2018 ANNUAL REPORT

Submit the completed document and any additional information identified to the Division by March 31, 2019.

GENERAL INFORMATION

Company Name	Canyon Fuel Company, LLC	Mine Name	Skyline Mine
Permit Number	C/007/0005	Permit Expiration Date	April 30, 2022
Operator Name	Gregg A. Galecki	Phone Number	+1 (435) 448-2636
Mailing Address	HC 35 Box 380	Email	ggalecki@wolverinefuels.com
City	Helper		
State	Utah	Zip Code	84526

		DOGM File Location or Annual Report Location
Excess Spoil Piles	☐ Required ☒ Not Required	
Refuse Piles	☒ Required ☐ Not Required	Quarterly Certified Refuse Pile Inspection reports were submitted electronically to the Division on 4/19/18, 8/10/18, 11/2/18, and 2/4/19 for the 1st through 4th quarters, respectively.
Impoundments	☒ Required ☐ Not Required	Quarterly Certified Pond Inspection reports were submitted electronically to the Division on 4/19/18, 8/10/18, 11/2/18, and 2/4/19 for the 1st through 4th quarters, respectively.
Other:		

OPERATOR COMMENTS

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

COMMITMENTS AND CONDITIONS

The Permittee is responsible for ensuring annual technical commitments in the Mining and Reclamation Plan and conditions accepted with the permit are completed throughout the year. The Division has identified these commitments below and has provided space for you to report what you have done during the past year for each commitment. If additional written response is required, it should be filed as an attachment to this report.

Title: WASTE ROCK SAMPLING

Objective: To document chemical characteristics and support reclamation plan using less than four feet of cover and to protect surface and groundwater.
Frequency: During periods of deposition at the waste rock site.
Status: Quarterly sampling, one sample per 2000 tons hauled to the disposal site.
Reports: Annual report
Citation: Chapter 4, Section 4.4, page 4-30 and 1988 Soils Guidelines Table 6

OPERATOR COMMENTS

Lab Analysis report S1901036 for the six (6) samples collected (WRS-1 through WRS-6) during 2018 are attached to this report.

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

Title: RAPTOR SURVEYS

Objective: To monitor known nest locations and identify new raptor nests that could be impacted from subsidence or new surface facilities. Damaged nests will be replaced immediately with an artificial structure in consultation with DWR.
Frequency: Annually and according to the Division's Raptor Survey Guidelines
Status: Ongoing
Reports: As Available
Citation: Chapter 4, Section 4.18, page 4-103

OPERATOR COMMENTS

The 2018 raptor and other wildlife surveys for drill sites, subsidence areas, and potential other surface facilities are located in attached . pdf file titled, "2018 Drill Site Report".

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

Title: MACROINVERTEBRATE SURVEYS
Objective: To determine if mining and mining related activities are impacting Eccles Creek.
Frequency: Conduct studies in the fall for two consecutive years then two years off.
Status: Surveys due 2019/2020
Reports: Annual
Citation: Appendix A-3, Volume 2, Volume 1A, Section 2.8, pages 2-70-2-71C Section 2.8, Table 2.8-1a

OPERATOR COMMENTS

Macroinvertebrate surveys are scheduled for 2019.

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

Title: FISH SURVEY
Objective: To determine if mining and mining related activities are impacting fish in Eccles Creek.
Frequency: In the fall every three years.
Status: Survey due 2019
Reports: Every three years
Citation: MRP, Volume 1A, Section 2.8, page 2-71d

OPERATOR COMMENTS

Fish surveys are scheduled for 2019.

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

Title: SUBSIDENCE MONITORING
Objective: To document the amount of subsidence that has occurred.
Frequency: Annually
Status: Ongoing
Reports: Annual Update of Drawing 4.17.3-1 and digitized area survey information and results of on the ground visual inspection.
Citation: Chapter 4, page 4-97 thru 4-99a

OPERATOR COMMENTS

The Cumulative Subsidence 1982 - 2018 map is attached. Note that since aerial flights are conducted in the summer not all of the 2018 potential subsidence is documented. Visual ground inspections of the 2018 full extraction mining areas was done in September-October in conjunction with water monitoring; no hazardous conditions were observed during the inspections.

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

Title: SUBSOIL SAMPLING AT WASTE ROCK SITE

Objective: To provide chemical characteristics of purchased subsoil.
Frequency: Once. Sample purchased subsoil for parameters in Table 1 of the Utah 1988 Guidelines.
Status: Ongoing with contemporaneous reclamation at the waste rock site.
Reports: None specified. Suggest verbal communication with Division and lab analysis to be included in bond release application.
Citation: Volume 3, Section 4.6.4.1, page 4-38a and page 4-38b

OPERATOR COMMENTS

No contemporaneous reclamation was conducted at the Waste Rock site in 2018 and no subsoil was purchased.

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

Title: AGE-MONITORING OF WATER

Objective: To understand the possible sources of groundwater inflows.
Frequency: When inflows of 800 gpm are encountered.
Status: No significant inflows in the North Lease.
Reports: Immediately notify Division
Citation: Volume 1, page 2-35b

OPERATOR COMMENTS

No significant inflows were encountered while conducting mining operations in 2018.

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

Title: SAMPLING PRIOR TO SLURRY PLACEMENT IN ABANDONED UNDERGROUND WORKINGS

Objective: Protection of groundwater
Frequency: Every 450 feet of advance
Status: Report if placed slurry in abandoned underground workings.
Reports: Notification if parameters are out of compliance with Guidelines for Topsoil and Overburden.
Citation: Volume 2, Incorporation of 97K-1 and Section 1.2 (at the end of section 3.2)

OPERATOR COMMENTS

No slurry was placed in abandoned underground workings in 2018.

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

Title: MONITORING OF REFERENCE AREAS

Objective: Determine condition class of reference site to ensure the site is still appropriate for "reference"
Frequency: During last 2 years of mining leading up to reclamation
Status: Overdue
Reports: Submit evaluation of all reference areas with determination of condition class as established by the NRCS.
Citation: Chapter 4, Page 4-47

OPERATOR COMMENTS

Section 4.7 of the M&RP on pages 4-46 and 4-47 were modified on 8-15-16 to clarify assessing the conditions of the reference areas prior to reclamation. Reference area class conditions will be assessed per the citations on said pages. No NRCS work is necessary and no evaluations are overdue per the current M&RP. Ongoing monitoring of the Reference Areas is not a commitment in the M&RP. Please modify both this section and the section below (Future Commitments and Conditions) to reflect that evaluations of the Reference Areas are not a commitment in the permit.

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

FUTURE COMMITMENTS AND CONDITIONS

The following commitments are not required for the current annual report year, but will be required by the permittee in the future as indicated by the "status" field. These commitments are included for information only, and do not currently require action. If you feel that the commitment is no longer relevant or needs to be revised, please contact the Division.

Title: TOPSOIL SAMPLING

Objective: To determine fertilizer application rate.
Frequency: At final reclamation sample redistributed topsoil for N, P, K, Fe, Mg, Mn, Zn, Ca and pH.
Status: At final reclamation
Reports: None specified. Suggest verbal communication with Division and lab analyses to be included in bond release application.
Citation: Section 4.5, page 4-32

Title: SAMPLING OF WASTE ROCK IN TEMPORARY STOCKPILES

Objective: Protection of surface and groundwater
Frequency: one sample per 2000 tons of temporary stockpiled material if remains in temporary location longer than three months.
Status: Ongoing
Reports: Not specified. Assumed to be the same as disposal site sampling (previous paragraph on same page.)
Citation: Volume 3, page 4-30 and 1988 Soils Guidelines, Table 6

Title: MONITORING OF REFERENCE AREAS

Objective: Determine condition class of reference site to ensure the site is still appropriate for "reference"
Frequency: During last 2 years of mining leading up to reclamation
Status: Ongoing
Reports: Submit evaluation of all reference areas with determination of condition class as established by the NRCS.
Citation: Chapter 4, Page 4-47

REPORTING OF OTHER TECHNICAL DATA

Please list other technical data or information that was not included in the form above, but is required under the approved plan, which must be periodically submitted to the Division.

Please list attachments:

Baseline Riparian Vegetation Reports for Little Swens, Swens, and Upper Huntington creeks are attached as Acrobat files R1Report_SwensRiparian, R2Report_LittleSwensRiparian, and R3Report_UpperHuntingtonRiparian; respectively. The vegetation surveys were conducted as baseline surveys as outlined on page 2-63a1, Section 2.7 of the approved M&RP.

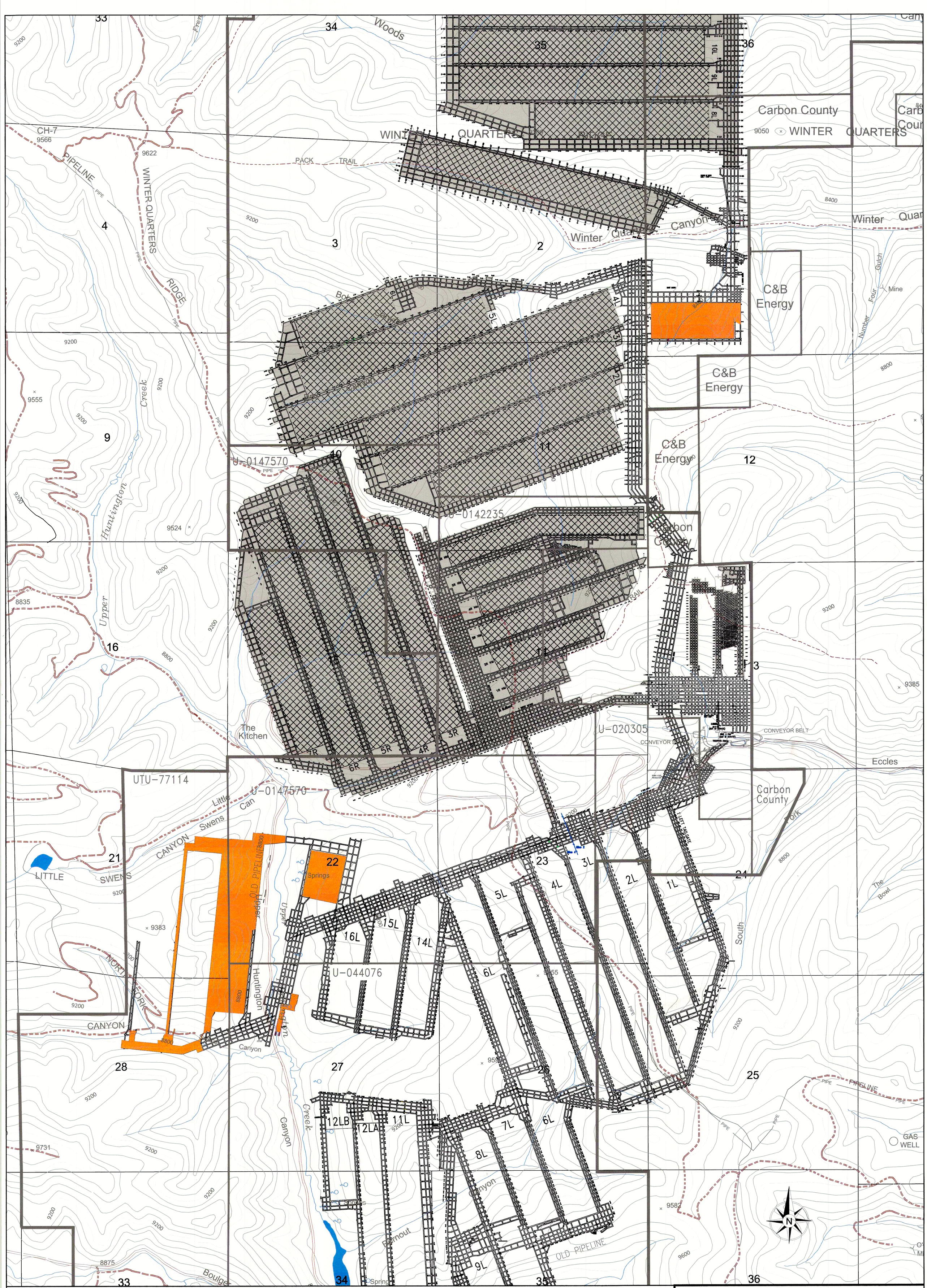
REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements

MAPS

Copies of mine maps, current and up-to-date, are to be provided to the Division as an attachment to this report in accordance with the requirements of R645-301-525.240. The map copies shall be made in accordance with 30 CFR 75.1200 as required by MSHA. Mine maps are not considered confidential.

Map Name	Map Number	Included		Confidential	
		Yes	No	Yes	No
Annual Subsidence Map		☒	☐	☐	☒
2018 As-Mined Map		☒	☐	☐	☒
5-year Mine Plan		☒	☐	☒	☐
		☐	☐	☐	☐
		☐	☐	☐	☐

REVIEWER COMMENTS ☐ Met Requirements ☐ Did Not Meet Requirements



Skyline Mine
As-Mined
2018

Canyon Fuel Company, LLC
Skyline Mines

HCR 35 BOX380, HELPER, UT, 84526 435-448-2632	DATE: 3/28/2019	CK.BY: GGalecki	REVISION: 0
CAD FILE:	SCALE: 1"=1000'	DR.BY: TEarl	
DWG. NO.:			

2018 Wildlife Survey Report

2018 Drill Sites,
Areas of Potential Subsidence,
And
Waterline

Northern Goshawk, other Raptors, and
General Wildlife Surveys

Prepared for:

Skyline Mine
Gregg Galecki
Sr. Environmental Engineer
Canyon Fuel Company, LLC

Prepared By:
Alpine Ecological
HC 80 Box 570
Greenwich, UT 84732

07.31.2018

1.0 Introduction

The following narrative is submitted pursuant to requirements regulating potential impacts to threatened, endangered, candidate and sensitive species and their associated habitats. The following report details the results of the northern goshawk (*Accipiter gentilis*), American three-toed woodpecker (*Picoides dorsalis*), general raptor, and general wildlife surveys conducted for the 2018 Exploration Drilling Program and to meet UDOGM survey requirements over the areas of potential subsidence. Areas of potential subsidence included the surface above panels which are scheduled to be mined in 2018, 2019, and 2020. No other special status species were identified to have suitable habitat within these project areas. The areas surveyed are displayed on the attached maps.

Pre-field research was completed by Alpine wildlife biologists who utilized GIS data from the Utah Division of Wildlife Resources' (UDWR) Utah Threatened, Endangered, and Sensitive Species Occurrences shapefiles and mapping services. The US Fish and Wildlife Services' species by County list was reviewed and a search was conducted in their Information, Planning and Consultation System (IPaC) on May 27th, 2018. Research included species occurrences, historic records, species ecology, life histories, known distributions, and habitat requirements. Coordination with UDOGM and Forest Service Wildlife Biologists was conducted in the spring prior to survey initiation. Survey requirements were discussed and are in accordance with the Northern Goshawk Technical Guide. American three-toed woodpecker surveys were conducted using the same methodology as the Forest Service; conducted along northern goshawk transects in suitable habitat. Northern goshawk protocol surveys, nesting raptor surveys, American three-toed woodpecker, and general wildlife surveys have been conducted in or near the project area by both professional and federal biologists over the past several years.

There are no threatened, endangered, or candidate species known to occur within the project area. State or Federally listed sensitive species which were identified as species of concern included raptors, with emphasis on northern goshawk, golden eagle, and American three-toed woodpecker. The remaining special status species were dismissed from further consideration, as a result of the multiple agency review, because there is no suitable habitat or the project is outside of the species known distribution.

