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State of Utah
DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
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Division of Oil, Gas and Mining
JOHN R. BAZA
Division Director

February 13, 2018

Kirk Nicholes, Resident Agent
Alton Coal Development, LLC
463 North 100 West, Suite 1
Cedar City, Utah 84720

Subject: Approval of 2017 Annual Sage Grouse Report, Task #5606, Alton Coal Development, LLC, Coal Hollow Mine, C/025/0005

Dear Mr. Nicholes:

The above-referenced amendment is approved effective February 13, 2018. The Division has completed a Technical Analysis of the change and found that it meets the requirements of the Utah Coal Rules. A stamped incorporated copy of the amendment is enclosed for your copy of the Mining and Reclamation Plan.

If you have any questions, please feel free to call me at (801) 538-5325.

Sincerely,

Daron R. Haddock
Coal Program Manager

DRH/sqs
Enclosure
O:\025005.COL\WG5606 GROUSE RPT\Approve.doc

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UTAH DNR OIL, GAS & MINING

APPLICATION FOR COAL PERMIT PROCESSING
Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: Alton Coal Development, LLC
Mine: Coal Hollow Mine
Title: 2017 Greater Sage-grouse Population Monitoring and Habitat Improvement
Permit Number: C/025/0005

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
☒ Add	☐ Replace	☐ Remove	MRP Vol. 2, Chapter 3, End of Appendix 3-6
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Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.	Received by Oil, Gas & Mining

Greater Sage-grouse Population Monitoring and Habitat Improvement

Alton - Sink Valley, Utah

Progress Report

For

Alton Coal Development, LLC

November 4, 2017
Updated December 27, 2017

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Prepared by
Steven L. Petersen, Ph.D.
Sage-grouse Population and Habitat Consultant

Greater Sage-grouse Population Monitoring and Habitat Improvement Alton – Sink Valley, Utah

Steven L. Petersen, Ph.D., Consultant

Introduction and Background

Alton Coal Development (ACD) continues to actively mine coal from the Alton/Sink Valley area, work that has been ongoing since fall 2010. Along with the surface removal of coal from shallow deposits, the mine has established a conservation program that promotes the health and maintenance of a local wildlife species, in particular greater sage-grouse (Petersen et al. 2016). Habitat improvements implemented in the past year have focused on post-disturbance habitat reclamation, pinyon-juniper tree removal, and removing sage-grouse predators (i.e. ravens and coyotes).

Report Objectives

The purpose of this report is to provide a detailed description of the 2016-2017 activities and accomplishments summarized below:

1. During non-breeding months, ACD has monitored both breeding and non-breeding birds in the Sink Valley area within important habitats that include:
    - the sagebrush field to the south of the mine
    - the bullhogged area further to the south and southwest of the mine
    - the conservation area to the east
    - the historic and new leks plus surrounding sagebrush habitats
2. Counted the number of male birds attending the lek, including the highest number of males reported lekking since 2001.
3. Reclaimed 249 acres of mined lands using mixes with both native and introduced plant species.
4. Destroyed approximately 142 ravens and 1 coyote, both reported threats to sage-grouse nesting success and chick survival.
5. Mitigated 432.5 acres of mining disturbance with 2,296 acres of habitat improvements. By the end of 2017, mining disturbance will be 452.5 acres with mitigation and 2,596 acres of habitat improvement.

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FEB 13 2018
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Table of Contents

Introduction and Background 2
Report Objectives 2
Table of Contents 3
1. Sage-grouse Population Monitoring 4
1.1 Employee Observations and Sage-grouse Population Monitoring 4
1.2 Ground-based Sage-grouse Surveys 5
1.3 GPS Collaring and Monitoring 9
1.4 Historic and Current Lek use in Alton/Sink Valley 10
1.5 Noise Detection and Sound Assessment 11
2. Habitat Mitigation and Improvements 12
2.1 Reclamation Response 12
2.2 Juniper Mastication 14
3. Predator Control Activities 16
3.1 Raven Control 16
4. Participation and Involvement with Local Working Groups 17
References 18
Acknowledgements 18

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FEB 13 2018
Div. of Oil, Gas & Mining

1. Sage-grouse Population Monitoring

1.1 Employee Observations and Sage-grouse Population Monitoring

During the 2016-2017 year, ACD employees recorded all sightings of sage-grouse observed within the mining area. These observations were then reported to Kirk Nicholes, ACD Environmental Manager, who keeps an ongoing log of these accounts. Typical observations include birds seen along roadsides and within mine sites and disturbed areas.

All ACD employee observations are casual (employees are not charged to survey for birds). While sighting locations may suggest spatiotemporal seasonal variability in sage-grouse occurrence within the mine footprint, variability in observations may be a result of heightened awareness by employees rather than an increase in bird use activity or density.

With the focus of mining at the North Lease area where sage-grouse occurrence is less (Frey Annual Report 2016, 2017), the total number of birds observed by employees has decreased. All ACD mine employee are trained in sage-grouse conservation strategies, and how to identify sage-grouse from other bird species. When reported, Kirk determines the exact location where birds were observed and identifies the coordinate location for that observation. The results of these sightings are used to assess population patterns and trends within the mining area (Table 1).

