	< 0.0200	B 0.0240	< 0.0200	
Chromium_3	UG/L	< 10.0000	< 10.0000	< 10.0000	< 20.0000	< 20.0000	< 20.0000	
Chromium_6	UG/L	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	< 5.0000	
Bicarbonate As HCO3	MG/L	130.0000	234.0000	69.9000	170.0000	40.7000	105.0000	
Carbonate As CO3	MG/L	< 2.0000	< 2.0000	45.7000	< 2.0000	< 2.0000	< 2.0000	
Hydroxide As OH	MG/L	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	< 2.0000	
Phosphate As PO4	MG/L							
Cation_Anion Balance	%	< -1.6000	< -3.2000	< -3.4000	< 0.0000	< -3.5000	< 0.0000	
SAR	%	0.2600	0.4700	1.4000	0.2500	0.2900	0.4400	
Solids, Diss. (Calc)	MG/L	172.0000	250.0000	250.0000	685.0000	563.0000	986.0000	
Sum Of Anions	MEQ/L	3.1000	4.8000	4.5000	11.0000	8.8000	15.0000	
Sum Of Cations	MEQ/L	3.0000	4.5000	4.2000	11.0000	8.2000	15.0000	
Total Recoverable Al	MG/L							
Total Recoverable As	UG/L							
Total Recoverable Ba	UG/L							
Total Recoverable Cd	UG/L							
Total Recoverable Cr	UG/L							
Total Recoverable Cu	UG/L							
Total Recoverable Fe	MG/L							
Total Recoverable Pb	UG/L							
Total Recoverable Mn	MG/L							
Total Recoverable Hg	UG/L							
Total Recoverable Mo	UG/L							
Total Recoverable Ni	UG/L							
Total Recoverable Se	UG/L							
Total Recoverable Ag	UG/L							

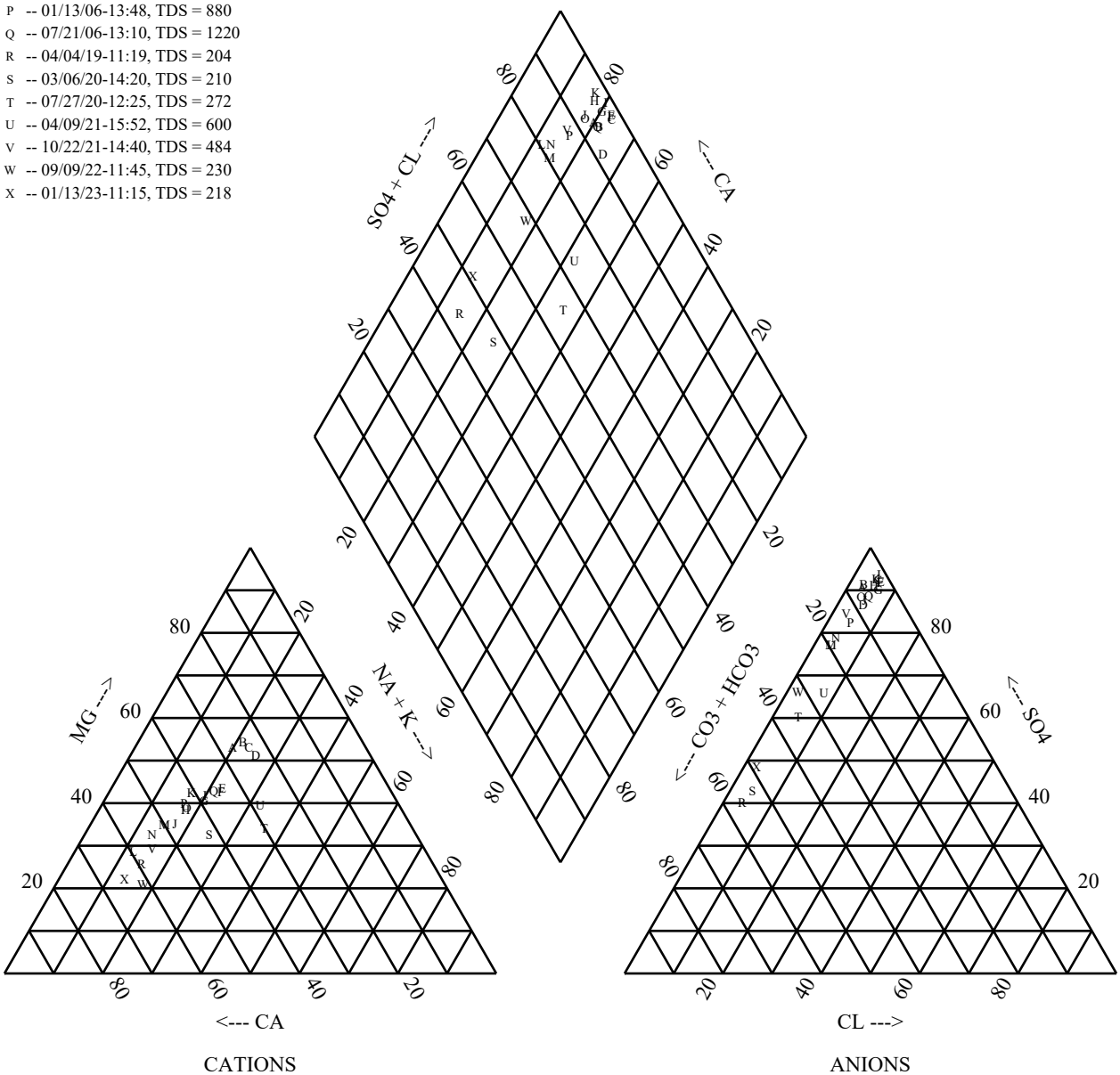
"B" -- Between MDL and PQL, "<" -- Less than detection limit