2.0 Project Description

The 2018 wildlife survey area included the following areas: six drill sites 1-18, 2-18, 2-18a, 3-18, 4-18, 5-18, and 7-18 and a 0.5 mile buffer around each drill site (See Attachment 1, 2, and 3); the surface areas above mine panels scheduled to be mined in 2018, 2019, and 2020 (See Attachment 4); and a potential waterline route from the Vent Shaft in Swens Canyon (See Attachment 5). Northern goshawk protocol surveys, general raptor surveys, American three-toed woodpecker, and general wildlife surveys were conducted in and around the areas as displayed on the attached maps.

3.0 General Habitat Overview

The vegetation across the survey area is very diverse and yet somewhat consistent throughout the survey area. Vegetation is dependent on elevation, slope, and available water resources. Riparian areas are dominated by typical high elevation riparian species.

The bottoms of the valleys that are drier are dominated by mountain big sagebrush and silver sagebrush communities. South and East facing slopes, at higher elevations are dominated by quaking aspen communities. However, there are some areas that are open on South and East facing slopes. These open areas are typically grass and tall forb communities. However, a significant number of the open areas are dominated by false hellebore. The North and West facing slopes are dominated by conifer communities. The tree species within the conifer community are mostly dead or dying, and most areas have an abundance of deadfall due to beetle infestations. Because of the deadfall and dead trees the forbs and grasses within the conifer communities are very diverse and most areas have a solid understory. The tops of the ridges in the survey area vary with some being dominated by shrub communities such as mountain big sagebrush, elderberry or chokecherry while others are dominated by grass and tall forb communities. Some of the ridge tops are dominated by cluster tarweed.

4.0 Methodology

Northern Goshawk broadcast acoustical surveys were conducted following U.S. Department of Agriculture (USDA) Forest Service, 2006, Northern Goshawk Inventory and Monitoring Technical Guide pp.3.13-15. Using GIS, survey transects were established 250 meters apart throughout the survey area which extended 0.5 miles beyond the project footprint. Broadcast calling stations were then established every 200 meters along each transect. Calling stations were then overlaid on aerial imagery in a GIS and call stations not located in suitable habitat were removed from the survey. Upon arrival at each broadcast calling station, the surveyor looked and listened before broadcasting the pre-recorded alarm calls. Utilizing FoxPro game calls, pre-recorded northern goshawk alarm calls were broadcast for approximately 10 seconds followed by 30 seconds of looking and listening. After turning 120 degrees the sequence was then repeated. Once the sequence of 10 seconds of calling and 30 seconds of looking and listening was completed 3 times and no response was elicited the surveyor then repeated the sequence before moving to the next calling station. Surveys were timed in accordance to the survey requirements outlined in the 2006 Technical Guide and were based on local knowledge of nesting chronologies in the area and coordination with the US Forest Service. Additionally, surveyors searched for foraging raptors between calling stations when vantage points were available.

American three-toed woodpecker surveys are conducted simultaneously with the northern goshawk survey. Biologists listened for drumming activity while at the call stations and inventoried for three-toed woodpeckers in suitable habitat while walking linear transects between call stations. This methodology is also commonly used by the USFS.

General wildlife surveys include the identification of general terrestrial wildlife species and were conducted along transects between call stations. The results of the general survey are listed at the beginning of Section 5.

5.0 Survey Results

Species observed during the course of the inventories included, but are not limited to, red-tailed hawk (*Buteo jamaicensis*) (REHA), common raven (*Corvus corax*) (CORA),

dark-eyed junco (*Junco hyemalis*), brown creeper (*Certhia americana)*, black-capped chickadee (*Poecile atricapillus*), Stellar's jay (*Cyanocitta stelleri*), red-naped sapsucker (*Sphyrapicus nuchalis*), Clark's nutcracker (*Nucifraga columbiana*), American robin (*Turdus migratorius*), mountain chickadee (*Poecile gambeli*), ruby-crowned kinglet (*Regulus calendula)*, white-crowned sparrow (*Zonotrichia leucophrys)*, western tanager (*Piranga ludoviciana)*, tree swallow (*Tachycineta bicolor)*, Townsend's solitaire (*Myadestes townsendi)*, Rocky Mountain elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), and MacGillivray's warbler (*Geothlypis tolmiei*).

Information such as species, call station observed, and type of observation (e.g., aural (A) or visual (V)) were documented for species of concern; other species listed were observed and listed herein for reference only.

Table 1 summarizes the results of the survey by call station, raptor species, and type of observation. Only key observations are summarized. Common raven (CORA) observations are not listed in Table 1.

Station#	Survey	Aural	Visual	Species	Notes
188	1		X	REHA	REHA soaring to the E
778	1		X	GHOW	GHOW flying from tree. No nest located.
518	1		X	REHA	REHA seen soaring to the S
550	1		X	REHA	REHA soaring S of call station 150 yards.
452	1	X	X	REHA	REHA pair seen hiking to call station. Did not respond to to call.
444	1		X	REHA	REHA soaring over Flat Canyon
445	1		X	REHA	REHA soaring over Flat Canyon
446	1		X	REHA	REHA soaring over Flat Canyon
613	1		X	Unknown	Unknown raptor couldn't see through the trees.
710	1		X	Unknown	Raptor soaring down drainage, could not identify through trees, REHA?
744	1		X	REHA	REHA soaring to the east
465	1		X	OSPR	Osprey over bulger res. Flying E to Electric Lake
685	1	X	X	TUVU	Turkey Vulture soaring to the North
526	1		X	REHA	REHA responded to call down slope a long distance.
496	1		X	REHA	REHA responded to call down slope a long distance.
501	1		X	CORA, REHA	CORA and REHA both seen flying down canyon.
576	1	X	X	REHA	REHA Pair soaring to the NE
574	2		X	REHA	REHA soaring to the E
498	2	X	X	REHA	REHA soaring over

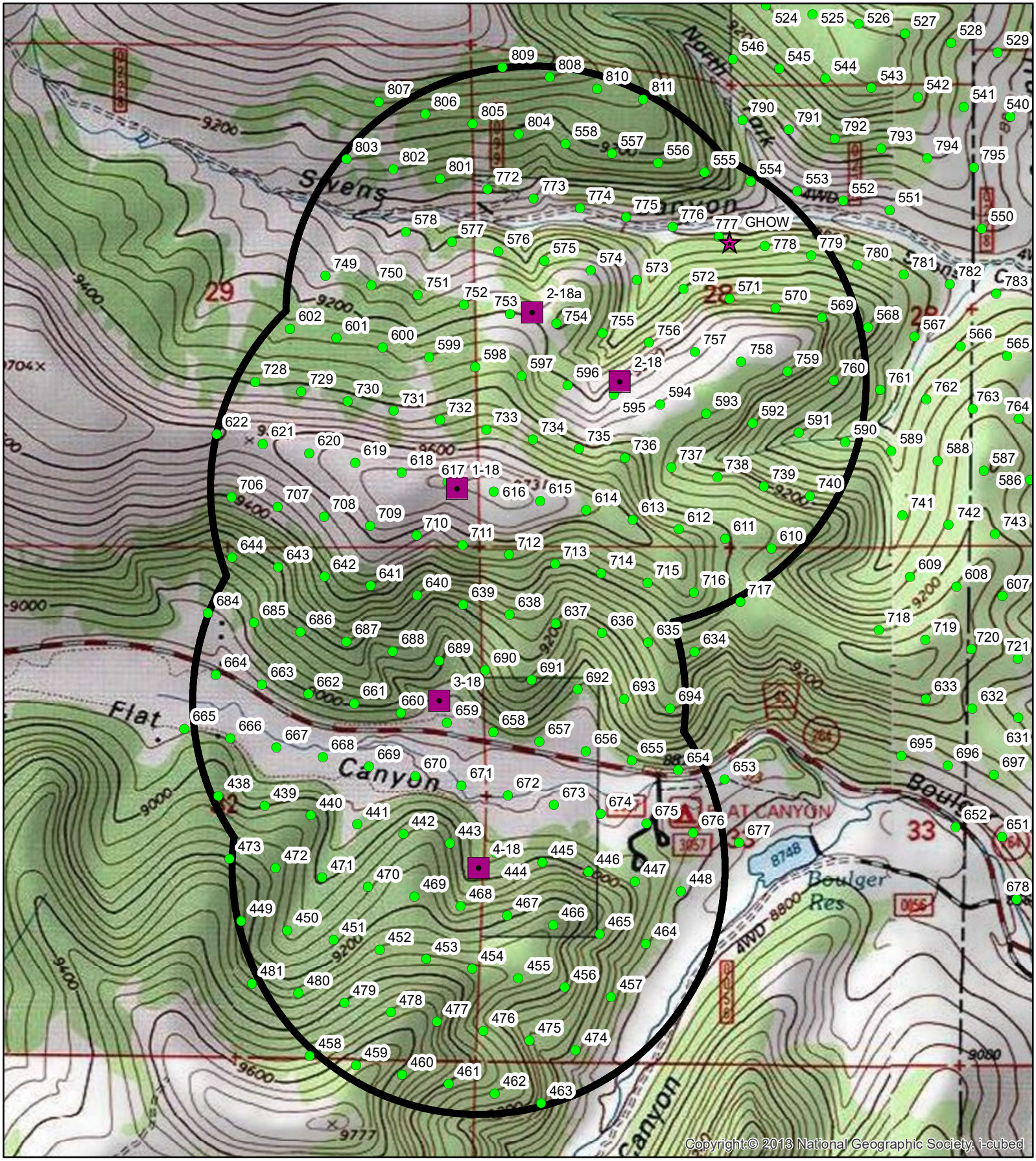
516	2	X	X	REHA	REHA soaring over call station
459	2		X	REHA	REHA responded to call, stopped calling.
449	2		X	REHA	Soaring over call station to the N. Territory defense display, might have territory in area. Observed until out of sight.

During the first survey, at call station 603 biologist elicited a response from a northern goshawk to the east in Burnout Canyon. Biologist searched for the individual for over two hours using a combination of calling and listening for a response. The individual became less responsive as it moved to the east. Biologists did not locate a nest during the initial nest search. The Burnout Canyon northern goshawk territory was determined to be active by FS biologists; monitoring conducted by the FS was a part of their annual monitoring surveys. The territory is east of the survey area and shaded from drilling activity by topography. During the second inventory some call stations were not called to reduce potential effects on the nesting pair from conducting the survey.

Golden eagle activity was observed multiple times during both the first and second surveys. Most of the activity was observed in Flat and Huntington Canyons. Individuals were observed soaring over the open areas as listed in the results table. Red-tailed hawks were observed on multiple occasions and are listed in the results table. One great-horned owl was documented at UTM 12 S 0477959-4390417. The individual flew from a snag tree to the south east. The nest search was conducted around the snag tree but was unsuccessful.

There were no American three-toed woodpeckers observed during either survey. There were no other special status species observed during either survey.

The drilling areas are classified by the Utah Division of Wildlife Resources as crucial elk calving and mule deer fawning areas. Both elk calves and mule deer fawns were observed during the course of the inventory.