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Table 1. Observations of sage-grouse reported by ACD employees between October 2015 and December 2016 within the Alton/Sink Valley region.

Obs ID	Date	Time of observation	Number of birds Observed	Location	State Plane Coordinates
1	Nov. 8, 2016	8:45 am	3	Observed flying from south of Pit B1 toward Pond 3 (Rod R.)	353168 E 1764929 N
2	Dec. 28, 2016	9:40 am	30	Observed birds (males) 100 yards from Pit B1 (Riley A.)	353168 E 1766129 N
3	Dec. 30, 2016	8:00 am	30	Observed birds (males) 100 yards from Pit B1 (Riley A.)	352869 E 1766179 N
4	Jan 3, 2017	7:27 am	16	Observed birds 100 yards from Pit B1 (Riley A.)	352790 E 1766225 N
5	Jan 4, 2017	9:00 am	34	Observed at drill in east end of Pit B1 (Davey J.)	352886 E 1766283 N
6	Jan 16, 2017	7:30 am	6	Observed at Pit B1 (Erik L.)	352977 E 1766187 N
7	Jan 17, 2017	7:30 am	5	Observed at Pit B1 (Erik L.)	352933 E 1766080 N
8	Jan 17, 2017	7:45 am	30+	Observed at the entrance of Pit 10 (Erik L.)	364067 E 1768171 N
9	Jan 19, 2017	8:29 am	20	Observed south of subsoil pile #2 (Clark A.)	354573 E 1768181 N
10	Feb 15, 2017	7:35 am	6	Observed at Pit B1 Church House (Adam)	353243 E 1766304 N
11	Feb 17, 2017	7:30 am	9	Observed at Church House near Pit B1 (Rick A.)	353336 E 1766389 N
12	Feb 22, 2017	10:30 am	2	Observed at NPL at County Road / McDonald road junction (Riley A.)	361944 E 1763860 N
13	April 19, 2017	9:00 pm	3	Hens trapped and collared – 1 male, 2 hens (Nicki F, Kirk N, and Steve P.)	348434 E 1766644 N
14	May 25, 2017	8:00 am	1	Observed crossing the road near the cattle guard (that has been removed) north of the mine	357926 E 1767132 N
15	July 18, 2017	10:30 am	2	Observed at the orchard (Joe K.)	353527 E 1770397 N
16	Aug 21, 2017	10:26 am	6	Flushed at SPL near the 2-track that leads to BLM property (Kirk N.)	349823 E 1768171 N
17	Aug 24, 2017	9:52 am	1	Observed at county road junction with Pond 3 access road (Joe K.)	353156 E 1767993 N

1.2 Ground-based Sage-grouse Surveys

Surveys were conducted by S. Petersen near the beginning of each month. The purpose of these surveys is to count the total number of sage-grouse observed within the Sink Valley and mining area. During breeding months, surveys are limited to non-nesting habitats and lek counts to prevent hens flushing from nests or disturbing hens with chicks during the early brood-rearing period. Habitats surveys are those dominated by sagebrush, primarily black and mountain big sagebrush.

Surveys are conducted by walking through each habitat along a pre-determined transects. Each time an individual bird or group of birds were observed, the coordinate position for that

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location was recorded (using GPS). The time of day and a decibel level (recorded during active mining periods) was also recorded.

During each survey, all areas where birds may be found were searched (Figure 1). These areas included 1) the sagebrush flat area 0.5 km south of the open coal pits (SF), 2) the new lekking area located at the top of the ridge at the south end of the sagebrush flat area, 3) the sagebrush patch located just south of the spoils pile (SMSP) and north of the spoils piles (NMSP), 4) the original lekking area (OL), 5) the wet meadow (WM) located in grass/rush/sedge community surrounding the well, 6) the sagebrush area immediately east of the open mine along the lower bench, 7) the conservation area east of the mine site along the upper bench (CA), 8) the bullhog area located south of the new lek, and 9) Ford's Pasture located 10 miles south of Sink Valley.

