

ANNUAL REPORT

This Annual Report shows information the Division has for your mine. Submit the completed document and any additional information identified in the Appendices to the Division by the date specified in the cover letter. During a complete inspection an inspector will check and verify the information.

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 - Skyline Mine	Phone Number	+1 (435) 448-2636
Mailing Address	HC 35 Box 380	Email	ggalecki@bowieresources.com
City	Helper		
State	UT	Zip Code	84526

DOG M File Location or Annual Report Location

Excess Spoil Piles	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Not Required	
Refuse Piles	<input checked="" type="checkbox"/> Required <input type="checkbox"/> Not Required	1st, 3rd, and 4th quarter inspection reports were sent electronically to the Division on 4/11/17, 11/15/17, and 2/5/18, respectively. The refuse pile
Impoundments	<input checked="" type="checkbox"/> Required <input type="checkbox"/> Not Required	3rd and 4th quarter inspection reports were sent electronically to the Division on 11/2/17, and 2/5/18, respectively. The pond inspections for the
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: MRP, Volume 3, Section 4.4, page 4-30, 2nd paragraph and 1988 Soils Guidelines Table 6.

Operator Comments

A total of 16,015 tons of waste rock was hauled to the Waste Rock site in 2017. Analysis for eight (8) samples WRS2017-1 through WRS2017-8 are attached to this report. Two (2) .pdf files titled, "SkylineS1801225-soil-1" and "SkylineS1803005-soil_2-8" 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: MRP, Chapter 4, Section 4.18, page 4-103

Operator Comments

The 2017 raptor and general wildlife survey report is titled, "2017 Subsidence Report_wildlife" is attached to this 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 for 2015/2016 then 2019/2020

Reports: Annual

Citation: MRP, Appendix A-3, Volume 2, Volume 1A, Section 2.8, pages 2-70-2-71C Section 2.8, table 2.8-1a

Operator Comments

The next macroinvertebrate surveys are due in 2019.

Reviewer Comments Met Requirements

Did Not Meet Requirements

Title: NORTH LEASE VEGETATION SURVEY

Objective: To determine the effects of longwall mining on riparian vegetation along Winter Quarters and Woods Canyon stream channels.

Frequency: Baseline survey of entire length of channels in 2005. Survey two years prior and during undermining of channel lengths and follow-up surveys two years after undermining.

Status: Ongoing, Please include a discussion of possible impacts from mining on riparian vegetation in report from qualified biologist.

Reports: Annual

Citation: MRP, Volume 1A, Section 2.7, pages 2-61d; A-2 volume 2, and A-3 Volume 2

Operator Comments

The final riparian vegetation study for the North Lease area surveying Woods Creek is titled, "canyon19.WQ17.rip.rpt.FINAL", is attached to this report.

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 2016

Reports: Every three years

Citation: MRP, Volume 1A, Section 2.8, page 2-71d.

Operator Comments

The next fish survey is due in Eccles Creek in 2019.

Reviewer Comments Met Requirements

Did Not Meet Requirements

Title: Topsoil nutrient sampling during construction of the NOG Bleeder

Objective: Determine N:P:K status of salvaged topsoils, because this analysis was not included with the soil survey

Frequency: once Fall 2015 or if construction is delayed, prior to construction

Status: Submit with 2015 annual report

Reports: Annual

Citation: Conditional approval of NOG Bleeder Shaft Task 4883. Outgoing folder 9212015.4883.doc

Operator Comments

The North of Graben (NOG) Bleeder was never constructed. This site will be taken out of the permit in a future application.

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: MRP, Chapter 4, page 4-97 thru 4-99a

Operator Comments

Submittal of the 2017 subsidence drawing will be delayed until approximately mid-April 2018 due to technical difficulties. The area of potential subsidence was flown in June 2017 by a new contractor (Aerographics). The 2012 baseline aerial survey data file (flown by Psomas) was determined to be corrupted in March 2018. Aerographics has acquired the original 2012 aerial photos and will re-digitize the baseline data. Skyline will then be able to submit the cumulative subsidence data through June 2017.

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: MRP, Volume 3, Section 4.6.4.1, page 4-38a, 3rd paragraph, and page 4-38b.

Operator Comments

No contemporaneous reclamation was conducted in 2017 requiring any subsoil sampling at the Waste Rock site.

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: MRP, Volume 1, page 2-35b, paragraph 2.

Operator Comments

No significant inflows of greater than 800 gpm have encountered anywhere in the Skyline Mine in 2017.

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: MRP, 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 2017.

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: Every 5 years

Status: Overdue

Reports: Submit evaluation of all reference areas with determination of condition class as established by the NRCS.

Citation: MRP, Chapter 4, Page 4-47, paragraph 4.

Operator Comments

Page 4-47 of the M&RP was modified in 2016 to more accurately reflect evaluation of reference areas. "During the last two years of mining, prior to the initiation of final restoration efforts, reference areas will be evaluated to determine the adequacy of the reference area vegetative parameters." This is the second annual report with this response. This item should be removed from the Annual Report.

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: MRP, Volume 3, Section 4.5, page 4-32, 2nd paragraph.

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: MRP, Volume 3, page 4-30, 3rd paragraph, and 1988 Soils guidelines, table 6.

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:

1st and 2nd Quarter Pond Inspection reports; 2nd Quarter Refuse Pile Report; 2017 Subsidence Report_wildlife; Woods Canyon Riparian report (canyon18.WQ17.rip.rpt.FINAL); and Waste Rock analysis (SkylineS1801255_soil-1 and Skyline S1803005_soils_2-8).

Reviewer Comments

State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Oil, Gas & Mining

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Quarterly Inspection Form - Refuse Disposal Areas

(please provide to DOGM promptly after inspection is complete)

Permit Number : C/007/005 Inspection Date : March 13, 2017
 Mine Name : Skyline Mine Quarter / Year : Q01/Y2017
 Mine Operator (Permittee) : Canyon Fuel Company, LLC Inspector Name : G. Galecki / Craig Brown
 MSHA ID # : 42-01566; Pile 1211-UT-09-01566 Inspector Signature : _____
 Facility Name / Location / Address : 7 miles SW of Scofield, Utah. HC35 Box 380, Helper, Utah 84526

- Describe any changes in the geometry of the structure (as well as instrumentation, if any, used to monitor changes):
No obvious instability or structural weakness was observed during the 1st Quarter 2017 inspection.
No signs of slumping or heating were observed. No instrumentation is used at the site.
- Lift Height / Thickness Avg 2-ft Maximum # _____ Elevation of Active Benches : _____, _____, _____
- Vertical Angle of Outslope(s) / Location(s) where measured 1 1/2h:1v / _____ / _____
- Total storage capacity: 334,125 tons (cu) Remaining storage capacity site expansion is Volume placed during year : 0 tons
- Describe foundation preparation (including removal of vegetation, stumps, topsoil, and all other organic material) :
The Refuse Pile is currently disturbed, and material placement is occurring in previously disturbed areas.
Subsoil that was collected from a DOGM reclamation project is stored in the lower topsoil/subsoil storage area.
- Describe placement and compaction of fill materials (including an explanation of how compaction is confirmed) :
No refuse material was placed at the site during the quarter.
Once a sufficient amount of waste rock has accumulated, the material is placed in lifts of 24-inches or less and compacted in place.
- Is there any evidence of fires or burning on the structure ? (If YES, specify extent, location, and abatement/extinguishment of such fires) :
There is no evidence of fires or burning on the refuse pile.
- Describe placement of under drains, protective filter systems, and final surface drainage systems (report any seepage, including location, color, flow) :
No under-drains are present or required at the site. Areas that are to final grade are capped with the prescribed amount of topsoil.
- Describe any appearances of instability, structural weakness, or other hazardous conditions :
No obvious instability or structural weakness, or other hazardous conditions were noted during the 1st Quarter 2017 inspection.
- Please provide any other information pertaining to the stability of the structure (attach any photos taken during the inspection)

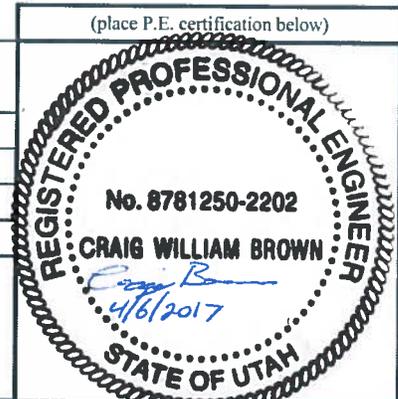
Are there cracks or scarps in crest ?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Is there any detectable sloughing or bulging ?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Do slope erosion problems exist ?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Cracks or scarps in slope ?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Surface movements? (valley bottom, hillsides)	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Erosion of Toe ?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Water impounded by structure ?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
Are diversion ditches stable?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	<u>appear to be functioning as designed. The area is covered in 3-ft of</u>
Is drainage positive ?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	

Could failure of structure create an impoundment (provide description) ? Yes. Failure of the south slope could dam a small ephemeral stream.