2018 Survey Results

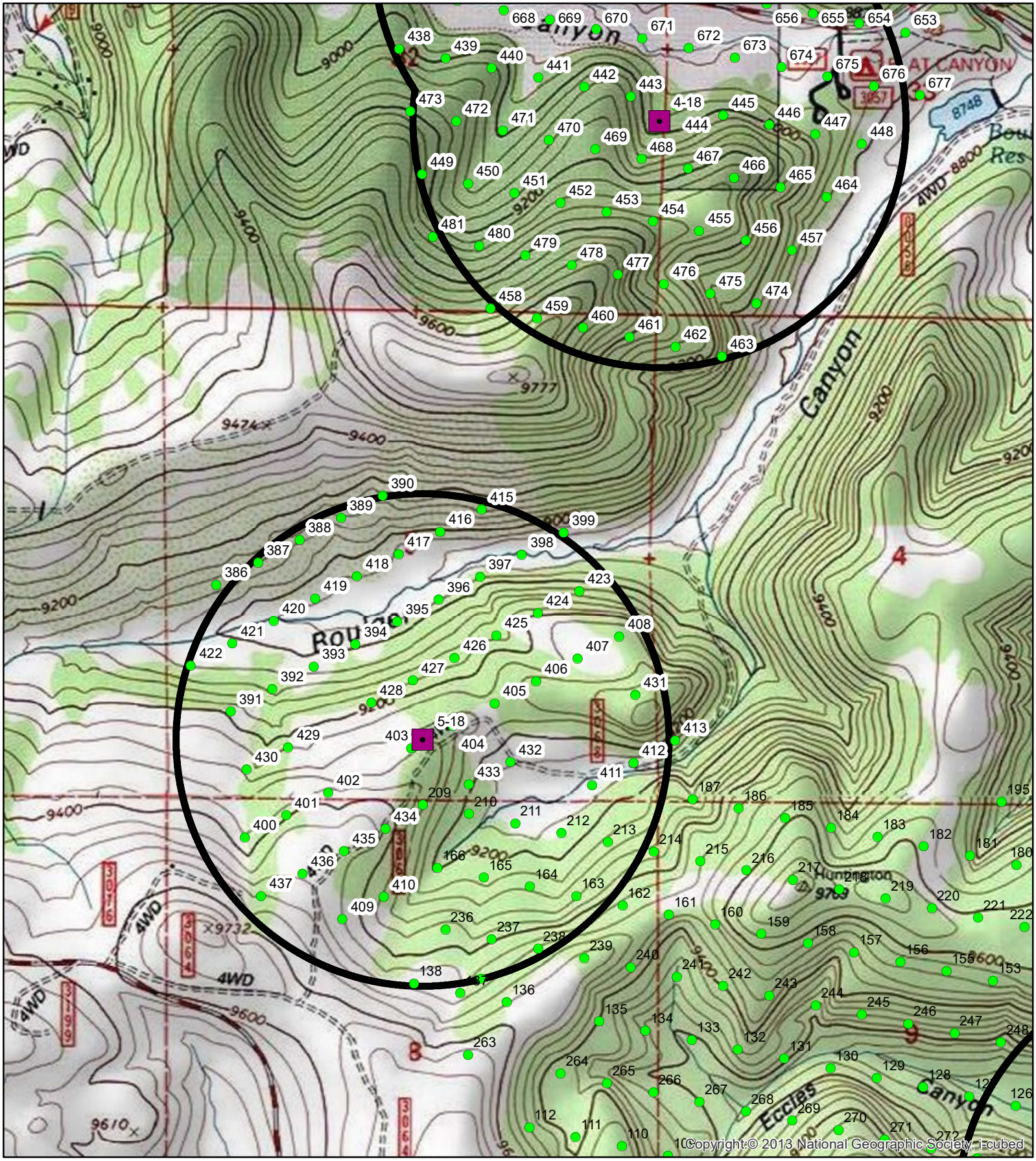
2018 Drill Sites

2018 Call Stations

0.5 Mile Buffer

N
W E
S

2018 Drill Sites
Attachment 1



2018 Survey Results

2018 Drill Sites

2018 Call Stations

0.5 Mile Buffer

N
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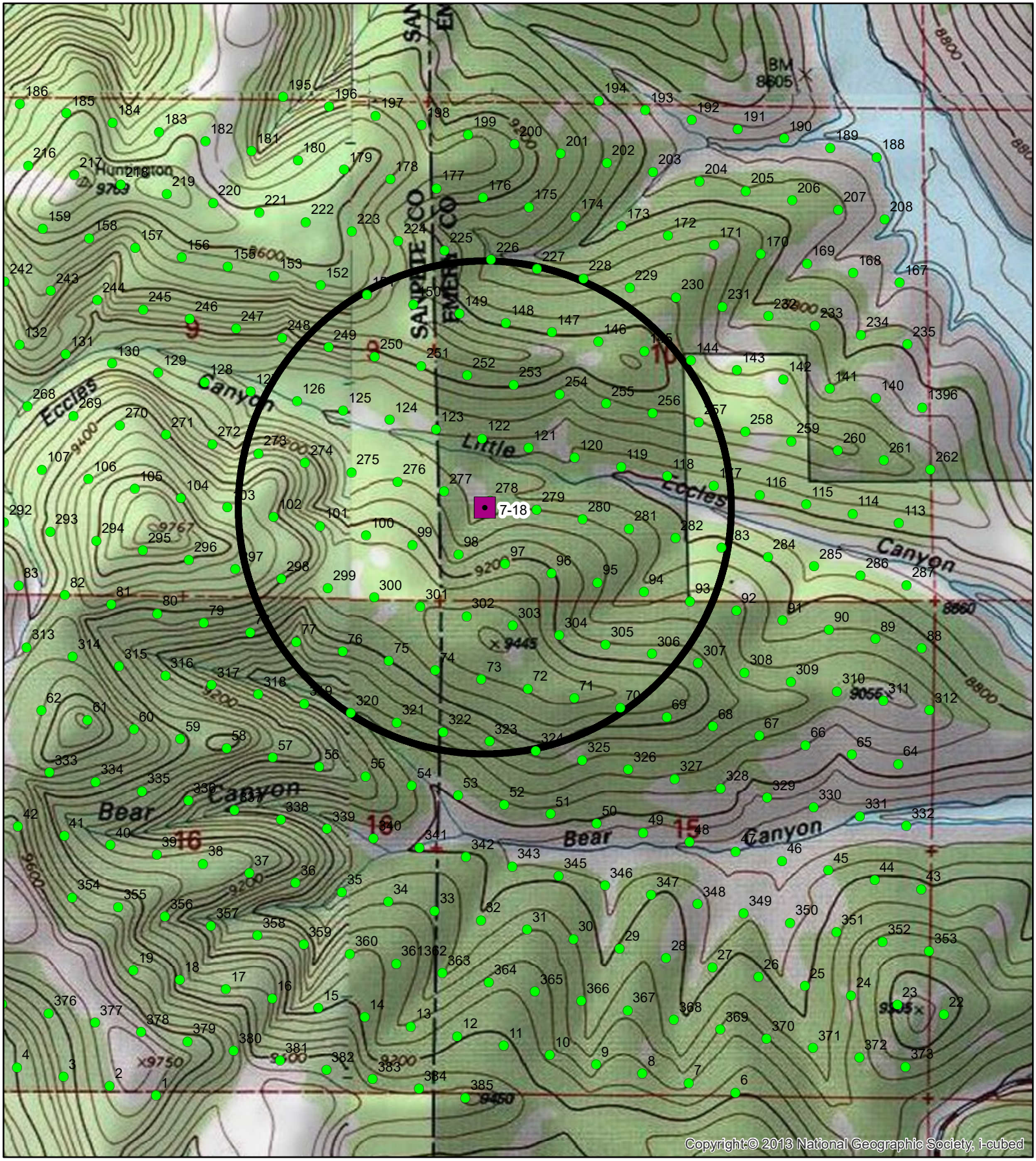
2018 Drill Sites
Attachment 2



2018 Survey Results

2018 Drill Sites

2018 Call Stations

0.5 Mile Buffer

N
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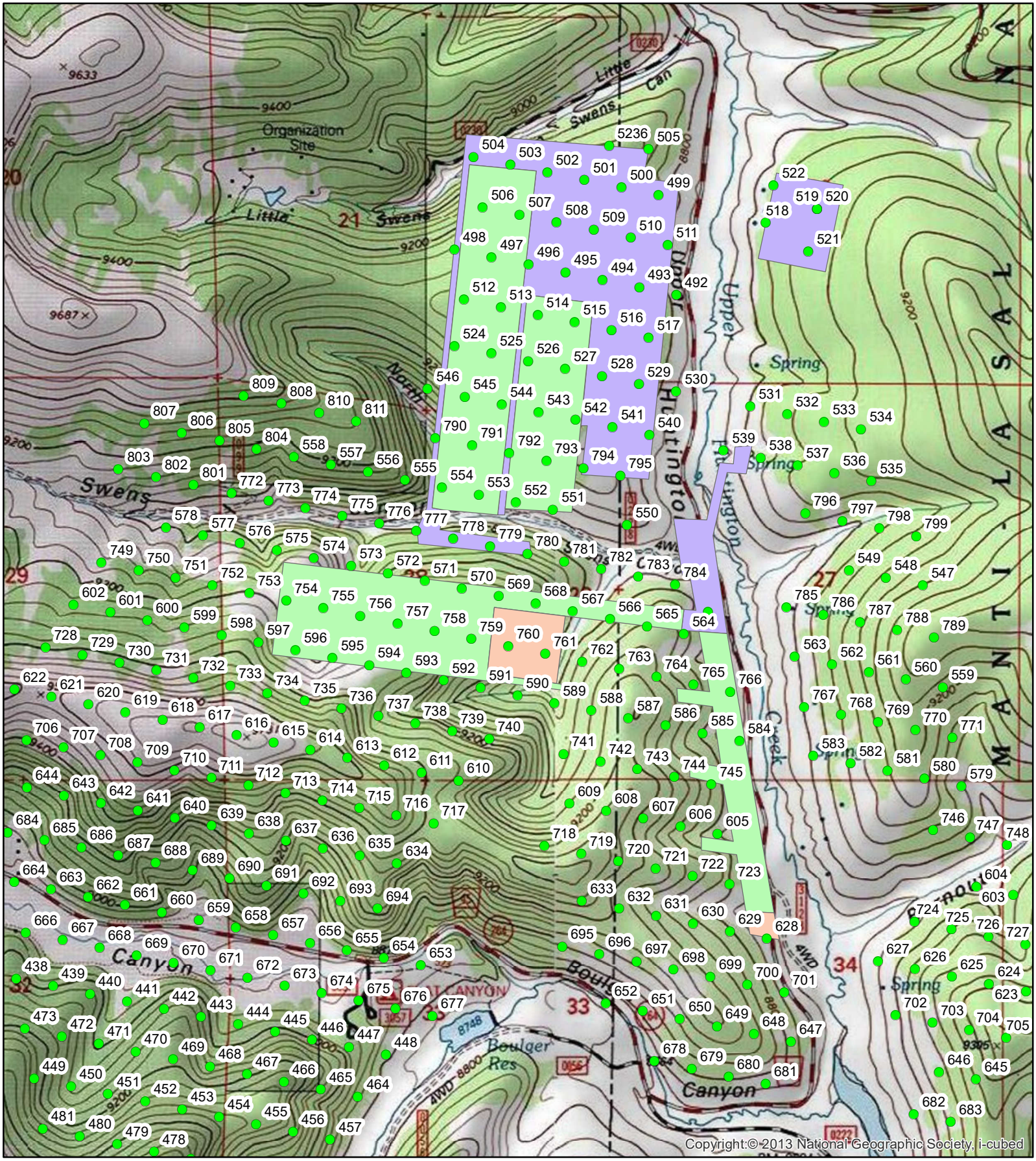
2018 Drill Sites
Attachment 3



2018 Call Stations

Mine Plan Year

- 2018
- 2019
- 2020

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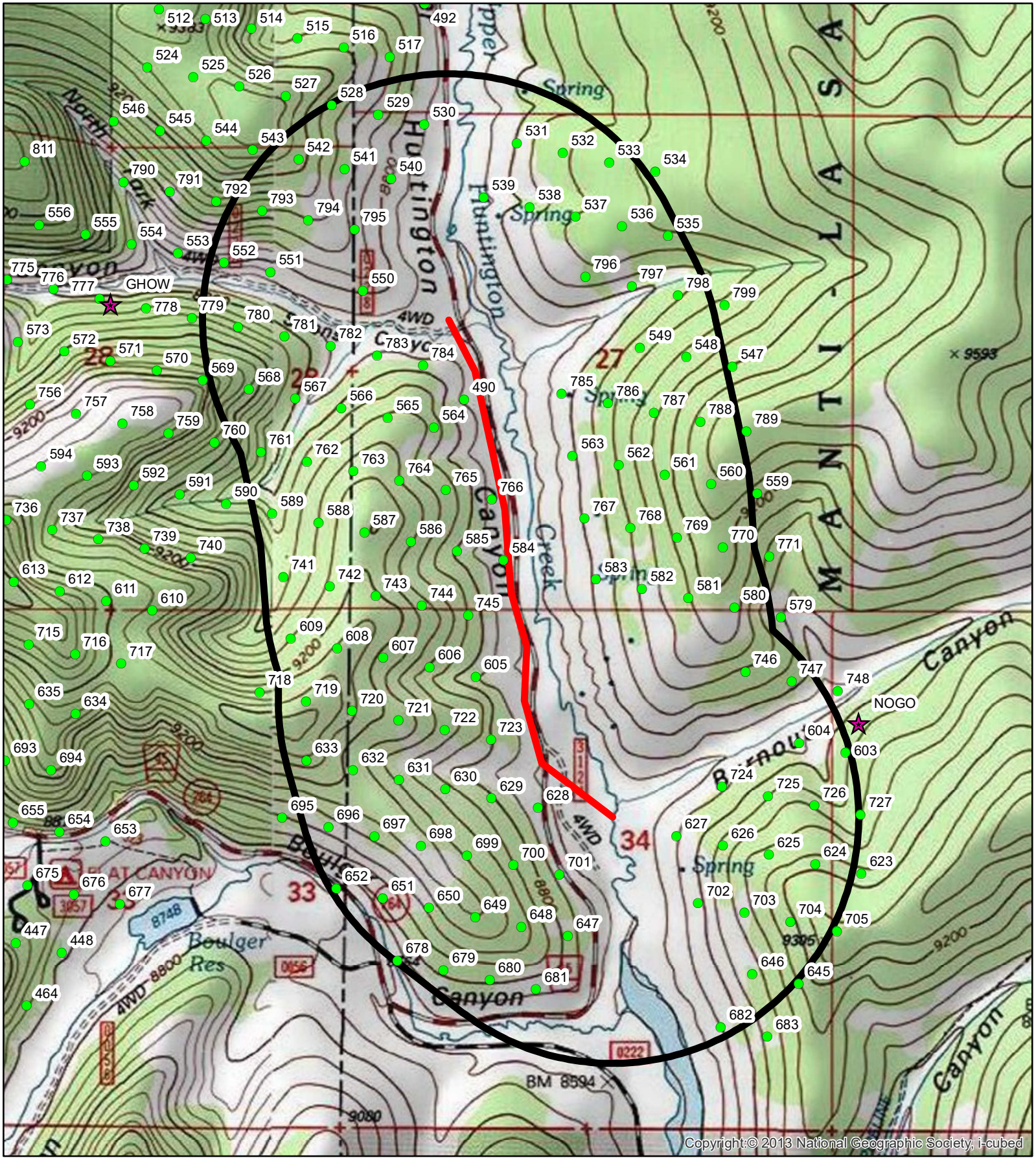
2018 Areas of Potential Subsidence Survey Attachment 4



2018 Survey Results

2018 Call Stations

0.5 Mile Buffer

Waterline Route

N
W E
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2018 Waterline Route
Attachment 5

PROJECT NAME: Skyline Mine Seismic Stations

DATE: 08/31/2018

PROPOSED ACTION:

Skyline Mine proposes to install up to 6 seismic monitoring stations in the areas near Huntington Creek, Flat Canyon and Swens Canyon in Sanpete County, Utah. Stations will be installed using primarily hand tools. The proposed locations are generally by roads or easily accessible from a nearby road.

PURPOSE AND NEED FOR ACTION:

The purpose of this project is it provide Skyline Mine with the ability to conduct seismic monitoring on a site specific scale which will provide more accurate data and result in more informed decisions.

LOCATION:

The project is located in both Sanpete and Emery County, Utah. The legal description is Sec. 16, 17, 20, 22, 29, 33 Township 13 S., Range 6 E., Salt Lake Meridian (see attached maps).

RANGER DISTRICT: FERRON/PRICE RANGER DISTRICT

COUNTIES: SANPETE and EMERY

EXISTING CONDITIONS:

The vegetation across the survey area is very diverse and yet somewhat consistent throughout the survey area. Vegetation is dependent on elevation, slope, and available water resources. Riparian areas are dominated by typical high elevation riparian species. The

bottoms of the valleys that are drier are dominated by mountain big sagebrush and silver sagebrush communities. South and East facing slopes, at higher elevations are dominated by quaking aspen communities. However, there are some areas that are open on South and East facing slopes. These open areas are typically grass and tall forb communities. However, a significant number of the open areas are dominated by false hellebore. The North and West facing slopes are dominated by conifer communities. The tree species within the conifer community are mostly dead or dying, and most areas have an abundance of deadfall due to beetle infestations. Because of the deadfall and dead trees the forbs and grasses within the conifer communities are very diverse and most areas have a solid understory. The tops of the ridges in the survey area vary with some being dominated by shrub communities such as mountain big sagebrush, elderberry or chokecherry while others are dominated by grass and tall forb communities. Some of the ridge tops are dominated by cluster tarweed.

Special status species which may occur within the project area were identified using the Fish and Wildlife Service's IPaC system, the INTERMOUNTAIN REGION (R4) THREATENED, ENDANGERED, PROPOSED, AND, SENSITIVE SPECIES dated June 2016, and GIS Special Status Species shapefiles. Installation of the seismic stations is scheduled for the Fall of 2018, outside of the nesting, breeding, or flowering season of any of the listed special status species. Surface disturbance is expected to be minimal at each site through the primary use of hand tools.

The following tables list the Endangered, Threatened and Sensitive species of fish, wildlife, and plants that are known to (or may) occur on the Manti-La Sal National Forest in Emery County, Utah. Depending on the specific project, the scope, magnitude and effects this checklist will be considered as documentation for assessment of these TE &S species. Determinations for each species are documented by an "X" in the appropriate block. There is also a table listing the Manti-La Sal National Forest Management Indicator Species and Migratory Birds that will serve as a Wildlife Resources Report.

Biologists and botanists have reviewed this project, used available information on species distributions and habitat (using one or more of the following: topo maps, aerial photos, field reconnaissance, previous surveys), and then assessed the potential for impacts for all federal listed and Region 4 sensitive species. If the project was determined to have **no effect** or **no impact,** this determination was based on one or more of these criteria:

1. Habitat for the species is not present in the project area.
2. Habitat for the species is present but the species does not occur in this area.
3. Habitat for the species is present, the species occurs or may occur in the project area, but the project would not have any direct, indirect or cumulative effects on this species.

Matrix Legend

Federally Listed Species
NE - No Effect
NLAA - May Affect, Not Likely to Adversely Affect
LAA - May Affect, Likely to Adversely Affect

Forest Service Sensitive Species
NI - No Impact
MIIH - May Impact Individuals or their Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing or Loss of Population Viability
WIFV - Will Impact Individuals or Their Habitat That May Contribute To a Trend Towards Federal Listing or Cause A Loss of Population Viability

Status
T - Federally Listed As Threatened
PT – Federally Listed As Proposed Threatened
E - Federally Listed As Endangered
C - Federal Candidate Species
S - Regional Sensitive Species
R – Recovery

MAP

Seismic Stations

N
W E
S

2018 Seismic Stations Skyline Mine

Table 1 Listed and candidate plant, wildlife, and fish species that could occur on National Forest System Land in the project area.