Water Quality Report
N14-H-P - PERM IMPOUND N14-H
01/01/1989-00:00 to 12/31/2024-23:59

Parameters	Units	04/04/2019 13:20	01/09/2020 15:35	07/27/2020 12:45	09/16/2022 12:57	01/12/2023 16:20	09/21/2023 13:13	05/02/2024 13:07
Laboratory Parameters								
Total Recoverable Zn	MG/L							
TDS Ratio	%	1.2300	1.0600	1.2600	1.0300	1.0500	1.0100	
Total Recoverable Sb	UG/L							
Total Recoverable V	UG/L							
Aluminum, Acid-soluble	mg/l					< 0.0500	B 0.2150	

N14-G-P

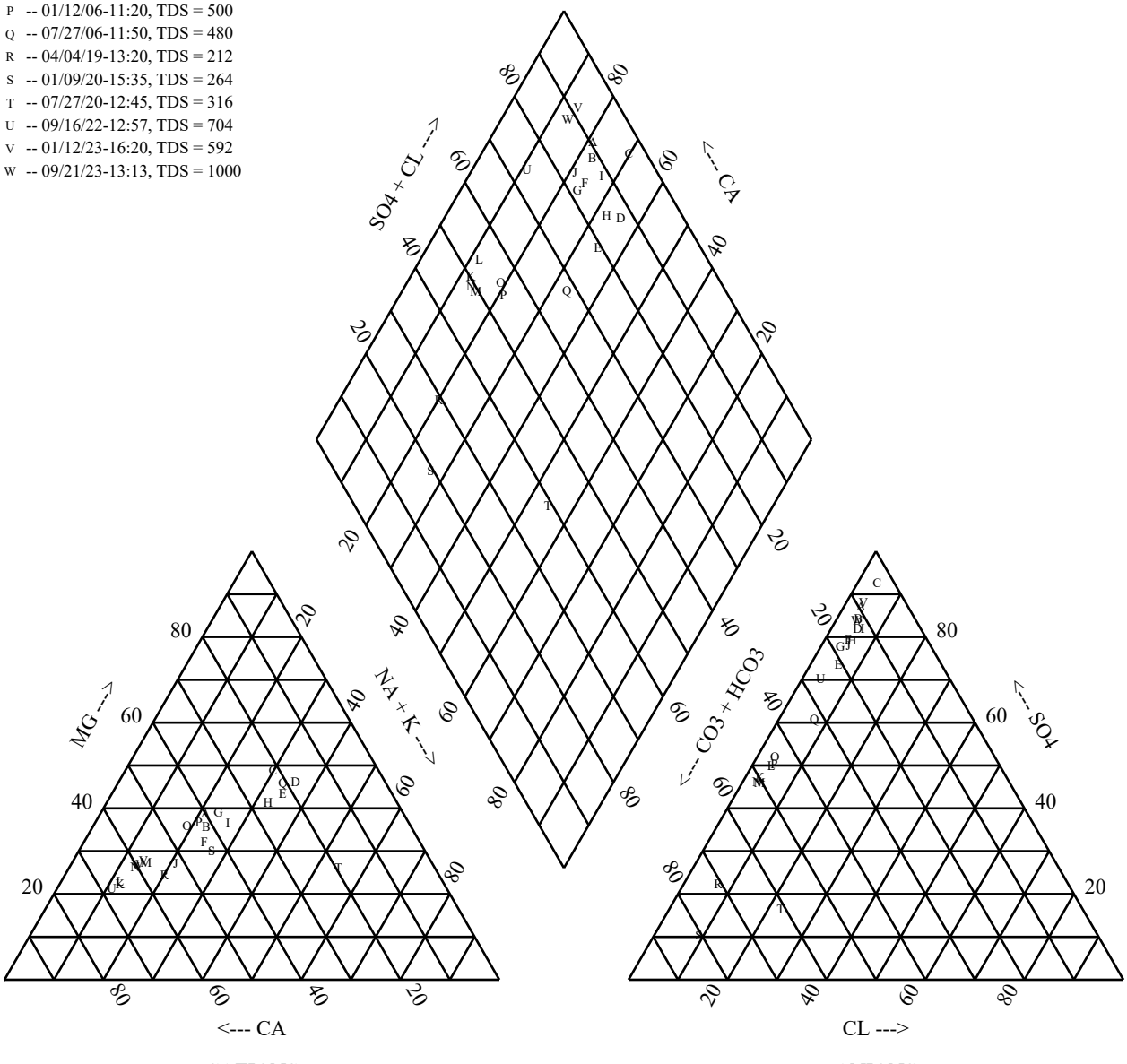
A -- 04/12/89-11:36, TDS = 4260
B -- 12/04/89-09:30, TDS = 4900
C -- 09/18/90-09:40, TDS = 6532
D -- 06/11/91-15:15, TDS = 6378
E -- 09/15/00-08:42, TDS = 3710
F -- 01/26/01-11:15, TDS = 3390
G -- 07/13/01-08:32, TDS = 2410
H -- 01/21/02-09:50, TDS = 1780
I -- 07/03/02-15:02, TDS = 3310
J -- 01/17/03-10:32, TDS = 690
K -- 07/17/03-12:10, TDS = 1810
L -- 01/09/04-12:35, TDS = 450
M -- 07/12/04-11:45, TDS = 560
N -- 01/14/05-11:42, TDS = 680
O -- 07/08/05-11:00, TDS = 780
P -- 01/13/06-13:48, TDS = 880