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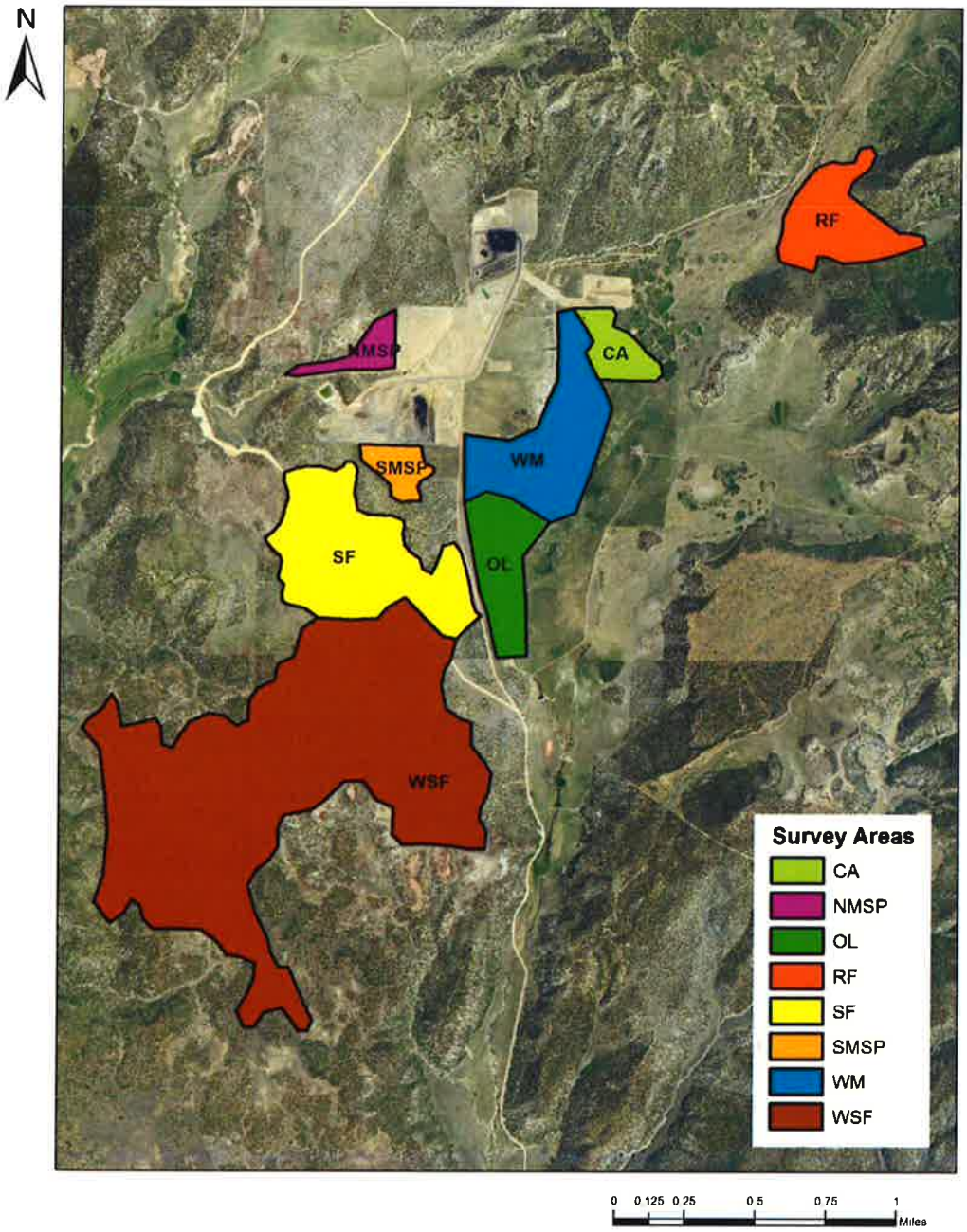

Figure 1. Location of survey areas for greater sage-grouse during the 2012-2016 monitoring seasons. CA = Conservation area, NMSP = North mine sagebrush patch, OL = Original lek, Rabbitbrush field, Sagebrush flat, SMSP = South mine sagebrush patch, WM = Wet meadow, and WSF = West sagebrush fields. Additional sites not shown above include the corridor (C) and the alfalfa fields (AF) south of Alton.

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A summary of the results recorded for each monthly sage-grouse survey is provided in table 2. Historically, highest occurrence of sage-grouse has been within the sagebrush flat. However, with extensive bullhogging south of that area, birds are more often observed in those treated areas. This demonstrates the value of habitat improvement projects for this region (Frey et al. 2013).

Table 2. Observations from monthly surveys conducted by S.L. Petersen.

Date	Time of observation	Number of birds	Location
Jan 7, 2017	8am-12pm	29	Flushed 15-19 birds (10-12 pm) while spotlighting at FP. Flushed 14 birds from SP (10:50am). No birds flushed in SF or surrounding area.
Feb 3, 2017	7am–12pm	2	2 birds observed at FP (10-12 pm). Vegetation covered in snow creating wide open view. No birds observed.
March 4, 2017	6:30am-12pm	22	No birds at FP. 15 males lekking at HL and SB. Saw an additional 7 birds (likely hens).
April 7, 2017	6:30-11am	19	14 males strutting at NL. Survey limited to prevent flushing hens from nests. Flushed 1 bird from upper CA and 2 from lower CA. Flushed 2 birds north of county road.
May 6, 2017	6:30–10am	4	Flushed 3 birds from NL. Flushed 1 bird from MSP. Numerous roost piles observed at FP.
June 7, 2017	7–11am	17	12 birds at SB (north) and 5 from SB (south)
June 26, 2017	7–11am	19	Flushed birds from SB in groups (2, 5, 3 (1 hen with 2 chicks), 6, 1, and 2).
Aug 7, 2017	7–12pm	32	10 birds in bowl west of NL. Flushed birds from SB in groups (6, 5, 9, 2).
Sept 9, 2017	7-12pm	14	4 birds next to county road at SF. Flushed 5 birds in the bowl west of NL. Flushed 2 chicks at the upper CA (on the edge of the disked area). Flushed 3 birds in MSP.
Oct 6, 2017	7:30-1pm	3	3 birds in the upper CA, within the treated area.
Nov 12, 2017	8-11am	23 (36)	Flushed 9 birds in the south bullhog area and 14 birds in the sagebrush patch just south of the spoils pile. Flushed 16 birds from hill north of the road in the SF. Could be a different group of birds
Dec 2017	8-11am	4	2 birds in south bullhog, 2 birds at hill north of road in SF. Cold windy day likely keeping birds down.