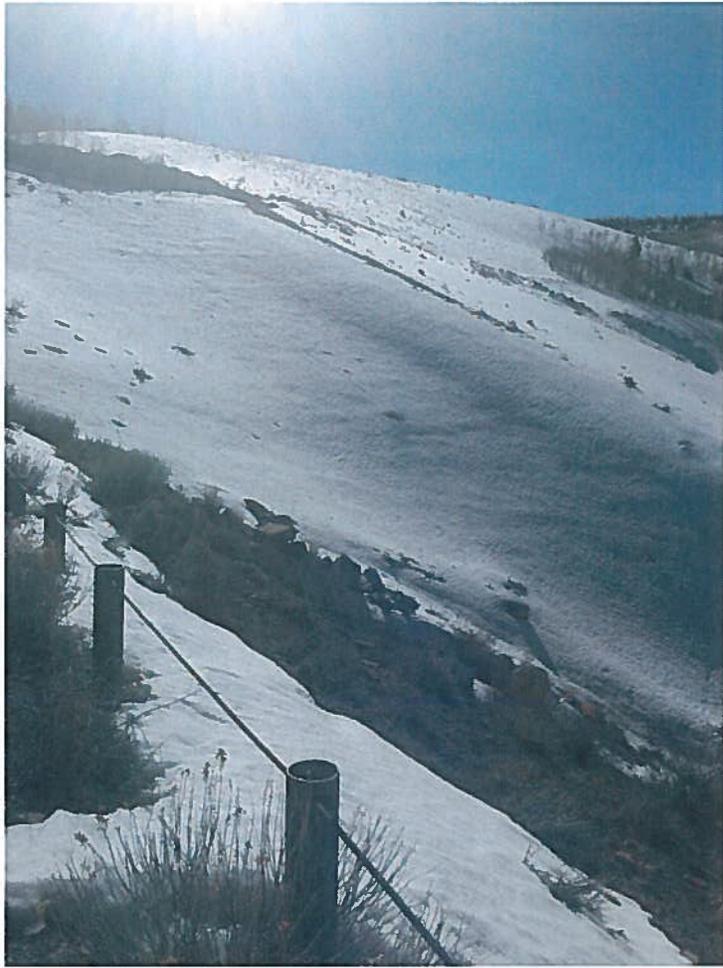
Are design standards established within the mining and reclamation plan for the disposal facility being met ?
Yes

Proctor Determination : N/A

I hereby certify that: I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with structure; that the fill structure has been maintained in accordance with the approved design and meets or exceeds the minimum design requirements under all applicable federal, state, and local regulations; and, that inspections and inspection reports are made by myself or under my direction and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

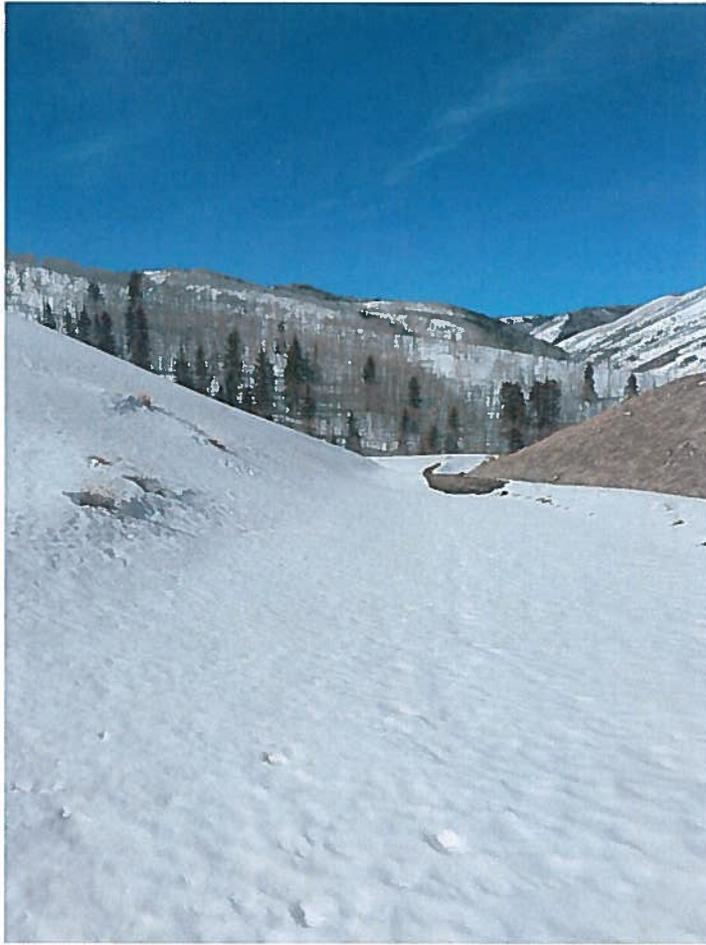












IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			
Permit Number	C/007/005	Report Date	March 16, 2017
Mine Name	Skyline Mine		
Company Name	Canyon Fuel Company		
Impoundment Identification	Impoundment Name	Mine Site Sediment Pond	
	Impoundment Number	001	
	UPDES Permit Number	UT0023540	
	MSHA ID Number	NA	
IMPOUNDMENT INSPECTION			
Inspection Date	March 13, 2017		
Inspected By	Gregg Galecki		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	Quarterly		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No signs of instability were observed. No hazardous conditions were observed during the inspection of the pond. The pond was not discharging during the time of the inspection. The pond was covered with snow and ice. The pond is incised, with all the banks appearing stable, with vegetation typically along a many of the banks. Particular attention was paid to the pond banks looking for signs of instability or structural weakness.</p>			
<p>Required for an impoundment which functions as a SEDIMENTATION POND.</p>	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>Remaining Sediment Storage Capacity: 91,023 ft³ 60% Elevation: 8571.75feet ASL 100% Elevation: 8573.75 feet ASL Based on a survey of the pond using a total station after cleaning, approximately 91,023 cu-ft of sediment storage capacity are available in the pond after the 3rd quarter 2016 survey following cleaning. Original sediment-loading calculations estimated a 3-year sediment load from the site at 74,490 cu-ft. The elevation of the bottom of the pond is 8566.2 with a 100% sediment capacity elevation of 8573.75.</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principal and Emergency Spillway Elevations: 8579.6 feet ASL (The outlet structure for Pond 001 serves as both the Principal and Emergency Spillways) Storage volumes listed below are based on the 3rd quarter 2016 survey. Total volume of pond at Spillway: 269,553 ft³ Required runoff storage: 163,010 ft³ 100% Sediment storage: 106,662 ft³ 60% Sediment storage: 63,997 ft³ Current sediment amount: 15,639 ft³</p>		

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		
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4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outcrops of embankments, etc.

The water level in the pond was 0.01 feet below the decant. The sediment pond discharged periodically during the quarter. A sample of the mine discharge water, (normally) including this pond's discharge, is taken on weekly basis throughout the quarter as required by the Mine's UPDES permit. On a biweekly basis the water sample is analyzed for total iron. Weekly samples include oil and grease, total dissolved solids, total suspended solids, pH and conductivity. Flow is recorded by in-line flow meters.

Surface water is collected from the upper mine pad and discharged to the pond through a culvert located on the west end of the pond. The culvert is functioning as designed. The outlet structure was working as designed and appears to be in good working condition. The pond is an incised structure.

A series of turbidity curtains are installed in the pond to help contain the suspended load within the west section of the pond. The turbidity needs to be replaced to adequately contain sediment in the upper reaches of the pond. The spillway was clear of debris and was functioning as designed.

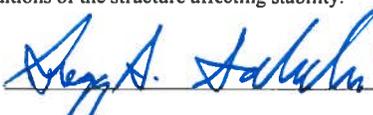
5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

The overall geometry or footprint of the pond has not changed. Spill kits were labeled and full of supplies. A survey conducted after the pond was cleaned in 3rd quarter 2016 indicates approximately 91,023 cu-ft of sediment storage capacity is available in the pond (or approximately 15% of the sediment capacity used). Assuming an annual sediment accumulation of approximately 25,000 cu-ft of sediment (original calculations), the pond won't need cleaning until approximately 2019. The pond will be re-surveyed annually to measure the remaining sediment capacity.

A moderate amount of sediment was deposited during the quarter.