Q -- 07/21/06-13:10, TDS = 1220
R -- 04/04/19-11:19, TDS = 204
S -- 03/06/20-14:20, TDS = 210
T -- 07/27/20-12:25, TDS = 272
U -- 04/09/21-15:52, TDS = 600
V -- 10/22/21-14:40, TDS = 484
W -- 09/09/22-11:45, TDS = 230
X -- 01/13/23-11:15, TDS = 218



Percent Of Total Milliequivalents Per Liter

N14-H-P

A -- 04/12/89-09:33, TDS = 794
B -- 09/18/90-10:25, TDS = 784
C -- 10/17/95-12:47, TDS = 2310
D -- 09/15/00-10:49, TDS = 900
E -- 01/26/01-13:50, TDS = 1050
F -- 07/13/01-10:55, TDS = 660
G -- 01/23/02-09:40, TDS = 810
H -- 07/03/02-15:15, TDS = 930
I -- 01/17/03-10:50, TDS = 690
J -- 08/20/03-11:18, TDS = 820
K -- 12/04/03-13:40, TDS = 300
L -- 02/09/04-12:30, TDS = 320
M -- 07/19/04-14:15, TDS = 360
N -- 01/14/05-11:57, TDS = 430
O -- 07/08/05-11:16, TDS = 430
P -- 01/12/06-11:20, TDS = 500
Q -- 07/27/06-11:50, TDS = 480
R -- 04/04/19-13:20, TDS = 212
S -- 01/09/20-15:35, TDS = 264
T -- 07/27/20-12:45, TDS = 316
U -- 09/16/22-12:57, TDS = 704
V -- 01/12/23-16:20, TDS = 592
W -- 09/21/23-13:13, TDS = 1000



