FREEPORT-McMoRan

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September 30, 2016

Certified Mail #70160750000113394940
Return Receipt Requested

Mr. Bruce Yurdin, Director
New Mexico Environment Department
Water Protection Division
P.O. Box 5469
Santa Fe, New Mexico 87502

Dear Mr. Yurdin:

Re: Vegetation Monitoring Report, Groundhog Mine Site and Small Stockpile Sites Interim Remedial Action, Hanover/Whitewater Creeks Investigation Unit-Chino AOC

Freeport-McMoRan Chino Mines Company (Chino) submits under separate cover the *Vegetation Monitoring Report* for the Interim Remedial Actions at the Groundhog Mine Site and Small Historical Stockpile Sites under the Hanover/Whitewater Creeks Investigation Unit under the Chino Administrative Order on Consent (AOC). The report was submitted today to Mr. David Mercer, the NMED AOC Project Manager.

Please contact Mr. Ned Hall at (520) 393-2292 if you have any questions regarding this quantitative vegetation survey report.

Sincerely,

Sherry Burt-Kested

SBK:pp
20160928-001

c: David Mercer, NMED
Joseph Fox, NMED (via email)
Petra Sanchez, U.S. Environmental Protection Agency (via email)
Ned Hall, FCX (via email)

REPORT

VEGETATION MONITORING REPORT

Groundhog Mine Site and Small Stockpile Sites Interim Remedial Actions, Hanover and Whitewater Creeks Investigation Unit

Submitted To: Freeport-McMoRan
Chino Mines Company
PO Box 10
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Submitted By: Golder Associates Inc.
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Distribution: 4 Copies Chino Mines Company
2 Copies Golder Associates Inc.

September 22, 2016

Project No. 141-1160

Golder Associates

FREEPORT-McMoRan

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July 21, 2017

Certified Mail #70160750000113393608
Return Receipt Requested

Mr. Bruce Yurdin, Director
New Mexico Environment Department
Water Protection Division
P.O. Box 5469
Santa Fe, NM 87502

Dear Mr. Yurdin:

Re: Vegetation Monitoring Report, Groundhog Mine Site and Small Stockpile Sites Interim Remedial Action, Hanover/Whitewater Creeks Investigation Unit – Chino AOC

Freeport-McMoRan Chino Mines Company (Chino) submits under separate cover a document presenting responses to comments received in a letter dated June 13, 2017 from the New Mexico Environment Department (NMED). The comments address the *Vegetation Monitoring Report* for the Interim Remedial Actions at the Groundhog Mine Site and Small Historical Stockpile Sites under the Hanover/Whitewater Creeks Investigation Unit under the Chino Administrative Order on Consent (AOC), submitted to NMED on September 30, 2016. This response to comments document was submitted today to Mr. David Mercer, the NMED AOC Project Manager.

Please contact Ms. Pam Pinson at (575) 912-5213 if you have any questions regarding this quantitative vegetation survey report.

Sincerely,

Sherry Burt-Kested, Manager
Environmental Services

SBK
20170721-001

xc: David Mercer, NMED (via email)
Joseph Fox, NMED (via email)
Petra Sanchez, U.S. Environmental Protection Agency (via email)
Alicia Voss, FCX (via email)

Response to New Mexico Environment Department Comments
on the Vegetation Monitoring Report, Groundhog Mine Site and Small Historic Stockpile Sites
Interim Remedial Actions, Hanover/Whitewater Creeks Investigation Unit (HWCIU)

This document presents Freeport-McMoRan Chino Mines Company's (Chino) response to comments received from the New Mexico Environment Department (NMED) in a letter dated June 13, 2017 on the Vegetation Monitoring Report, Groundhog Mine Site and Small Historic Stockpile Sites Interim Remedial Actions. The quantitative vegetation survey report was submitted to NMED on September 30, 2016 and documents overall vegetation re-establishment success in these remediated sites over the last 5 years per the completion report requirements (Golder, 2009a and 2009b).

NMED Comment #1
A number of NMED's comments from draft document review August 9, 2016 on the Groundhog Mine Site Vegetation Monitoring Report requested clarifications on the statistics discussed in the report. These included Specific Comments #2, 3, 5, and 6. While some additional text was added to the report as indicated in the response to comments (September 12, 2016), the additions do not fully address the concerns raised in the comments. As written, it is not possible to verify the statements made in the report because insufficient information about the statistics used to make the statements is provided.

Statements such as 'there is a 90% probability that the true mean is within 10% of the sample mean' require more information to verify. It is our assumption that those statistics were derived by solving the sample adequacy equation provided in Section 2.4 for the t value in the equation. The probability (alpha) is then reported based on the probability provided by the Student's T distribution at that t value and based on the degrees of freedom in the data. Such an approach would be appropriate, but since that level of detail is not provided in the revised version of the text, it cannot be confirmed. Please verify that our assumption of the statistics is accurate and add the necessary information to the document to allow the readers to verify the statistics provided.

Response to Comment #1
NMED's assessment of the probability statistic is correct. The statistic Golder calculated is based on the Student's t-distribution:

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}}$$

where μ is the population mean, $\bar{x}$ is the sample mean, s is the population standard deviation and n is the sample number. This equation is also the basis to calculate sample adequacy. By solving for the one-tailed t-value, Golder determine the probability for the Student t-distribution for the true mean to be within 10% of the sample mean given the degree of freedom for the sampling. Golder uses the probability statistic to better understand the confidence level for the sample mean when sample adequacy is not achieved. This information is provided as a convenience to aid in framing the statistical value of the data.

NMED Comment #2

In Section 1.1 -Background, the growth medium is described as "A 6 to 12-inch thick layer from a local borrow source". Please describe the location of the borrow source and the composition of the growth medium. Was this source amended with manure or other organic material? If the growth medium was amended, would this account for the higher densities in shrubs on the remediated site?

Response to Comment #2
As described in the Groundhog and the Small Stockpiles completion reports (2009a and 2009b, respectively), soil cover materials were excavated from areas adjacent to the stockpiles. Those reports describe the materials as "colluvium with tuff and granodiorite rock fragments up to several inches in diameter with a clayey sand matrix." No soil amendments or fertilizers were applied to the cover materials prior to or after seeding. In general, Chino has avoided the use of fertilizers and amendments because these products have the potential to promote weedy species at the detriment to the more desirable perennial vegetation.

NMED Comment #3
In Section 4.2 –Shrub Density, it is reported that the remediated sites have substantially higher shrub densities compared to the reference area. Please discuss why the remediated site might have a higher density of shrubs. Were there shrubs included in the seed mix used in hydro-seeding? Would the growth medium be a factor that contributed to higher densities of shrubs in the remediated site?

Response to Comment #3
Shrubs were included in seed mix that was used in the remediated areas. Seed germination and plant establishment is primarily contingent on the precipitation regime in the first few years after seeding. Other factors affecting plant establishment included seedbed preparation, adequate soil-seed contact, seed placement, seed predation, herbivory, seed viability and the date of seeding. The precise reason for more shrubs in the reclamation compared to the reference area is unknown. In general, shrubs tend to be more prevalent in soils with moderate levels of rock fragments and grasses tend to be more prevalent in somewhat finer textured soils. The rock fragment content of the cover materials in this area may partially explain the shrub response on this site.

NMED Comment #4
In Section 4.3 -Plant Diversity, the report states "The viability of achieving the cool season grass requirement on the reclamation in this region is becoming increasingly unlikely based on this and other studies (i.e. Chino Test Plot cover suitability demonstration, Tyrone vegetation monitoring) conducted over the past several years". Please discuss why the cool season grasses are unlikely to be present? Please describe the Chino Test Plot sites where these grasses are not returning. Could changes in temperature averages affect the return of cool season grasses?

Response to Comment #4
In general, warm season grasses are better adapted to the prevailing precipitation and temperature regime of southern New Mexico than cool-season grasses, which are more prevalent in the sagebrush dominated communities in Northern Mexico. Cool season grasses have been observed in the reclamation at Tyrone and Chino in the first several years after seeding, but tend to decline over time. Because cool season grasses respond favorably to winter precipitation, the severe droughts in 2011 and 2012 may have contributed to the poor response of cool-season grasses. However, overall this response is consistent with the general lack of cool-season grasses in this region at the lower to mid-elevations. Thus, the cool season grass requirement for the plant diversity performance standard proposed in the late 1990's is being reconsidered by Chino and the MMD on the basis of ecological

incompatibility of cool-season grasses in this region.

NMED Comment #5

In Section 5.0 -Closing, the report states "all of these sites are intersected by mine infrastructure and are not isolated from mining activities". Please describe how infrastructure impacts the growth of vegetation and the impact of mining activities on this area. What is the duration of monitoring anticipated for this area?

Response to Comment #5

In general, mine infrastructure does not affect plant growth at Groundhog and the small historic stockpile sites. As documented in the subject vegetation monitoring report, the remediated area vegetation within the Groundhog and the small historic stockpile sites surveys as successfully meeting the MMD requirements. Since the date of this report, vegetation continues to show improvement. However because the remediated areas exist among mine facilities (pipelines, haul roads, utility corridors, etc.), the sites could be disturbed by necessary mine operation and maintenance activities. These AOC remediated sites due to their location are also under operational discharge permit requirements and the Closure/Closeout Permit.

The vegetation monitoring schedule and reporting requirements have been met per the approved completion reports (2009a and 2009b). However, Chino continues to regularly inspect the sites for erosion and stability as per the completion report requirements pending resolution of the Record of Decision, under which vegetation monitoring may be performed to update current status.

REFERENCES

Golder Associates Inc (Golder). 2009a. Completion report interim remedial action Groundhog Mine Stockpile Hanover and Whitewater Creeks investigation unit. Prepared for Chino Mines Company. June 2009.

Golder. 2009b. Completion report interim remedial action Osceolla, CG Bell, and Tenderfoot B Stockpiles Hanover and Whitewater Creeks investigation unit. Prepared for Chino Mines Company. October 2009.

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1.0 INTRODUCTION

Freeport-McMoRan Chino Mines Company (Chino) remediated several small waste rock stockpiles in 2004 and the Groundhog Mine Site in 2008. These sites are located in the headwaters of Whitewater Creek. The remedial actions fulfilled the mitigation requirements under Interim Remedial Actions (IRAs) in the Hanover and Whitewater Creeks Investigation Unit, pursuant to the Chino Administrative Order on Consent (AOC) between Chino and the New Mexico Environment Department (NMED). There are three reports documenting the completion of all associated IRA activities:

- The IRA Groundhog Mine Stockpile Completion Report (Golder 2009a)
- The Osceolla, CG Bell, and Tenderfoot B Stockpiles IRA Completion Report (Golder 2009b)
- The Groundhog Mine Site Completion Report Addendum (Pipeline Removal, Sampling, and Reclamation) (Golder 2011)

Pursuant to the commitments presented in the IRA Work Plan (Chino 2003a and 2003b) and the Completion Reports (Golder 2009a and 2009b), Chino performed annual qualitative vegetation and erosion monitoring of the remediated areas. Golder Associates Inc. (Golder) was retained by Chino to perform the inspections.

1.1 Background

The project sites are approximately 1.5 miles northeast of Bayard, New Mexico (Figure 1). The Groundhog Mine is located on the flanks of San Jose Mountain in a small canyon upgradient of Whitewater Creek along the Lake One road. Collectively known as the Small Stockpile sites; Osceolla, CG Bell, and Tenderfoot B sites reside along Whitewater Creek. The Star Rock Stockpile, which is located across the Whitewater Creek drainage from the Tenderfoot B was also included in the monitoring efforts. This site was reclaimed even though it is not included in an IRA under the AOC because the stockpile consists of unreactive and unmineralized limestone and granodiorite.

Remediation at four of the five sites included the removal of potentially-reactive stockpile materials and affected soils, closure of mine openings, site regrading, cover placement, and revegetation (Golder 2009a and 2009b). This work was performed as part of the IRAs to reduce potential mass loading of metals and acidity to groundwater and surface water. At all the sites the residual soils were removed down to bedrock (refusal) following removal of the stockpile materials. A 6 to 12 inch thick layer of growth medium from a local borrow source was applied on all sites except for portions of the CB Bell and Osceolla sites in areas that were too steep (Golder 2009b). Hydro-seeding was performed for the Groundhog Mine in 2008 except for the pipeline corridor which was drill seeded in 2011 (Golder 2011). All of the other sites were hand broadcast seeded (2009) with a native seed mix (Table 1).

Pursuant to Section 6.0 of the IRA Completion Reports for the Groundhog Mine (Golder 2009a) and the Small Stockpile sites (Golder 2009b), Chino performed qualitative vegetation and erosion inspections of

the remediated Small Stockpile sites and the Groundhog Mine on an annual basis. Pursuant to the IRA Work Plan (Chino 2003a and 2003b), annual inspections were conducted for 4 years after initial vegetation establishment. Since the Groundhog Mine was seeded in 2009, qualitative inspections have been performed annually through 2014, exceeding Chino's 4-year inspection commitment. However, because the Groundhog pipeline corridor was reseeded in 2011, Chino continued the annual inspections of the sites until the Groundhog pipeline corridor reached the fourth year in 2014 (Golder 2014).

1.2 Objectives

In September 2015, Golder conducted a quantitative vegetation survey of the Groundhog Mine and Small Stockpile sites to evaluate the progress of the revegetation after a minimum of five growing seasons. Combined, the survey covered approximately 11.26 acres of remediated sites. This survey is intended to fulfill the vegetation monitoring plan as described in the completion reports. The objective of this vegetation monitoring report is to document vegetation status of the Groundhog Mine and the Small Stockpile sites after more than the required 4 years. The overall IRA objective is to return these areas to a post-mining beneficial use, such as wildlife habitat or grazing with the understanding that these areas are not isolated from mining activities. As stated in the 2009 Completion Reports, Chino will evaluate the remediated sites relative to the success targets consistent with the *Vegetation Success Standards of Appendix C* in the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD) Revision 01-1 to Permit GR009RE. The MMD vegetation success standards for Chino are based on canopy cover, shrub density, and plant diversity compared to an undisturbed reference site.

2.0 METHODS

Golder conducted the quantitative vegetation survey of the remediated sites and reference area between September 24 and 28, 2015. The reference area specified in the MMD revision 01-1 to Permit GR009RE for the North Mine area at Chino is the Rustler Canyon reference area (Figure 2). The field effort was performed in coordination with the vegetation data collection for the Chino Test Plots cover suitability demonstration (Golder 2015). Vegetation data from the Rustler Canyon reference area was collected and used to support both studies.