A. PLANT SPECIES				
SPECIES	**STATUS**	**DETERMINATION**	**SPECIES DESCRIPTION AND EFFECTS**	**COUNTY LIST**
Jones Cycladenia ***Cycladenia humilis var. jonesii***	T	NE	*Cycladenia humilis var. jonesii* is restricted to the canyon-lands of the Colorado Plateau in Emery, Grand, Garfield and Kane counties, as well as in immediately adjacent Arizona, Coconino County. Occurs in eriogonum-ephedra, mixed desert shrub, and juniper communities at elevations ranging from 4400 ft. – 6000 ft. in Central Emery County, Utah (off-Forest) (Welsh et al. 2003). Often on steep slopes in gypsiferous soils derived from the Summerville, Cutler, and Chinle formations (Franklin 2005, Welsh et al. 2003). This species is not found on the Manti -La Sal N.F.; therefore, the Seismic Station Project will have **No Effect** on the Jones cycladenia or its habitat.	Emery
B. TERRESTRIAL WILDLIFE SPECIES				
SPECIES	**STATUS**	**DETERMINATION**	**SPECIES DESCRIPTION AND EFFECTS**	**COUNTY**
California Condor ***Gymnogyps californianus***	E	NE	California condors are opportunistic scavengers, feeding only on carcasses. Typical foraging behavior includes long distance reconnaissance flights, lengthy circling flights over a carcass, and hours of waiting at a roost or on the ground near a carcass (USDI, U.S. Fish and Wildlife Service 1996). The Vermilion Cliffs release site is on the southwestern corner of the Paria Plateau Coconino County, Arizona. This project is not within foraging distance from the release site; therefore, the Seismic Station Project will have **No Effect** on the California condor or its habitat.	Sanpete, Emery

Mexican Spotted Owl *Strix occidentalis*	T	NE	In Utah, the Mexican spotted owl nests in steep-walled, complex rock canyons at relatively low elevations (USDI, U.S. Fish and Wildlife Service 2004). There is no suitable habitat within the project area; therefore, the Seismic Station Project will have **No Effect** on the Mexican spotted owl or its habitat.	Sanpete, Emery
Western Yellow-Billed Cuckoo *Coccyzus americanus*	PT	NE	In Utah, nesting habitats are found at elevations between 2,500 to 6,000 feet. They appear to require large tracts (100 to 200 acres) of contiguous riparian nesting habitat (Parrish et al. 2002). There is no suitable habitat within or near the project area; therefore the Seismic Station Project will have **No Effect** on the yellow-billed cuckoo or its habitat.	Sanpete, Emery
C. AQUATIC WILDLIFE SPECIES				
SPECIES	**STATUS**	**DETERMINATION**	**SPECIES DESCRIPTION AND EFFECTS**	**COUNTY LIST**
Bonytail *Gila elegans*	E	NE	Historically, the bonytail existed in warm water reaches of larger rivers in the Colorado River Basin; it is considered to be adapted to pools and eddies of mainstream rivers. It has been extirpated from most of its historic range. Currently, a small number of wild adults exist in Lake Mohave in the Lower Colorado River Basin, and there are small numbers of wild individuals in the Green River and in sub basins of the Upper Colorado River Basin (USDI, U.S. Fish and Wildlife Service 2002). The project will not affect down stream flows; therefore, the Seismic Station Project will have **No Effect** on the bonytail or its habitat.	Emery
Colorado Pikeminnow *Ptychocheilus lucius*	E	NE	The Colorado pikeminnow is endemic to the Colorado River Basin, and it historically extended from the Green River in Wyoming, to the Gulf of California; it was widespread and abundant in warm-water rivers and tributaries. It is a long-distance migrator (hundreds of kilometers to and from spawning areas). Adults require deep pool and eddie habitats in streams that have high spring flows. Currently, in Utah this species occurs in the Green River from Lodore Canyon to the confluence of the Colorado River (USDI, U.S. Fish and Wildlife Service 2002a). The proposed project has not and will not affect down stream flows; therefore, the	Emery

			Seismic Station Project will have **No Effect** on the Colorado Pikeminnow or its habitat.	
Humpback Chub ***Gila cypha***	E	NE	The humpback chub is restricted to deep, swift mainstream and large tributaries in relatively inaccessible canyons of the Colorado River Basin. Adults require eddies and sheltered shorelines in streams that maintain high spring flows that flush sediments from spawning areas and form gravel deposits used for spawning. Young require low-velocity shoreline habitats. Currently, there are six known extant populations, which are located in the Upper Colorado River, Yampa River and Little Colorado River (USDI, U.S. Fish and Wildlife Service 2002b). The project has not and will not affect down stream flows; therefore, the Seismic Station Project will have **No Effect** on the humpback chub or its habitat.	Emery
Razorback Sucker ***Xyrauchen texanus***	E	NE	Historically the razorback sucker was widely distributed in warm-water reaches of the Colorado River and its tributaries from Wyoming to Mexico. Adults require deep pools, eddies and backwaters in spring; shallow water associated with sandbars in summer; and low velocity pools and eddies in winter. Young require quiet, warm, shallow water found at tributary mouths, and in coves or shorelines in reservoirs. Currently, within the Upper Colorado River Basin this species is only found in small numbers in the middle Green River, between the confluence of the Duchesne and Yampa rivers, and in the lower reaches of those two tributaries (USDI, U.S. Fish and Wildlife Service 2002c). The proposed project has not and will not affect down stream flows; therefore, the Seismic Station will have **No Effect** on the razorback sucker or its habitat.	Emery

Table 2 Intermountain Regional Forester's list of sensitive plant, wildlife, and fish species that could occur on the Manti Division Of the Manti-La Sal National Forest (MLNF)

A. PLANT SPECIES			
SPECIES	**STATUS**	**DETERMINATION**	**SPECIES DESCRIPTION AND EFFECTS**
Arizona Willow *Salix arizonica*	S	NI	*Salix arizonica* occurs in wet meadows along perennial streams and occurs only in the Muddy Creek drainage on the MLNF (NatureServe 2015, UNPS 2015, and USDA, NRCS 2015). There are no known occurrences of this species in or near the project area; therefore, the Seismic Station Project will have **No Impact** on the Arizona willow or its habitat.
Canyon Sweet-vetch *Hedysarum occidentale var. canone*	S	NI	*Hedysarum occidentale var. canone* is found on sites with a high water table, near springs or stream beds within the pinyon/juniper vegetation type at 5,500 to 7,000 ft. elevations. River birch and squaw brush are associated species. It is endemic to Duchesne, Carbon and Emery Counties (NatureServe 2015, UNPS 2015, and USDA NRCS 2015). URPG 2015 states it can be found in pinyon/juniper, service berry, maple, mountain mahogany, and sagebrush communities 6,400-8,300 feet. There are no known occurrences of this species in the proposed project area; therefore, the Seismic Station Project will have **No Impact** on the canyon sweet-vetch or its habitat.
Carrington Daisy *Erigeron carringtoniae*	S	NI	*Erigeron carringtoniae* occurs in limestone outcrops and escarpments in subalpine vegetation type on wind-blown ridge tops and snowdrift sites at high elevations of the Wasatch Plateau (9,000 to 11,000 feet) (UNPS 2015, USU 2015, USDA NRCS 2015). There are no known occurrences of this species in the proposed project area; therefore, the Seismic Station Project will have **No Impact** on the Carrington daisy or its habitat.
Creutzfeldt-flower *Cryptantha creutzfeldtii*	S	NI	*Cryptantha creutzfeldtii* occurs in shallow, rocky, heavy silty-clay soils; on Mancos shale slopes. It is endemic to central Utah in Carbon, Emery, and Sevier Counties (Franklin 2005) at 5,000 to 6,500 ft. elevations. It grows in scattered piñon-juniper communities with an understory of black sagebrush and/or *Atriplex* (NatureServe 2015, UNPS 2015, USDA NRCS 2015, and USU 2015). There are no known occurrences of this species in the proposed project area; therefore, the Seismic Station Project will have **No Impact** on the Creutzfeldt-flower or its habitat.

Link Trail Columbine ***Aquilegia flavescens rubicunda***	S	NI	*Aquilegia flavescens* var. *rubicunda* occurs near spring seeps and perennial wetland sites within the Mesa Verde group of sandstones near coal seams on the east side of the Wasatch Plateau in Emery, Garfield, and Sevier Counties (NatureServe 2015, UNPS 2015, USDA NRCS 2015 URPG 2015). There are no known occurrences of this species in the proposed project area; therefore, the Seismic Station Project will have **No Impact** on the Link Trail columbine or its habitat.
Maguire Campion ***Silene petersonii***	S	NI	*Silene petersonii* is endemic to Garfield, Iron and Sanpete counties in ponderosa pine, aspen, and spruce-fir communities on Flagstaff Limestone and Claron Formation, mainly at plateau margins from 7,000 - 11,300 ft. Occurs at high elevations on open calcareous and igneous soils (Welsh et al. 2003, NatureServe 2015, UNPS 2015, USU 2015, and USDA, Natural Resource Conservation Service 2015). There are no known occurrences of this species in the proposed project area; therefore, the Seismic Station will have **No Impact** on the Maguire campion or its habitat.
Musinea Groundsel ***Senecio musiniensis***	S	NI	*Senecio musiniensis* is endemic to Sanpete county on ridge tops of Flagstaff Limestone, barrens and talus slopes at Musinea Peak and on the margins of the Wasatch Plateau from 9,700 -10,800 ft. (Welsh et al. 2003, NatureServe 2015, UNPS 2015, USDA, Natural Resource Conservation Service 2015). There are no limestone barrens or talus slopes in the project area. There are no known occurrences of this species in the proposed project area; therefore, the Seismic Station Project will have **No Impact** on the Musinea groundsel or its habitat.
B. TERRESTRIAL WILDLIFE SPECIES			
SPECIES	**STATUS**	**DETERMINATION**	**SPECIES DESCRIPTION AND EFFECTS**
Bald Eagle ***Haliaeetus leucocephalus***	S	NI	Bald eagle nests are typically located in multi-storied (uneven-aged) coniferous forest stands that contain elements of old growth structure, and are located near bodies of water that support prey species. Nest trees are generally one of the largest trees in the stand, which provides a good view of the surrounding area (Spahr et al. 1991). There is suitable fall/winter habitat near the project area but this project will not remove or disturb large roost trees which may be used by individual wintering eagles; therefore, the Seismic Station Project will have **No Impact** on the bald eagle or its habitat.

Bighorn Sheep ***Ovis Canadensis*** – Includes **Rocky Mountain bighorn** (***O. c. canadensis***), **California bighorn** (***O. c. californiana***), and **desert bighorn sheep** (O. c. nelsoni).	S	NI	*Ovis Canadensis nelsoni* occurs in open rocky areas of desert mountain ranges in the southwestern United States and northern Mexico. A native Utah species, the desert bighorn sheep can be found in the southern (especially southeastern) area of the state (UDNR, 2015). The closest populations are within the San Rafael Swell, approximately 30 miles from the project area. *Ovis canadensis canadensis* is native to rugged mountainous areas of western North America. The species has been eliminated from much of its former range due to over-hunting, habitat alterations, and diseases introduced by domestic livestock (UDNR, 2015). In Utah, Rocky Mountain bighorn sheep can now be found in a number of mountain ranges. Rocky Mountain bighorn sheep prefer steep rocky slopes, and may migrate from higher elevations to lower valleys in the winter. The closest populations are located in the Book Cliff Mountains, more than 40 miles from the project area. *Ovis canadensis californiana* historically inhabited portions of the Great Basin in Nevada and Idaho. Although it is not known conclusively whether or not California bighorns inhabited Utah, recent studies indicate there is no genetic or taxonomic distinction between Rocky Mountain and California bighorns (UDWR 2015). There is some evidence to suggest that it was once native to Utah. In recent times, a population of California bighorn sheep has been established by the UDWR and the Utah Division of Parks and Recreation (UDPR) on Antelope Island, in the Great Salt Lake (UDWR 2013). This population is located more than 60 miles from the gravel pit. This species is not near the project area therefore, the Seismic Station Project will have **No Impact** on bighorn sheep.
Flammulated owl ***Otis flammeollus***	S	NI	Flammulated owls are associated with mature pine or mixed conifer forests with a ponderosa pine and/or Douglas-fir component. No suitable habitat would be removed as a result of this project; therefore, the Seismic Station Project will have **No Impact** on the flammulated owl or its habitat.
Greater Sage Grouse ***Centrocercus urophasianus***	S	NI	Sage grouse are generally found where there are large tracts of sagebrush habitat with a diverse and substantial understory of native grasses and forbs or in areas where there is a mosaic of sage brush, grasslands, and aspen. Wet meadows, springs, seeps, or other green areas within sagebrush shrublands are generally needed for the early brood-rearing period (Connelly et al. 2004). There is no suitable habitat affected by the proposed project. Although portions near the project area are currently mapped as priority habitat, that delineation was conducted at a very broad-scale In this case; field visits, research, and knowledge of this area has indicated that it is not suitable habitat and is not occupied by sage grouse. Therefore, the Seismic Station Project will have **No Impact** on the greater sage

			grouse or its habitat.
Northern goshawk ***Accipiter gentilis***	S	NI	In Utah, most nests can be found in mid-elevation sites occupied by quaking aspen or coniferous forest (Graham et al. 1999). Northern goshawks migrate to lower elevations during the winter months. There is suitable habitat near the proposed project area, however this project will not impact nesting or foraging habitat; therefore, the Seismic Station Project will have **No Impact** on the northern goshawk or its habitat.
Peregrine Falcon ***Falco peregrinus***	S	NI	Peregrine falcons most commonly occupy habitats which contain cliffs for nesting and more open country for foraging. There is no preference to certain vegetation types (White et al. 2002). There is suitable foraging habitat near the project; however, the quality of the habitat is low based on the proximity to a high use, well-traveled FSR. Therefore, the Seismic Station Project will have **No Impact** on the peregrine falcon or its habitat.
Spotted Bat ***Euderma maculatum***	S	NI	In Utah, the spotted bat is likely found throughout the state. It is known to use a variety of vegetation types from approximately 2,500 to 9,500 feet, including riparian, desert shrub, spruce-fir, ponderosa pine, montane forests and meadows (Oliver 2000). Spotted bats roost alone in rock crevices high up on steep cliff faces. There is suitable roosting habitat near the gravel pit. This project may impact foraging habitat; however, the impact would be minimal based on the size of the project, the availability of foraging habitat throughout the forest, and limited use of the project area. Therefore the Seismic Station Project will have **No Impact** on Spotted Bat
Three-toed Woodpecker ***Picoides tridactylus***	S	NI	Three-toed woodpeckers use forests containing spruce, grand fir, ponderosa pine, tamarack, and lodge-pole pine. There is no suitable habitat for three-toed woodpeckers within the project area; therefore, the Seismic Station Project will have **No Impact** on the three-toed woodpecker or its habitat.
Townsend's Big-eared Bat ***Plecotus townsendii pallescens***	S	NI	Townsend's big-eared bats use buildings, caves, and mines as day roosts, night roosts, and maternity roosts. In Utah, wintering habitats of this species is better known than any other bat species, where it is well known as a hibernator in Utah utilizing caves and mines as hibernaculum (Oliver 2000). This species uses a variety of habitat in Utah including: desert scrub, pinyon/juniper, sagebrush, mountain brush, mixed forest, and ponderosa pine. No habitat will be affected by the proposal. Therefore, will have **No Impact** on Townsend's Big-eared Bat.