Qualification Statement

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature:  Date: March 17, 2017

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			
Permit Number	C/007/005	Report Date	March 16, 2017
Mine Name	Skyline Mines		
Company Name	Canyon Fuel Company		
Impoundment Identification	Impoundment Name	Rail Loadout Sediment Pond	
	Impoundment Number	002	
	UPDES Permit Number	UT0023540	
	MSHA ID Number	NA	
IMPOUNDMENT INSPECTION			
Inspection Date	March 13, 2017		
Inspected By	Gregg Galecki		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	Quarterly		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No instability of the embankment or hazardous conditions was noted during the inspection.</p>			
Required for an impoundment which functions as a SEDIMENTATION POND.	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>Remaining Sediment Storage Capacity: 14,878 ft³ 60% Elevation: 7915.37 feet ASL (above sea level) 100% Elevation: 7916.08 ASL</p> <p>The sediment level in the pond was measured using a Total Station survey of the entire pond during the 3rd Quarter 2016 following removal of sediment. Approximately 14,878 cu-ft of sediment storage capacity are available in the pond following the 2016 3rd quarter cleaning. The original sediment-loading calculations estimate a 3-year sediment load from the site at 9,148 cu-ft. In the 2016 survey, the bottom of the pond was measured with the total capacity to be approximately 54,082 cu-ft.</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principle Spillway Elevation: 7919.7 feet ASL Emergency Spillway Elevation: 7922 feet ASL Total volume of pond at Spillway (based on 2014 survey): 54,082 ft³ Required runoff storage: 39,204 ft³ 100% Sediment Storage: 14,878 ft³ 60% Sediment Storage: 8,927 ft³</p>		

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.

The water level was 1.10 below the discharge point during the inspection. The pond was covered with snow and ice. The pond did not discharge during the quarter. The pond embankment appears stable and without noticeable erosion. Both the inlet and outlet are functioning as designed. The footprint of the pond remains unchanged.

A new sediment trap was constructed upstream of the main entrance to the pond during the 3rd quarter 2015. This sediment trap should significantly reduce the amount of sediment reporting to the pond.

Three (3) turbidity curtains contain a majority of material in the upper, southeast side and south sides (inlets) of the pond where sediment can be periodically removed. It was hard to determine whether all three (3) turbidity curtains appeared to be functioning as designed (covered with snow and ice) during the inspection. The discharge pipe or outlet is in good condition and functioning as designed.

The pond had sediment removed during was 3rd the quarter 2016 to increase storage volume. The amount of sediment storage capacity was reported in 4th quarter 2016 based on a survey conducted following the pond cleaning.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

The geometry of the pond remains consistent. The average depth of the water ranged from approximately 5.0 feet to 1.10 feet below the spillway during the quarter. The amount of sediment storage in the pond was based on a total-station survey conducted after the pond was cleaned. Assuming a 3-year sediment accumulation of approximately 9,000 cu-ft, the pond should be scheduled for cleaning in 2019, but is surveyed on an annual basis to monitor actual accumulation of sediment..

The pond is routinely inspected on a weekly basis during weekly water monitoring.

Qualification Statement

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature:  Date: March 17, 2017

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			
Permit Number	C/007/005	Report Date	March 16, 2017
Mine Name	Skyline Mines		
Company Name	Canyon Fuel Company		
Impoundment Identification	Impoundment Name	Waste Rock Site Sediment Pond	
	Impoundment Number	003	
	UPDES Permit Number	UT0023540	
	MSHA ID Number	NA	
IMPOUNDMENT INSPECTION			
Inspection Date	March 13, 2017		
Inspected By	Gregg Galecki		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	Quarterly		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No instability, structural weakness or other hazardous condition was noted at the site during the quarterly pond site inspection. The banks of the pond are normally well-vegetated – both on the inside and outside of the bank. The pond was snow-covered during the inspection</p>			
Required for an impoundment which functions as a SEDIMENTATION POND.	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>Sediment Storage Capacity: 10,330 ft³ (calculated 1-yr sediment storage volume) 60% Elevation: 7857.2 feet ASL (above sea level) 100% Elevation: 7858.1 ASL Current Sediment Level Elevation: The pond was cleaned in 3rd quarter 2016. A bedrock shelf exists in the bottom of the pond, enabling portions of the pond to be deeper in areas where the shelf does not exist. The available sediment storage was calculated using a total-station survey.</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principal and Emergency Spillways Elevation: 7864.0 feet ASL (The outlet of Pond 003 serves as both the principal and emergency spillway). A manual decant pipe in the pond marks the sediment cleanout elevation of 7858.1 feet. Total volume of pond at Spillway: 69,945 ft³ Required runoff storage: 35,036 ft³ 100% Sediment storage: 13,802 ft³ 60% Sediment storage: 8,281 ft³</p>		

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.

This pond did not discharge during the 1st quarter 2017, therefore no water samples were obtained. The bottom of the pond was approximately 5.18 feet below the decant pipe. The out slopes of the pond embankment do not appear to present any type of hazardous conditions. The pond was covered with snow and ice, with only the very bottom of the pond melted to see bottom. No instability was noted in the pond embankment.

The current sediment storage capacity is based on a survey conducted during the 3rd quarter 2016. The perimeter footprint of the pond did not change during the cleaning project, only the depth of the pond was modified.

The pond is routinely inspected during weekly water monitoring.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

No changes or modifications have been noted in the geometry of the pond since the last inspection. The pond was covered with snow and no signs of added deposition were apparent. The pond was covered with snow, with a small area of the pond where sediment was exposed. The pond may have retained water periodically during the 1st quarter. The bottom of the pond was approximately 5.18 feet below the discharge pipe based on the survey. Based on the current sediment level measured during the 2016 total-station survey, the accumulated sediment is approximately 0 percent of the 13,802 cu-ft sediment capacity. Since the pond collects water only periodically, and a rock outcrop exists in the middle of the pond, sediment does not fill the pond uniformly and typically tends to accumulate at the inlet. Minor run off was encountered during the quarter, with the pond functioning as designed. The sediment accumulation is surveyed annually.

Qualification Statement

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature:  Date: March 17, 2017

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			
Permit Number	C/007/005	Report Date	March 16, 2017
Mine Name	Skyline Mines		
Company Name	Canyon Fuel Company		
Impoundment Identification	Impoundment Name	Winter Quarters Ventilation Facility Sediment Pond	
	Impoundment Number	004	
	UPDES Permit Number	UT0023540	
	MSHA ID Number	NA	
IMPOUNDMENT INSPECTION			
Inspection Date	March 15, 2017		
Inspected By	Gregg Galecki		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	Quarterly		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No instability, structural weakness or other hazardous condition was noted at the site during the quarterly pond site inspection.</p>			
Required for an impoundment which functions as a SEDIMENTATION POND.	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>Sediment Storage Capacity: 740 ft³ 60% Elevation: 8072.15 feet ASL (above sea level) per as-built survey 100% Elevation: 8072.6 ASL per as-built survey Current Sediment Level Elevation: Only minimal delta of sediment was apparently forming at the inlet (covered in snow). The pond was surveyed during 3rdquarter 2016, with results attached to this 4th quarter report (at mine site).</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principal Spillways Elevation: 8076.32 feet ASL (per C. Ware survey) Emergency Spillway Elevation: 8076.73 feet ASL (per C. Ware survey) Total Volume of pond at Spillway: 5016 cu-ft (per 2016 survey) Required runoff storage: 4,182 cu-ft 100% Sediment Storage: 834 cu-ft 60% Sediment Storage: 500 cu-ft</p>		

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

This pond did not discharge during the 1st quarter of 2017, therefore no water samples were obtained. The pond was dry but snow-covered during the inspection. The pond received limited runoff/snow melt during the quarter, with the ditches functioning as designed. The out slopes of the pond embankment do not appear to present any type of hazardous conditions. Both the inlet and outlet are clear and appear to be ready to function as designed. No instability was noted in the pond embankment.

The 2016 survey determined the sediment storage for the pond is approximately 834 cu-ft.

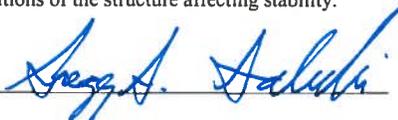
The pond is routinely inspected during weekly water monitoring (often inspected using a camera posted at the site).

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

No changes or modifications have been noted in the geometry or perimeter footprint of the pond since construction in 2011. The pond was functioning, and may have received minor water/snow melt periodically during the 1st quarter 2017. The pond was cleaned during the 3rd quarter 2016 with the results of the total removal being documented in 4th quarter 2016. The pond was dry during the inspection. Minimal run off was encountered during the quarter, with the pond functioning as designed. The 2016 survey indicated approximately 94 cu-ft. of additional sediment storage is now available after the 2016 cleaning of the pond.