Vegetation attributes were quantified using sampling methods approved by the MMD. Golder collected vegetation data using a transect/quadrat system. The same methods were used for the remediated sites and the Rustler Canyon Reference area. Transect locations were selected from randomly generated coordinates on a 50-foot grid imposed over both the remediated sites and reference areas (Figure 1 and Figure 2). Transect coordinates originated from the southwestern corner of the grid. In the reference area, transects that intersected mature trees were excluded based on an agreement with the MMD. This approach was adopted to compensate for the difference in plant community development. Each transect consisted of a 30-meter (m) long dogleg pattern (Figure 3). Four 1-m^2 quadrats were placed at pre-determined intervals along each transect for quantitative vegetation measurements. Adjustments to this sampling scheme were made due to the configuration of some of the Small Stockpile sites relative to the 50-foot sampling grid resulting in some transects having only two quadrats that actually occurred on reclamation.

For each quadrat, ocular estimates were made of total canopy, species canopy cover, basal cover, surface litter, surface rock fragments, and bare soil. Prior to and during formal sampling, each site was traversed on foot to inventory the plant community. Not all plant species that are observed during the general site inspection are expected to occur in the sampling quadrats.

2.1 Vegetation and Ground Cover

Field scientists made ocular estimates of species canopy cover, total canopy cover, surface litter, surface rock fragments, and bare soil in each quadrat. They also estimated basal cover and plant frequency on a species-basis by counting the number of individual plants rooted in each quadrat. Each scientist used a percent-area card with a minimum resolution of 0.1 percent to increase accuracy and consistency of the measurements. Cover estimates less than 0.1 percent were entered as trace amounts.

Canopy cover is the percentage of quadrat area included in the vertical projection of the canopy (Daubenmire 1968). Canopy cover estimates made on the species basis may exceed 100 percent in individual quadrats where the vegetation overlaps (multi-layered canopies). In contrast, the total canopy cover, surface litter, rock fragments, and bare soil does not exceed 100 percent. Relative canopy cover for a specific species or plant class is the calculated proportion of the total canopy cover.

Basal cover is the proportion of ground occupied by the crowns of grasses and rooting stems of forbs and shrubs. Like the total cover estimates, basal cover estimates do not exceed 100 percent.

2.2 Shrub Density

Shrub density, or the number of plants per square meter, was determined using the frequency count data from the quadrats and the point-centered quarter (PCQ) method (Bonham 1989). Shrub density was calculated from the quadrat data by dividing the total number of individual plants counted by the number of quadrats measured. The PCQ method requires the field scientist to measure the distance to the nearest shrub stem in the four quadrants surrounding a fixed point. The center node of the dogleg transect was used as the fixed point for the PCQ measurements (Figure 4). Shrub density is then calculated as:

$$Shrub\ Density = \frac{1}{d^2}$$

Where d = the mean distance (cm) of the sample points.

2.3 Plant Diversity

Plant diversity for Chino Mine is assessed by comparing the number and occurrence of perennial species by life form found in the remediated sites to the technical standard developed for Chino (Revision 01-1 to Permit GR009RE; DBS&A 1999). The number of perennial grass (warm and cool seasons), perennial forb, and perennial shrub species observed within the quadrats and the associated cover levels were compared to the technical standard (Table 2).

2.4 Sample Adequacy

Sample adequacy is the minimum number of samples required to estimate a parameter within a given level of precision (Cochran 1977). The number of samples required to characterize a particular vegetation attribute depends on the uniformity of the vegetation and the desired degree of certainty required for the analysis. Rigorous statistical guidelines are typically applied to bond release analyses. In contrast, interim monitoring activities like those performed at these remediated sites do not need to have this level of statistical rigor. Often it is impractical to achieve sample adequacy in vegetation monitoring studies and a minimum sample number approach is taken. MMD recognizes this limitation and has provided minimum sample sizes for various quantitative methods (MMD 1996). With normally distributed data where sample adequacy cannot be met because of operational constraints or for other reasons, 40 samples are often considered adequate for bond release analyses in which a t-test would be required (Sokal and Rohlf 1981). Schulz et al. (1961) have also demonstrated that this number remains robust for most cover and density measures with increased numbers of samples only slightly improving precision.

Sample adequacy was calculated using the following method:

$$N_{min} = \frac{t^2 s^2}{(dX)^2}$$

Where N_{min} = minimum number of quadrats or samples needed
t = 1-tailed t-value for the appropriate confidence interval
s = sample variance
d = desired change in the mean (0.1)
X = the sample mean

Statistical adequacy was determined on the basis of the total canopy data. Sample adequacy is achieved when there is 90% confidence that the sample mean for total canopy cover is within 10% of the true population mean. Chino agreed to achieve sample adequacy for the Chino Test Plot cover suitability demonstration for MMD (Golder, 2015). As such, the sample number collected on the reference area (n=40) is greater than the sample number of the remediated sites (n=32). The interim monitoring of the remediated sites (this study) did not attempt to meet sample adequacy. Rather, the 90% confidence interval of the sample mean (n=32) and the level of confidence that the sample mean is within 10% of the true mean are reported. The number of samples necessary to meet sample adequacy for total canopy cover are reported, even though they are not required.

3.0 RESULTS

Vegetation attributes were measured at 40 quadrats along 10 randomly located transects at the reference area and 32 quadrats were evaluated along 9 randomly located transects at the remediated sites during the 2015 monitoring event. Precipitation measured at the Reservoir 3A Met Station for the past 5 years is listed in Table 3. Table 4 lists the plant species identified over the past seven inspections of the Groundhog Mine and Small Stockpile sites. Table 5 lists the plant species observed at the Rustler Canyon reference area since 1999. Mean cover and density data for individual plant species captured in the quadrats are also listed in Tables 4 and 5. Tables summarizing the quadrat data are in Appendix A, photographs of the quadrats are provided in Appendix B, and overview photos of the reclaimed areas and reference area are in Appendix C. Summary statistics for total canopy cover, basal cover, and shrub density are listed in Table 6.

3.1 Precipitation

Precipitation measured at the Reservoir 3A gage between January and September 2015 totaled 12.6 inches (Table 3). This is equivalent to the long-term regional average of 12.63 inches for January through September at Fort Bayard, New Mexico (Western Regional Climate Center, www.wrcc.dri.edu). The majority of the 2015 precipitation measured at Res 3A through September fell in the June through September period (8.72 inches). The monthly precipitation totals recorded between June and September were below normal, with exception of June which totaled 2.42 inches. The June total recorded at Res 3A in 2015 is roughly three times the Fort Bayard regional monthly average for June.

3.2 Canopy Cover

3.2.1 Remediated Sites

Mean canopy cover for the remediated sites was 49.0% (± 20.8%; Table 6). The canopy cover for the individual quadrats ranged from 10.2 to 83.4% (Table A-1). The calculated minimum sample size needed to meet sample adequacy (N_{min}) based on total canopy cover is 52 samples (Table 6). However, there is a 90% probability that the true value of the mean is within 10% of the sample mean based on the Student's t-test. In other words, the level of confidence for the sample mean for the remediated sites, assuming it is within 10% of the population mean, is estimated at 90%. Figure 4a illustrates the mean canopy cover, surface rock, litter, and bare soil observed in the quadrats.

Perennial grasses represent 69.7% of the total relative canopy cover at the remediated sites (Figure 4b). Blue grama (*Bouteloua gracilis*), sideoats grama (*B. curtipendula*), and green sprangletop (*Leptochloa dubia*) were the most prevalent grasses (Table 4). Shrubs were the next most abundant plant class captured in the quadrats with 18.8% of the total relative cover. California brickellbush (*Brickellia californica*) and tasselflower brickellbush (*Brickellia grandiflora*) were the most prevalent shrubs. Relative perennial and annual forbs cover was 6.2 and 4.7%, respectively. Common forbs included caliche globmallow

(*Sphaeralcea laxa*), gray everlasting (*Pseudognaphalium canescens*), Russian thistle (*Salsola tragus*), slender goldenweed (*Xanthisma gracilis*), sagewort (*Artemisia carruthii*), and silverleaf nightshade (*Solanum elaeagnifolium*).

3.2.2 Reference Area

Mean canopy cover, surface rock, litter and bare soil in the Rustler Canyon reference area are displayed in Figure 5a. Mean total canopy cover was 53.5% (± 10.6%; Table 6) at the reference area with individual quadrats ranging from 27.5 to 78.1% in 2015 (Table A-3). There was less variability among the individual quadrats compared to the remediated sites and sample adequacy for total canopy cover was achieved with 11 samples. The level of confidence that the sample mean is within 10% of the population mean is 99% based on the Student's t-test for the reference area.

At the reference area, perennial grasses dominated the canopy cover with 92.5% relative cover (Figure 5b). Blue grama and sideoats grama were the most prevalent species captured in the quadrats with 35.9% and 11.3% absolute cover, respectively (Table 4). Blue grama represents 64.9% of the relative cover, while sideoats grama represents 20%. The relative cover of annual grasses was 2.5% and the dominant species was six-weeks threeawn (*Aristida adscensionis*). Perennial forbs comprise 2.9% of the relative cover and the dominant species included sagewort (*Artemisia carruthii*), moss, caliche globmallow (*Sphaeralcea laxa*), and New Mexico fanpetals (*Sida neomexicana*). Shrubs were the least abundant plant class captured in the quadrats with 1.9% relative cover. Three shrub species were encountered in the quadrats including Beargrass (*Nolina microcarpa*), catclaw mimosa (*Mimosa aculeaticarpa var. biucifera*), and tree cholla (*Cylindropuntia imbricata*).

3.3 Basal Cover

Basal cover associated with vegetation is a fraction of the total canopy cover and reflects the morphology of the predominant vegetation in the Chino Mine area (i.e., bunchgrasses, annual forbs, and shrubs). Although basal cover is not evaluated for revegetation success, it was measured to aid in ecological interpretations of a site. Basal cover is an important attribute because it is less affected by annual climatic variations than canopy cover, and thus, provides a consistent basis for evaluating reclamation success and changes in community structure.

3.3.1 Remediated Sites

Mean basal cover for the remediated sites was 4.0% (± 2.7%; Table 6). The basal cover for the individual quadrats ranged from 0.3 to 12.8% (Table A-2). The composition of the mean basal cover of the remediated sites is about 49.4% rock fragments, 43.9% bare soil, 2.7% litter and 4.0% vegetation (Figure 6a). Basal cover of the remediated sites is dominated by perennial grasses with 88.3% relative cover (Figure 6b).

3.3.2 Reference Area

Mean basal cover for the remediated sites was 5.8% (± 2.4%; Table 6). The basal cover for the individual quadrats ranged from 1.5 to 11.5% (Table A-4). The composition of the mean basal cover of the remediated sites is about 68.2% rock fragments, 23.8% bare soil, 2.2% litter and 5.8% vegetation (Figure 7a). The relative basal cover of the reference area is dominated by perennial bunch grasses with 88.3% relative cover (Figure 7b).

3.4 Shrub Density

3.4.1 Remediated Sites

Shrub density at the test plots was 2.41 (± 4.71) plants/m^2 based on the frequency data compared to 0.39 (± 0.53) plants/m^2 using the PCQ method (Table 6). The frequency data included nine shrub species: four-wing saltbush (*Atriplex canescens*), California brickellbush, tassleflower, tree cholla, broom snakeweed (*Gutierrezia sarothrae*), burroweed (*Isocoma tenuisecta*), catclaw mimosa, honey mesquite (*Prosopis glandulosa*), and Siberian elm (*Ulmus pumila*). Eight shrub species were represented in the PCQ data: four-wing saltbush, California brickellbush, tassleflower, tree cholla, rubber rabbitbush (Eramerica nauseosus), broom snakeweed, catclaw mimosa, and prickly pear (*Opuntia engelmannii*).

3.4.2 Reference Area

At the Rustler Canyon reference area, shrub density was 0.68 (± 1.07) plants/m^2 based on the frequency data and 0.05 (± 0.04) plants/m^2 using the PCQ method (Table 6). Parry's agave (*Agave parryi*), California brickelbrush, mountain mahogany (*Cercocarpus montanus*), alligator juniper (*Juniperus deppeana*), Beargrass, and prickly pear (*Opuntia phaeacantha*) were encountered in the PCQ plots, but only beargrass, tree cholla, and catclaw mimosa were captured in the quadrats

3.5 Diversity

3.5.1 Remediated Sites

The Groundhog Mine and Small Stockpile sites have a diverse complement of vegetation. A total of 113 species have been identified in the remediated areas in the past five years (Table 4). About half (56 species) of the species identified on the remediated sites were captured in the 32 individual quadrats.

The perennial forbs, sagewort, tarragon (*Artemisia dracunculus*), red dome blanketflower (*Gaillardia pinnatifida*), Wright's milkpea (*Galactia wrightii*), purple aster (*Machaeranthera canescens*), Rosary bean (*Rhynchosia senna*), silverleaf nightshade, caliche globemallow, and common mullein (*Verbascum thapsus*) all had greater than 0.1% canopy cover. Annual fobs exceeding 0.1% canopy cover include redroot amaranth (*Amaranthus retroflexus*), Rose's tick clover (*Desmodium rosei*), telegraph plant (*Heterotheca subaxillaris*), cottonbatting plant (*Pseudognaphalium stramineum*), Russian thistle, and slender goldenweed. Four perennial warm season grasses including sideoats grama, blue grama, black

grama (*Bouteloua hirusta*), and green sprangletop had greater than 1% canopy cover. California brickellbush and tassleflower exceeded 1% canopy cover for shrubs.

3.5.2 Reference Area

In the reference area, 112 species have been identified, though only 29 were encountered in the quadrats during the 2015 survey. Four grasses exceeded 1% cover including blue and sideoats grama, cane bluestem (*Bothriochloa barbinodis*) and the annual grass, six-weeks threeawn. Perennial forbs having >0.1% mean cover include sagewort, moss, caliche globemallow, and New Mexico fanpetals. No cool season grasses were observed in the quadrats and shrub canopy cover did not exceed 1% for any individual species.

4.0 VEGETATION SUCCESS

The MMD vegetation success standards for Chino are based on a comparison of vegetation performance of the reclamation to the Rustler Canyon reference area. Golder evaluated the 2015 vegetation data with respect to the numerical vegetation success standards for Chino Mine outlined in MMD Permit GR009RE (DBS&A 1999). The revegetation efforts are considered successful when the canopy cover on the reclaimed facility is at least 70% of the reference area canopy cover. Shrub density is considered adequate if it is a least 60% of the reference area. Diversity will be judged by evidence of colonization of the reclaimed site by native species and numerical guidelines for different structural components of the vegetation. The numerical diversity guidelines for the Chino are listed in Table 2. In summary, the diversity guideline would be met if at least three warm season grasses and two shrubs, with individual cover levels of at least 1%, and one perennial, cool- or intermediate-season grass with a minimum cover level of 0.5%. In addition, two non-weedy forb species with minimum cover level of at least 0.1% are required to meet the proposed diversity guideline.