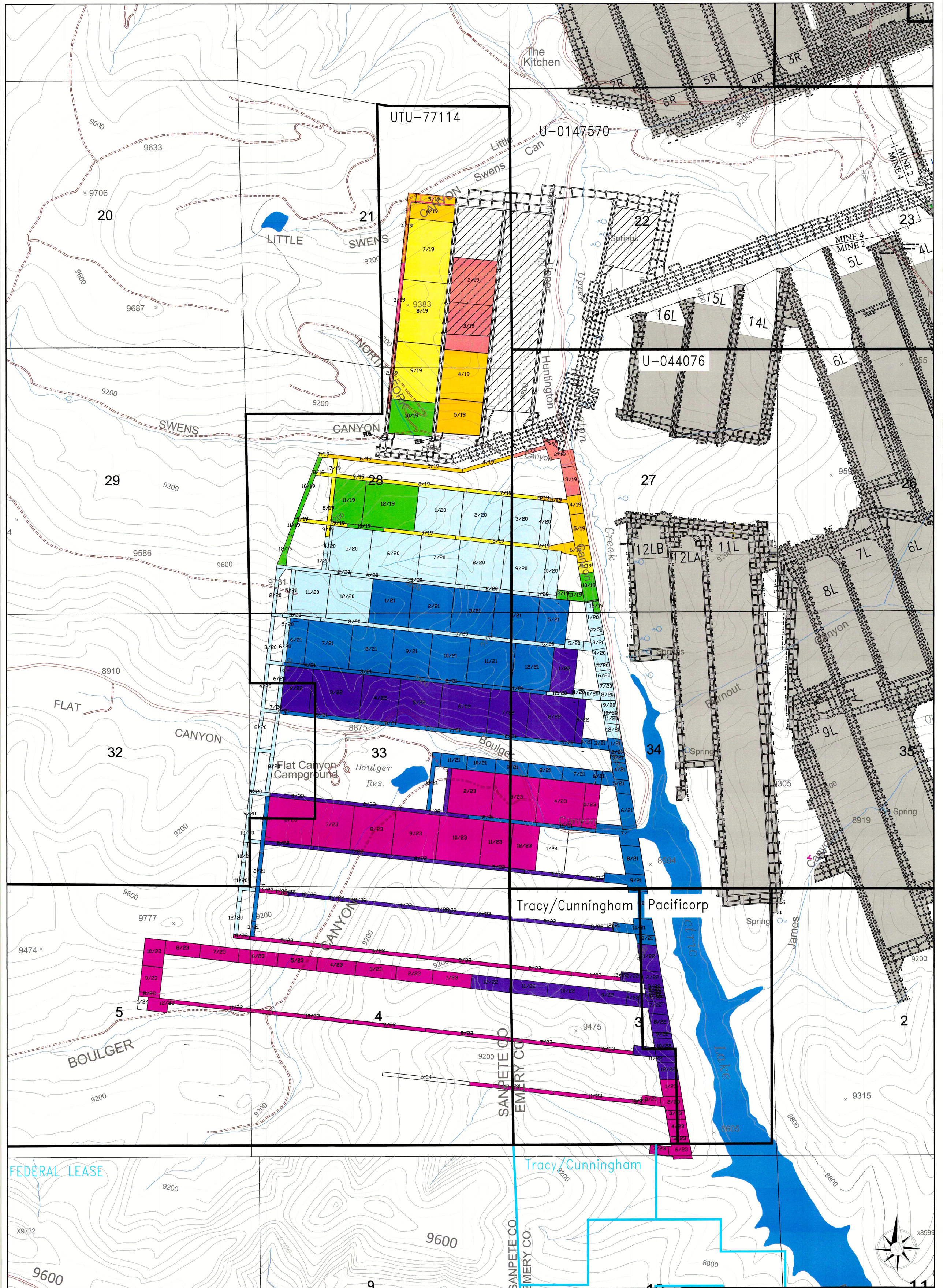
C. AQUATIC WILDLIFE SPECIES			
SPECIES	**STATUS**	**DETERMINATION**	**SPECIES DESCRIPTION AND EFFECTS**
Bonneville Cutthroat Trout *Oncorhynchus clarki utah*	S	NI	Bonneville cutthroat trout (BVCT) range from high-elevation streams with coniferous and deciduous riparian trees to low-elevation streams in sage-steppe grasslands containing herbaceous riparian zones to lakes. BVCT primarily occur in small headwater streams and slow, deep water with vegetated stream banks which provide shade, and bank stability (NatureServe 2015). There are no streams on or near the land occupied by the gravel pit and the proposed project will not affect BCT; therefore, the Seismic Station Project will have **No Impact** on the Bonneville cutthroat trout or its habitat.
Colorado River Cutthroat Trout *Oncorhynchus clarki pleuriticus*	S	NI	Colorado River cutthroat trout (CRCT) require cool, clear water with well vegetated stream banks which provide cover, shade, and bank stability. CRCT tend to occupy headwater stream areas, especially when other trout species are present (NatureServe 2015). There are no streams on or near the land occupied by the gravel pit; therefore, the Seismic Station Project will have **No Impact** on the Colorado River cutthroat trout or its habitat.
Columbia Spotted Frog *Rana luteiuentris*	S	NI	Spotted frogs are most commonly found in cold, still, permanent water in such habitats as marshy edges of ponds or lakes, in algae-grown overflow pools of streams, and near flat-water springs with emergent vegetation. The Columbian spotted frog may move considerable distances from water after breeding, often frequenting mixed conifer and sub alpine forests, grasslands, and brush lands of sage and rabbit brush. There is no suitable habitat in or near the project area; therefore, the Seismic Station Project will have **No Impact** on the Columbian spotted frog or its habitat.
Southern Leatherside Chub *Leidomeda aliciae*	S	NI	Southern leatherside chubs inhabit desert streams of the Bonneville Basin. Southern leatherside chubs require flowing water and do not persist in lakes or reservoirs. Southern leatherside chub have been documented in three 4th level HUCs (Hydrologic Unit Code) in the Utah Lake drainage and six 4th level HUCs in the Sevier River Drainage (UDWR 2009). There are no streams near the project area containing leatherside chub; therefore, the Seismic Station Project will have **No Impact** on the Southern Leatherside Chub or its habitat.
Western Boreal Toad *Bufo boreas boreas*	S	NI	The western boreal toad inhabits western Canada and much of the western (especially northwestern) United States. It occurs throughout most of Utah, and can be found in a variety of habitats, including slow moving streams, wetlands, desert

			springs, ponds, lakes, meadows, and woodlands (UDNR 2015). There is no suitable habitat in or near the project area; therefore, the Seismic Station Project will have **No Impact** on the western boreal toad or its habitat.

Table 3 Manti-La Sal National Forest Management Indicator Species (MIS)

SPECIES	STATUS	DETERMINATION	COMMENTS
Golden Eagle *Aquila chrysaetos*	MIS	NI	Golden eagles generally inhabit mountainous or hilly terrain, but can also be found in valleys and western plains, especially during migration and winter. They generally nest on cliffs, but they also nest in trees. Golden eagles hunt over open country for small mammals, snakes, birds and carrion. Surveys for nesting raptors have been conducted in and around the project area for multiple years. There were no documented golden eagle nest sites near the project area.
Macro-invertebrates Aquatic Insects	MIS	NI	Macro-invertebrates (aquatic insects) are ecological indicator species in aquatic habitats. Habitat requirements for aquatic macroinvertebrates vary with species; habitat requirements for any one species are very specific. Many macro-invertebrates are the larval form of flying insects such as mayflies, stonflies, and caddisflies. There is no suitable aquatic habitat affected by the Seismic Station Project.
Mule Deer *Odocoileus hemionus*	MIS	NI	Mule deer use a wide array of habitat types and exhibit seasonal movement (elevational migration) in response to snow cover. There is no identified key or general winter range within the gravel pit. This area does seem to serve as transition range for big game, moving from higher elevations in the late fall to lower winter ranges in the winter with a return in the early spring. Movements depend on snowfall amounts. There will be no impacts to big game as installation will be conducted during the Fall 2018 outside of crucial fawning season.
Rocky Mountain Elk Cervus canadensis	MIS	NI	Elk tend to occupy the higher elevation aspen and mixed conifer habitats from spring through early fall, and move to lower elevation mixed shrub, pinyon/juniper, and sagebrush habitats for winter. There is no identified key or general winter range within the gravel pit. This area does seem to serve as transition range for big game, moving from higher elevations in the late fall to lower winter ranges in the winter with a return in the early spring. Movements depend on snowfall amounts. There will be no impacts to big game as installation

			will be conducted during the Fall 2018 outside of crucial calving season.



TIMING LEGEND

- 1st QUARTER 2019
- 2nd QUARTER 2019
- 3rd QUARTER 2019
- 4th QUARTER 2019
- 2020
- 2021
- 2022
- 2023

LICENSED PROFESSIONAL GEOLOGIST
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STATE OF UTAH

—8100— Topo

Lease

Skyline Mine
5 Year Plan
2019 Budget

Canyon Fuel Company, LLC
Skyline Mines

HCR 35 BOX380, HELPER, UT, 84526 435-448-2632	DATE: 3/27/19	CK.BY: GGalecki	REVISION: 0
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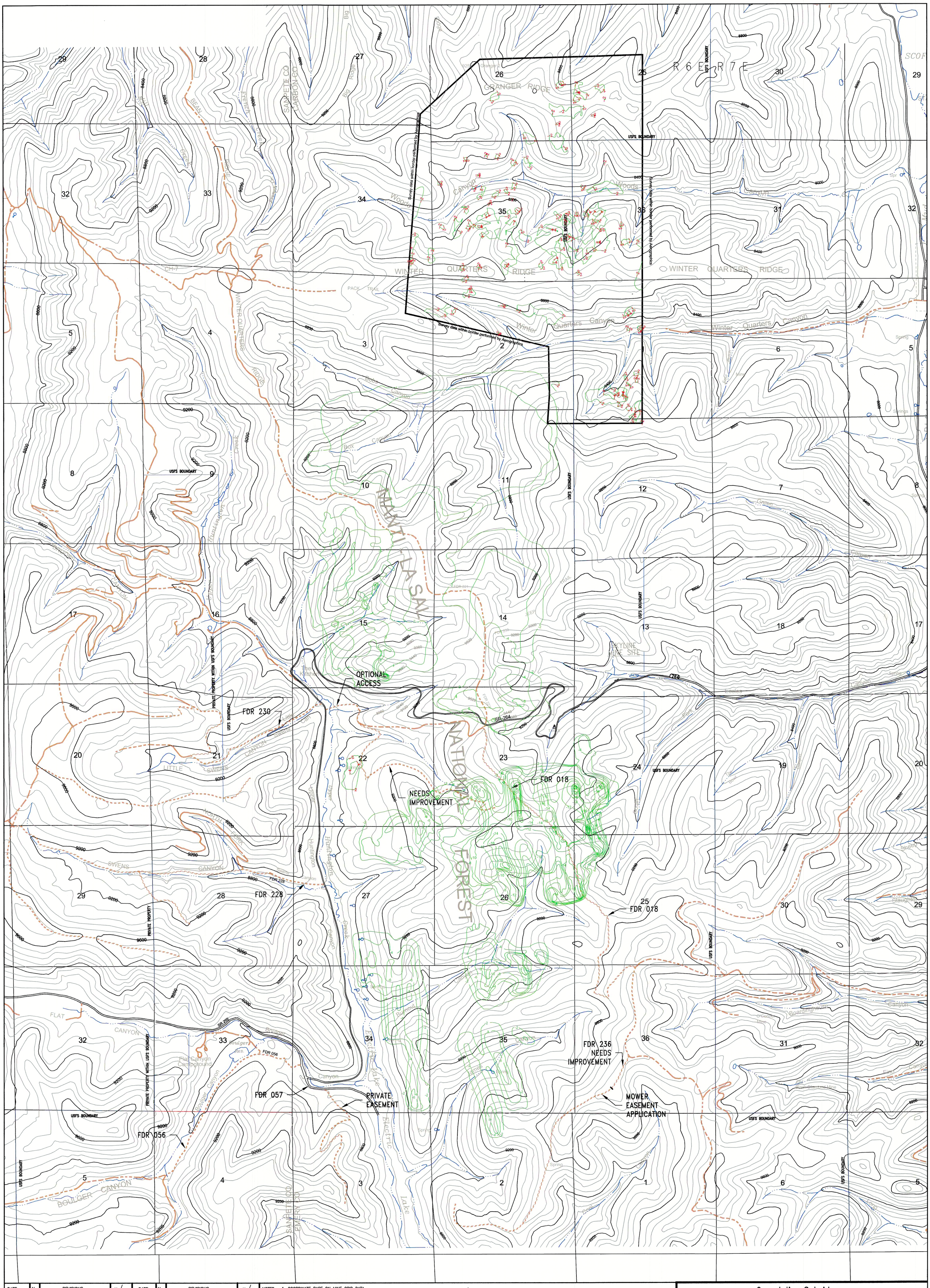

DATE	No.	REVISIONS	DR./CHKD.	DATE	No.	REVISIONS	DR./CHKD.
MARCH 06	1	2005 SUBSIDENCE	GAG/GAG	MARCH 13	8	2012 SUBSIDENCE	GAG/GAG
MARCH 07	2	2006 SUBSIDENCE	GAG/GAG	MARCH 14	9	2013 SUBSIDENCE	JCA/GAG
JUNE 08	3	2007 SUBSIDENCE	KMC/GAG	MARCH 15	10	2014 SUBSIDENCE	JCA/GAG
MAY 09	4	2008 SUBSIDENCE	ARB/GAG	MARCH 16	11	2015 Prelim. SUBSIDENCE	GAG/GAG
MARCH 10	5	2009 SUBSIDENCE	ARB/GAG	MARCH 17	12	2016 SUBSIDENCE	GAG/GAG
MARCH 11	6	2010 SUBSIDENCE	GAG/GAG	MARCH 18	13	2017 SUBSIDENCE	TWE/GAG
MARCH 12	7	2011 SUBSIDENCE	GAG/GAG	MARCH 19	14	2018 SUBSIDENCE	TWE/GAG

-2
-2
SUBSIDENCE CONTOUR

NOTES:
1. COORDINATE BASE ON MINE GRID DATA.
2. MAP DIGITIZED FROM 1:24000 USGS QUADRANGLE MAPS, SCOFIELD, UTAH AND FAIRVIEW LAKES, UTAH.
3. MINE FACILITY, CONVEYOR, AND NEW ECCLES CANYON ROAD LOCATIONS FROM EXISTING RECORD DATA AND INCORPORATED TO MAP IN BEST FIT LOCATIONS.
4. UTM GRID TICK VALUES SHOWN ARE IN METERS.
5. Subsidence within black border performed by Aerographics

BASE PREPARED BY INTERMOUNTAIN AERIAL SURVEYS, SALT LAKE CITY, UTAH – M96147

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W E
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3000" 1500" 0' 1500" 3000"

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3-29-19
STATE OF UTAH

Cumulative Subsidence
1982–2018

Canyon Fuel Company, LLC
Skyline Mines

HCR 35 BOX380, HELPER, UT, 84526 435-448-2632	DATE: 3/27/19	CK.BY: GGalecki	REVISION: 14
CAD FILE:	SCALE: 1"=1500"	DR.BY: TEarl	3/27/19
DWG. NO.: Cumulative Subsidence 2018			

Skyline Mine
Riparian Analysis of Swens Canyon

Report Prepared By

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July 2018

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Introduction

The purpose for conducting riparian studies is to understand the plant composition and ecological state of a riparian ecosystem. This data can be used to understand how riparian ecosystems change over time. The data collected in these surveys do not only give a picture of the riparian ecosystem at the time the data is collected, but the results can be compared to data collected in the future to help scientists and managers understand the effects of management practices on a riparian community over time.

Three types of data are collected on each site (vegetation cross section, green line, woody species). Using the data collected, the following results are obtained: Plant composition, greenline successional status, greenline bank stability and woody species density.