Qualification Statement

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature:  Date: March 17, 2017

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			
Permit Number	C/007/005	Report Date	July 22, 2017
Mine Name	Skyline Mine		
Company Name	Canyon Fuel Company		
Impoundment Identification	Impoundment Name	Mine Site Sediment Pond	
	Impoundment Number	001	
	UPDES Permit Number	UT0023540	
	MSHA ID Number	NA	
IMPOUNDMENT INSPECTION			
Inspection Date	June 30, 2017		
Inspected By	Gregg Galecki		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	Quarterly		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No signs of instability were observed. No hazardous conditions were observed during the inspection of the pond. The pond was being drained for cleaning. The pond is incised, with all the banks appearing stable, with vegetation typically along a many of the banks. Particular attention was paid to the pond banks looking for signs of instability or structural weakness, drainage from the road located just west of the scales will continue to be monitored.</p>			
Required for an impoundment which functions as a SEDIMENTATION POND.	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>Remaining Sediment Storage Capacity: 91,023 ft³ 60% Elevation: 8571.75 feet ASL 100% Elevation: 8573.75 feet ASL Removal of sediment was initiated at the end of the quarter. The sediment storage capacity will be calculated using a total-station survey that will be reported in with the 3rd quarter report. Original sediment-loading calculations estimated a 3-year sediment load from the site at 74,490 cu-ft. The elevation of the bottom of the pond is 8566.2 with a 100% sediment capacity elevation of 8573.75.</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principal and Emergency Spillway Elevations: 8579.6 feet ASL (The outlet structure for Pond 001 serves as both the Principal and Emergency Spillways) Storage volumes listed below are based on the 3rd quarter 2016 survey. Total volume of pond at Spillway: 269,553 ft³ Required runoff storage: 163,010 ft³ 100% Sediment storage: 106,662 ft³ 60% Sediment storage: 63,997 ft³ Current sediment amount: (current capacity will be reported in the 3rd quarter following cleaning)</p>		
<p>4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.</p>			

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT

The water level in the pond was minimal due to draining in preparation of removing sediment. The sediment pond discharged periodically during the quarter prior to draining. A sample of the mine discharge water, (normally) including this pond's discharge, is taken on weekly basis throughout the quarter as required by the Mine's UPDES permit. On a biweekly basis the water sample is analyzed for total iron. Weekly samples include oil and grease, total dissolved solids, total suspended solids, pH and conductivity. Flow is recorded by in-line flow meters.

Surface water is collected from the upper mine pad and discharged to the pond through a culvert located on the west end of the pond. The culvert is functioning as designed. The outlet structure was working as designed and appears to be in good working condition. The pond is an incised structure.

A series of turbidity curtains are installed in the pond to help contain the suspended load within the west section of the pond. The turbidity needs to be replaced to adequately contain sediment in the upper reaches of the pond. The spillway was clear of debris and was functioning as designed.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

The overall geometry or footprint of the pond has not changed. Spill kits were labeled and full of supplies. Following draining of the pond for sediment removal, the geometry appears unchanged, with the exception of a delta of sediment originating at the inlet. No signs of instability are apparent in the functionality of the pond.

A moderate amount of sediment was deposited during the quarter.

Qualification Statement

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Signature:  Date: July 22, 2017

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			
Permit Number	C/007/005	Report Date	July 22, 2017
Mine Name	Skyline Mines		
Company Name	Canyon Fuel Company		
Impoundment Identification	Impoundment Name	Rail Loadout Sediment Pond	
	Impoundment Number	002	
	UPDES Permit Number	UT0023540	
	MSHA ID Number	NA	
IMPOUNDMENT INSPECTION			
Inspection Date	June 30, 2017		
Inspected By	Gregg Galecki		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	Quarterly		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No instability of the embankment or hazardous conditions was noted during the inspection.</p>			
<p>Required for an impoundment which functions as a SEDIMENTATION POND.</p>	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>Remaining Sediment Storage Capacity: 14,878 ft³ 60% Elevation: 7915.37 feet ASL (above sea level) 100% Elevation: 7916.08 ASL</p> <p>The sediment level in the pond was measured using a Total Station survey of the entire pond during the 3rd Quarter 2016 following removal of sediment. Approximately 14,878 cu-ft of sediment storage capacity are available in the pond following the 2016 3rd quarter cleaning. The original sediment-loading calculations estimate a 3-year sediment load from the site at 9,148 cu-ft. This 3-year estimate was done prior to the construction of the sediment trap installed in 2015 which considerably reduces the amount of sediment reporting to the pond. In the 2016 survey, the bottom of the pond was measured with the total capacity to be approximately 54,082 cu-ft.</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principle Spillway Elevation: 7919.7 feet ASL Emergency Spillway Elevation: 7922 feet ASL Total volume of pond at Spillway (based on 2014 survey): 54,082 ft³ Required runoff storage: 39,204 ft³ 100% Sediment Storage: 14,878 ft³ 60% Sediment Storage: 8,927 ft³</p>		

4. **Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.

The water level was 0.74 below the discharge point during the inspection. The pond surface contained a noticeable amount of algae. The pond discharged a total of six (6) times during the quarter (from April 17 through May 22) due to snowmelt. The pond embankment appears stable and without noticeable erosion. Both the inlet and outlet are functioning as designed. The footprint of the pond remains unchanged.

A new sediment trap was constructed upstream of the main entrance to the pond during the 3rd quarter 2015. This sediment trap should significantly reduce the amount of sediment reporting to the pond.

Three (3) turbidity curtains contain a majority of material in the upper, southeast side and south sides (inlets) of the pond where sediment can be periodically removed. It was hard to determine whether all three (3) turbidity curtains appeared to be functioning as designed (covered with snow and ice) during the inspection. The discharge pipe or outlet is in good condition and functioning as designed.

The pond had sediment removed during was 3rd the quarter 2016 to increase storage volume. The amount of sediment storage capacity was reported in 4th quarter 2016 based on a survey conducted following the pond cleaning.

5. **Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

The geometry of the pond remains consistent. The average depth of the water ranged from approximately 5.0 feet to 0.74 feet below the spillway during the quarter. The amount of sediment storage in the pond was based on a total-station survey conducted after the pond was cleaned. Assuming a 3-year sediment accumulation of approximately 9,000 cu-ft, the pond should be scheduled for cleaning in 2019, but is surveyed on an annual basis to monitor actual accumulation of sediment..

The pond is routinely inspected on a weekly basis during weekly water monitoring.

Qualification Statement

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Signature:  Date: July 22, 2017

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			
Permit Number	C/007/005	Report Date	July 22, 2017
Mine Name	Skyline Mines		
Company Name	Canyon Fuel Company		
Impoundment Identification	Impoundment Name	Waste Rock Site Sediment Pond	
	Impoundment Number	003	
	UPDES Permit Number	UT0023540	
	MSHA ID Number	NA	
IMPOUNDMENT INSPECTION			
Inspection Date	June 30, 2017		
Inspected By	Gregg Galecki		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	Quarterly		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No instability, structural weakness or other hazardous condition was noted at the site during the quarterly pond site inspection. The banks of the pond are normally well-vegetated – both on the inside and outside of the bank. The pond was dry during the inspection.</p>			
Required for an impoundment which functions as a SEDIMENTATION POND.	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>Sediment Storage Capacity: 10,330 ft³ (calculated 1-yr sediment storage volume) 60% Elevation: 7857.2 feet ASL (above sea level) 100% Elevation: 7858.1 ASL Current Sediment Level Elevation: The pond was cleaned in 3rd quarter 2016. A bedrock shelf exists in the bottom of the pond, enabling portions of the pond to be deeper in areas where the shelf does not exist. The available sediment storage was calculated using a total-station survey.</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principal and Emergency Spillways Elevation: 7864.0 feet ASL (The outlet of Pond 003 serves as both the principal and emergency spillway). A manual decant pipe in the pond marks the sediment cleanout elevation of 7858.1 feet. Total volume of pond at Spillway: 69,945 ft³ Required runoff storage: 35,036 ft³ 100% Sediment storage: 13,802 ft³ 60% Sediment storage: 8,281 ft³</p>		

4. **Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.

This pond did not discharge during the 2nd quarter 2017, therefore no water samples were obtained. The bottom of the pond was approximately 5.18 feet below the decant pipe. The out slopes of the pond embankment do not appear to present any type of hazardous conditions. The pond was dry. No instability was noted in the pond embankment.

The current sediment storage capacity is based on a survey conducted during the 3rd quarter 2016. The perimeter footprint of the pond did not change during the cleaning project, only the depth of the pond was modified.

The pond is routinely inspected during weekly water monitoring.

5. **Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

No changes or modifications have been noted in the geometry of the pond since the last inspection. The pond was dry and no signs of appreciable deposition were apparent. The pond may have retained water periodically during the 2nd quarter. The bottom of the pond was approximately 5.18 feet below the discharge pipe based on the survey. Based on the current sediment level measured during the 2016 total-station survey, the accumulated sediment is approximately 0 percent of the 13,802 cu-ft sediment capacity. Since the pond collects water only periodically, and a rock outcrop exists in the middle of the pond, sediment does not fill the pond uniformly and typically tends to accumulate at the inlet. Minor run off was encountered during the quarter, with the pond functioning as designed. The sediment accumulation is surveyed annually.