Birds were surveyed along transects within each of the following area. SF = sagebrush field located along the bypass haul road south of the mine, **SMSP** = mine sagebrush patch located adjacent to (south) of the reclaimed area of pit #1, **OL** = historic lek located in Sink Valley, **FP** = Fords pasture located 10 miles south of the mine site, **SP** = Spoils Pile, **AF** = Alfalfa field, located immediately south of the town of Alton, **WSF** = West sagebrush fields located .5 to 1 mile west of SF, which includes slopes south of SF that have been extensively bullhogged, **WM** = wet meadow area located in close proximity to the well (pump) southwest of the conservation area, **CA** = conservation area, **NMSP** = North Mine Sagebrush Patch, **NL** = New lek located south of SF.

Habitats where birds were most frequently observed are dominated by black sagebrush (*Artemisia nova* A. Nelson) and mountain big sagebrush (*Artemisia tridentata* Nutt. ssp. *vaseyana* (Rydb.) Beetle). Within these habitats, other species are common including a diversity

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of perennial grasses and forbs. Chicks and juveniles birds have been most frequently observed using habitat near the well on the east side of the mine (near the conservation area and in the lower sagebrush patch immediately adjacent to the active mining area east of the haul road).

1.3 GPS Collaring and Monitoring

Dr. Frey has been monitoring sage-grouse in the Sink Valley area by harnessing birds with GPS backpack transmitters. GPS transmitters are programmed to provide 4 point locations per day resulting in approximately 112 points per month per bird. In November 2016, a hen was trapped that provided point locations through fall 2017 (Figure 2). The hen has likely died during January ending data collection by GPS transmitter until additional birds are trapped and collared in this area.

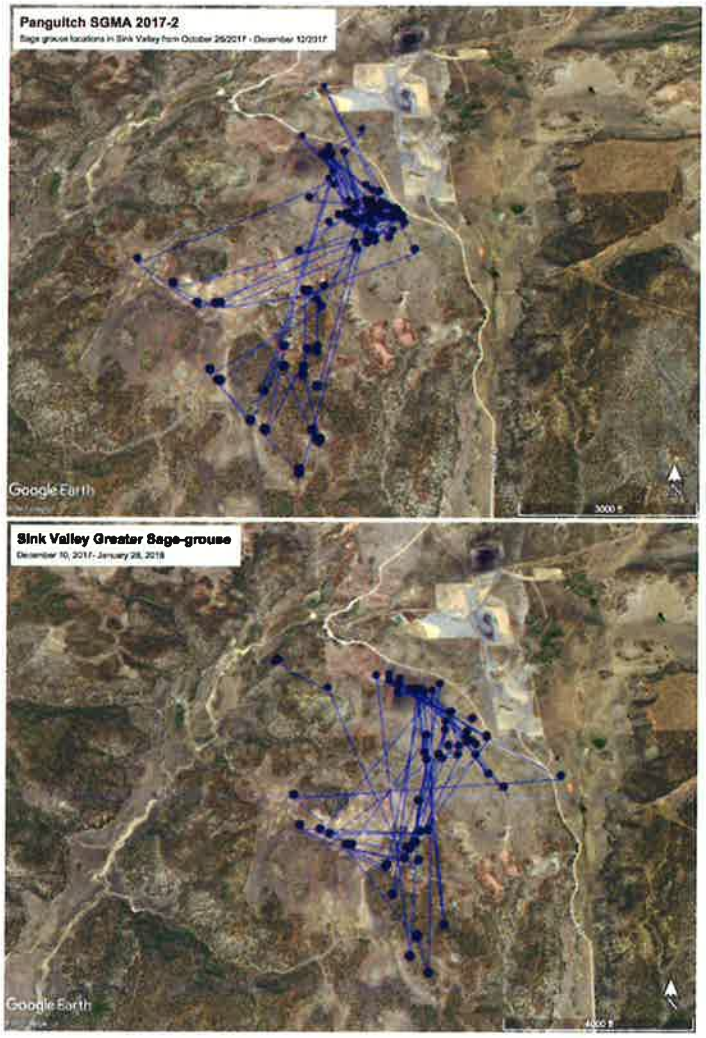

Figure 2. The location of a single greater sage-grouse hen remaining in the Sink Valley mining area between Oct. 26 – Dec. 12, 2017 (top) and Dec. 10 – Jan. 26, 2018. Data was provided by Dr. Nicki Frey, Utah State University Extension.

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Over the past 5 years, Dr. Frey has collared and monitored 5 birds (1 male, 4 females). Birds carried collars from 2 months to 1.5 years. According to this longer-term data, sage-grouse in the Sink Valley area spend the majority of their time in juniper treated areas (bullhog) and big sagebrush dominated shrublands. Additionally, females and males use habitat areas differently, with females spending most of the time in PJ treated and semi desert shrub areas and males in big sagebrush shrublands (Figure 3, Frey Report 2017).