4.1 Canopy Cover

The canopy cover on the remediated sites is 92% of the canopy cover on the reference area, which exceeds the minimum canopy cover requirement for vegetation success. Precipitation during the growing season in 2015 near the remediated sites was normal during the growing season (Table 3) although the majority of the rainfall came in May in June. The precipitation regime during the 6-year IRA monitoring period illustrated the variability of the region where individual years may have either above normal and severe drought conditions. Given the less than favorable precipitation during the establishment period at the remediated sites and the condition of the plant communities in 2015, the level of canopy cover demonstrates that the remediated sites are resilient.

4.2 Shrub Density

Based on the 2015 sampling, the remediated sites have substantially higher shrub densities compared to the reference area using either of the shrub density estimation methods (quadrat frequency or PCQ). Shrub density on the remediated sites is nearly 4 times that of the reference area as determined using the quadrat frequency method and over 7 times using the PCQ method. Thus, the shrub density at the remediated sites exceeds the success standard.

4.3 Plant Diversity

The number of species identified at the remediated sites (>100) demonstrates that the site is being colonized by native species and is self-sustaining. Vegetation on the remediated sites meets the diversity requirements for warm-season grasses, forbs, and shrubs. Four warm-season, perennial grasses met the minimum occurrence of 1% canopy cover. Five annual forbs (excluding Russian thistle) and nine perennial

forbs met the minimum occurrence of 0.1% canopy cover. Two shrub species met the 1% canopy cover minimum occurrence.

Cool season grasses are generally lacking in both the remediated sites and the reference area and thus the minimum cover levels were not met as specified in the success standards. While several perennial cool season grasses, including Canadian wild rye (*Elymus canadensis*), bottlebrush squirreltail (*Elymus elymoides*), thickspike wheatgrass (*Elymus lanceolatus*), and Western wheatgrass (*Pascopyrum smithii*), have been documented on the remediated sites in the past, none were encountered in the sample quadrats.

The viability of achieving the cool season grass requirement on the reclamation in this region is becoming increasingly unlikely based on this and other studies (i.e., Chino Test Plot cover suitability demonstration, Tyrone vegetation monitoring) conducted over the past several years. Thus, the cool-season grass cover requirements for vegetation success at Chino and Tyrone are currently being reconsidered (Golder 2015). Ultimately, the lack of cool season grasses on the reclamation is consistent with the surrounding ecosystem.

5.0 CLOSING

The results from the vegetation surveys of the remediated sites along Whitewater Creek and Rustler Canyon reference area indicate the remediated sites are capable of supporting a self-sustaining ecosystem. Thus, the IRA objective to return these areas to a post-mining beneficial use, such as wildlife habitat or grazing is met with a viable self-sustaining vegetated cover. The survey data demonstrate that the vegetation on the Groundhog Mine and Small Stockpile sites meets or exceeds the vegetation success standards for Chino. However, all of these sites are intersected by mine infrastructure and are not isolated from mining activities. The interim action for these remediated sites will remain under the oversight of the Chino AOC and will be addressed under the Record of Decision for the Hanover and Whitewater Creeks Investigation Unit.

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TABLES

Table 1: Reclamation Seed Mix

Scientific Name	Common Name	Code
Grasses and Graminoids		
Bouteloua curtipendula	Sideoats grama	BOCU
Bouteloua gracilis	Blue grama	BOGR
Elymus elymoides	Bottlebrush squirreltail	ELEL
Elymus lanceolatus	Thickspike wheatgrass	ERLA
Eragrostis curvula	Weeping lovegrass	ERCU
Leptochloa dubia	Green sprangletop	LEDU
Sporobolus cryptandrus	Sand dropseed	SPCR
Forbs		
Linum lewisii	Blue flax	LILE
Penstemon spp.	Penstemon	PEspp
Sphaeralcea fendlerii	Fendler's globemallow	SPFE
Shrubs, Trees, and Cacti		
Atriplex canescens	Four-wing saltbush	ATCA

Table 2: Numerical Diversity Guidelines for Chino Mine

Class	Seasonality	Number	Minimum Occurrence (% cover)
Perennial grass	Warm	3	1
Perennial grass	Cool	1	0.5
Perennial shrub	NA	2	1
Forbs	NA	2	0.1

Notes:

NA - Not Applicable

Table 3: Measured Precipitation at the Reservoir 3A Met Station (January through September)

Year	Precipitation (inches)
	Reservoir 3A
2011	**7.2**
2012	**6.9**
2013	**16.4**
2014	**12.6**
2015	**12.6**

Notes:

Fort Bayard long-term average precipitation for January to September is 12.63 inches

Table 4: Comprehensive Plant List and Vegetation Cover and Density -- Remediated Sites

Scientific Name	Common Name	Code	Tenderfoot B	CG Bell	Osceolla	Star Rock Stkpl	Groundhog	Mean Canopy Cover (%)	Mean Basal Cover (%)	Mean Density (#/m^2)
Grasses and Graminoids										
Aristida harvardii	Harvard's threeawn	ARHA		X				0.19	<0.10	<0.10
Aristida purpurea	Purple threeawn	ARPU	X		X	X		0.29	<0.10	0.41
Aristida schiedeana	Single-awn threeawn	ARSC	X	X	X	X	X	--	--	--
Bothriochloa barbinodis	Cane bluestem	BOBA3		X	X	X	X	0.85	<0.10	1.34
Bothriochloa ischaemum	Yellow bluestem	BOIS					X	--	--	--
Bouteloua barbata	Six-weeks grama	BOBA2		X	X			--	--	--
Bouteloua curtipendula [1]	Sideoats grama	BOCU	X		X	X	X	12.67	1.54	8.34
Bouteloua eriopoda	Black grama	BOER				X		0.97	<0.10	0.50
Bouteloua gracilis [1]	Blue grama	BOGR	X	X	X		X	12.56	1.43	7.03
Bouteloua hirusta	Hairy grama	BOHI	X		X	X	X	1.25	0.13	1.59
Chloris virgata	Showy windmillgrass	CHVI			X		X	<0.10	<0.10	<0.10
Cyperus fendleriannus	Fendlers's flatsedge	CYFE	X		X		X	--	--	--
Cyperus squarrosus	Bearded flatsedge	CYSQ			X			<0.10	<0.10	<0.10
Elymus canadensis	Canadian wild rye	ELCA	X					--	--	--
Elymus elymoides [1]	Bottlebrush squirreltail	ELEL					X	--	--	--
Elymus lanceolatus [1]	Thickspike wheatgrass	ERLA					X	--	--	--
Eragrostis curvula [1]	Weeping lovegrass	ERCU	X				X	--	--	--
Eragrostis intermedia	Plains lovegrass	ERIN					X	--	--	--
Eragrostis mexicana	Mexican Lovegrass	ERME					X	0.25	<0.10	0.25
Eragrostis spp.	Lovegrass	ERspp	X				X	--	--	--
Hilaria belangeri	Curly mesquite	HIBE					X	--	--	--
Leptochloa dubia [1]	Green sprangletop	LEDU	X		X	X	X	3.01	0.35	2.94
Muhlenbergia metcalfei	Metcalfe's muhly	MUME					X	--	--	--
Panicum obtusum	Vine mesquite	PAOB	X				X	--	--	--
Panicum virgatum	Switchgrass	PAVI			X			<0.10	<0.10	<0.10
Pascopyrum smithii	Western wheatgrass	PASM					X	--	--	--
Pleuraphis jamesii	Galleta	PLJA			X		X	0.26	<0.10	0.28
Pleuraphis mutica	Tabosa	PLMU					X	0.56	<0.10	0.97
Schizachyrium scoparium	Little bluestem	SCSC				X		--	--	--
Setaria macrostachya	Plains bristlegrass	SEMA	X		X		X	--	--	--
Sporobolus contractus	Spike dropseed	SPCO					X	0.41	<0.10	0.31
Sporobolus cryptandrus [1]	Sand dropseed	SPCR	X		X	X	X	0.57	0.03	0.56

Table 4: Comprehensive Plant List and Vegetation Cover and Density -- Remediated Sites

Scientific Name	Common Name	Code	Tenderfoot B	CG Bell	Osceolla	Star Rock Stkpl	Groundhog	Mean Canopy Cover (%)	Mean Basal Cover (%)	Mean Density (#/m^2)
Forbs										
Amaranthus retroflexus	Redroot amaranth	AMRE					X	0.10	<0.10	0.19
Artemisia carruthii	Sagewort	ARCA	X		X		X	0.30	<0.10	0.34
Artemisia dracunculus	Tarragon	ARDR					X	0.16	<0.10	0.38
Astragalus mollissimus	Woolly locoweed	ASMO					X	<0.10	<0.10	<0.10
Astragalus nuttallii	Nuttall's milkvetch	ASNU	X				X	--	--	--
Bahia dissecta	Bahia	BADI	X		X	X	X	<0.10	<0.10	<0.10
Chenopodium album	Lambsquarters	CHAL			X	X		<0.10	<0.10	<0.10
Chaenactis stevioides	False yarrow	CHST	X	X	X	X	X	<0.10	<0.10	0.28
Cirsium spp.	Thistle	Cispp	X					--	--	--
Cleome serrulata	Beeplant	CLSE				X		--	--	--
Conyza canadensis	Horseweed	COCA					X	--	--	--
Dalea candida	White prairie clover	DACA				X	X	<0.10	<0.10	<0.10
Dalea leporina	Foxtail dalea	DALE	X				X	--	--	--
Datura quercifolia	Oak-leaved thornapple	DAQU			X		X	--	--	--
Desmodium rosei	Rose's tick clover	DERO			X	X	X	0.15	<0.10	1.31
Eriogonum wrightii	Bastardsage	ERWR	X			X	X	--	--	--
Euphorbia dentata	Toothed poinsettia	EUDE					X	--	--	--
Evolvulus sericeus	Silver dwarf morning-glory	EVSE					X	<0.10	<0.10	<0.10
Galactia wrightii	Wright's milkpea	GAWR					X	0.14	<0.10	<0.10
Gaillardia pinnatifida	Red dome blanketflower	GAPI				X	X	0.11	<0.10	0.13
Gaura spp.	Beeblossom	GAspp	X				X	--	--	--
Grindelia squarosa	Curly-cup gumweed	GRSQ					X	--	--	--
Heliomeris longifolia	Long-leaf goldeneye	HELO			X	X	X	0.24	<0.10	0.38
Heterotheca subaxillaris	Telegraph plant	HESU			X			<0.10	<0.10	<0.10
Heterotheca villosa	Hairy goldenaster	HEVI		X			X	--	--	--
Hoffmannseggia glauca	Hog potato	HOGL			X		X	--	--	--
Ipomoea cristulata	Scarlet morning glory	IPCR			X		X	--	--	--
Ipomoea costellata	Cretrib morning glory	IPCO					X	<0.10	<0.10	<0.10
Ipomoea purpurea	Wild morning glory	IPPU			X		X	--	--	--
Ipomopsis multiflora	Many-flowered ipomopsis	IPMU			X	X	X	<0.10	<0.10	1.66
Linum lewisii [1]	Blue flax	LILE					X	--	--	--
Lotus wrightii	Wright's deervetch	LOWR	X	X		X		--	--	--

Table 4: Comprehensive Plant List and Vegetation Cover and Density -- Remediated Sites

Scientific Name	Common Name	Code	Tenderfoot B	CG Bell	Osceolla	Star Rock Stkpl	Groundhog	Mean Canopy Cover (%)	Mean Basal Cover (%)	Mean Density (#/m^2)
Forbs										
Machaeranthera canescens	Purple aster	MACA	X			X	X	0.14	<0.10	<0.10
Malva neglecta	Common mallow	MANE					X	--	--	--
Melampodium leucanthum	Blackfoot	MELE	X				X	--	--	--
Melilotus officinalis	Yellow sweetclover	MEOF					X	--	--	--
Mentzelia multiflora	Blazing star	MEMU			X			--	--	--
Mirabilis linearis	Narrowleaf four-o'clock	MILI					X	--	--	--
Monardella odoratissima	Horsemint	MOOD	X				X	--	--	--
Pectis angustifolia	Lemonweed	PEAN	X		X	X	X	<0.10	<0.10	0.38
Penstemon spp. [1]	Penstemon	PEspp	X			X		--	--	--
Phaseolus angustissimus	Slimleaf limabean	PHAN	X			X		--	--	--
Physalis virginiana	Virginia groundcherry	PHVI					X	--	--	--
Proboscidea parviflora	Devil's claw	PRPA					X	--	--	--
Pseudognaphalium canescens	Gray everlasting	PSCA	X	X		X		0.60	<0.10	<0.10
Quincula lobata	Chinese lantern	QULO					X	<0.10	<0.10	<0.10
Ratibida columnifera	Cone flower	RACO					X	<0.10	<0.10	0.13
Rhynchosia senna	Rosary bean	RHSE		X	X			0.28	<0.10	<0.10
Salsola tragus	Russian thistle	SATR					X	0.42	<0.10	0.22
Salvia subincisa	Sawtooth sage	SASU					X	--	--	--
Schoenocrambe linearifolia	Slimleaf purple mustard	SCLI					X	--	--	--
Senecio flaccidus	Threadleaf ragwort	SEFL				X		<0.10	<0.10	<0.10
Solanum elaeagnifolium	Silverleaf nightshade	SOEL	X	X	X		X	0.30	<0.10	0.63
Sphaeralcea coccinea	Scarlet globemallow	SPCO	X		X			--	--	--
Sphaeralcea fendleri1	Fendler's globemallow	SPFE	X		X		X	--	--	--
Sphaeralcea laxa	Caliche globemallow	SPLA			X		X	1.38	<0.10	3.71
Tradescantia pinetorum	Pine spiderwort	TRPI					X	--	--	--
Trifolium pratense	Red clover	TRPR					X	<0.10	<0.10	<0.10
Verbascum thapsus	Common mullen	VETH	X	X		X	X	0.22	<0.10	<0.10
Xanthisma gracilis	Slender goldenweed	XAGR	X		X	X	X	0.37	<0.10	1.84
Unknown Forb 1	--	UNK1		X				<0.10	<0.10	<0.10
Unknown Forb 2	--	UNK2					X	<0.10	<0.10	<0.10

Table 4: Comprehensive Plant List and Vegetation Cover and Density -- Remediated Sites