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Signature:  Date: July 22, 2017

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			
Permit Number	C/007/005	Report Date	July 22, 2017
Mine Name	Skyline Mines		
Company Name	Canyon Fuel Company		
Impoundment Identification	Impoundment Name	Winter Quarters Ventilation Facility Sediment Pond	
	Impoundment Number	004	
	UPDES Permit Number	UT0023540	
	MSHA ID Number	NA	
IMPOUNDMENT INSPECTION			
Inspection Date	June 30, 2017		
Inspected By	Gregg Galecki		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	Quarterly		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No instability, structural weakness or other hazardous condition was noted at the site during the quarterly pond site inspection.</p>			
<p>Required for an impoundment which functions as a SEDIMENTATION POND.</p>	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>Sediment Storage Capacity: 740 ft³ 60% Elevation: 8072.15 feet ASL (above sea level) per as-built survey 100% Elevation: 8072.6 ASL per as-built survey Current Sediment Level Elevation: Only minimal delta of sediment was apparently forming at the inlet (covered in snow). The pond was surveyed during 3rdquarter 2016 with a Total Station to calculate sediment storage capacity.</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principal Spillways Elevation: 8076.32 feet ASL (per C. Ware survey) Emergency Spillway Elevation: 8076.73 feet ASL (per C. Ware survey) Total Volume of pond at Spillway: 5016 cu-ft (per 2016 survey) Required runoff storage: 4,182 cu-ft 100% Sediment Storage: 834 cu-ft 60% Sediment Storage: 500 cu-ft</p>		

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.

This pond did not discharge during the 2nd quarter of 2017, therefore no water samples were obtained. The pond was dry during the inspection. The pond received moderate runoff/snow melt during the quarter, with the ditches functioning as designed. The out slopes of the pond embankment do not appear to present any type of hazardous conditions. Both the inlet and outlet are clear and appear to be ready to function as designed. No instability was noted in the pond embankment.

The 2016 survey determined the sediment storage for the pond is approximately 834 cu-ft.

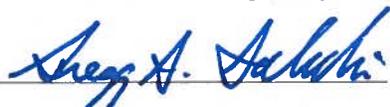
The pond is routinely inspected during weekly water monitoring (often inspected using a camera posted at the site).

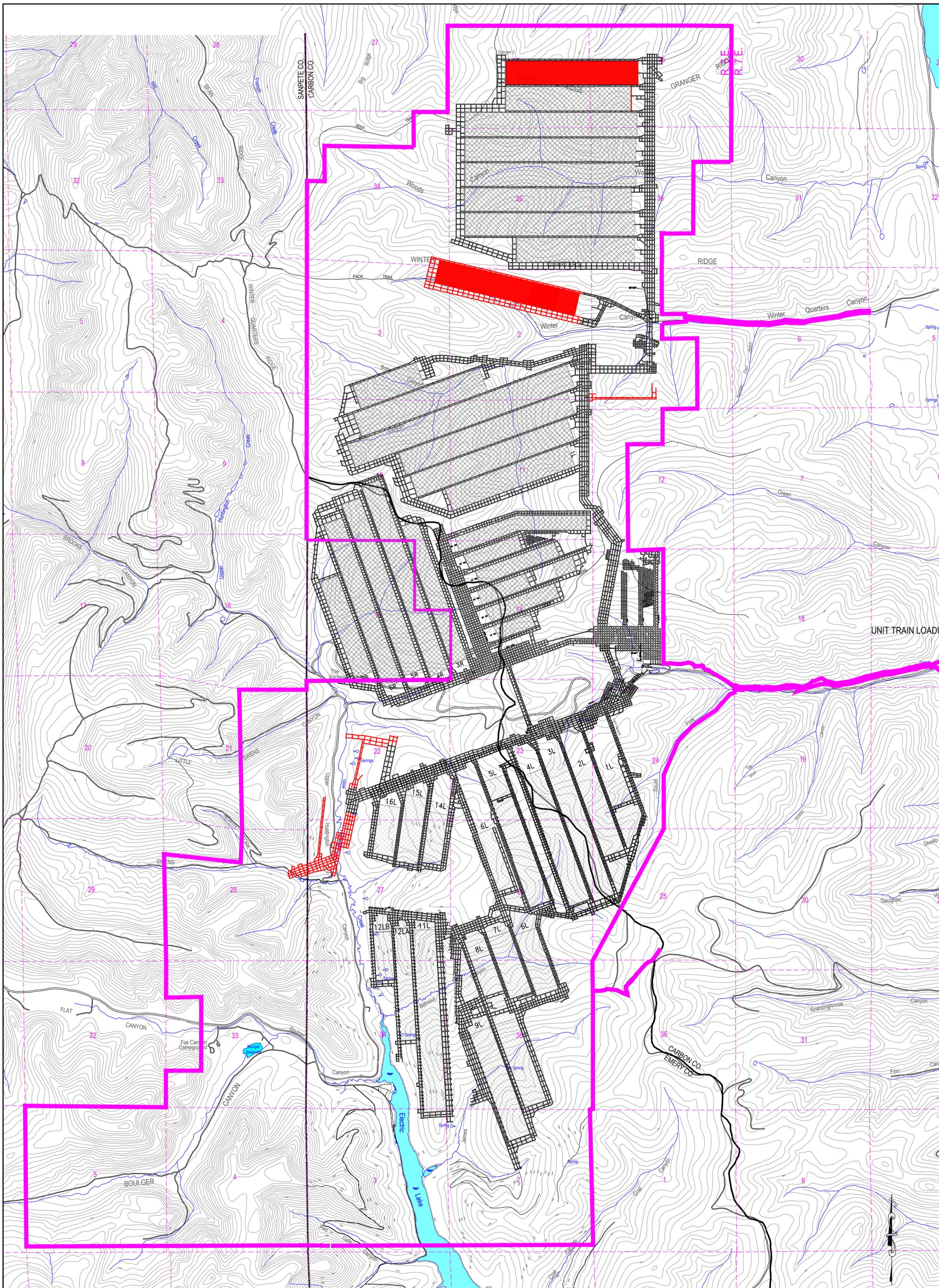
5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

No changes or modifications have been noted in the geometry or perimeter footprint of the pond since construction in 2011. The pond was functioning, and may have received minor water/snow melt periodically during the 2nd quarter 2017. The pond was cleaned during the 3rd quarter 2016 with the results of the total removal being documented in 4th quarter 2016. The pond was dry during the inspection. Minimal run off was encountered during the quarter, with the pond functioning as designed. The 2016 survey indicated approximately 94 cu-ft. of additional sediment storage is now available after the 2016 cleaning of the pond.

Qualification Statement

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Signature:  Date: July 22, 2017



LEGEND

— Area Approved for Mining Activities

— 2017 As Mined

Skyline Mine
2017 As Mined

Canyon Fuel Company, LLC
Skyline Mines

HR 35 BOX380, HELPER, UT, 84526	DATE: 2/20/18	CK.BY: CBrown	REVISION:
CAD FILE: 435-448-2632	SCALE: 1"=1500'	DR.BY: GGalecki	
P:/Reports/...AsMined 2017			
DWG. NO.:			



2017 Wildlife Survey Report

Areas of Potential Subsidence Survey

Northern Goshawk, other Raptors, and
General Wildlife Surveys

Prepared for:

Skyline Mine
Gregg Galecki
Environmental Engineer
Canyon Fuel Company, LLC

Prepared By:

Alpine Ecological
HC 80 Box 570
Greenwich, UT 84732

07.05.2017

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 Jig Plant and Mine Area Projects. No other special status species were identified to have suitable habitat within these project areas. The areas surveyed are displayed on Maps titled North Subsidence Area and South Subsidence Area.

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 the Information, Planning and Consultation System (IPaC). Research included species occurrences, historic records, species ecology, life histories, known distributions, and habitat requirements. Coordination with the UDOGM and the 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 private 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 and golden eagle, and American three-toed woodpecker. The remaining listed species were dismissed from further consideration, as a result of the multiple agency review, because there is no suitable habitat present within the project area or the project is outside of the species known distribution.

2.0 Project Description

The 2017 Area of Potential Subsidence Survey included the 2017, 2018, and 2019 mine panels, as per UDOGM direction. Northern goshawk protocol surveys, general raptor surveys, American three-toed woodpecker, and general wildlife surveys were conducted in and around the areas displayed on the attached maps.

3.0 General Habitat Overview

The vegetation across the survey area is very diverse and is 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 NAIP 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. Consultation with the USFS and UDOGM was conducted concerning survey timing and the survey area. The survey was conducted within the seasonal guidelines as defined in the 2006 Technical Guide and was conducted across the approved survey area.

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.