Percent Of Total Milliequivalents Per Liter

CERTIFICATION

PEABODY WESTERN COAL COMPANY
KAYENTA MINE, N14 and J16 COAL RESOURCE AREAS, PHASE III BOND RELEASE APPLICATION
NAVAJO COUNTY, ARIZONA

I HEREBY CERTIFY that, to the best of my knowledge and belief, all applicable reclamation activities described in the attached Phase III Bond Release Application, dated December 12, 2024 have been accomplished in accordance with the reclamation requirements of the Act, the regulatory program, and the approved reclamation plan contained in the AZ-0001F Permit. The bond release parcel is free from enforcement actions.

Peabody Western Coal Company – Kayenta Mine

By: _____

Randy Lehn
Director Operations Support – Kayenta Mine

STATE OF ARIZONA

COCONINO COUNTY

Signed or attested before me this 12 day of December 2024, by Randy Lehn, Director Operations Support of Kayenta Mine owned by Peabody Western Coal Company, a Delaware Corporation, on behalf of said Kayenta Mine.

SUSIE CRANK
Notary Public - Arizona
Navajo County
Commission # 664886
My Comm. Expires Apr 5, 2028

Susie Crank

Notary Public

My commission expires:

April 5, 2028

Peabody Western Coal Company

December 12, 2024

Bureau of Indian Affairs
Navajo Area Office
Mr. Deborah Shirley, Regional Director
P.O. Box 1060
301 West Hill Street
Gallup, New Mexico 87305-1060

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Ms. Shirley:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

The Phase III bond release area is located within the Kayenta Mine Permanent Program permit area (AZ-0001F PAP) in the northeastern portion of the PWCC lease area. PWCC is seeking a reduction of the total N14 and J16 bond amount of $6,458,202 at this time by gaining regulatory approval for release of lands described in the application from Phase III bond liability. The total area sought for release includes 992 acres of disturbed land. Phase III is the final bond release step and, once approved, will allow for the planned return of these lands to the Navajo Nation. Until that time, PWCC will continue to control and manage reclaimed lands in the release area described.

This Phase III application documents the permit, reclamation and management history, protection of the hydrologic balance, and a postmine land use summary for the release area. Mining within the release parcel was completed between 1982 and 2001 while revegetation was completed between 1984 and 2013. All reclamation activities were conducted in accordance with the Surface Mining Control and Reclamation Act (SMCRA) and the requirements of the OSMRE Permit AZ-0001F Permit Application Package approved October 3, 2017. Reclamation activities are documented in annual reports submitted previously to OSMRE.

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The Navajo Nation Minerals Department
Office of Surface Mining
Window Rock Boulevard
Window Rock, AZ 86515

Forest Lake Chapter House
Navajo Route 41
17 miles north of Pinon
Pinon, AZ 86510

Peabody Western Coal Company
Kayenta Mine
Mesa Central Warehouse Office Complex
8 Miles from Hwy 160 and Route 41 Junction
Kayenta, Arizona 86033

OSMRE Website: https://www.osmre.gov/news/archive/kayentaBlack Mesa

If you have questions, comments, or wish to request a hearing or informal conference regarding this bond release application, please contact:

Ms. Amy Ryser
Western Region Office
Office of Surface Mining Reclamation & Enforcement
P. O. Box 25065
One Denver Federal Center, Building 41
Lakewood, CO 80225-0065
WR Permitting Information Line, 1-866-847-7362

Please direct your questions about this application to me at 928.280.7091 or email them to me at mshepherd2@peabodyenergy.com.