Scientific Name	Common Name	Code	Tenderfoot B	CG Bell	Osceolla	Star Rock Stkpl	Groundhog	Mean Canopy Cover (%)	Mean Basal Cover (%)	Mean Density (#/m^2)
Shrubs, Trees, and Cacti										
Acacia angustissima	Prairie acacia	ACAN					X	--	--	--
Ailanthus altissima	Tree of heaven	AIAL				X		--	--	--
Atriplex canescens [1]	Four-wing saltbush	ATCA	X		X		X	0.94	<0.10	<0.10
Brickellia californica	California brickellbush	BRCA	X	X	X	X	X	4.16	0.14	0.81
Brickellia grandiflora	Tasselflower brickellbush	BRGR	X	X	X	X		2.88	0.12	1.19
Cylindropuntia imbricata	Tree cholla	CYIM	X				X	<0.10	<0.10	<0.10
Eramerica nauseosus	Rubber rabbitbush	ERNA		X	X	X		--	--	--
Fallugia paradoxa	Apache plume	FAPA					X	--	--	--
Gutierrezia sarothrae	Broom snakeweed	GUSA	X			X	X	0.56	<0.10	0.13
Isocoma tenuisecta	Burroweed	ITSE		X		X		<0.10	<0.10	<0.10
Krascheninnikovia lanata	Winterfat	KRLA	X					--	--	--
Mimosa aculeaticarpa var. biucifera	Mimosa	MIACB	X		X		X	<0.10	<0.10	<0.10
Opuntia engelmannii	Pickly pear	OPEN	X					--	--	--
Pinus edulis	Piñon pine	PIED		X	X			--	--	--
Prosopis glandulosa	Honey mesquite	PRGL					X	0.19	<0.10	<0.10
Quercus emoryi	Emory oak	QUEM			X			--	--	--
Senecio flaccidus	Douglas' ragwort	SEFL	X	X	X	X		--	--	--
Ulmus pumila	Siberian elm	ULPU				X		0.34	<0.10	<0.10
Yucca baccata	Banana yucca	YABA			X		X	--	--	--

Notes:

[1] Species in the Reclamation Seed Mix

-- Indicates vegetation was observed but not captured in the quadrats

Table 5: Comprehensive Plant List and Vegetation Cover and Density -- Reference Area

Scientific Name	Common Name	Code	Mean Canopy Cover (%)	Mean Basal Cover (%)	Mean Density (#/m^2)
Grasses and Graminoids					
Achnatherum hymenoides	Indian ricegrass	ACHY	--	--	--
Aristida adscensionis	Six-weeks threeawn	ARAD	1.16	<0.10	8.95
Aristida divaricata	Poverty threeawn	ARDI	--	--	--
Aristida havardii	Harvard's threeawn	ARHA	0.30	<0.10	0.10
Aristida purpurea	Purple threeawn	ARPU	0.82	<0.10	0.25
Bothriochloa barbinodis	Cane bluestem	BOBA3	1.92	0.16	0.78
Bouteloua curtipendula	Sideoats grama	BOCU	11.33	1.09	5.43
Bouteloua gracillis	Blue grama	BOGR	35.92	3.96	28.63
Bouteloua hirsuta	Hairy grama	BOHI	--	--	--
Bromus californicus	California brome	BRCA	--	--	--
Cyperus esculentus	Chufa flatsedge	CYES	<0.10	<0.10	<0.10
Cyperus fendlerianus	Fendler's flatsedge	CYFE	--	--	--
Cyperus parishii	Parish's flatsedge	CYPA	--	--	--
Elymus elymoides	Squirreltail	ELEL	--	--	--
Eragrostis intermedia	Plains lovegrass	ERIN	--	--	--
Eragrostis mexicana	Mexican lovegrass	ERME	0.20	<0.10	<0.10
Panicum obtusum	Vine mesquite	PAOB	0.25	<0.10	1.80
Piptochaetium fimbritum	Piñon ricegrass	PIFI	--	--	--
Pleuraphis mutica	Tabosa	PLMU	<0.10	<0.10	<0.10
Koeleria macrantha	Prairie junegrass	KOMA	--	--	--
Lycurus phleoides	Wolftail	LYPH	--	--	--
Muhlenbergia fragilis	Delicate muhly	MUFR	--	--	--
Muhlenbergia metcalfeii	Metcalfe's muhly	MUME	--	--	--
Muhlenbergia torreyi	Ring muhly	MUTO	--	--	--
Muhlenbergia rigens	Deergrass	MURI	--	--	--
Muhlenbergia wrightii	Spike muhly	MUWR	--	--	--
Schizachyrium scoparium	Little bluestem	SCSC	0.50	<0.10	0.18
Setaria leucopila	Streambed bristlegrass	SELE	<0.10	<0.10	<0.10
Forbs					
Allium geyeri	Geyer's onion	ALGE	--	--	--
Allium macropetalum	Largeflower onion	ALMA	<0.10	<0.10	0.23
Amaranthus albus	Prostrate pigweed	AMAL	<0.10	<0.10	<0.10
Amaranthus retroflexus	Redroot amaranth	AMRE	--	--	--
Anoda cristata	Crested anoda	ANCR	--	--	--
Asteraceae	Unknown aster	ASTE	--	--	--
Artemisia carruthii	Sagewort	ARCA	0.99	<0.10	0.78
Bahia absinthifolia	Hairyseed bahia	BAAB	--	--	--
Bahia dissecta	Ragleaf bahia	BADI	--	--	--
Calliandra humilus	Slimlobe beggarticks	CAHU	--	--	--
Castilleja integra	Dwarf stickpea	CAIN	--	--	--
Cheilanthes fendleri	Wholeleaf Indian paintbrush	CHFE	--	--	--
Chaenactis stevioides	False yarrow	CHST	<0.10	<0.10	<0.10
Chenopodium graveolens	Fendler's lipfern	CHGR	--	--	--
Chenopodium neomexicanum	New Mexico goosefoot	CHNE	<0.10	<0.10	<0.10
Chamaesyce serpyllifolia	Fetid goosefoot	CHSE	--	--	--
Cologania angustifolia	Thymeleaf sandmat	COAN	--	--	--
Commelina dianthifolia	Longleaf cologania	CODI	--	--	--
Cosmos parviflorus	Birdbill dayflower	COPA	--	--	--
Conyza schiedeana	Southwestern cosmos	COSC	--	--	--
Dalea filiformis	Pineland marshall	DAFI	--	--	--

Table 5: Comprehensive Plant List and Vegetation Cover and Density -- Reference Area

Scientific Name	Common Name	Code	Mean Canopy Cover (%)	Mean Basal Cover (%)	Mean Density (#/m^2)
Forbs					
Dalea leporina	Foxtail prarie clover	DALE	--	--	--
Desmodium batocaulon	San Pedro ticktrefoil	DEBA	--	--	--
Desmodium grahamii	Graham's ticktrefoil	DEGR	--	--	--
Desmodium rosei	Rose's tricktrfoil	DERO	--	--	--
Dyssodia papposa	Fetid marigold	DYPA	--	--	--
Echeandia flavescens	Torrey's craglily	ECFL	--	--	--
Eriogonum annuum	Annual buckwheat	ERAN	--	--	--
Eriogonum wrightii	Bastardsage	ERWR	--	--	--
Euphorbia dentata	Toothed spurge	EUDE	--	--	--
Euphorbia spathulata	Warty spurge	EUSP	--	--	--
Evolvulus serceus	Silver dwarf morning-glory	EVSE	--	--	--
Gaura coccinea	Scarlet beeblossom	GACO	--	--	--
Guara parviflora	Velvetweed	GUPA	--	--	--
Gnaphalium canescens	Wright's cudweed	GNCA	--	--	--
Grindelia squarosa	Curlycup gumweed	GRSQ	--	--	--
Hedeoma drummondii	Drummond's false pennyroyal	HEDR	--	--	--
Heliomeris multiflora	Showy goldeneye	HRMU	--	--	--
Heterospermum pinnatum	Wingpetal	HEPI	--	--	--
Hoffmanseggia glauca	Eifert	HOGL	--	--	--
Hymenothrix wrightii	Wright's thimblehead	HYWR	--	--	--
Ipomoea costellata	Crestrib morning-glory	IPCO	--	--	--
Ipomoea cristulata	Transpecos morning-glory	IPCR	--	--	--
Lathyrus graminifolius	Grassleaf peavine	LAGR	--	--	--
Melilotus officinalis	Yellow sweetclover	MEOF	<0.10	<0.10	<0.10
Mirabilis oblongifolia	Mountain four o'clock	MIOB	--	--	--
	Moss	MOSS	0.34	0.34	<0.10
Oxytropis lambertii	Lambert's crazyweed	OXLA	--	--	--
Pectis angustifolia	Lemonscent	PEAN	<0.10	<0.10	<0.10
Pectis cylindrica	Sanoran chinchweed	PECY	--	--	--
Phaseolus angustissumus	Sonoran cinchweed	PHAN	0.06	<0.10	0.55
Physalis virginiana	Slimleaf bean	PHVI	--	--	--
Planto patagonica	Virginia groundcherry	PLPA	--	--	--
Pseudognaphalium stramineum	Cottonbatting plant	PSST	<0.10	<0.10	<0.10
Sanvitalia abertii	Woolly Plantain	SAAB	--	--	--
Salvia subincisa	Albert's creeping zinnia	SASU	--	--	--
Schoenocrambe linearifolia	Sawtooth sage	SCLI	--	--	--
Schkuhria wislizeni	Slimleaf plains mustard	SCWI	--	--	--
Sida neomexicana	Wislizenus' false threadleaf	SINE	0.11	<0.10	0.60
Sphaeralcea coccinea	New Mexico fanpetals	SPCO	--	--	--
Sphaeralcea fendleri	Fendler's globemallow	SPFE	<0.10	<0.10	<0.10
Sphaeralcea laxa	Caliche globemallow	SPLA	0.10	<0.10	0.25
Tagetes micrantha	Scarler globemallow	TAMI	--	--	--
Thelypodium wrightii	Licorice marigold	THWR	--	--	--
Verbascum thapsus	Wright's thelpody	VETH	--	--	--
Woodsia oregana	Common mullein	WOOR	--	--	--
Xanthisma gracilis	Slender goldenweed	XAGR	<0.10	<0.10	0.05
Xanthium spinosum	Spiny cocklebur	XASP	--	--	--

Table 5: Comprehensive Plant List and Vegetation Cover and Density -- Reference Area

Scientific Name	Common Name	Code	Mean Canopy Cover (%)	Mean Basal Cover (%)	Mean Density (#/m^2)
Shrubs, Trees, and Cacti					
Ageratina herbacea	Fragrant snakeroot	AGHE	--	--	--
Agave parryi	Parry's agave	AGPA	--	--	--
Baccharis pteronioides	Yerba de pasmo	BAPT	--	--	--
Brickelia californica	California brickelbrush	BRCA	--	--	--
Ceratoides lanata	Winterfat	CEIA	--	--	--
Cercocarpos montanus	Mountain mahogany	CEMO	--	--	--
Cylindropuntia imbricata	Tree cholla	CYIM	<0.10	<0.10	<0.10
Echinocereus triglochidiatus	Kingcup cactus	ECTR	--	--	--
Juniperus deppeana	Alligator juniper	JUDE	--	--	--
Mimosa aculeaticarpa var. biucifera	Catclaw mimosa	MIACB	0.20	<0.10	0.55
Nolina microcarpa	Beargrass	NOMI	0.85	0.26	<0.10
Opuntia phaecantha	Tulip pricklypear	OPPH	--	--	--
Opuntia spinosior	Walkingstick cactus	OPSP	--	--	--
Pinus edulis	Piñon pine	PIED	--	--	--
Rhus trilobata	Skunkbush sumac	RHTR	--	--	--
Yucca baccata	Sanana yucca	YUBA	--	--	--

Notes:

-- Indicates vegetation was observed but not captured in the quadrats

Table 6: Summary Statistics

Statistic	Remediated Sites	Reference Area
Total Canopy (%)		
Mean	49.0	53.5
Standard Deviation	20.8	10.6
Sample Number	32	40
90% Confidence Interval	42.8 to 55.3	50.7 to 56.3
Sample Adequacy - Nmin[1]	52	11
Probability within true mean[2]	0.90	0.99
Basal Cover (%)		
Mean	4.0	5.8
Standard Deviation	2.7	2.4
Sample Number	32	40
90% Confidence Interval	3.2 to 4.9	5.1 to 6.4
Sample Adequacy - Nmin[1]	132	47
Probability within true mean[2]	0.79	0.94
Shrub Density (plants/m^2) from Quadrats		
Mean	2.41	0.68
Standard Deviation	4.71	1.07
Sample Number	32	40
80% Confidence Interval	1.32 to 3.50	0.5 to 0.9
Sample Adequacy - Nmin[1]	1101	715
Probability within true mean[2]	0.61	0.65
Shrub Density (plants/m^2) from Point-Centered Quarter		
Mean	0.39	0.05
Standard Deviation	0.53	0.03
Sample Number	9	10
80% Confidence Interval	0.14 to 0.64	0.04 to 0.06
Sample Adequacy - Nmin[1]	657	107
Probability within true mean[2]	0.58	0.71

Notes:

The remediated sites includes the Groundhog Mine and the six Small Historic Stockpiles.