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

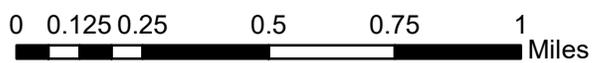
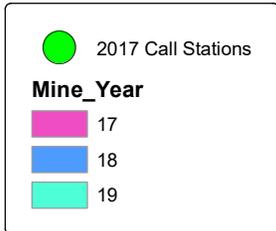
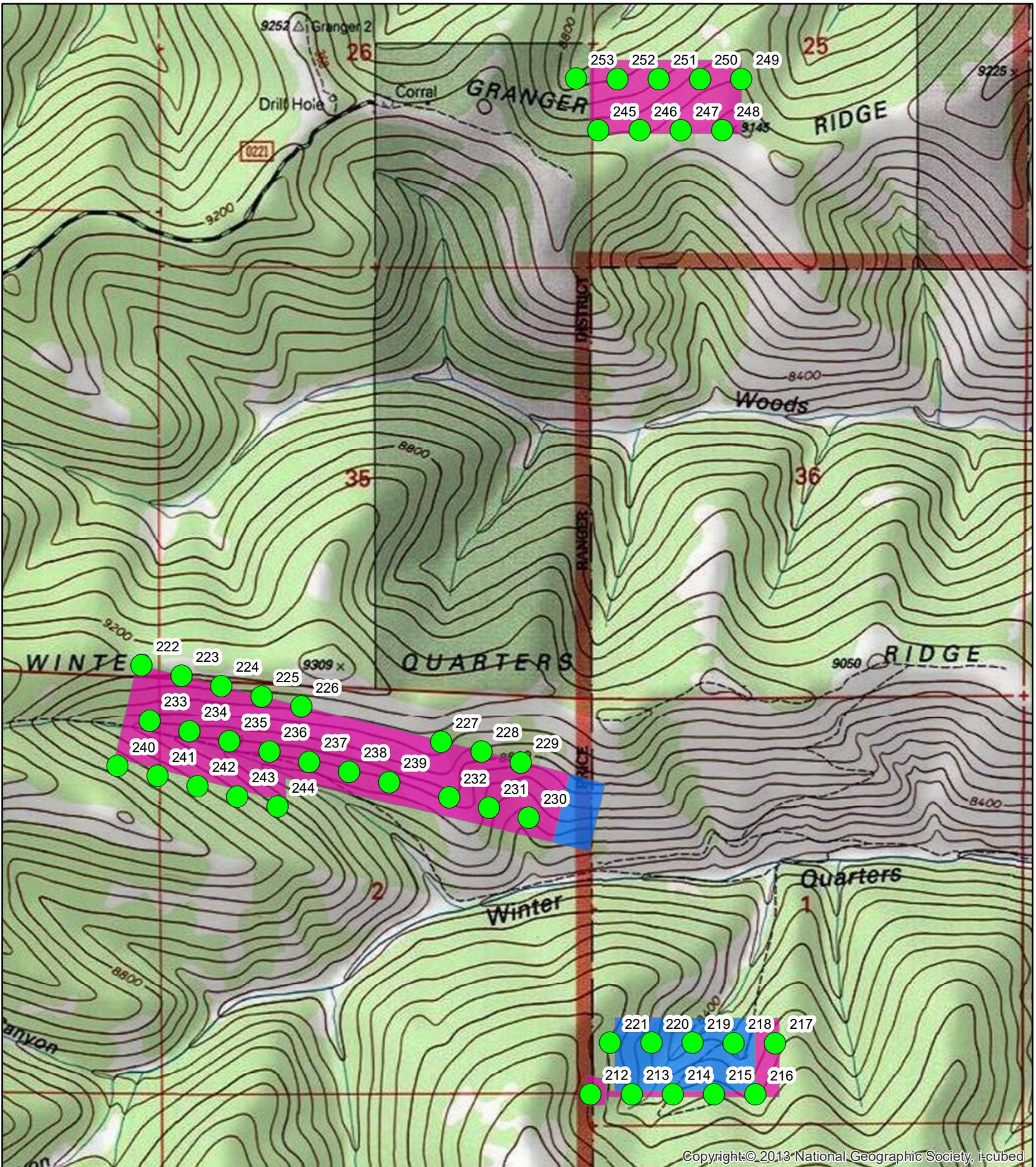
Species observed during the course of the inventories included, but are not limited to, red-tailed hawk (*Buteo jamaicensis*) (REHA), common raven (*Corvus corax*) (CORA), dark-eyed junco (*Junco hyemalis*), brown creeper (*Certhia americana*), black-capped chickadee (*Poecile atricapillus*), Stellar’s jay (*Cyanocitta stelleri*), red-naped sapsucker (*Sphyrapicus nuchalis*), Clark’s nutcracker (*Nucifraga columbiana*), American robin (*Turdus migratorius*), dusky blue grouse (*Dendragapus obscurus*), 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 raptor species of concern; other species listed were observed and listed herein for reference only.

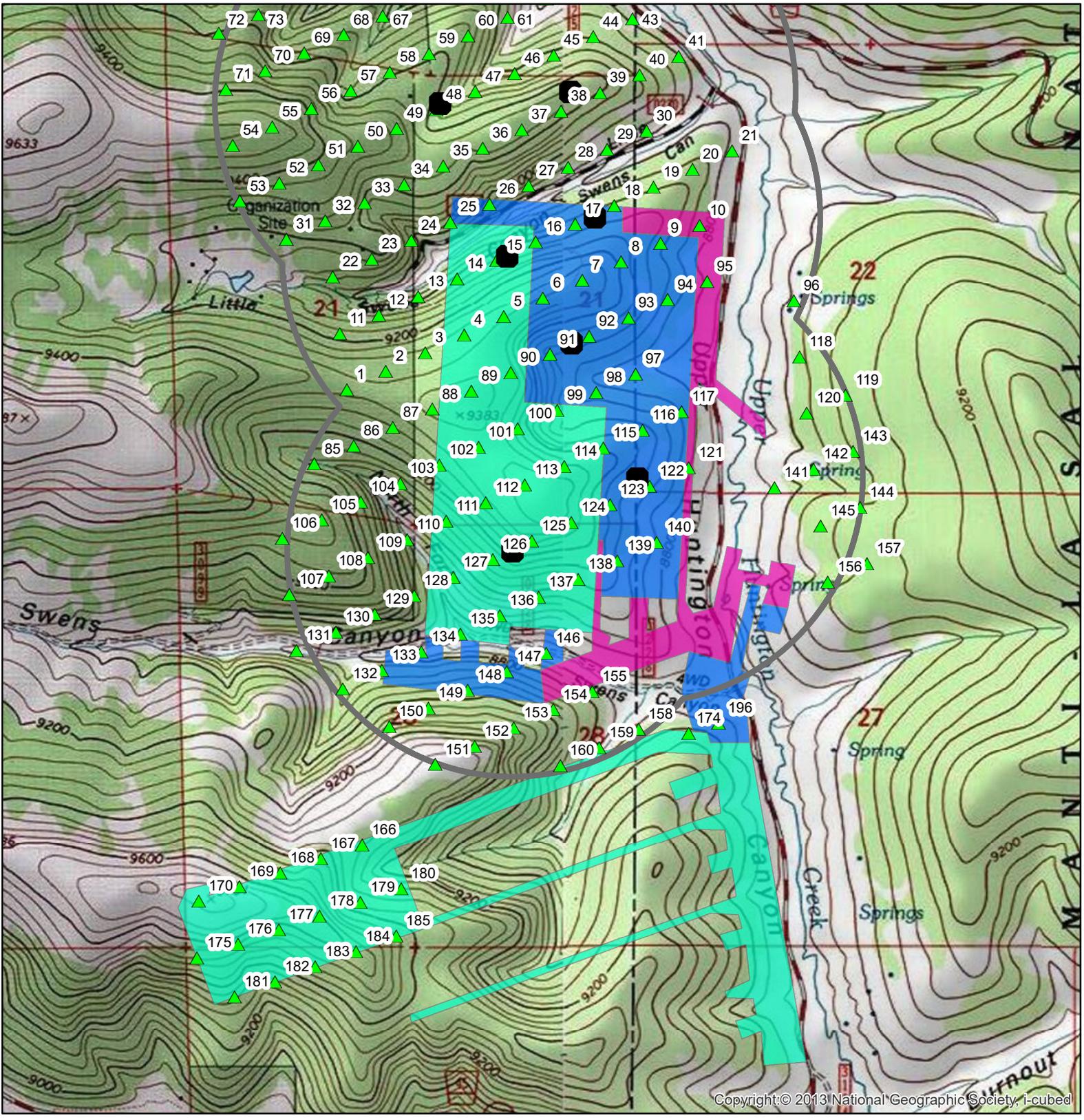
Table 1 summarizes the results of the survey by call station, raptor species, and type of observation.