Skyline Mine is a coal mine with its surface facilities located about 4 miles southwest of the town of Scofield in Carbon County, Utah. The riparian area studied is located approximately 3 miles southwest of the surface facilities of the mine. The elevation of the riparian area is 8,766 feet above sea level.

Methods

Sampling Standards

Methodologies used for this analysis were performed in accordance with vegetation guidelines and standard found in "Monitoring the Vegetation Resources in Riparian Areas" (General Technical Report RMRS-GTR-47) by Alma H. Winward. In July of 2018, quantitative and qualitative data were collected in the Swens Canyon riparian communities so that results can be used to determine how or if management practices affect the riparian ecosystem over time.

Sampling Methodology for Vegetation Cross-Section Composition

Each riparian complex is usually composed of a number of community types. This procedure is designed to quantify the percent of each community type in a particular riparian area. This data can then be used to determine how much change occurs in the riparian system.

Five (5) step transects were established perpendicular to the grade in the riparian complex. The 5 transects were placed randomly to best represent the entire complex. The number of steps in each transect is determined by the width of the riparian community at each transect. Community type composition is obtained by counting the

number of steps encountered for each vegetative type in all five transects divided by the total number of steps taken in all five transects. The GPS coordinates for the beginning and ending points for each transect can be found in Appendix 6. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Sampling Methodology for Greenline Composition and Function

Each riparian complex is usually composed of a number of community types. Using the compositional values obtained in greenline sampling provides a good indication of a streambank's ability to buffer the hydrologic forces of moving water. Since the greenline is located where the forces of water are greatest, a greenline measurement can provide an indication of health of the total watershed above the point of sampling.

One (1) 726' greenline transect was established randomly within the cross-section transects in the Swens Canyon riparian area. This provides a more complete evaluation of the streamside and valley bottom health within a given complex. Greenline transects begin on the right-hand side of the stream looking downsteam and proceeds down the greenline using a step transect methodology. Vegetative communities are identified and the number of steps of each community type are recorded for 363' on each side of the stream. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Sampling Methodology for Woody Species Density and Regeneration

Woody species in a riparian community usually indicates that the riparian system is healthy and will resist the buffering effects of water.

Measurement of woody species were made by counting the number of woody species from the middle of the stream to 3' outside the greenline of the stream. This is done along the same transect used for the greenline measurements so 363' is measured on each side of the stream. When a woody species is encountered the species was determined as well as the age class of the individual plant. The age classes uses were, sprout, young mature, decadent and dead as described in Woodward's publication. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Photographs and Map

A google earth map was created with start and end points of each cross-section transect and the starting point of the greenline transect (Appendix 6). In addition photographs were taken of each cross-section transect and the greenline transect (Appendix 5).

Threatened, Endangered, Candidate and Sensitive Species

The inventory of federally listed threatened, endangered and candidate plant species for Emery and Sanpete Counties was consulted prior to field work. Both Emery and Sanpete County lists were consulted because the riparian site is close to the Sanpete/Emery County line. In addition the State of Utah, Department of Natural Resource's biodiversity database and the USDA Forest Service Intermountain Region's list of proposed, endangered, threatened and sensitive species for the Manti portion of the Manti-La Sal National Forest was consulted for possible impacts by the proposed project. If applicable, this information would be used to drive species of concern field surveys if any of the species or habitats were found on or near the riparian area being sampled.

Results

Swens Canyon riparian area is located on a stream that runs from west to east in Swens Canyon (Appendix 5).

The plant composition for the cross-section and greenline transects are found in Appendix 1 and 2. The data obtained in this riparian system indicates that the system is in a mid succsisional state and has a moderate stability rating as described in Winward. The woody species found were Drummond's willow (*Salix drummondiana*) and Narrowleaf Willow (*Salix exigua*). The number of woody individuals in age classes of each species are found in Appendix 3.

Endangered, threatened, candidate and sensitive plant species know to occur in Sanpete and Emery counties were not found in the sampled riparian community.

Threatened, Endangered, Candidate and Sensitive Species

The following is a table of potential endangered, threatened, candidate and sensitive plant species know to occur in Sanpete and Emery Counties. Next to each species name information is provided about the likelihood of occurrence for each species in the Swens Canyon riparian area.

Federally listed endangered, threatened, candidate and sensitive species for Emery and Sanpete County.	
Endangered	
Pediocactus despainii (San Rafael cactus)	This species is found in open pinyon-juniper communities at 6,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Schoenocrambe barnebyi (Barnaby reed-mustard)	This species is found in mixed shadscale, eriogonum and ephedra communities at 5,600-5,700 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species
Sclerocatus wrightiae (Wright fishhook cactus)	This plat is found on the Mancos Shale Formation in salt desert shrub to juniper communities at 4,790-6,120 ft. elevation. The study area is above the elevation range for this species. The vegetative types are very different and there is no Mancos Shale in the study area. The proposed project will not impact this plant species.
Threatened	
Astragalus montii (Heliotrope milk-vetch)	This species is found in alpine on windblown ridges and snowdrift sites at 10,500-11,000 ft. elevation.

	The study areas are below the elevation range for this species. The habitat is different. The know locations of this species are well South of the study area. The proposed project will not impact this plant species
Cycladenia humilis var jonesii (Jones Cyladenia)	This species is found in cool desert shrub and juniper communities at 4,400-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Pediocactus despainii (Despain Footcactus)	This species is found in open piyon-juniper communities at 6,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Townsendia aprica (Last Chance townsendia)	This species is found in salt desert shrub and pinyon-juniper communities in the Arapien and Mancos Shale formations at 6,100-8,000 ft. elevation. The study areas are not found in the Arapien or Mancos Shale formation. The vegetative types are very different.

	The proposed project will not impact this plant species.
Candidate/Sensitive	
Aster kingie var barnebyana (Barneby woody aster)	This species is found in mountain mahogany-oak communities in rock outcrops composed of Precambrian quartzite at 7,345-7,610 ft. elevation. There are not outcrops of Precambrian quartzite in the study areas. The vegetative types are very different. The proposed project will not impact this plant species.
Astragalus consobrinus (Bicknell milkvetch)	This species is found in sagebrush-grassland and pinyon-juniper communities on the Mancos Shale formation at 5,200-9,000 ft. elevation. The study areas are not found in the Mancos Shale formation. The vegetative types are very different. The proposed project will not impact this plant species.
Astragalus subcinereus var. basalticus (Basalt milkvetch or Silver milkvetch)	This species is found in pinyon-juniper and ponderosa communities at 4,520-7,970 ft. elevtation. The vegetative types of the study areas are very different and the know population of this plant are found in southern Emery County. The proposed project will not impact this plant species.

Cryptantha compacta (Mound cryptanth)	This species is found in salt desert shrub and mixed desert shrub communities at 4,950-9,250 ft. elevation. The vegetative types of the study areas are very different. The proposed project will not impact this plant species.
Cryptantha creutzfeldtii (Creutzfeldt-flower)	This species is found in mat atriplex communities on the Mancos Shale formation at 5,250-6,495 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Cymopterus coulteri (Coulter biscuitroot)	This species is found in black sagebrush, shadscale, desert shrub and juniper communites at 4,955-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Erigeron carringtonae (Carrington daisy)	This species is found in medows and escarpment margins at 10,000-11,000 ft. elevation. The study areas are below the elevation range. The proposed project will not impact this plant species.

Erigonoum corymbosum var. smithii (Big Flattop buckwheat or Smith wild buckwheat)	This species is found in purple-sage matchweed, ephedra-Indian ricegrass and rabbitbrush communities at 5,200-5,610 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Festuca dasyclada (Sedge fescue)	This species is found on open slopes and ridges in sagebrush, mountain brush, and juniper communities on the Green River Shale Formation and limestone gravels at 6,990-10,000 ft. elevation. The study areas are in a different formation. The proposed project will not impact this plant species.
Gilia tenuis (Mussentuchit Gilia)	This species is found in pinyon-juniper woodlands. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Hedysarum occidentale var. canone (Canyon sweetvetch or Coal sweetvetch)	This species is found in pinyon-juniper, sagebrush and wash communities at 5,000-8,000 ft. elevation. The study sited have a very different vegetative type.

	The proposed project will not impact this plant species.
Hymenoxys depressa (Low hymenoxys or Depressed bitterweed)	This species is found in ephedra, sagebrush, shadscale and pinyon-juniper communities at 4,400-7,100 ft. elevation. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Hymenoxys helenioides (Helenium hymenoxys or Intermountain bitterweed)	This species is found in mountain brush, sagebrush, aspen and meadow communities at 8,800-10,700 ft. elevation. Know populations of this species are found at quite a distance south and north of the study site. The proposed project will not impact this plant species.
Lygodesmia entrada (Entrada rushpink)	This species is found in mixed desert shrub and juniper communities at 4,400-4,800 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Mentzelia argillosa (Arapien stickleaf)	This species is found in salt desert shrub and pinyon-juniper communities on the Arapien Shale formation at 5,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative

	types are very different. The Arapien Shale formation is not found in the study areas. The proposed project will not impact this plant species.
Mentzelia multicaulis var. librina (Book Cliffs blazing star)	This species is found in sagebrush, rabbitbrush, and pinyon-juniper communities at 6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Penstemon tidestromii (Tidestrom beardtongue)	This species is found in desert shrub, sagebrush, and pinyon-juniper communities at 5,300-8,200 ft elevation. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Penstemon wardii (Ward beardtongue)	This species is found in desert shub, pinyon-juniper, sagebrush, shadescale and greasewood communities on the Arapien Shale formation at 5,495-6,810 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.

Phacelia utahensis (Utah phacelia)	This species is found in salt desert shrub communites on the Arapien Shale Formation at 5,500-5,700 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Psorothamnus polydenius var. jonesii (Jones indigo-bush or glandular indigo-bush)	This species is found in salt desert shrub communities on Mancos Shale formations at 4,820 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Silene petersonii (Maguire campion, Wasatch limestone catchfly or Peterson catchfly)	This species is found in ponderosa pine, rocky mountain juniper, bristlecone pine, spruce-fier, and aspen-sagebrush communities on open calcareous and igneous gravels at 6,955-11,200 ft. elevation. The study sites have no open calcareous and igneous gravels. The proposed project will not impact this plant species.
Sphaeralcea psoraloides (Psoralea globemallow)	This species is found in zuckia ephedra communities at 4,000-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different.

	The proposed project will not impact this plant species.
Talinum thompsonii (Thompson talinum)	This species is found on silicious conglomeratic gravels in pinyon-juniper and ponderosa pine communities at 7,500 ft. elevation. The study sites do not contain any silicious conglomeratic gravels. The proposed project will not impact this plant species.

Appendix 1- Plant Composition of Swens Canyon Riparian Site as Determined from Cross-Section Transects

Swens Canyon 2018	
Community Type	**% Composition**
Achillea millefolium (Common Yarrow)	1
Artemisia cana (Silver Sagebrush)	8
Carex nebrascensis (Nebraska Sedge)	8
Miscellaneous Forb *Hymenoxys hoopesii* (Orange Sneezeweed)	6
Juncus arcticus (Mountain Rush)	26
Poa pratensis (Kentucky Bluegrass)	31
Salix drummondiana (Drummond's willow)	15
Salix exigua (Narrowleaf Willow)	5

Appendix 2- Plant Composition of Swens Canyon Riparian Site as Determined from Greenline Transect

Swens Canyon 2018	
Community Type	**% Composition**
Carex nebrascensis (Nebraska Sedge)	25
Poa pratensis (Kentucky Bluegrass)	20
Potentilla gracilis (Slender Cinquefoil)	1
Salix drummondiana (Drummond's willow)	24
Salix exigua (Narrowleaf Willow)	30

Appendix 3- Woody Species Individuals in Each Age Class

Swens Canyon 2018		
Species	**Age Class**	
	Young/Sapling	**Mature**
Salix drummondiana (Drummond's willow)	3	28
Salix exigua (Narrowleaf Willow)	21	39

Appendix 4- Swens Canyon Riparian Photos

Cross-Section 1

Cross-Section 2

Cross-Section 3

Cross-Section 4

Cross-Section 5

Greenline Photo

Appendix 5- Study Area Map

Swens Canyon Riparian

Appendix 6 - UTM Coordinates Cross-Section Transects and Green Line Starting Point

R11A 12S 478196 E 4390520 N
R11B 12S 478189 E 4390488 N
R12A 12S 478257 E 4390518 N
R12B 12S 478247 E 4390485 N
R13A 12S 478337 E 4390505 N
R13B 12S 478323 E 4390477 N
R14A 12S 478398 E 4390489 N
R14B 12S 478388 E 4390465 N
R15A 12S 478444 E 4390474 N
R15B 12S 478435 E 4390452 N
Greenline 12S 478323 E 4390499 N

Skyline Mine
Riparian Analysis of Little Swens Canyon

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July 2018

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Introduction

The purpose for conducting riparian studies is to understand the plant composition and ecological state of a riparian ecosystem. This data can be used to understand how riparian ecosystems change over time. The data collected in these surveys do not only give a picture of the riparian ecosystem at the time the data is collected, but the results can be compared to data collected in the future to help scientists and managers understand the effects of management practices on a riparian community over time.

Three types of data are collected on each site (vegetation cross section, green line, woody species). Using the data collected, the following results are obtained: Plant composition, greenline successional status, greenline bank stability and woody species density.

Skyline Mine is a coal mine with its surface facilities located about 4 miles southwest of the town of Scofield in Carbon County, Utah. The riparian area studied is located approximately 3 miles southwest of the surface facilities of the mine. The elevation of the riparian area is 8,766 feet above sea level.

Methods

Sampling Standards

Methodologies used for this analysis were performed in accordance with vegetation guidelines and standard found in "Monitoring the Vegetation Resources in Riparian Areas" (General Technical Report RMRS-GTR-47) by Alma H. Winward. In July of 2018, quantitative and qualitative data were collected in the Little Swens Canyon riparian communities so that results can be used to determine how or if management practices affect the riparian ecosystem over time.

Sampling Methodology for Vegetation Cross-Section Composition

Each riparian complex is usually composed of a number of community types. This procedure is designed to quantify the percent of each community type in a particular riparian area. This data can then be used to determine how much change occurs in the riparian system.

Five (5) step transects were established perpendicular to the grade in the riparian complex. The 5 transects were placed randomly to best represent the entire complex. The number of steps in each transect is determined by the width of the riparian community at each transect. Community type composition is obtained by counting the

number of steps encountered for each vegetative type in all five transects divided by the total number of steps taken in all five transects. The GPS coordinates for the beginning and ending points for each transect can be found in Appendix 6. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Sampling Methodology for Greenline Composition and Function

Each riparian complex is usually composed of a number of community types. Using the compositional values obtained in greenline sampling provides a good indication of a streambank's ability to buffer the hydrologic forces of moving water. Since the greenline is located where the forces of water are greatest, a greenline measurement can provide an indication of health of the total watershed above the point of sampling.

One (1) 726' greenline transect was established randomly within the cross-section transects in the Little Swens Canyon riparian area. This provides a more complete evaluation of the streamside and valley bottom health within a given complex. Greenline transects begin on the right-hand side of the stream looking downsteam and proceeds down the greenline using a step transect methodology. Vegetative communities are identified and the number of steps of each community type are recorded for 363' on each side of the stream. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Sampling Methodology for Woody Species Density and Regeneration

Woody species in a riparian community usually indicates that the riparian system is healthy and will resist the buffering effects of water.