All collars used in this study were paid for by ACD for use in monitoring the Sink Valley population.

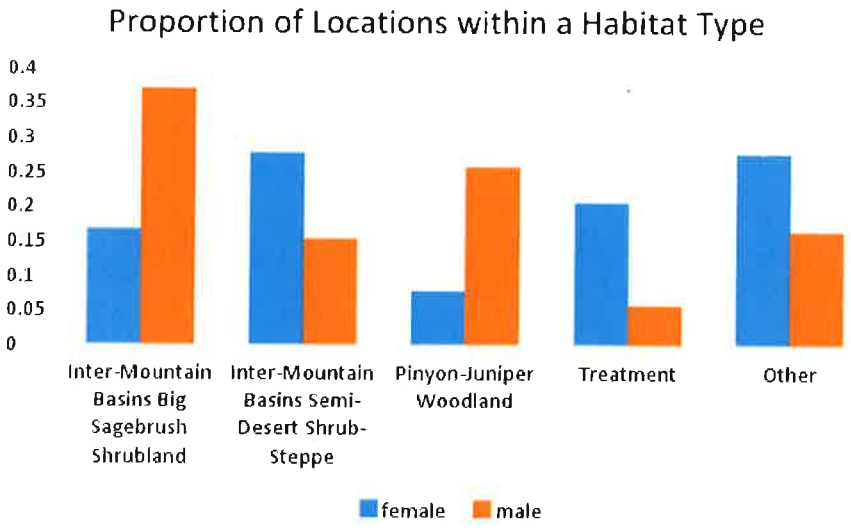

Figure 3. Proportion of habitat used by greater sage-grouse by sex in the Sink Valley region. Data represent collar information collected from 2014-2017 (5 birds). Data was provided by Dr. Nicki Frey, Utah State University Extension.

1.4 Historic and Current Lek use in Alton/Sink Valley

Greater sage-grouse continue to attend the Sink Valley lek, fluctuating in total counts annually (Figure 4). The most accurate estimates of bird densities in this region are provided by lek counts conducted annually by wildlife biologists with the Utah Division of Wildlife Resources (UDWR) with contribution from observations made by ACD employees and consultants. In Figure 2, Observations between 1991-2016 were provide by Utah DWR, based on surveys during lekking periods (February – April). For 2017, observations were made by Petersen (ACD consultant) and ACD employees (Kirk N and Josh) from surveys in the lekking period. UDWR was unable to provide 2017 count data due to policies that limit the distribution of these data. Both 2005 and 2007 data reported no males at the lek. In 2011, no males were counted, but it was assumed that the birds were displaying at the new lek location and remained unobserved until

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the following year. Birds recorded from 2012-17 were located on the new lek and surrounding bullhogged area. Observations from 1991-2011 were of birds lekking at the historic lek. In an unofficial report by ACD, a mining employee observed 22 males lekking one morning at the new lek area during the breeding season.

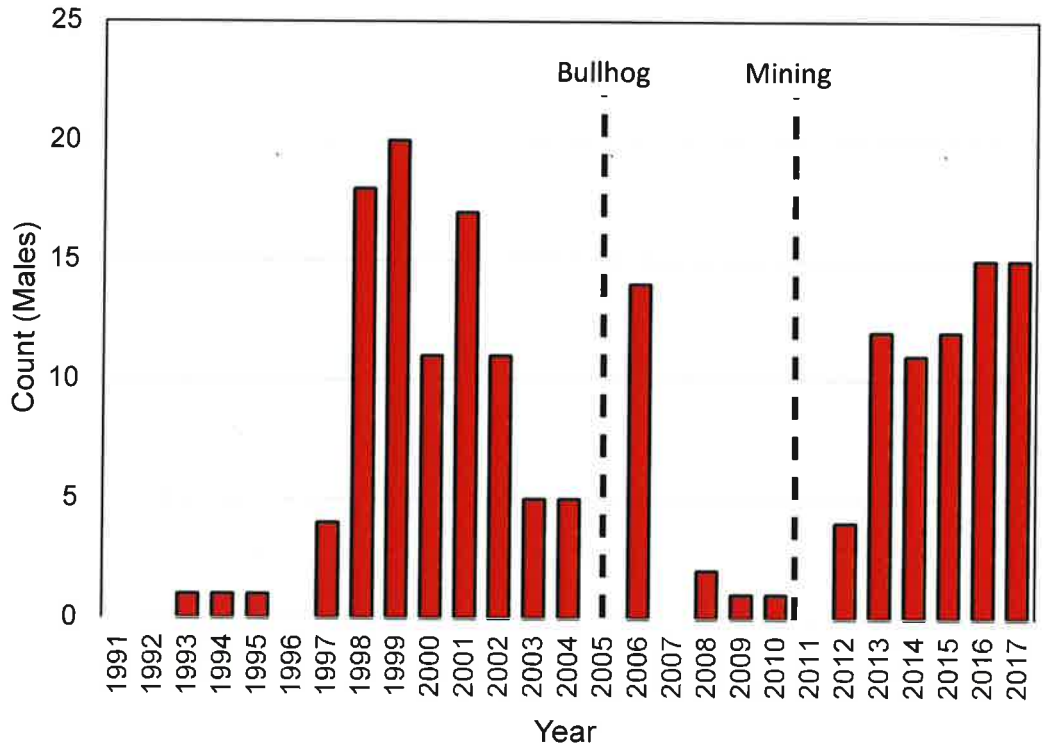

Figure 4. Male bird attendance at the Sink Valley lek, located south of Alton, Utah.