[1] minimum number of samples required to obtain 90 percent probability that the sample mean is within 10 percent of the population mean

[2] Probability the true value of the mean is within 10 percent of the mean for the sample size

FIGURES

Drawing file: Figure01_Grid.dwg Jan 21, 2016 – 11:49am

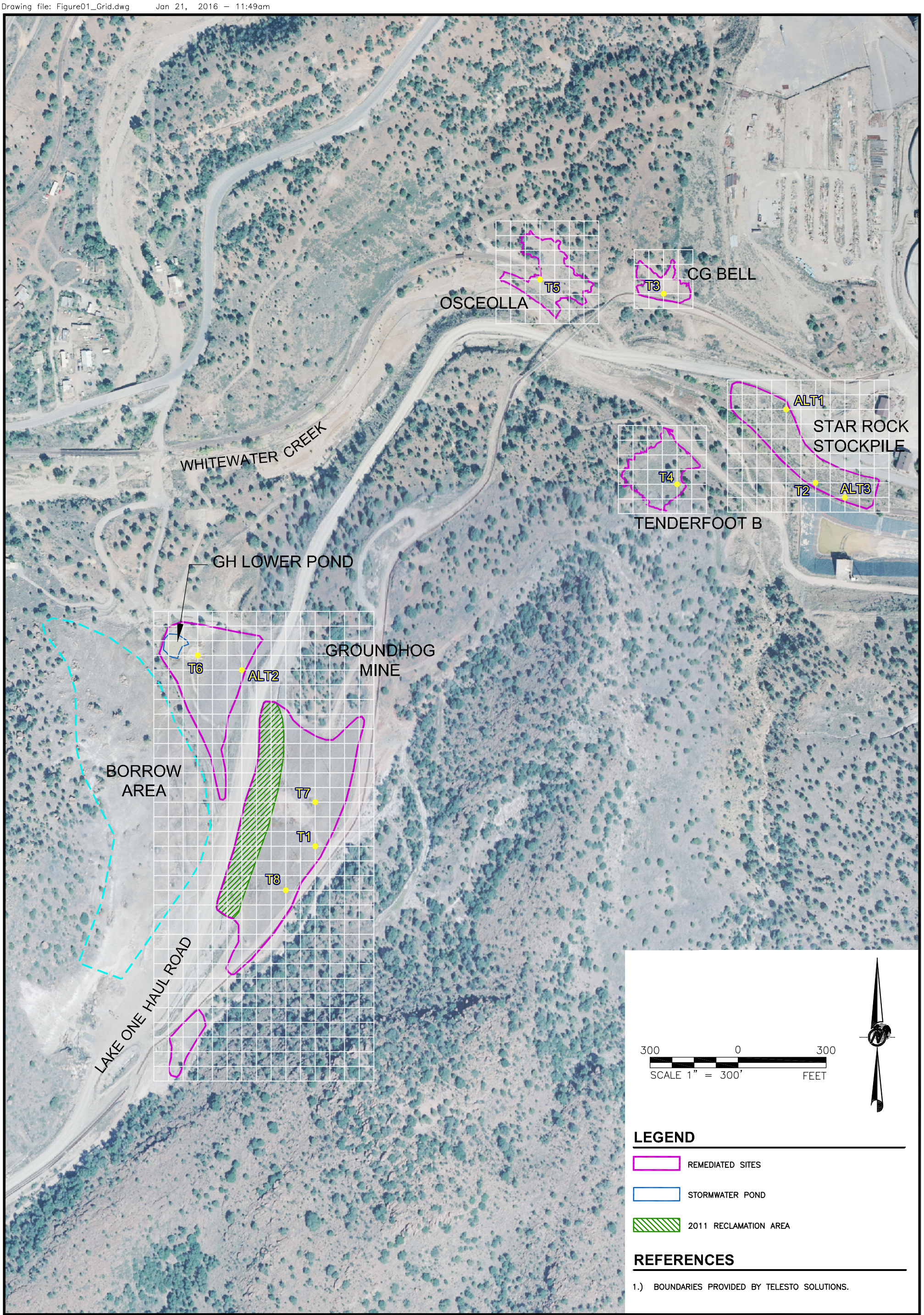


FIGURE 1

PROJECT No.	141-1160	
FILE No.	Figure01.dwg	
REV. 0	SCALE AS SHOWN	
DESIGN	DR	10/28/10
CADD	CM	01/19/16
CHECK	EC	01/19/16
REVIEW	DR	01/19/16

TITLE

OVERVIEW OF REMEDIATION SITES AND 2015 VEGETATION TRANSECT LOCATIONS

PROJECT

FREEPORT-MCMORAN COPPER & GOLD
CHINO MINES COMPANY

GROUNDHOG MINE AND SMALL STOCKPILES REMEDIAL ACTIONS, HANOVER/WHITEWATER CREEKS INVESTIGATION UNIT
GRANT COUNTY, NEW MEXICO

Golder Associates
Albuquerque, NM

Drawing file: Figure02_Grid.dwg Feb 08, 2016 – 1:33pm

VICINITY MAP
NOT TO SCALE

REFERENCE AREA

REF-T-03
REF-T-06
REF-T-01
REF-T-10
REF-T-09
REF-T-14
REF-T-08
REF-T-07
REF-T-11
REF-T-02

160 0 160
SCALE FEET

LEGEND

APPROXIMATE FACILITY BOUNDARY

REFERENCES

2006 ENVIROGROUP LIMITED CENTANNIAL, COLORADO.
SEPTEMBER 2014 AERIAL IMAGE FROM CHINO MINE COMPANY.
MAP COORDINATES ARE BASED ON CHINO MINE COORDINATE SYSTEM.

FIGURE 2

REVIEW	DR	01/19/16
CHECK	EC	01/19/16
CADD	CM	01/19/16
DESIGN	DR	11/12/15
REV. 0	SCALE AS SHOWN	
FILE No.	Figure02.dwg	
PROJECT No.	141-1160	

TITLE

2015 TRANSECT LOCATIONS RUSTLER CANYON REFERENCE AREA

PROJECT

FREEPORT-MCMORAN COPPER & GOLD
CHINO MINES COMPANY

GROUNDHOG MINE AND SMALL STOCKPILES REMEDIAL ACTIONS, HANOVER/WHITEWATER CREEKS INVESTIGATION UNIT
GRANT COUNTY, NEW MEXICO

Golder Associates
Albuquerque, NM

Figure 3: Vegetation Plot, Transect and Quadrat Layout

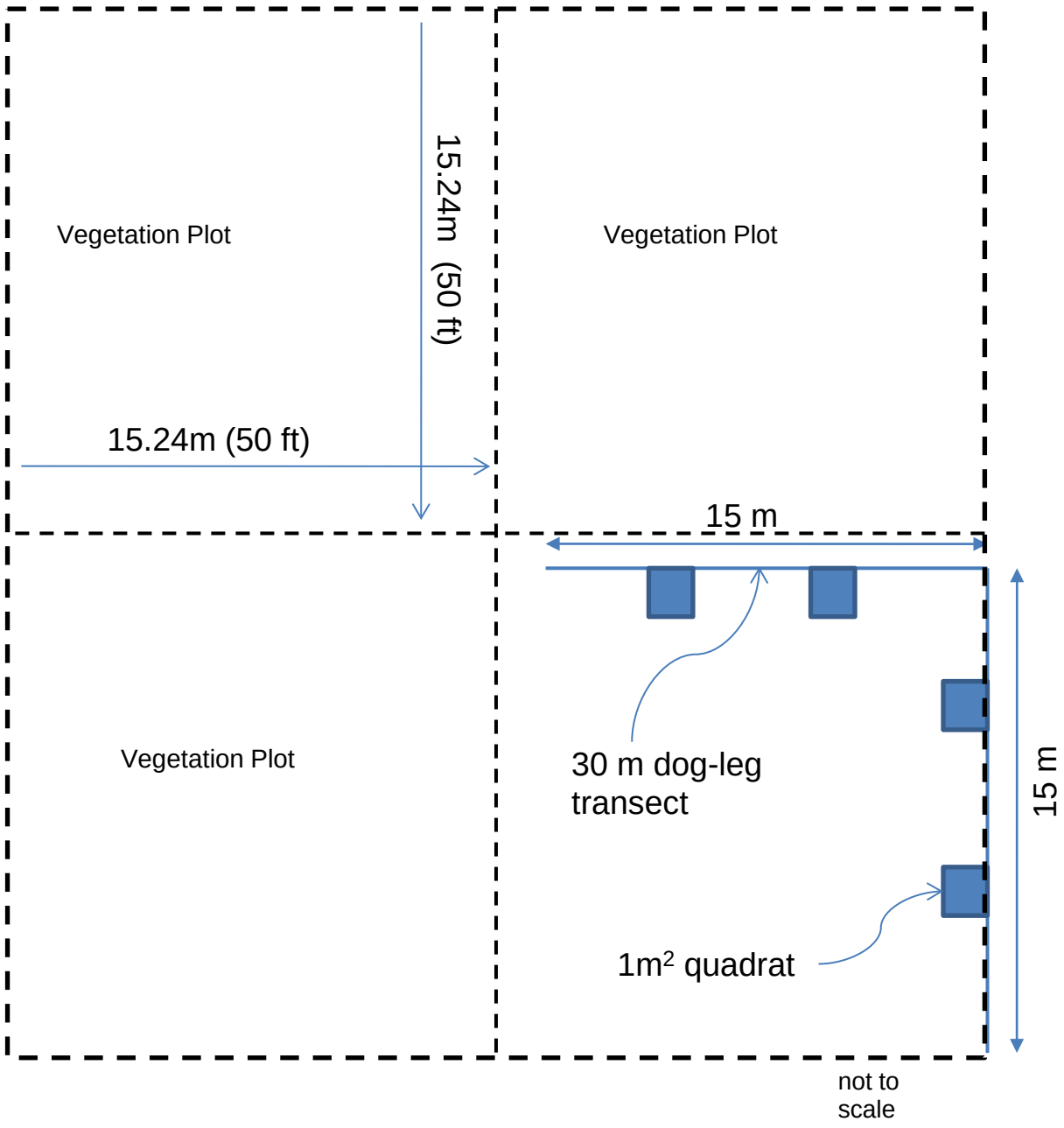
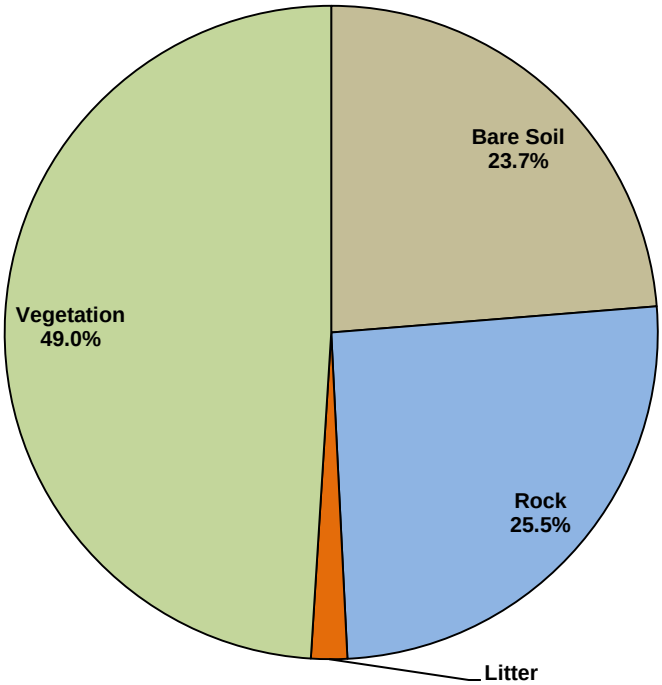
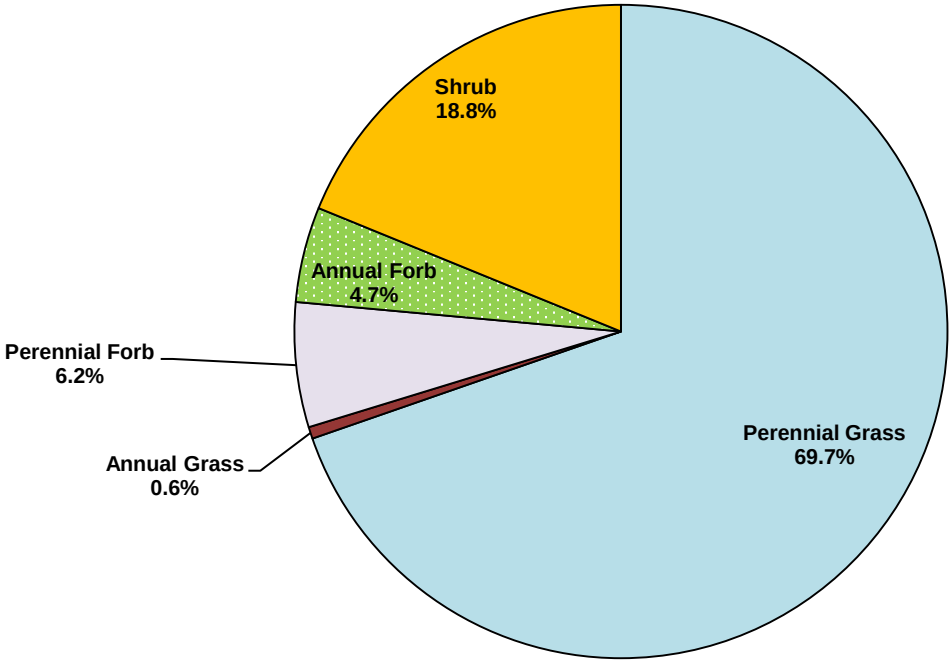