Measurement of woody species were made by counting the number of woody species from the middle of the stream to 3' outside the greenline of the stream. This is done along the same transect used for the greenline measurements so 363' is measured on each side of the stream. When a woody species is encountered the species was determined as well as the age class of the individual plant. The age classes uses were, sprout, young mature, decadent and dead as described in Woodward's publication. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Photographs and Map

A google earth map was created with start and end points of each cross-section transect and the starting point of the greenline transect (Appendix 6). In addition photographs were taken of each cross-section transect and the greenline transect (Appendix 5).

Threatened, Endangered, Candidate and Sensitive Species

The inventory of federally listed threatened, endangered and candidate plant species for Emery and Sanpete Counties was consulted prior to field work. Both Emery and Sanpete County lists were consulted because the riparian site is close to the Sanpete/Emery County line. In addition the State of Utah, Department of Natural Resource's biodiversity database and the USDA Forest Service Intermountain Region's list of proposed, endangered, threatened and sensitive species for the Manti portion of the Manti-La Sal National Forest was consulted for possible impacts by the proposed project. If applicable, this information would be used to drive species of concern field surveys if any of the species or habitats were found on or near the riparian area being sampled.

Results

Little Swens Canyon riparian area is located on a stream that runs from west to east in Little Swens Canyon (Appendix 5).

The plant composition for the cross-section and greenline transects are found in Appendix 1 and 2. The data obtained in this riparian system indicates that the system is in a early succsisional state and has a moderate stability rating as described in Winward. The woody species found were Drummond's willow (*Salix drummondiana*). The number of woody individuals in age classes of each species are found in Appendix 3.

Endangered, threatened, candidate and sensitive plant species know to occur in Sanpete and Emery counties were not found in the sampled riparian community.

Threatened, Endangered, Candidate and Sensitive Species

The following is a table of potential endangered, threatened, candidate and sensitive plant species know to occur in Sanpete and Emery Counties. Next to each species name information is provided about the likelihood of occurrence for each species in the Little Swens Canyon riparian area.

Federally listed endangered, threatened, candidate and sensitive species for Emery and Sanpete County.	
Endangered	
Pediocactus despainii (San Rafael cactus)	This species is found in open pinyon-juniper communities at 6,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Schoenocrambe barnebyi (Barnaby reed-mustard)	This species is found in mixed shadscale, eriogonum and ephedra communities at 5,600-5,700 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species
Sclerocatus wrightiae (Wright fishhook cactus)	This plat is found on the Mancos Shale Formation in salt desert shrub to juniper communities at 4,790-6,120 ft. elevation. The study area is above the elevation range for this species. The vegetative types are very different and there is no Mancos Shale in the study area. The proposed project will not impact this plant species.
Threatened	
Astragalus montii (Heliotrope milk-vetch)	This species is found in alpine on windblown ridges and snowdrift sites at 10,500-11,000 ft. elevation.

	The study areas are below the elevation range for this species. The habitat is different. The know locations of this species are well South of the study area. The proposed project will not impact this plant species
Cycladenia humilis var jonesii (Jones Cyladenia)	This species is found in cool desert shrub and juniper communities at 4,400-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Pediocactus despainii (Despain Footcactus)	This species is found in open piyon-juniper communities at 6,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Townsendia aprica (Last Chance townsendia)	This species is found in salt desert shrub and pinyon-juniper communities in the Arapien and Mancos Shale formations at 6,100-8,000 ft. elevation. The study areas are not found in the Arapien or Mancos Shale formation. The vegetative types are very different.

	The proposed project will not impact this plant species.
Candidate/Sensitive	
Aster kingie var barnebyana (Barneby woody aster)	This species is found in mountain mahogany-oak communities in rock outcrops composed of Precambrian quartzite at 7,345-7,610 ft. elevation. There are not outcrops of Precambrian quartzite in the study areas. The vegetative types are very different. The proposed project will not impact this plant species.
Astragalus consobrinus (Bicknell milkvetch)	This species is found in sagebrush-grassland and pinyon-juniper communities on the Mancos Shale formation at 5,200-9,000 ft. elevation. The study areas are not found in the Mancos Shale formation. The vegetative types are very different. The proposed project will not impact this plant species.
Astragalus subcinereus var. basalticus (Basalt milkvetch or Silver milkvetch)	This species is found in pinyon-juniper and ponderosa communities at 4,520-7,970 ft. elevtation. The vegetative types of the study areas are very different and the know population of this plant are found in southern Emery County. The proposed project will not impact this plant species.

Cryptantha compacta (Mound cryptanth)	This species is found in salt desert shrub and mixed desert shrub communities at 4,950-9,250 ft. elevation. The vegetative types of the study areas are very different. The proposed project will not impact this plant species.
Cryptantha creutzfeldtii (Creutzfeldt-flower)	This species is found in mat atriplex communities on the Mancos Shale formation at 5,250-6,495 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Cymopterus coulteri (Coulter biscuitroot)	This species is found in black sagebrush, shadscale, desert shrub and juniper communites at 4,955-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Erigeron carringtonae (Carrington daisy)	This species is found in medows and escarpment margins at 10,000-11,000 ft. elevation. The study areas are below the elevation range. The proposed project will not impact this plant species.

Erigonoum corymbosum var. smithii (Big Flattop buckwheat or Smith wild buckwheat)	This species is found in purple-sage matchweed, ephedra-Indian ricegrass and rabbitbrush communities at 5,200-5,610 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Festuca dasyclada (Sedge fescue)	This species is found on open slopes and ridges in sagebrush, mountain brush, and juniper communities on the Green River Shale Formation and limestone gravels at 6,990-10,000 ft. elevation. The study areas are in a different formation. The proposed project will not impact this plant species.
Gilia tenuis (Mussentuchit Gilia)	This species is found in pinyon-juniper woodlands. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Hedysarum occidentale var. canone (Canyon sweetvetch or Coal sweetvetch)	This species is found in pinyon-juniper, sagebrush and wash communities at 5,000-8,000 ft. elevation. The study sited have a very different vegetative type.

	The proposed project will not impact this plant species.
Hymenoxys depressa (Low hymenoxys or Depressed bitterweed)	This species is found in ephedra, sagebrush, shadscale and pinyon-juniper communities at 4,400-7,100 ft. elevation. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Hymenoxys helenioides (Helenium hymenoxys or Intermountain bitterweed)	This species is found in mountain brush, sagebrush, aspen and meadow communities at 8,800-10,700 ft. elevation. Know populations of this species are found at quite a distance south and north of the study site. The proposed project will not impact this plant species.
Lygodesmia entrada (Entrada rushpink)	This species is found in mixed desert shrub and juniper communities at 4,400-4,800 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Mentzelia argillosa (Arapien stickleaf)	This species is found in salt desert shrub and pinyon-juniper communities on the Arapien Shale formation at 5,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative

	types are very different. The Arapien Shale formation is not found in the study areas. The proposed project will not impact this plant species.
Mentzelia multicaulis var. librina (Book Cliffs blazing star)	This species is found in sagebrush, rabbitbrush, and pinyon-juniper communities at 6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Penstemon tidestromii (Tidestrom beardtongue)	This species is found in desert shrub, sagebrush, and pinyon-juniper communities at 5,300-8,200 ft elevation. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Penstemon wardii (Ward beardtongue)	This species is found in desert shub, pinyon-juniper, sagebrush, shadescale and greasewood communities on the Arapien Shale formation at 5,495-6,810 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.

Phacelia utahensis (Utah phacelia)	This species is found in salt desert shrub communites on the Arapien Shale Formation at 5,500-5,700 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Psorothamnus polydenius var. jonesii (Jones indigo-bush or glandular indigo-bush)	This species is found in salt desert shrub communities on Mancos Shale formations at 4,820 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Silene petersonii (Maguire campion, Wasatch limestone catchfly or Peterson catchfly)	This species is found in ponderosa pine, rocky mountain juniper, bristlecone pine, spruce-fier, and aspen-sagebrush communities on open calcareous and igneous gravels at 6,955-11,200 ft. elevation. The study sites have no open calcareous and igneous gravels. The proposed project will not impact this plant species.
Sphaeralcea psoraloides (Psoralea globemallow)	This species is found in zuckia ephedra communities at 4,000-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different.

	The proposed project will not impact this plant species.
Talinum thompsonii (Thompson talinum)	This species is found on silicious conglomeratic gravels in pinyon-juniper and ponderosa pine communities at 7,500 ft. elevation. The study sites do not contain any silicious conglomeratic gravels. The proposed project will not impact this plant species.

Appendix 1- Plant Composition of Little Swens Canyon Riparian Site as Determined from Cross-Section Transects

Little Swens Canyon 2018	
Community Type	**% Composition**
Carex nebrascensis (Nebraska Sedge)	30
Conifer	7
Poa pratensis (Kentucky Bluegrass)	40

Appendix 2- Plant Composition of Little Swens Canyon Riparian Site as Determined from Greenline Transect

Little Swens Canyon 2018	
Community Type	**% Composition**
Carex nebrascensis (Nebraska Sedge)	35
Conifer/Popr	7
Conifer/Shrub	3
Poa pratensis (Kentucky Bluegrass)	50
Salix drummondiana (Drummond's willow)	5

Appendix 3- Woody Species Individuals in Each Age Class

Little Swens Canyon 2018		
Species	**Age Class**	
	Young/Sapling	**Mature**
Salix drummondiana (Drummond's willow)	0	2

Appendix 4- Little Swens Canyon Riparian Photos

Cross-Section 1

Cross-Section 2

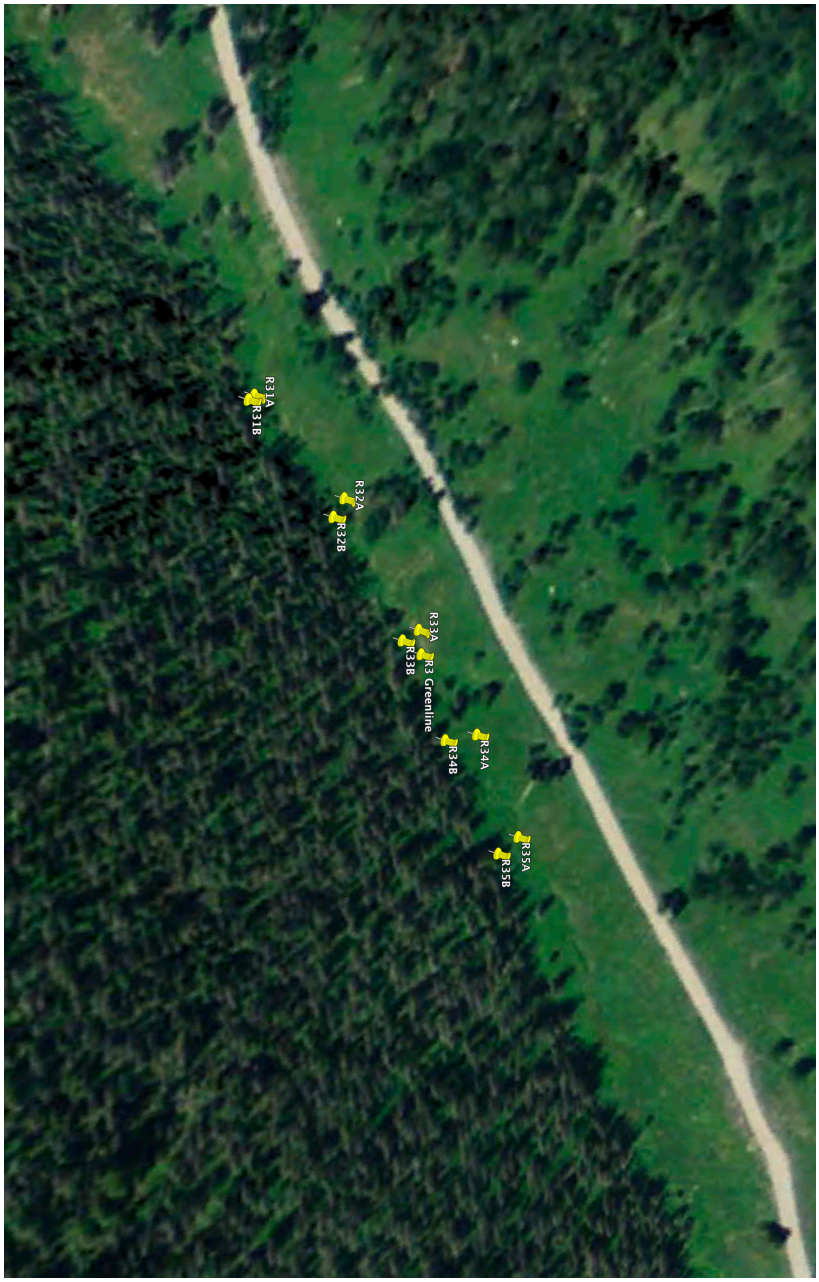
Cross-Section 3

Cross-Section 4

Cross-Section 5

Greenline Photo

Appendix 5- Study Area Map



Little Swens Canyon Riparian

Appendix 6 - UTM Coordinates Cross-Section Transects and Green Line Starting Point

R31A 12S 478170 E 4391946 N
R31B 12S 478172 E 4391944 N
R32A 12S 478206 E 4391978 N
R32B 12S 478213 E 4391974 N
R33A 12S 478254 E 4392005 N
R33B 12S 478258 E 4391999 N
R34A 12S 478293 E 4392027 N
R34B 12S 478295 E 4392015 N
R35A 12S 478332 E 4392043 N
R35B 12S 478338 E 4392035 N
Greenline 12S 478263 E 4392006 N

Skyline Mine
Riparian Analysis of Upper Huntington Creek

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Introduction

The purpose for conducting riparian studies is to understand the plant composition and ecological state of a riparian ecosystem. This data can be used to understand how riparian ecosystems change over time. The data collected in these surveys do not only give a picture of the riparian ecosystem at the time the data is collected, but the results can be compared to data collected in the future to help scientists and managers understand the effects of management practices on a riparian community over time.

Three types of data are collected on each site (vegetation cross section, green line, woody species). Using the data collected, the following results are obtained: Plant composition, greenline successional status, greenline bank stability and woody species density.

Skyline Mine is a coal mine with its surface facilities located about 4 miles southwest of the town of Scofield in Carbon County, Utah. This survey was conducted because a power line will be run under Upper Huntington Creek. The riparian area studied is located approximately 3 miles southwest of the surface facilities of the mine. The elevation of the riparian area is 8,766 feet above sea level.

Methods

Sampling Standards

Methodologies used for this analysis were performed in accordance with vegetation guidelines and standard found in "Monitoring the Vegetation Resources in Riparian Areas" (General Technical Report RMRS-GTR-47) by Alma H. Winward. In July of 2018, quantitative and qualitative data were collected in the Upper Huntington Creek riparian communities so that results can be used to determine how or if management practices affect the riparian ecosystem over time.

Sampling Methodology for Vegetation Cross-Section Composition

Each riparian complex is usually composed of a number of community types. This procedure is designed to quantify the percent of each community type in a particular riparian area. This data can then be used to determine how much change occurs in the riparian system.

Five (5) step transects were established perpendicular to the grade in the riparian complex. The 5 transects were placed randomly to best represent the entire complex. The number of steps in each transect is determined by the width of the riparian

community at each transect. Community type composition is obtained by counting the number of steps encountered for each vegetative type in all five transects divided by the total number of steps taken in all five transects. The GPS coordinates for the beginning and ending points for each transect can be found in Appendix 6. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Sampling Methodology for Greenline Composition and Function

Each riparian complex is usually composed of a number of community types. Using the compositional values obtained in greenline sampling provides a good indication of a streambank's ability to buffer the hydrologic forces of moving water. Since the greenline is located where the forces of water are greatest, a greenline measurement can provide an indication of health of the total watershed above the point of sampling.