1.5 Noise Detection and Sound Assessment

The influence of sound (noise pollution) on sage-grouse continues to be measured at each observation location when mining activity is active and wind levels are low enough to provide reliable data. Decibels have been recorded using an Extech 407735 Sound Level Meter. Sound levels were monitored during periods of no mining activity (ambient sound levels) and during high mining activity within the Sink Valley area.

Average sound levels across the Sink Valley site were 52.0 ± 2.5 db (mean ± standard deviation) and maximum levels were 60.0. Average sound levels within Sink Valley during mining activities were 60.4 ± 8.6 and maximum levels were 62.1 ± 4.1. The highest average sound levels were recorded at the mine headquarters (77.3 ± 2.8), the sagebrush patch adjacent to the mine on the east (64.6), the conservation area (63.0 ± 6.6), and the well area (61.3 ± 8.3). Other

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FEB 13 2018
Div. of Oil, Gas & Mining

important measurements included the historic lek (58.8), the sagebrush field (55.1 ± 4.0), the spoils pile area (54.6 ± 1.8) and the new lek area (55.8 ± 2.1) (Petersen Annual Report 2016).

Sounds levels were not recorded near the north lease area because wind levels were too high during sampling periods. It has been determined that wind speeds greater than 3-5 mph create excess noise in sound measurements rendering the results as unreliable.

2. Habitat Mitigation and Improvements

Land improvements in relation to coal mining are a primary goal for ACD. Most improvements are designed to improve habitat conditions for sage-grouse. To date, a total of 2,296 acres have been treated by ACD (Figure 5). This includes bullhogging, chaining, and lop-and-scatter of PJ woodlands, reduction of rabbitbrush, mowing and treating willow with herbicide, and disking and reseeding sagebrush to improve sage-grouse habitat in the Conservation Area.

2.1 Reclamation Response

Habitat improvements are critical for reclaiming habitat impacted by mining activities. These activities improve habitat by stabilizing soils, reducing potential soil erosion, increasing seed establishment and plant community sustainability. These activities aid in returning ecological structure and function, and facilitating establishment of grass and shrub species important for habitat required by sagebrush obligate species (i.e. greater sage-grouse, sage sparrows). Dahlgren et al. (2006) found that implementing mechanical treatments can increase sage-grouse use of managed landscapes.

Following mining operations, the landscape has been recontoured to resemble pre-mining landform conditions. Topsoil is replaced and reseeded using a mix of native and introduced shrub and herbaceous species. Seed is distributed using a seed drill pulled behind a John Deer tractor (Kevin Heaton operator). In 2017, a total of 425.5 acres of land had been mined of which 249 had been reclaimed (seeded with straw covering to protect seed from desiccation). During the same year 2,596 acres of the surrounding Sink Valley landscape had been treated for habitat improvement (i.e. bullhogging PJ woodlands, thistle weed removal, seedling-juvenile PJ tree removal).