Respectfully,

Marie Shepherd
Senior Manager Environmental
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)

PEABODY WESTERN

Peabody Western Coal Company

December 12, 2024

Bureau of Land Management
Arizona State Office
Mr. Peter Godfrey, Native American Minerals Lead
One North Central Ave., Suite 800
Phoenix, Arizona 85004

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Mr. Godfrey:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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Respectfully,

Marie Shepherd
Senior Manager Environmental
Kayenta Mine

C: Amy Ryser (OSMRE-WRO)

Peabody Western Coal Company

December 12, 2024

Chilchinbeto Chapter
Mr. Paul Madson, President
P.O. Box 1681
Kayenta, Arizona 86033

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Mr. Madson:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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Respectfully,

Marie Shepherd
Senior Manager Environmental - Kayenta Mine
Peabody Western Coal Company

C: Amy Ryser (OSMRE-WRO)

PEABODY WESTERN

Peabody Western Coal Company

December 12, 2024

Forest Lake Chapter
Ms. Mae Gilene Begay, President
P.O. Box 441
Pinon, Arizona 86510

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Ms. Begay:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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Please direct your questions about this application to me at 928.280.7091 or email them to me at mshepherd2@peabodyenergy.com.

Respectfully,

Marie Shepherd
Senior Manager Environmental - Kayenta Mine
Peabody Western Coal Company

C: Amy Ryser (OSMRE-WRO)

PEABODY WESTERN

Peabody Western Coal Company

December 12, 2024

The Hopi Tribe
Office of Mining and Minerals
Attn: Dr. Carrie Joseph
P.O. Box 123
Kykotsmovi, AZ 86039

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Dr. Joseph:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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Please direct your questions about this application to me at 928.280.7091 or email them to me at mshepherd2@peabodyenergy.com.

Respectfully,

Marie Shepherd
Senior Manager Environmental - Kayenta Mine
Peabody Western Coal Company

C: Amy Ryser (OSMRE-WRO)

Peabody Western Coal Company

December 12, 2024

Kayenta Chapter
Mr. Dalton Singer, President
P.O. Box 1088
Kayenta, Arizona 86033

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Mr. Singer:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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Respectfully,

Marie Shepherd
Senior Manager Environmental - Kayenta Mine
Peabody Western Coal Company

C: Amy Ryser (OSMRE-WRO)

PEABODY WESTERN

Peabody Western Coal Company

December 12, 2024

Navajo Nation
Minerals Department
Ms. Rowena L. Cheromiah
P.O. Box 1910
Window Rock, AZ 86515

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Ms. Cheromiah:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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Respectfully,

Marie Shepherd
Senior Manager Environmental - Kayenta Mine
Peabody Western Coal Company

C: Amy Ryser (OSMRE-WRO)

Peabody Western Coal Company

December 12, 2024

Navajo Nation Environmental Protection Agency
Navajo Area Office
Mr. Stephen B. Etsitty, Executive Director
P.O. Box 339
Admin Building No. 2695 Window Rock Blvd
Window Rock, Arizona 86515-0339

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Mr. Etsitty:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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Respectfully,

Marie Shepherd
Senior Manager Environmental - Kayenta Mine
Peabody Western Coal Company

C: Amy Ryser (OSMRE-WRO)

PEABODY WESTERN

Peabody Western Coal Company

December 12, 2024

Navajo Tribal Utility Authority
Mr. Walter W. Haase, P.E., General Manager
P.O. Box 170
Fort Defiance, Arizona 86504-0170

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Mr. Haase:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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WR Permitting Information Line, 1-866-847-7362

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Respectfully,

Marie Shepherd
Senior Manager Environmental - Kayenta Mine
Peabody Western Coal Company

C: Amy Ryser (OSMRE-WRO)

PEABODY WESTERN

Peabody Western Coal Company

December 12, 2024

Shonto Chapter
Mr. Roland Smallcanyon, President
P. O. Box 7800
Shonto, AZ 86054

RE: Notice of Application for Phase III Bond Release, N14 and J16 Coal Resource Areas, Kayenta Mine

Dear Mr. Smallcanyon:

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for Phase III bond release on portions of the N14 and J16 Coal Resource Areas. The release area is in the northeastern portion of the PWCC lease area. PWCC is seeking release from Phase III bond liability for those surety bonds currently held with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. The total combined bond for Kayenta Mine is $107,171,138.