Figure 4: Mean Canopy Cover - Remediated Sites

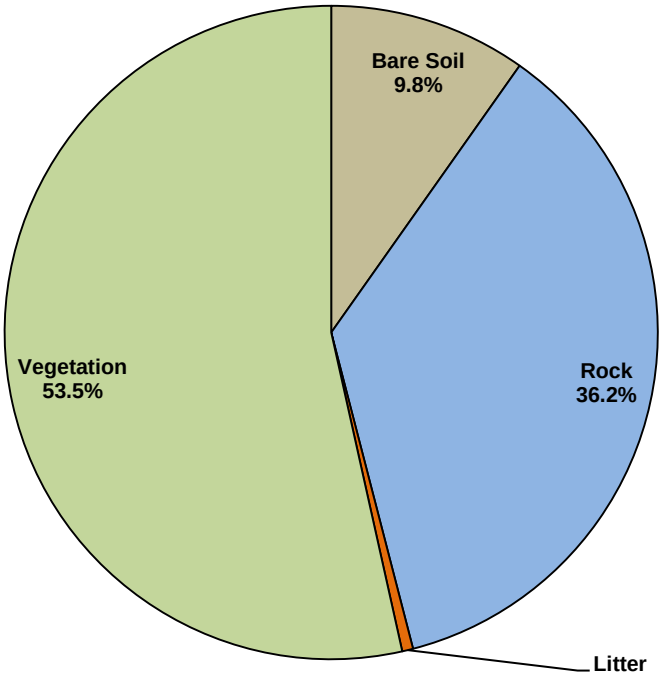


4a: Mean Canopy Cover Components

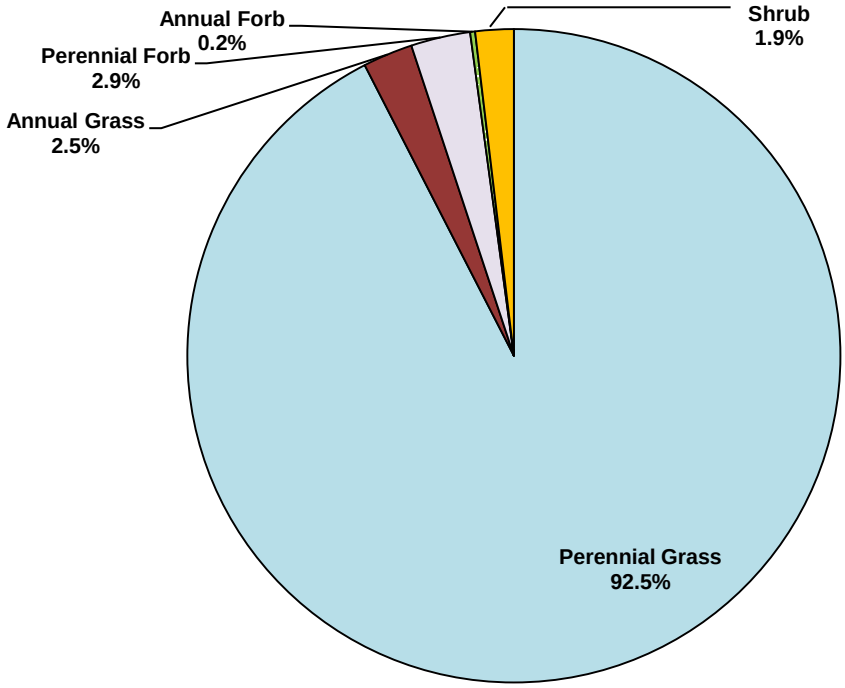


4b: Proportional Canopy Cover by Plant Classes

Figure 5: Mean Canopy Cover - Reference Area

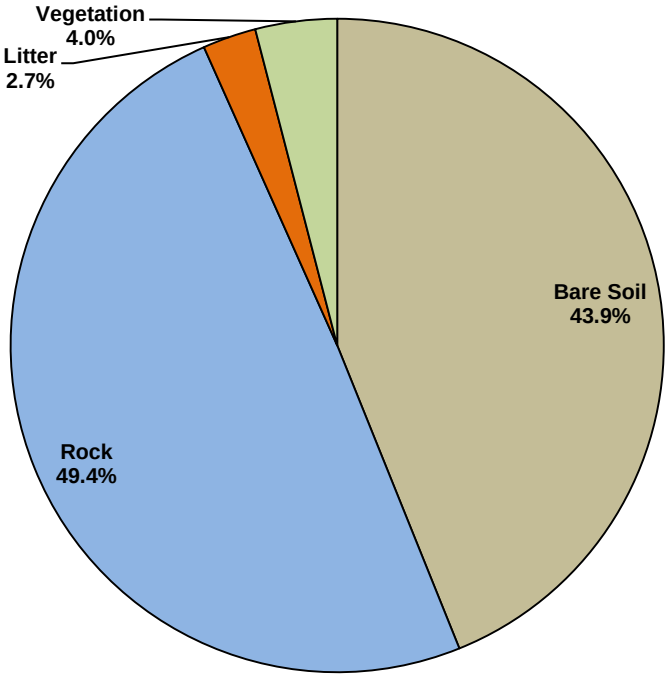


5a: Mean Canopy Cover Components

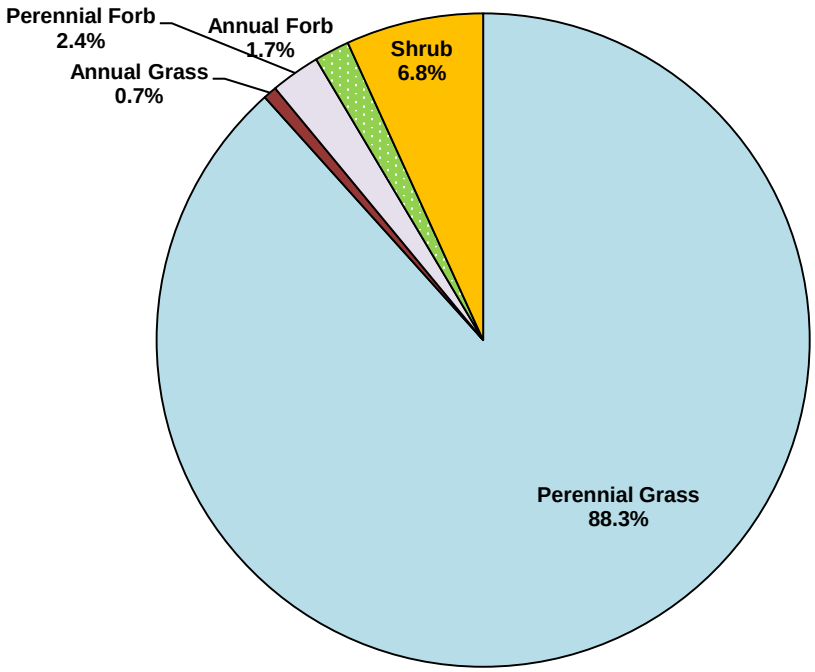


5b: Proportional Canopy Cover by Plant Classes

Figure 6: Mean Basal Cover - Remediated Sites

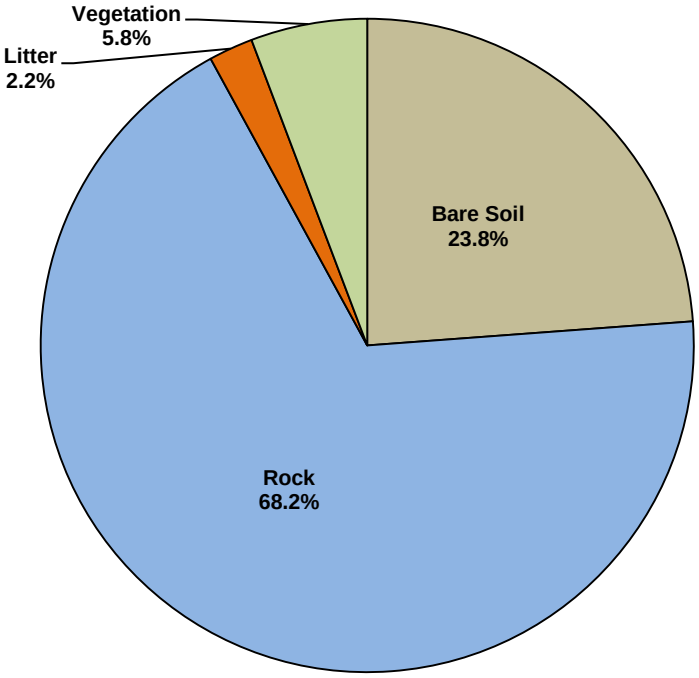


6a: Mean Basal Cover Components

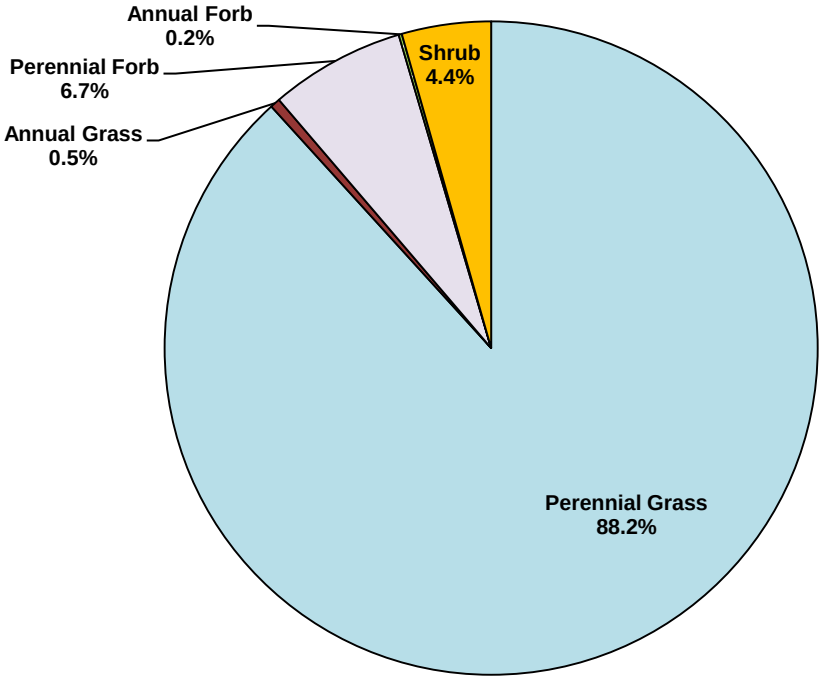


6b: Proportional Basal Cover by Plant Classes

Figure 7: Mean Basal Cover - Reference Area



7a: Mean Basal Cover Components



7b: Proportional Basal Cover by Plant Classes

APPENDIX A
QUADRAT DATA SUMMARIES

TABLE A-1
REFERENCE AREA CANOPY COVER

Transect	1				2				3				6				7				8				9				10				11				14			
Quadrat	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Grasses																																								
ARAD	0	0	1	0	0	0	7	0.5	0	0	0	0	0	3.7	0	0.25	0	0	0	0	0	14	0	0	1.7	0.1	0	0	0	0	0	0	2.8	14.5	1	T	0	0	0	0
ARHA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	10	0	0	0	0
ARPU	5.2	2	0	8	0	0	0	0	0	0	1.5	0	5.5	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.5
BOBA3	9.7	0	3	10	0	0	0	0	16	5.1	14.5	0	0	0	0	0	6.3	4.9	0	0	0	7	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOCU	37.7	17.0	1.0	5.6	28.2	0	0	16.4	20.8	22.1	25.9	36.8	11.3	0	0	0	34.3	32.3	0	0	0	0	0	8.4	0	0	4.5	16.4	23.0	24.9	11.6	21.7	0	0	0	0	1.6125	0	16.675	35.36
BOGR	9.3	38.1	22.4	12.7	18.2	49.2	21.9	47.1	27.4	32.8	20.0	33.2	46.9	38.8	46.3	41.7	16.3	35.5	51.7	58.8	48.0	11.8	45.2	41.5	46.9	54.0	49.4	44.3	18.8	34.0	43.2	27.0	27.4	24.8	52.0	33.9	52.8	48.5	42.0	23.5
CYES	0	0	0	0.05	0.6	0	0.05	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0.5	0.3	0	0	0	0
ERME	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PAOB	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	4.5	1.3	1	0	0	0	0	0
PLMU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCSC	0	0	0	0	4.4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5	0	0	0	0	0	0	0	0
SELE	0	0	0	0	0	0	0	2	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forbs																																								
ALMA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0	0	0
AMRE	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARCA	0	0	0	0	11.8	0	1.5	0.25	0.7	7.2	0	0.4	0	0.8	0	0	0	0	11	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHNE	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.1	0	0	0	0	0	0	0
MEOF	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOSS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.6	8.9	0.1	0	0	0	0	0
PEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0	0
PHAN	0.1	0	T	0.5	0	0	0	0	0.25	0.1	0	0.1	0.3	0	0	0	0	0	0	0	0	0	0	0	0.4	0.4	0	0	0.1	0.05	0	0.25	0	0	0	0	0	0	0	0
PSST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SINE	0.1	0.2	0.2	0.5	0	0	0.05	0	0	0.4	0	0	0	0.5	0	0.1	0.4	0	0	0.05	0	1.4	0	0	0	0	0.05	0	0	0.3	0	0.07	0	0	0	0	0	0	0	0.1
SPFE	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPLA	0	0	0	0	0.5	0	0	0	0.75	0.4	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3	0	0	0	0	1	0	0	0	0
XAGR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shrubs																																								
CYIM	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIACB	0	0	0	0.1	0.7	2.4	0	0	0.5	0	0	0	0.3	0	0	0	0.3	0	0	2	0.4	0	0	0	0.25	0	0	0	0.1	0	0	0	0	0	0	0.1	0.4	0	0.25	0
NOMI	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.9	0	0	0	0	0	0	0	0	0	0
Totals																																								
BARE	3.0	5.0	7.5	7.0	6.8	11.3	5.0	5.0	7.0	9.5	7.9	11.1	10.8	18.9	8.0	5.0	14.7	13.5	9.0	5.0	12.7	14.9	7.0	13.6	12.0	9.6	11.0	12.1	13.9	14.4	4.0	10.0	5.9	14.2	7.5	14.0	18.5	9.5	5.5	10.4
LITTER	0.8	1.1	0.2	0.3	0.6	0.5	1.2	1.5	0.8	1.2	0.4	0.3	0.7	0.3	0.3	0.3	0.1	0.2	0.3	0.8	0.1	0.1	0.4	0.5	0.1	0.2	0.2	0.2	0.2	1.6	2.7	0.3	0.8	0.7	1.0	0.4	0.1	0.1	0.3	0.2
ROCK	38.0	36.6	64.8	57.0	28.0	26.0	59.5	31.0	28.0	17.0	33.0	27.0	26.0	38.0	45.5	49.0	30.0	23.0	30.0	34.5	38.0	50.0	47.5	22.0	38.0	34.0	37.0	30.0	44.0	6.0	37.3	40.0	51.0	35.0	37.5	40.9	28.0	42.0	36.0	31.0
TOTAL	58.2	57.3	27.5	35.8	64.6	62.2	34.4	62.5	64.2	72.4	58.7	61.6	62.5	42.8	46.3	45.7	55.2	63.4	60.7	59.8	49.2	35.0	45.2	63.9	49.9	56.2	51.8	57.7	41.9	78.1	56.0	49.7	42.4	50.1	54.0	44.7	53.5	48.5	58.2	58.4