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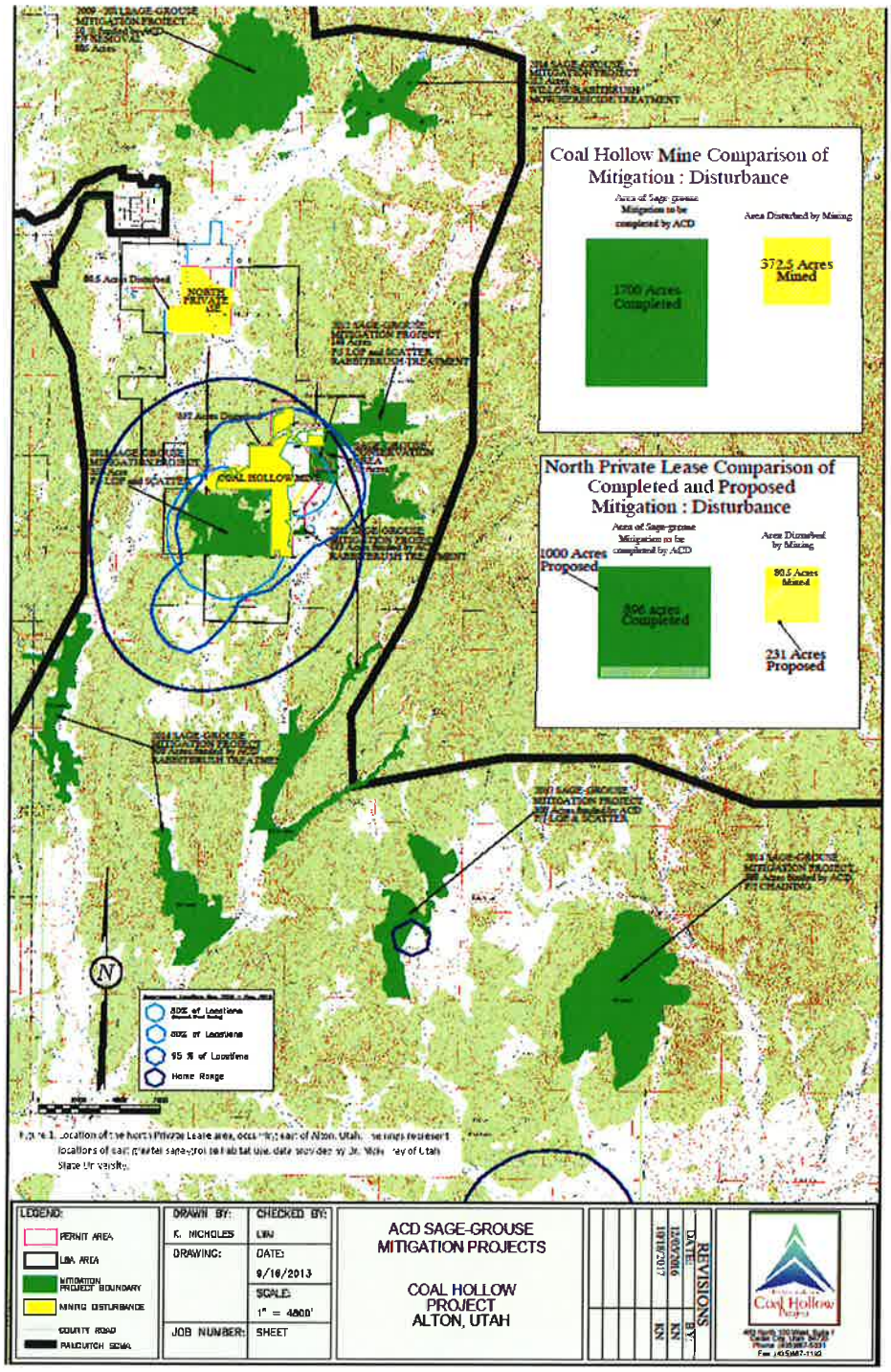

Figure 5. Total sage-grouse habitat mitigation completed between 2016-17. Habitat improvements totaled 896 acres for the North Private Lease. An additional 1,700 acres have been completed prior to 2016 for the South Private Lease.

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2.2 Juniper Mastication

Pinyon-juniper woodlands have been reduced within the Alton/Sink Valley area removal treatments implement by the BLM (Kanab field office) and ACD. BLM has continued to masticate phase II and phase III woodlands using primarily mastication techniques. This has enhanced connectivity of sagebrush habitats near the mine with open and intact sagebrush regions to the south and west of the mine. Mastication not only opens habitat, but also increases insect availability made available during the mastication process.

ACD environmental manager (Kirk Nicholes) and sage-grouse consultant (Steve Petersen) have removed seedling and juvenile pinyon and juniper trees using tree loppers. Trees range in size from 2" to 7'. A total of 1161 trees were removed in 2017, with a focus in areas that support critical sage-grouse habitat (Table 3).

Table 3. Number of trees killed throughout the Sink Valley area from July to October 2017.

Location	July	Aug	Sept	Oct	**Total**
Sagebrush Flat	40	20	33	11	**104**
North of sagebrush Flat	0	15	21	100	**136**
Valley east of Sagebrush Flat	0	16	22	50	**88**
New Lek	0	31	20	15	**66**
Bowl west of New Lek	0	47	28	28	**103**
South Bullhog	70	142	106	37	**355**
West of Historic Lek	0	31	22	92	**145**
Conservation Area (upper)	10	0	0	5	**15**
Conservation Area (lower)	6	2	0	0	**8**
Sagebrush Patch North of Mine	43	20	0	0	**63**
Sagebrush Patch by Pond	22	6	5	0	**33**
Other	0	0	0	45	**45**
Total	**191**	**330**	**257**	**383**	**1161**

To expand sagebrush habitat availability and in attempt to increase connectivity with the surrounding landscape, a lop and scatter plan has been approved for the Alton area. This project, titled Project # 4390, is part of the WRI mitigation effort designed to improve sage-grouse habitat (Figure 6).