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Respectfully,

Marie Shepherd
Senior Manager Environmental - Kayenta Mine
Peabody Western Coal Company

C: Amy Ryser (OSMRE-WRO)

PUBLIC NOTICE

Peabody Western Coal Company (PWCC) has filed an application with the Office of Surface Mining Reclamation and Enforcement (OSMRE) for bond release on a portion of the lands in the N14 and J16 Coal Resource Areas (CRAs) within the Kayenta Mine Permit AZ-0001F. PWCC is seeking a release of Phase III bond liability for portions of the N14 and J16 CRAs currently under surety bonds with Zurich American, Liberty Mutual, and SiriusPoint America Insurance and one Letter of Credit with Goldeman Sachs Bank, USA. PWCC is seeking a reduction in 2025 bond dollars of 6,458,202 under the Phase III application. The total combined bond for Kayenta Mine is $107,171,138.

The Phase III bond release application consists of information currently contained in the AZ-0001F Permit Application Package (PAP) approved October 3, 2017. The PAP outlines PWCC's reclamation operations on Permanent Program Lands. The area in N14 and J16 requested for Phase III release is 992 acres. Reclamation was completed between 1983 and 2013. Reclamation activities and results were completed in accordance with the approved PAP. The Phase III application documents the permit, reclamation, and management history, protection of the hydrologic balance, and a postmine land use summary for the release area. The Kayenta Mine permit for the release areas is under Navajo Tribal Coal Leases 14-20-0603-9910 and 14-20-0603-8580, and Hopi Tribal Coal Lease 14-20-0450-5743 and operates pursuant to Code of Federal Regulations (CFR), Title 30; Subchapter E, Part 750; Subchapter G, Parts 773 and 774; and Subchapter K, Parts 810 and 816. This notice is hereby given that:

1. The name and business address of the applicant is:

   Peabody Western Coal Company
   Kayenta Mine
   P.O. Box 650
   Kayenta, AZ 86033

2. The mine permit area is located approximately 18 miles south southwest of Kayenta, Arizona. The permit area for the Phase III bond release area is located in USGS 7.5 minute quadrangle maps "Yucca Hill" and "Marsh Pass SE" within the following lands of Navajo County, Arizona that are described relative to the Gila and Salt River Base Meridian as:

   A total of 531 acres of land within the N14 CRA. The computer-generated centroid location is Latitude 36º31'14.45" N and Longitude 110º18'35.39" W. A total of 461 acres of land within the J16 CRA. The computer-generated centroid location is Latitude 36º29'8.33" N and Longitude 110º18'7.01" W.

3. Locations of where copies of the application and permit are available for public review and/or inspection are:

The Navajo Nation Minerals Department
Office of Surface Mining
Window Rock Boulevard
Window Rock, AZ 86515

Forest Lake Chapter House
Navajo Route 41
17 miles north of Pinon
Pinon, AZ 86510

Peabody Western Coal Company
Kayenta Mine
Mesa Central Warehouse Office Complex
8 Miles from Hwy 160 and Route 41 Junction
Kayenta, Arizona 86033

OSMRE Website: https://www.osmre.gov/programs/regulating-active-coal-mines/indian-lands

4. The name and address of the OSMRE-WRO representative where written comments, objections, requests for a public hearing, or requests for an informal conference may be submitted on or before 5:00 p.m., January 24, 2025 thirty (30) days after the last publication date are:

Ms. Amy Ryser
Western Region Office
Office of Surface Mining Reclamation & Enforcement
P. O. Box 25065
One Denver Federal Center, Building 41
Lakewood, CO 80225-0065

WR Permitting Information Line, 1-866-847-7362

5. Interested persons may obtain more information concerning the bond release by contacting Marie Shepherd, Sr. Manager Environmental for PWCC at 928.280.7091.

6. The application has been filed with OSMRE and will be acted upon pursuant to the Permanent Regulatory Program (30 CFR Parts 750 and 774) approved by the Secretary of the Interior under Title V of the Surface mining Control and Reclamation Act of 1977.