Station#	Survey	Aural	Visual	Species	Notes
181	1		X	CORA	CORA observed south of call station.
182	1		X	CORA	CORA observed south of call station
217	1		X	REHA	REHA soaring across Winter Quarters Canyon to the northeast
222	1		X	CORA	CORA observed while hiking into call station. It did not respond to NOGO call.
232	1				Elk – cows and calves
244	2		X	CORA	CORA east of survey area.
243	2				Elk – cows and calves between 243 and 236.
196	2	X	X	CORA	CORA near Swens Canyon road

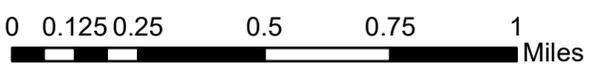
There were no observations of special status species during the course of either survey. No American three-toed woodpeckers were observed during either survey.



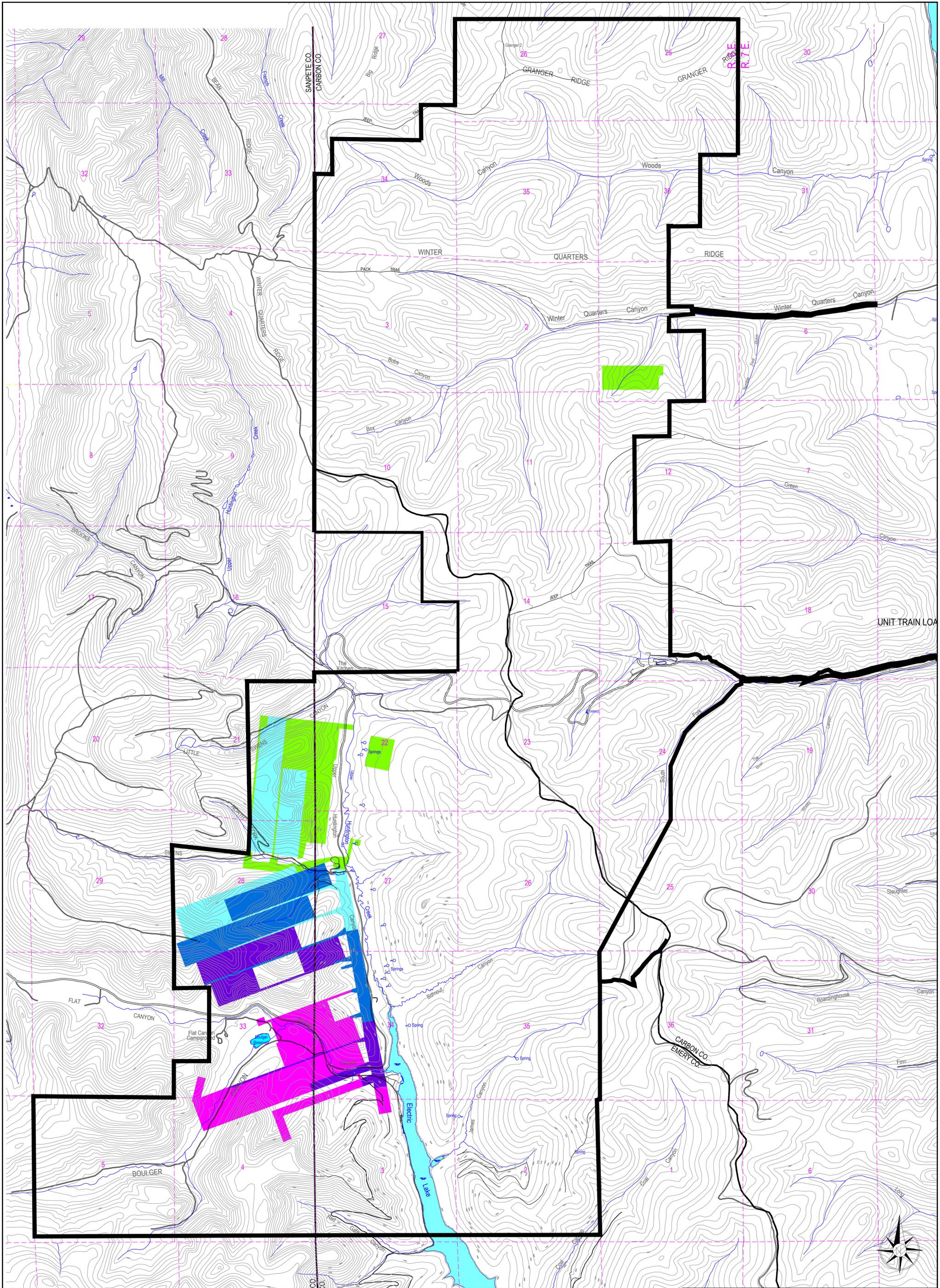
2017 North Subsidence Area
Wildlife Survey
Alpine Ecological



- 2017_Drill_Sites
- 2017 Call Stations
- 2017 Drill Sites Buffer
- Mine_Year**
- 2017
- 2018
- 2019



2017 South Subsidence Area
Wildlife Survey
Alpine Ecological



LEGEND

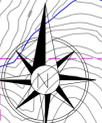
- 2018
- 2019
- 2020
- 2021
- 2022

— Lease Boundary

Skyline Mine
Five Year Plan
2018-2022

Canyon Fuel Company, LLC
Skyline Mines

HCR 35 BOX380, HELPER, UT, 84526 435-448-2632	DATE: 3/30/2018 CK.BY:CBrown	REVISION:
DWG. NO.:	SCALE: 1"=1200'	DR.BY:TEarl



**RIPARIAN PLANT COMMUNITY
MONITORING AT SELECTED REACHES
IN WOODS CANYON
2017**

**AT THE
SKYLINE MINE
CARBON COUNTY, UTAH**



Prepared by

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for

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Skyline Mines
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March 2018



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Introduction

History & Study Objectives

As described in the preceding reports regarding the riparian communities in the area, coal mining activities are currently being conducted at the Skyline Mine in Carbon County, Utah. Some of the mining has been underneath Winter Quarters Canyon, Woods Canyon and their tributaries. As a means to monitor impacts from mining to the riparian plant communities supported along the stream-sides in the area, baseline and yearly studies have been and will continue to be conducted. This report describes the results of the field study conducted in 2017 to monitoring in the riparian plant communities in the study area.

Vegetation monitoring studies have been conducted *before, during* and *after* the mining operations occur. The first such study began in 2005 with the objective to provide a comprehensive baseline dataset of representative stream reaches for the *entire* area in Winter Quarters Canyon and Woods Canyon, or those areas that could potentially be impacted by the proposed underground mining activities. The 2005 monitoring year has been called the *Initial Baseline Year* for the riparian studies of the area.

Regular vegetation monitoring in the riparian zones should provide data to determine long-term trends, natural variability and benchmark information including the possible impacts to the riparian plant communities caused by mining under the creeks and streams of the canyons. The studies have been designed so that the sample frequency is intensified in the areas where: 1) underground mining is planned for the near future (for more baseline data), 2) where mining is currently occurring, and 3) where mining has occurred in the recent past.

The methodologies used in the studies have been consistent for all monitoring periods. They were not designed to provide data that could show *subtle* changes to community structure and species composition as a result of minor changes to the riparian habitat (which can occur as a result of several factors i.e. precipitation changes, grazing impacts, etc.). Rather, the studies were designed to be compared with future monitoring studies in an attempt to document *major* impacts to the plant communities along the stream due to catastrophic events, such as

loss of water and habitat from the effects of subsidence caused from underground mining.

According to the environmental engineer at the Skyline Mine, mining has proceeded beyond the riparian plant communities that could be impacted by the associated subsidence. Consequently, the commitment for monitoring the potentially impacted riparian zones has now been fulfilled. Therefore, **this will be the final monitoring report** unless the mine plan progresses underneath other stream and riparian communities.

The Study Area

Only Woods Canyon was included in the study area in 2015, 2016 and 2017 due to the mining progress. This canyon is located within the Wasatch Plateau, a high plateau that lies between the Colorado Plateau and Great Basin regions of the western United States. The canyon is located approximately 2.5 miles west of the town of Scofield, Utah and are located within the Manti-La Sal National Forest.

The dominant plant communities of the canyon were riparian, spruce-fir, aspen/grass, sagebrush/grass and mountain herblands.

Methods

Sample Design, Transect Placement & Frequency

The riparian vegetation of specific reaches in Woods Canyon were sampled in August 2017. Selection of the sample locations of the reaches was based on the underground coal mining schedule for the Skyline Mines. The methods for 2017 follow the *Initial Baseline Year* (2005) described above. As mentioned, the riparian vegetation surveys have been designed to concentrate on recently mined areas, current mining, and areas to be mined in the near future. More specifically, the surveys have been conducted where mining activities are planned under the streams according to the following schedule: 1) two years prior to mining specific areas, 2) the year of the mining activities, and 3) two years after mining has occurred in the areas. During these study periods, sampling is intensified by placing sample stations at regular

intervals every 400 ft., rather than the 800 ft. spacing that was used in the *Baseline Year* (2005).