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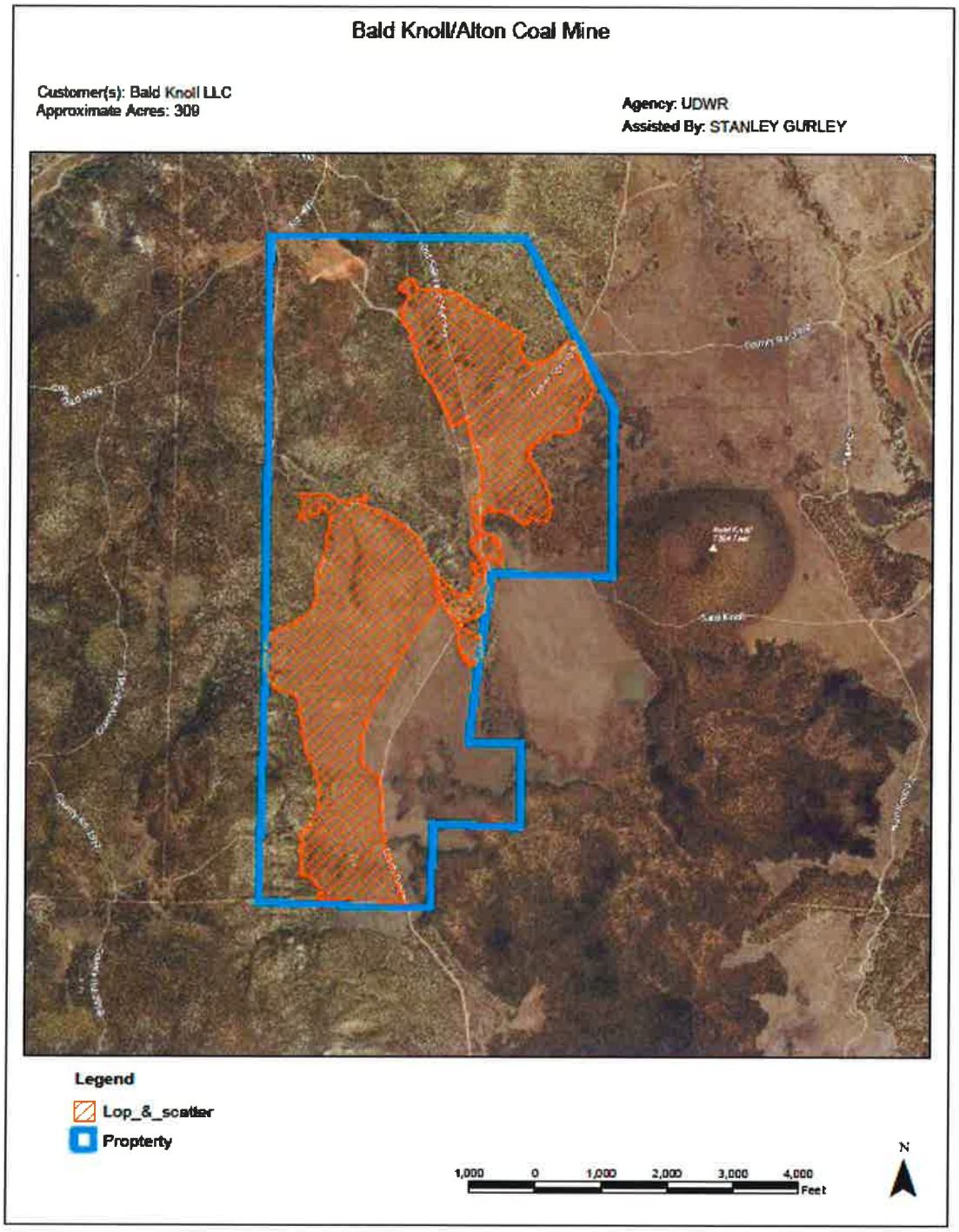

Figure 6. WRI lop and scatter project proposed to enhance sage-grouse habitat in the Alton area.

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3. Predator Control Activities

During 2017, sage-grouse predators were removed to increase potential nesting and brood rearing success. The types of predators that were removed included common ravens (*Corvus corax)* and coyotes (*Canis latrans*). All predator control activities were conducted by USDA Wildlife Services. Locations where eggs were distributed and coyotes trapped are displayed in Figure 5.

3.1 Raven Control

Teresa Wright, a raven control specialist with USDA wildlife services, is contracted by ACD to control ravens within the Alton/Sink Valley area. Control efforts occurred between January 30, 2017 and June 28, 2017. During that time, a total of 850 hard-boiled eggs treated with DRC1339 were distributed to areas surrounding the mine site (Figure 7). Considering the ratio of 1 raven killed for every 6 eggs applied, the total number of ravens killed would be approximately 142 birds. The lower numbers of birds killed this year can be attributed to a limited supply of DRC 1339, which was not being manufactured at that time.

3.2 Mesopredator Control

Roger Nauer, USDA Wildlife Services trapper and mesopredator control specialist, harvested 1 coyote within the mining area between December 1, 2016, and November 1, 2017. One den was also removed within the Alton Coal Mine and surrounding property. The coyotes was killed using either a foot snare, trap, or fixed-wing aircraft.

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Figure 7. Blue polygons indicate areas where poison eggs were distributed by USDA Wildlife Services for raven control. This includes roadsides near critical habitat and the stock yard near Alton where birds congregate. The yellow polygon represents the location where coyote snares are set and trapped.

4. Participation and Involvement with Local Working Groups

ACD participates in the Color Country Adaptive Resource Management (CCARM) quarterly meetings. CCARM contributes meaningful input and suggests for improving habitat conservation efforts within the Alton/Sink Valley area. This includes recommendations for sage-grouse population and habitat conservation planning. Feedback is considered in all aspects of project planning and implementation. Maintaining this cooperation with CCARM has been instrumental in the success of this project.

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