One (1) 726' greenline transect was established randomly within the cross-section transects in the Upper Huntington Creek riparian area. This provides a more complete evaluation of the streamside and valley bottom health within a given complex. Greenline transects begin on the right-hand side of the stream looking downsteam and proceeds down the greenline using a step transect methodology. Vegetative communities are identified and the number of steps of each community type are recorded for 363' on each side of the stream. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Sampling Methodology for Woody Species Density and Regeneration

Woody species in a riparian community usually indicates that the riparian system is healthy and will resist the buffering effects of water.

Measurement of woody species were made by counting the number of woody species from the middle of the stream to 3' outside the greenline of the stream. This is done along the same transect used for the greenline measurements so 363' is measured on each side of the stream. When a woody species is encountered the species was determined as well as the age class of the individual plant. The age classes uses were, sprout, young mature, decadent and dead as described in Woodward's publication. Plant nomenclature follows the USDA-ARS Plant Database (plants.usda.gov).

Photographs and Map

A google earth map was created with start and end points of each cross-section transect and the starting point of the greenline transect (Appendix 6). In addition photographs were taken of each cross-section transect and the greenline transect (Appendix 5).

Threatened, Endangered, Candidate and Sensitive Species

The inventory of federally listed threatened, endangered and candidate plant species for Emery and Sanpete Counties was consulted prior to field work. Both Emery and Sanpete County lists were consulted because the riparian site is close to the Sanpete/Emery County line. In addition the State of Utah, Department of Natural Resource's biodiversity database and the USDA Forest Service Intermountain Region's list of proposed, endangered, threatened and sensitive species for the Manti portion of the Manti-La Sal National Forest was consulted for possible impacts by the proposed project. If applicable, this information would be used to drive species of concern field surveys if any of the species or habitats were found on or near the riparian area being sampled.

Results

Upper Huntington Creek riparian area is located on a stream that runs from north to south in Upper Huntington Creek (Appendix 5).

The plant composition for the cross-section and greenline transects are found in Appendix 1 and 2. The data obtained in this riparian system indicates that the system is in a mid succsisional state and has a moderate stability rating as described in Winward. There were no woody species found.

Endangered, threatened, candidate and sensitive plant species know to occur in Sanpete and Emery counties were not found in the sampled riparian community.

Threatened, Endangered, Candidate and Sensitive Species

The following is a table of potential endangered, threatened, candidate and sensitive plant species know to occur in Sanpete and Emery Counties. Next to each species name information is provided about the likelihood of occurrence for each species in the Little Upper Huntington Creek riparian area.

Federally listed endangered, threatened, candidate and sensitive species for Emery and Sanpete County.	
Endangered	
Pediocactus despainii (San Rafael cactus)	This species is found in open pinyon-juniper communities at 6,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Schoenocrambe barnebyi (Barnaby reed-mustard)	This species is found in mixed shadscale, eriogonum and ephedra communities at 5,600-5,700 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species
Sclerocatus wrightiae (Wright fishhook cactus)	This plat is found on the Mancos Shale Formation in salt desert shrub to juniper communities at 4,790-6,120 ft. elevation. The study area is above the elevation range for this species. The vegetative types are very different and there is no Mancos Shale in the study area. The proposed project will not impact this plant species.
Threatened	
Astragalus montii (Heliotrope milk-vetch)	This species is found in alpine on windblown ridges and snowdrift sites at 10,500-11,000 ft. elevation.

	The study areas are below the elevation range for this species. The habitat is different. The know locations of this species are well South of the study area. The proposed project will not impact this plant species
Cycladenia humilis var jonesii (Jones Cyladenia)	This species is found in cool desert shrub and juniper communities at 4,400-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Pediocactus despainii (Despain Footcactus)	This species is found in open piyon-juniper communities at 6,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Townsendia aprica (Last Chance townsendia)	This species is found in salt desert shrub and pinyon-juniper communities in the Arapien and Mancos Shale formations at 6,100-8,000 ft. elevation. The study areas are not found in the Arapien or Mancos Shale formation. The vegetative types are very different.

	The proposed project will not impact this plant species.
Candidate/Sensitive	
Aster kingie var barnebyana (Barneby woody aster)	This species is found in mountain mahogany-oak communities in rock outcrops composed of Precambrian quartzite at 7,345-7,610 ft. elevation. There are not outcrops of Precambrian quartzite in the study areas. The vegetative types are very different. The proposed project will not impact this plant species.
Astragalus consobrinus (Bicknell milkvetch)	This species is found in sagebrush-grassland and pinyon-juniper communities on the Mancos Shale formation at 5,200-9,000 ft. elevation. The study areas are not found in the Mancos Shale formation. The vegetative types are very different. The proposed project will not impact this plant species.
Astragalus subcinereus var. basalticus (Basalt milkvetch or Silver milkvetch)	This species is found in pinyon-juniper and ponderosa communities at 4,520-7,970 ft. elevtation. The vegetative types of the study areas are very different and the know population of this plant are found in southern Emery County. The proposed project will not impact this plant species.

Cryptantha compacta (Mound cryptanth)	This species is found in salt desert shrub and mixed desert shrub communities at 4,950-9,250 ft. elevation. The vegetative types of the study areas are very different. The proposed project will not impact this plant species.
Cryptantha creutzfeldtii (Creutzfeldt-flower)	This species is found in mat atriplex communities on the Mancos Shale formation at 5,250-6,495 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Cymopterus coulteri (Coulter biscuitroot)	This species is found in black sagebrush, shadscale, desert shrub and juniper communites at 4,955-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Erigeron carringtonae (Carrington daisy)	This species is found in medows and escarpment margins at 10,000-11,000 ft. elevation. The study areas are below the elevation range. The proposed project will not impact this plant species.

Erigonoum corymbosum var. smithii (Big Flattop buckwheat or Smith wild buckwheat)	This species is found in purple-sage matchweed, ephedra-Indian ricegrass and rabbitbrush communities at 5,200-5,610 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Festuca dasyclada (Sedge fescue)	This species is found on open slopes and ridges in sagebrush, mountain brush, and juniper communities on the Green River Shale Formation and limestone gravels at 6,990-10,000 ft. elevation. The study areas are in a different formation. The proposed project will not impact this plant species.
Gilia tenuis (Mussentuchit Gilia)	This species is found in pinyon-juniper woodlands. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Hedysarum occidentale var. canone (Canyon sweetvetch or Coal sweetvetch)	This species is found in pinyon-juniper, sagebrush and wash communities at 5,000-8,000 ft. elevation. The study sited have a very different vegetative type.

	The proposed project will not impact this plant species.
Hymenoxys depressa (Low hymenoxys or Depressed bitterweed)	This species is found in ephedra, sagebrush, shadscale and pinyon-juniper communities at 4,400-7,100 ft. elevation. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Hymenoxys helenioides (Helenium hymenoxys or Intermountain bitterweed)	This species is found in mountain brush, sagebrush, aspen and meadow communities at 8,800-10,700 ft. elevation. Know populations of this species are found at quite a distance south and north of the study site. The proposed project will not impact this plant species.
Lygodesmia entrada (Entrada rushpink)	This species is found in mixed desert shrub and juniper communities at 4,400-4,800 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Mentzelia argillosa (Arapien stickleaf)	This species is found in salt desert shrub and pinyon-juniper communities on the Arapien Shale formation at 5,000-6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative

	types are very different. The Arapien Shale formation is not found in the study areas. The proposed project will not impact this plant species.
Mentzelia multicaulis var. librina (Book Cliffs blazing star)	This species is found in sagebrush, rabbitbrush, and pinyon-juniper communities at 6,200 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Penstemon tidestromii (Tidestrom beardtongue)	This species is found in desert shrub, sagebrush, and pinyon-juniper communities at 5,300-8,200 ft elevation. The study sites have a very different vegetative type. The proposed project will not impact this plant species.
Penstemon wardii (Ward beardtongue)	This species is found in desert shub, pinyon-juniper, sagebrush, shadescale and greasewood communities on the Arapien Shale formation at 5,495-6,810 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.

Phacelia utahensis (Utah phacelia)	This species is found in salt desert shrub communites on the Arapien Shale Formation at 5,500-5,700 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Psorothamnus polydenius var. jonesii (Jones indigo-bush or glandular indigo-bush)	This species is found in salt desert shrub communities on Mancos Shale formations at 4,820 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different. The proposed project will not impact this plant species.
Silene petersonii (Maguire campion, Wasatch limestone catchfly or Peterson catchfly)	This species is found in ponderosa pine, rocky mountain juniper, bristlecone pine, spruce-fier, and aspen-sagebrush communities on open calcareous and igneous gravels at 6,955-11,200 ft. elevation. The study sites have no open calcareous and igneous gravels. The proposed project will not impact this plant species.
Sphaeralcea psoraloides (Psoralea globemallow)	This species is found in zuckia ephedra communities at 4,000-6,000 ft. elevation. The study areas are above the elevation range for this species. The vegetative types are very different.

	The proposed project will not impact this plant species.
Talinum thompsonii (Thompson talinum)	This species is found on silicious conglomeratic gravels in pinyon-juniper and ponderosa pine communities at 7,500 ft. elevation. The study sites do not contain any silicious conglomeratic gravels. The proposed project will not impact this plant species.

Appendix 1- Plant Composition of Upper Huntington Creek Riparian Site as Determined from Cross-Section Transects

Upper Huntington Creek 2018	
Community Type	**% Composition**
Artemisia cana (Silver Sagebrush)	13
Carex nebrascensis (Nebraska Sedge)	17
Miscellaneous Forb *Hymenoxys hoopesii* (Orange Sneezeweed)	4
Juncus arcticus (Mountain Rush)	22
Phleum pretense (Timothy)	4
Poa pratensis (Kentucky Bluegrass)	40

Appendix 2- Plant Composition of Upper Huntington Creek Riparian Site as Determined from Greenline Transect

Upper Huntington Creek 2018	
Community Type	**% Composition**
Artemisia Cana (Silver Sagebrush)/ *Poa pratensis* (Kentucky Bluegrass)	6
Carex nebrascensis (Nebraska Sedge)	31
Juncus arcticus (Mountain Rush)	16
Poa pratensis (Kentucky Bluegrass)	47

Appendix 4- Upper Huntington Creek Riparian Photos

Cross-Section 1

Cross-Section 2

Cross-Section 3

Cross-Section 4

Cross-Section 5

Greenline Photo

Appendix 5- Study Area Map

Upper Huntington Creek Riparian

Appendix 6 - UTM Coordinates Cross-Section Transects and Green Line Starting Point

R21A 12S 479205 E 4390189 N
R21B 12S 479261 E 4390191 N
R22A 12S 479204 E 4390254 N
R22B 12S 479236 E 4390257 N
R23A 12S 479175 E 4390385 N
R23B 12S 479191 E 4390388 N
R24A 12S 479129 E 4390405 N
R24B 12S 479149 E 4390431 N
R25A 12S 479117 E 4390453 N
R25B 12S 479139 E 4390449 N
Greenline 12S 479152 E 4390397 N

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Date: 1/28/2019

CLIENT: Canyon Fuel Company
Project: Skyline Mine Utah Table 3
Lab Order: S1901036

CASE NARRATIVE

Report ID: S1901036001

Samples WRS18-1, WRS18-2, WRS18-3, WRS18-4, WRS18-5 and WRS18-6 were received on January 4, 2019.

Samples were analyzed using the methods outlined in the following references:

U.S.E.P.A. 600/2-78-054 "Field and Laboratory Methods Applicable to Overburden and Mining Soils", 1978
American Society of Agronomy, Number 9, Part 2, 1982
USDA Handbook 60 "Diagnosis and Improvement of Saline and Alkali Soils", 1969
Wyoming Department of Environmental Quality, Land Quality Division, Guideline No. 1, 1984
New Mexico Overburden and Soils Inventory and Handling Guideline, March 1987
State of Utah, Division of Oil, Gas, and Mining: Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining, April 1988
Montana Department of State Lands, Reclamation Division: Soil, Overburden, and Regraded Spoil Guidelines, December 1994
State of Nevada Modified Sobek Procedure
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company
HC 35 Box 380
Helper, UT 84526

Report ID: S1901036001

Project: Skyline Mine Utah Table 3
Date Received: 1/4/2019

Date Reported: 1/28/2019
Work Order: S1901036

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	Organic Matter LOI	CaCO3	Calcium PE	Magnesium PE	Potassium PE	Sodium PE	SAR
		s.u.	%	dS/m	%	%	meq/L	meq/L	meq/L	meq/L	
S1901036-001	WRS18-1	8.0	45.9	0.89	68.3	4.2	2.39	2.55	0.54	2.40	1.53
S1901036-002	WRS18-2	8.0	47.7	0.68	76.3	3.5	2.44	2.42	0.39	1.92	1.23
S1901036-003	WRS18-3	8.0	49.8	0.77	74.7	4.1	2.69	2.69	0.42	2.39	1.46
S1901036-004	WRS18-4	7.9	51.7	0.92	75.4	3.8	2.98	3.75	0.45	2.27	1.24
S1901036-005	WRS18-5	7.9	51.2	0.95	77.9	4.9	2.96	4.34	0.46	2.04	1.07
S1901036-006	WRS18-6	8.2	66.6	0.50	77.4	4.3	1.74	1.85	0.34	1.36	1.02

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company
HC 35 Box 380
Helper, UT 84526

Report ID: S1901036001

Project: Skyline Mine Utah Table 3
Date Received: 1/4/2019

Date Reported: 1/28/2019
Work Order: S1901036

Lab ID	Sample ID	Sand %	Silt %	Clay %	Texture	Very Fine Sand %	Phosphorus ppm	Nitrate(as N) ppm	Available Potassium meq/100g
S1901036-001	WRS18-1	80.0	14.0	6.0	Loamy Sand	4.2	3	0.4	0.16
S1901036-002	WRS18-2	80.0	16.0	4.0	Loamy Sand	1.8	4	0.4	0.10
S1901036-003	WRS18-3	79.0	17.0	4.0	Loamy Sand	3.5	3	0.4	0.09
S1901036-004	WRS18-4	78.0	18.0	4.0	Loamy Sand	1.4	3	0.4	0.10
S1901036-005	WRS18-5	80.0	17.0	3.0	Loamy Sand	4.7	3	0.3	0.08
S1901036-006	WRS18-6	86.0	11.0	3.0	Loamy Sand	5.6	3	0.3	0.10

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Canyon Fuel Company, LLC
A Subsidiary of Wolverine Fuels, LLC

Skyline Mine
Gregg A. Galecki, Sr. Environmental Engineer
HC35, Box 380
Helper, Utah 84526
(435) 448-2636
Fax (435) 448-2632

January 2, 2019

Ms. Karen Secor
Inter-Mountain Laboratories, Inc.
1633 Terra Avenue
Sheridan, Wyoming 82801

RE: Six (6) Sample for Analysis According to the Parameters Listed in Table 3 of the Utah Division of Oil, Gas and Mining 2008 Guidelines for Topsoil and Overburden

Dear Ms. Secor:

Please find enclosed in one (1) box a total of six (6) sample (WRS18-1 through WRS18-6) for analysis in accordance with the parameters listed in Table 3 of the Utah Division of Oil, Gas and Mining 2008 Guidelines for Topsoil and Overburden. Let me know if you need a copy of Table 3.

I'll forward a purchase order number ASAP.

If you have any questions regarding these samples, please give me a call at (435) 448-2636.

Sincerely,

Gregg A. Galecki

Gregg A. Galecki
Sr. Environmental Engineer – Skyline Mines
Canyon Fuel Company, LLC.
(435) 448-2636
ggalecki@wolverinefuels.com

Rec'd 1/4/19
Kare A Secor
51901036