TABLE A-2
REFERENCE AERA BASAL COVER

Transect	1				2				3				6				7				8				9				10				11				14			
Quadrat	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Grasses																																								
ARAD	0	0	T	0	0	0	0.05	T	0	0	0	0	0	T	0	T	0	0	0	0	0	0.1	0	0	T	T	0	0	0	0	0	0	T	0.05	T	T	0	0	0	0
ARHA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.6	0	0	0	0	0	0	0	0
ARPU	0.8	0.1	0	0.4	0	0	0	0	0	0	0.1	0	0.7	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2
BOBA3	0.9	0	0.1	0.2	0	0	0	0	0.6	0.9	1.8	0	0	0	0	0	0.8	0.4	0	0	0	0.7	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BOCU	4.3	1.8	0.1	0.2	1.5	0	0	1.1	1.3	1.4	2.7	3.8	1.7	0	0	0	4.4	3.2	0	0	0	0	0	1.1	0	0	0.4	1.5	2.5	3.5	0.3	2.8	0	0	0	0	0.3	0	0.6	3.2
BOGR	0.6	5.9	2.1	1.1	1.3	6.4	1.4	3.8	3.2	2.5	2.5	3.4	6.7	3.6	4.7	3.7	1.7	4.5	6	3.8	4.9	1.7	4.9	9	2.9	3.3	4.3	7.2	3.7	4.9	2.7	2.4	3.9	2.4	4.9	4.4	7.1	7.7	4.3	3
CYES	0	0	0	T	T	0	T	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	T	T	0	0	0	0
ERME	0	0	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PAOB	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	T	T	T	0	0	0	0	0
PLMU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCSC	0	0	0	0	0.3	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
SELE	0	0	0	0	0	0	0	0.3	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forbs																																								
ALMA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15	0	0	0	0	0	0
AMRE	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARCA	0	0	0	0	0.4	0	T	T	T	0.2	0	T	0	T	0	0	0	0	0.25	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHNE	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0
MEOF	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MOSS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.6	8.9	0.1	0	0	0	0	0
PEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0
PHAN	T	0	T	T	0	0	0	0	T	T	0	T	T	0	0	0	0	0	0	0	0	0	0	0	T	T	0	0	T	T	0	T	0	0	0	0	0	0	0	0
PSST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0
SINE	T	T	T	T	0	0	T	0	0	T	0	0	0	T	0	T	T	0	0	T	0	0.15	0	0	0	0	T	0	0	T	0	T	0	0	0	0	0	0	0	0	T
SPFE	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPLA	0	0	0	0	T	0	0	0	T	T	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	T	0	0	0	0
XAGR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shrubs																																								
CYIM	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIACB	0	0	0	T	T	T	0	0	T	0	0	0	T	0	0	0	T	0	0	T	T	0	0	0	T	0	0	0	T	0	0	0	0	0	0	T	T	0	T	0
NOMI	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0
Totals																																								
BARE	29.7	30.1	8.8	8.7	30.2	31.0	6.8	9.7	13.8	56.2	46.6	43.6	23.4	35.7	13.7	8.9	32.7	36.4	15.6	5.9	19.8	23.1	9.6	38.3	29.7	20.2	14.1	25.9	21.3	76.4	31.6	12.7	15.2	19.3	12.6	16.4	32.4	14.1	9.6	23.1
LITTER	3.3	4.3	0.9	1.1	2.5	3.0	4.2	5.3	2.9	4.2	2.7	2.4	2.4	1.3	1.0	1.7	0.6	0.9	1.2	2.8	0.6	0.5	1.6	1.9	0.5	0.9	1.6	0.8	1.1	6.0	9.1	1.3	2.5	2.4	3.8	1.7	0.4	0.5	1.1	0.9
ROCK	60.3	57.9	88.1	88.2	63.8	58.5	87.6	79.9	78.2	32.9	43.7	46.8	65.8	59.3	80.6	85.7	59.7	54.6	77.0	87.5	74.7	73.8	83.9	49.0	66.7	75.5	79.5	64.6	71.5	9.0	56.2	80.8	73.7	66.8	78.6	76.8	59.8	77.8	84.5	69.5
TOTAL	6.6	7.8	2.3	1.9	3.6	7.5	1.5	5.2	5.2	6.7	7.1	7.2	8.4	3.6	4.7	3.7	7.0	8.2	6.3	3.8	4.9	2.7	4.9	10.7	3.0	3.3	4.8	8.7	6.2	8.6	3.0	5.3	8.6	11.5	5.0	5.0	7.4	7.7	4.9	6.4

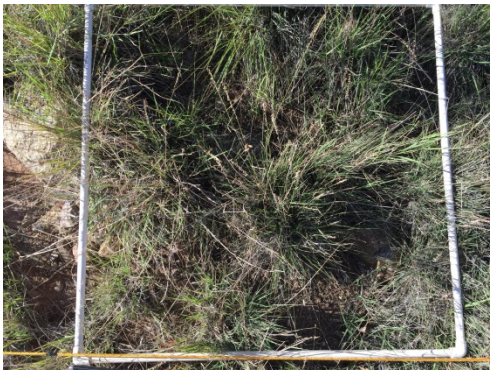
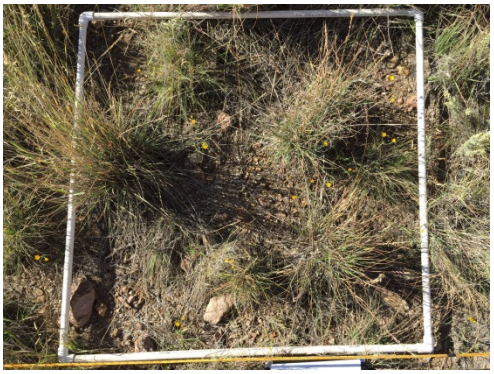
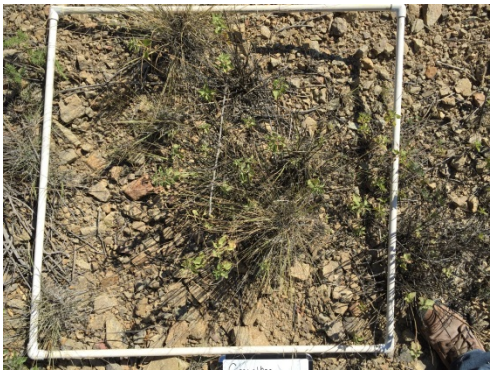
TABLE A-3
REMEDIATED SITES CANOPY COVER

Transect	T-1				T-2		T-3		T-4				T-5				T-6				T-8				ALT-1				ALT-2			
Quadrat	1	2	3	4	1	2	1	2	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Grasses																																
ARHA	0	0	0	0	0	0	0	6.13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARPU	0	0	0	0	1.9	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1.9	0	4.5	0	0	0	0	0
BOBA3	0	0	0	0	22.45	0	1	0	0	0	0	0	1	0	0.5	0	0.5	0	0	0	0	0	0	0	0	1.4	0	0.5	0	0	0	0
BOCU	66.7	34.2	25.3	32.6	0	8.3	0	0	20.8	4.2	12.2	8.7	0	4	0	0	2.0	0	14.1	12.7	23.1	8.6	32.3	25.9	4.2	2.2	0	1.5	20.0	10.0	16.6	15.5
BOER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30.9	0	0	0	0	0
BOGR	2.9	19.4	33.8	27.6	0	9.3	0	0	41.6	57.3	46.2	28.7	0	0	0	0	0	1.1	4.6	4.9	12.0	14.1	7.3	1.8	1.3	15.5	12.9	25.6	7.9	13.2	13.1	0
BOHI	0	0	0	3.5	0	0	0	0	0	0	0	0	8.6	4.1	0	9	0	0	0	0	0	0.3	7	0	0	0	0	0	1.4	0	0	6
CHVI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CYSQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERME	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LEDU	6.2	0	0	0	1.7	0	0	0	9	0.1	0	0	0	0	0	0	11.7	20.1	8	7.8	6.6	0	15	0	0	0	0	0	2.7	0	7.5	0
PAVI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLJA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.6	4	2.1	0	0	0	0	0	1.2	0	0
PLMU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.9	0	2	0	0	0	0	0	0	0	0
SPCO	0	0	0	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.5	4	0	0	1	0	0	0	0	0	0	0	0	0
SPCR	0	0	0	0	0	0	0	0	0	0	0	0	9.5	5.6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forbs																																
AMRE	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.5	0	2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARDR	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ASMO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0
BADI	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.05	0	0	0	0	0	0
CHST	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.1	0	0	0	0	0	0	0.05	0.3	0	0	0	0	0	0.4	0	0	0	0
DACA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	T	0	0	0	0	0	0
DERO	0	0	0	0	0	2.5	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	2.3	0	0	0.05	0	0	0	0	0
EVSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0
GAPI	0	0	0	0	0	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GAWR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
HELO	0	0	0	0.2	0	0	0	0	0	0	0	0	0.25	0	0	0	5.8	0	0	0	0	0.3	0	0	0.7	0	0	0	0	0	0.4	0
HESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IPCO	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IPMU	0	0	0	0	0	0	0	0	0	0	0	0	0	0.35	0	0	0	0	0	0	0	0	0	0	0	1.9	0	0.1	0	0	0	0
MACA	0	0	0	0	3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	1.4	0	0
PEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.15	0.1	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0.25
PSCA	0	0	0	0	8.8	7	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QULO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RACO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0	0	0	0	0	0	0	0
RHSE	0	0	0	0	0	0	9.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SATR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0	0	13	0	0
SEFL	0	0	0	0	0	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.6	2.7	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0
SPLA	0.3	0	0	4	0	0	0	0	0	0	0	0	0	0.05	0	0	22.9	14.4	0.25	1.3	0.25	0.3	0	0	0	0	0	0	0.3	0	0	0.1
TRPR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0
UNK1	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UNK2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0
VETH	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
XAGR	0	2.2	0	0	0.7	0.15	0	0	0.2	0	0	0	0.1	0	0.05	0	0	0	T	0.2	0.4	0.2	0.15	0	0	0	0	1.3	0	0	0	6
Shrubs																																
ATCA	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	13
BRCA	0	0	0	0	13	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0	0	0	0	0	0	0
BRGR	0	0	0	0	6	0	46.2	17.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.3	0	10	7.1	0	0	0	0
CYIM	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GUSA	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ISTE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
MIBI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRGL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.2	0	0	0	0	0	0	0	0	0	0	0
ULPU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0
Totals																																
BARE	10.0	21.7	13.5	18.0	9.5	0.3	2.0	13.6	11.5	20.0	14.0	13.0	33.6	62.8	20.4	21.8	45.2	58.9	53.4	11.8	40.1	47.0	6.0	31.8	3.6	14.7	2.5	8.2	44.6	39.2	38.6	28.0
LITTER	0.6	2.6	0.4	1.9	0.9	0.9	0.8	1.1	0.8	0.7	0.7	0.6	24.2	10.8	0.5	3.0	0.2	0.1	0.9	0.0	1.0	0.2	1.4	0.3	0.0	0.3	0.7	0.2	0.1	0.1	0.8	0.5
ROCK	10.0	20.5	24.0	10.5	32.0	19.6	38.0	50.0	16.0	17.6	27.0	32.0	22.0	11.8	62.0	65.0	4.0	2.1	12.5	6.0	10.0	12.0	18.5	30.0	13.0	64.0	30.5	55.0	23.0	22.0	23.0	32.0
TOTAL	79.4	55.2	62.1	69.6	57.7	79.3	59.2	35.3	71.7	61.7	58.3	54.4	20.3	14.6	17.1	10.2	50.6	38.9	33.3	82.2	49.0	40.8	74.1	37.9	83.4	21.1	66.4	36.6	32.3	38.7	37.6	39.5

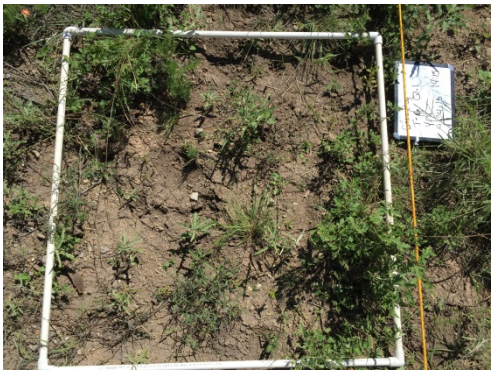
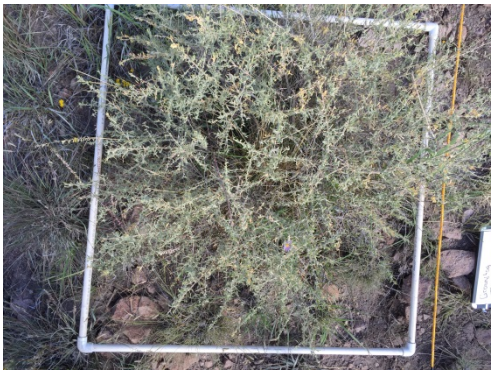
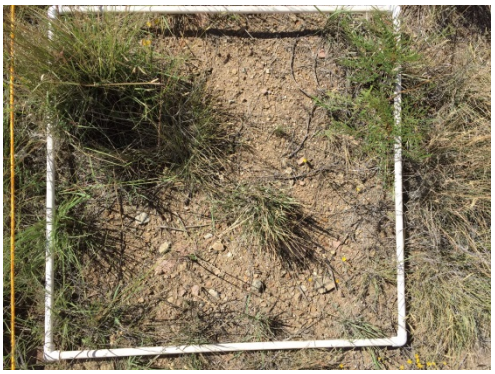
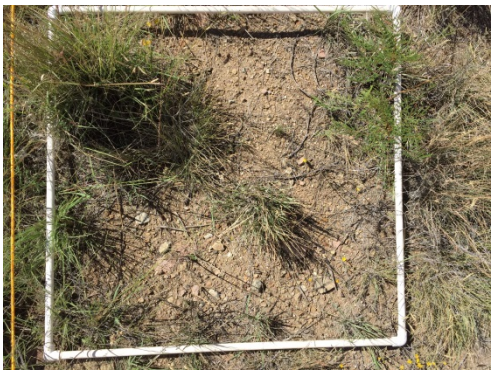
TABLE A-4
REMEDIATED SITES BASAL COVER

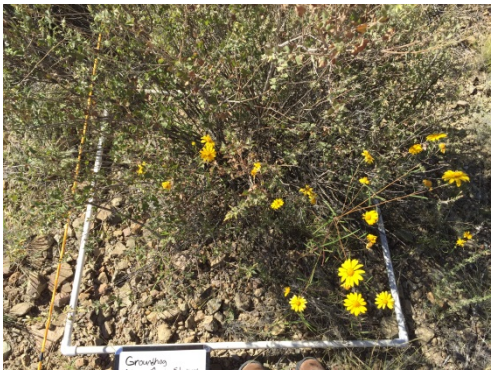
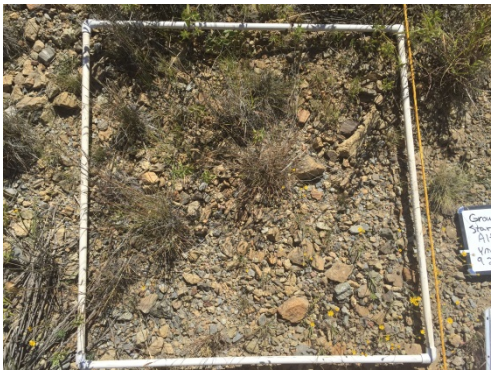
Transect	T-1				T-2		T-3		T-4				T-5				T-6				T-8				ALT-1				ALT-2			
Quadart	1	2	3	4	1	2	1	2	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Grasses																																
ARHA	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARPU	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.3	0	0.3	0	0	0	0	0
BOBA3	0	0	0	0	0.2	0	T	0	0	0	0	0	0.2	0	0.05	0	T	0	0	0	0	0	0	0	0	T	0	T	0	0	0	0
BOCU	11.6	5.3	3.6	2.3	0	0.15	0	0	1.1	0.1	0.9	0.6	0	0.5	0	0	0.1	0	0.8	0.7	4.1	2.1	2.8	2.5	0.6	T	0	T	4.8	2.3	1.2	1
BOER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.85	0	0	0	0	0
BOGR	0.1	1.6	2.5	1	0	0.5	0	0	3.4	5.4	4.1	2.2	0	0	0	0	0	T	0.2	2.5	1.2	5.1	0.2	0.3	0.2	4	0.7	3.6	2.1	3.9	1	0
BOHI	0	0	0	0.2	0	0	0	0	0	0	0	0	1.4	0.1	0	0.8	0	0	0	0	0	0.2	0.8	0	0	0	0	0	0.3	0	0	0.4
CHVI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CYSQ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERME	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LEDU	0.7	0	0	0	0.05	0	0	0	6	T	0	0	0	0	0	0	1.2	0.4	0.5	0.1	0.3	0	0.8	0	0	0	0	0	0.6	0	0.4	0
PAVI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLJA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.1	0.5	0.3	0	0	0	0	0	0.3	0	0
PLMU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.3	0	0.6	0	0	0	0	0	0	0	0
SPCO	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.3	0	0	0.1	0	0	0	0	0	0	0	0	0
SPCR	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0.3	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forbs																																
AMRE	0	0	0.15	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARDR	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ASMO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0
BADI	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	T	0	0	0	0	0	0
CHST	0	0	0	0	0	0	0	0	0	0	0	0	T	T	0	0	0	0	0	0	T	T	0	0	0	0	0	T	0	0	0	0
DACA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.066	0	T	0	0	0	0	0	0
DERO	0	0	0	0	0	T	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	T	0	0	T	0	0	0	0	0
EVSE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0
GAPI	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GAWR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
HELO	0	0	0	T	0	0	0	0	0	0	0	0	T	0	0	0	0.3	0	0	0	0	T	0	0	T	0	0	0	0	0	T	0
HESU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IPCO	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IPMU	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	T	0	T	0	0	0	0
MACA	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	T	0	0
PEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	T	T	T	0	0	0	0	0	0	0	0	0	0	0	0	T
PSCA	0	0	0	0	0.3	T	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QULO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RACO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0
RHSE	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SATR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04	0	0	0	0	0	0	0	0	0	0	0.1	0	0
SEFL	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	T	T	0	0	0	0	0	0	0	0	0	0	0	0	0
SPLA	T	0	0	0.05	0	0	0	0	0	0	0	0	0	T	0	0	1	0.5	0.05	0.1	0.1	T	0	0	0	0	0	0	0.1	0	0	T
TRPR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0
UNK1	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UNK2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0
VETH	0	0	0	0	0	0.15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
XAGR	0	T	0	0	T	T	0	0	T	0	0	0	T	0	T	0	0	0	T	T	T	T	T	0	0	0	0	T	0	0	0	T
Shrubs																																
ATCA	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15	0	0	0	0	0	0	0	0	0.1
BRCA	0	0	0	0	0.6	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.7	0	0	0	0	0	0	0
BRGR	0	0	0	0	0.1	0	2.2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.05	0.3	0	0	0	0
CYIM	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GUSA	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ISTE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0
MIBI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRGL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
ULPU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
Totals																																
BARE	66.1	58.7	15.4	51.9	16.9	1.6	2.7	19.1	38.6	50.1	15.9	15.2	63.1	84.3	31.6	25.2	89.9	95.3	82.5	70.7	73.3	77.5	6.7	46.6	23.0	20.1	3.0	15.6	62.9	63.2	71.1	47.2
LITTER	4.3	8.9	1.4	6.3	3.6	2.8	2.7	5.2	2.7	2.7	2.4	2.4	9.5	3.6	0.2	1.0	0.7	0.7	3.0	0.2	3.4	0.9	4.6	1.1	0.2	1.9	2.2	1.0	0.4	0.4	2.7	1.7
ROCK	16.9	25.6	76.9	38.2	78.2	93.4	92.4	72.4	53.7	41.6	76.6	79.4	25.3	11.2	67.9	72.5	6.7	2.8	12.5	24.9	17.3	11.9	83.3	48.4	72.9	74.1	92.8	79.5	28.8	29.8	23.7	49.6
TOTAL	12.8	6.9	6.25	3.65	1.3	2.1	2.2	3.3	5.1	5.5	5.05	3	2.2	0.9	0.3	1.3	2.75	1.1	2	4.2	6	9.8	5.35	3.85	3.9	4	2	3.9	7.9	6.6	2.6	1.5

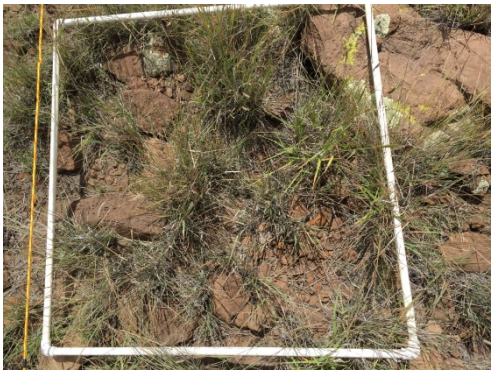
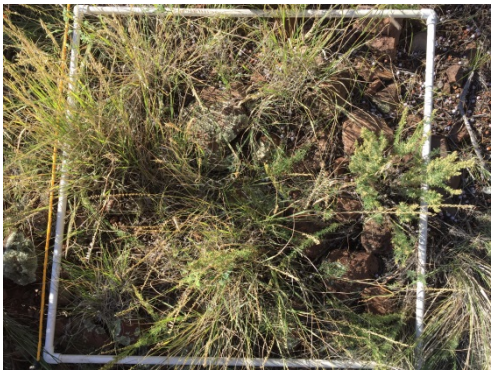
APPENDIX B
QUADRAT PHOTOGRAPHS

	
Groundhog T-1 Q1	Groundhog T-1 Q2
	
Groundhog T-1 Q3	Groundhog T-1 Q4
NO PHOTOGRAPH	
Star Rock T-2 Q1	Star Rock T-2 Q2
	
C.G. Bell T-3 Q1	C.G. Bell T-3 Q2

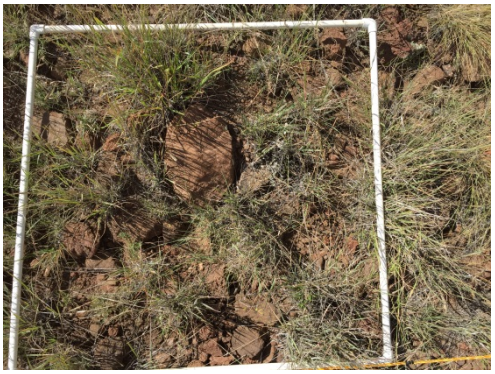
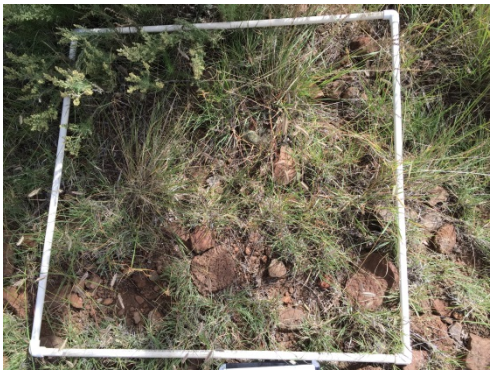
	NO PHOTOGRAPH
Tenderfoot B T-4 Q1	Tenderfoot B T-4 Q2
NO PHOTOGRAPH	
Tenderfoot B T-4 Q3	Tenderfoot B T-4 Q4
	
Osceolla T-5 Q1	Osceolla T-5 Q2
	
Osceolla T-5 Q3	Osceolla T-5 Q4

	
Groundhog T-6 Q1	Groundhog T-6 Q2
	
Groundhog T-6 Q3	Groundhog T-6 Q4
	
Groundhog T-8 Q1	Groundhog T-8 Q2
	
Groundhog T-8 Q3	Groundhog T-8 Q4

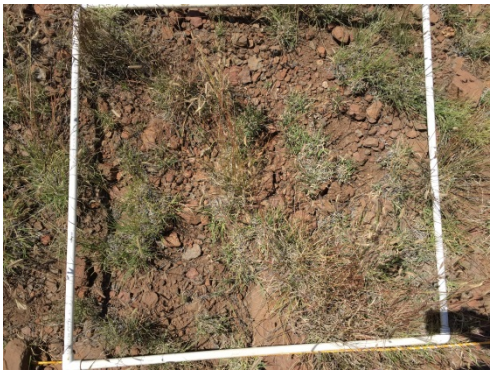
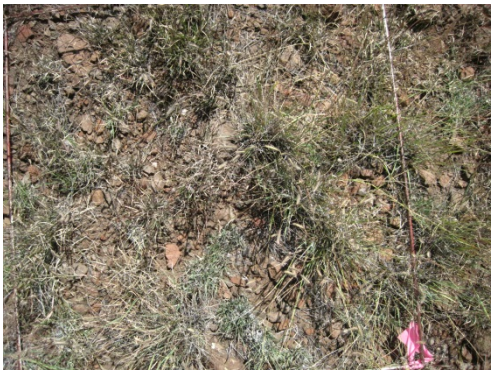
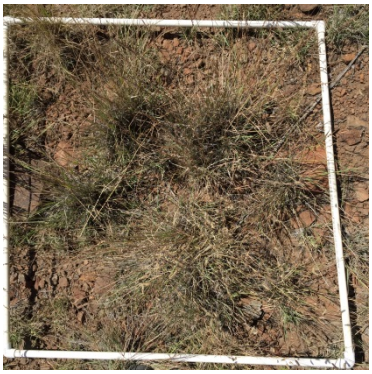
	
Star Rock ALT-1 Q1	Star Rock ALT-1 Q2
	
Star Rock ALT-1 Q3	Star Rock ALT-1 Q4
	
Groundhog ALT-2 Q1	Groundhog ALT-2 Q2
	NO PHOTOGRAPH
Groundhog ALT-2 Q3	Groundhog ALT-2 Q4

	NO PHOTOGRAPH
Chino REF-T1 Q1	Chino REF-T1 Q2
	
Chino REF-T1 Q3	Chino REF-T1 Q4
	
Chino REF-T2 Q1	Chino REF-T2 Q2
	
Chino REF-T2 Q3	Chino REF-T2 Q4

	
Chino REF-T3 Q1	Chino REF-T3 Q2
	
Chino REF-T3 Q3	Chino REF-T3 Q4
	
Chino REF-T6 Q1	Chino REF-T6 Q2
	
Chino REF-T6 Q3	Chino REF-T6 Q4

	
Chino REF-T7 Q1	Chino REF-T7 Q2
	
Chino REF-T7 Q3	Chino REF-T7 Q4
	
Chino REF-T8 Q1	Chino REF-T8 Q2
	
Chino REF-T8 Q3	Chino REF-T8 Q4

	
Chino REF-T9 Q1	Chino REF-T9 Q2
	
Chino REF-T9 Q3	Chino REF-T9 Q4
	NO PHOTOGRAPH
Chino REF-T10 Q1	Chino REF-T10 Q2
	
Chino REF-T10 Q3	Chino REF-T10 Q4

	
Chino REF-T11 Q1	Chino REF-T11 Q2
	
Chino REF-T11 Q3	Chino REF-T11 Q4
	
Chino REF-T14 Q1	Chino REF-T14 Q2
	
Chino REF-T14 Q3	Chino REF-T14 Q4

APPENDIX C
VEGETATION OVERVIEW PHOTOS
(SEPTEMBER 2015)

Vegetation Overview Photos (September 2015)	
PHOTO 1 Groundhog T1 Looking Southwest	
PHOTO 2 Groundhog Alt2 Looking West	

PHOTO 3 Groundhog T8 Looking East	
PHOTO 4 Groundhog T6 Looking Southeast	

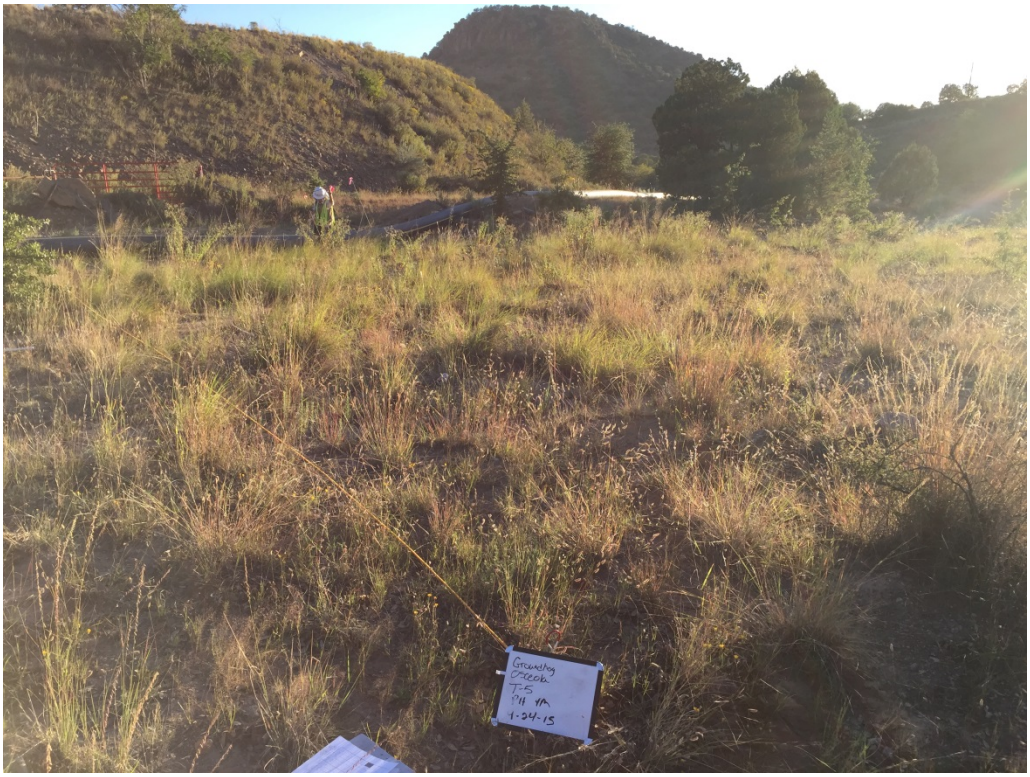
PHOTO 5 Osceola T5 Looking North	
PHOTO 6 CG Bell T3 Looking Southwest	

PHOTO 7 Tenderfoot T4 Looking South	
PHOTO 8 Star Rock T2	

PHOTO 9 Rustler Canyon Reference Area Looking North	
PHOTO 10 Rustler Canyon Reference Area Looking South	

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