[NOTE: *In the Initial Baseline Year (2005) sample locations were placed every 800 ft with the exception of those areas that were scheduled to be mined in late-2005, where the 400 ft spacing was used. Because of the spacing differences and because the underground mining progress determines where transects will be placed each year, sometimes the site numbers in each sample area are not in sequential order].*

Line transects were placed at each sample station. Locations and extent of the transects were semi-permanently marked using numbered and flagged wooden stakes and 12-inch metal rods. The vegetation monitoring methods of the studies have been primarily based on those described by the USDA Forest Service manual for a "*Level III Riparian Area Evaluation*" (Integrated Riparian Evaluation Guide, March 1992). Qualitative and quantitative data were recorded at the sample stations established in the field. In the first year of the studies, the overall objective of the study plan was to begin monitoring years with one complete baseline dataset for all riparian areas near the perennial streams located in the mine permit area prior to any mining. As mentioned in the previous monitoring reports, all sample station locations have been determined and mapped based on the timing and schedule of the underground mining activities (see Map A).

Geomorphological stream channel data outlined in the Forest Service protocol were not recorded as part of this study because Canyon Fuel Company has conducted other studies that will suffice for this information. Additionally, soils information through the Natural Resources Conservation Service (NRCS) were not available for the study areas.

Qualitative Data

The "Riparian Complex Data Sheet" shown on Table 1 lists all of the qualitative (and quantitative) data that has been, and will continue to be, collected in the future at each sample station.

Photographic stations for documentation and future comparisons have also been established

at each sample location. A sample location map has been included in this report (Map B).

Quantitative Data

USDA Forest Service protocol was employed as a model to drive the study plan for quantitative data. *Community Type Cover* is one method to record cover in the Forest Service Level III protocol. At the sample locations, transect lines have been placed across (or perpendicular to) the stream channel. By design, the line transects vary in lengths and are based on several factors. Although sometimes limited by topographical features, the intent was to make the transects long enough to cover the entire stream, its riparian communities, plus an additional 10 ft on each side of the stream to record the adjacent upland communities. Monitoring the total extent of the riparian plant communities including some upland community data should provide information about possible increases or decreases in the riparian communities relative to the adjacent upland communities.

TABLE 1: RIPARIAN COMPLEX DATA SHEET

CLIENT:
COMPLEX: Riverine - Number
WATERBODY NAME:
LOCATION:
DATE:
OBSERVER(S):
QUAD NAME:
GEOLOGIC PARENT MATERIAL:
ASPECT:
STREAM GRADIENT:
ELEVATION: .
ADJACENT UPLAND VEGETATION (looking downstream)
Left: Right:
VEGETATIVE DESCRIPTION (Dominance by Community Types)
SUCCESSIONAL STATUS:
APPARENT FORAGE TREND:
ESTIMATED FORAGE PRODUCTION:
BEAVER ACTIVITY:
PHOTOGRAPH TAKEN:
LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA:
SPECIES OBSERVED:
POOL ATTRIBUTES
 % area in pools:
 % pool area made up of pools > 2' deep:
AQUATIC VEGETATION
 % streambed with filamentous algae:
 % stream margin with rooted aquatic:
BANK TYPE & VEGETATION OVERHANG
 % bank length undercut (<90°):
 % bank length gently sloping (>135°):
 % bank length with overhanging vegetation:
BANK CONDITION (bankfull area only)
 % bank length vegetated, stable:
 % bank length unvegetated, stable:
 % bank length vegetated, unstable:
 % bank length unvegetated, unstable:
NOTES:
QUANTITATIVE DATA SUMMARY:
PHOTOGRAPHIC DOCUMENTATION:

Once the transects were placed, the line-intercept method was employed to measure the extent of each major riparian plant community. The communities have been named by the

dominant two plant species. If only one species dominated the community by a wide margin, the plant community was named by this single species. In this report, when reference is made to the left or right side of the drainage, this means “river left” or “river right”, *as characterized by looking downstream.*

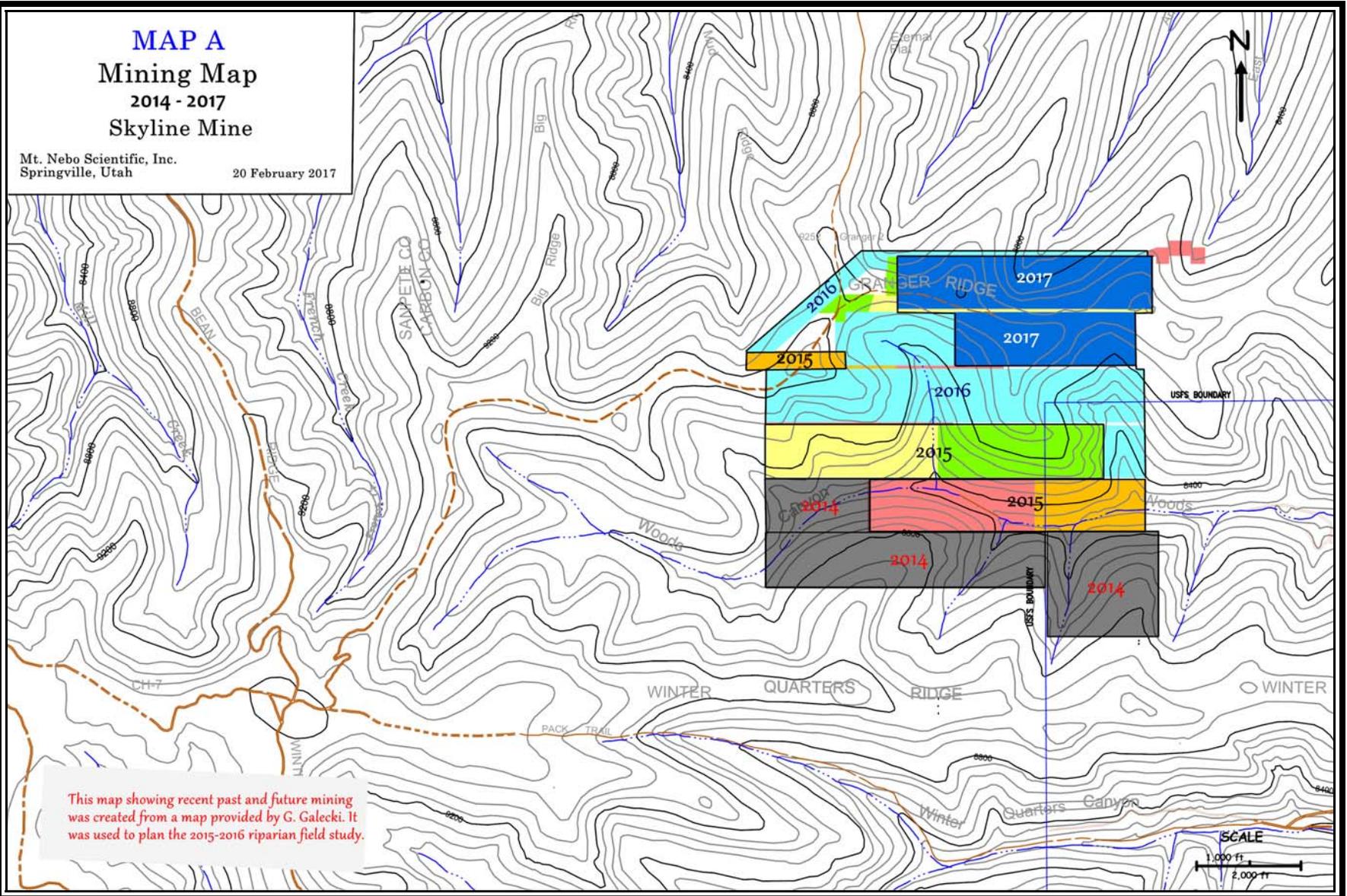
Results

Listed below is a summary of the sample stations for the study areas for 2017 (Table 2). For a map of the potential subsidence areas for the applicable mining years, refer to Map A. This map was used to determine the sample sites for 2017. For a map of the sample locations, refer to Map B in this report. Both of these maps are provided below.

TABLE 2: Riparian Sample Stations in Winter Quarters & Woods Canyons: 2017				
WOODS CANYON CREEK	BOB'S CANYON CREEK	NO-NAME DRAINAGE CREEK	BOX CANYON CREEK	WINTER QUARTERS CREEK
WD-01				
WD-02				
WD-03				
WD-04				
WD-05				
WD-06				
WD-07				
WD-08				
WD-09				
WD-10				
WD-11				
WD-12				

MAP A Mining Map 2014 - 2017 Skyline Mine

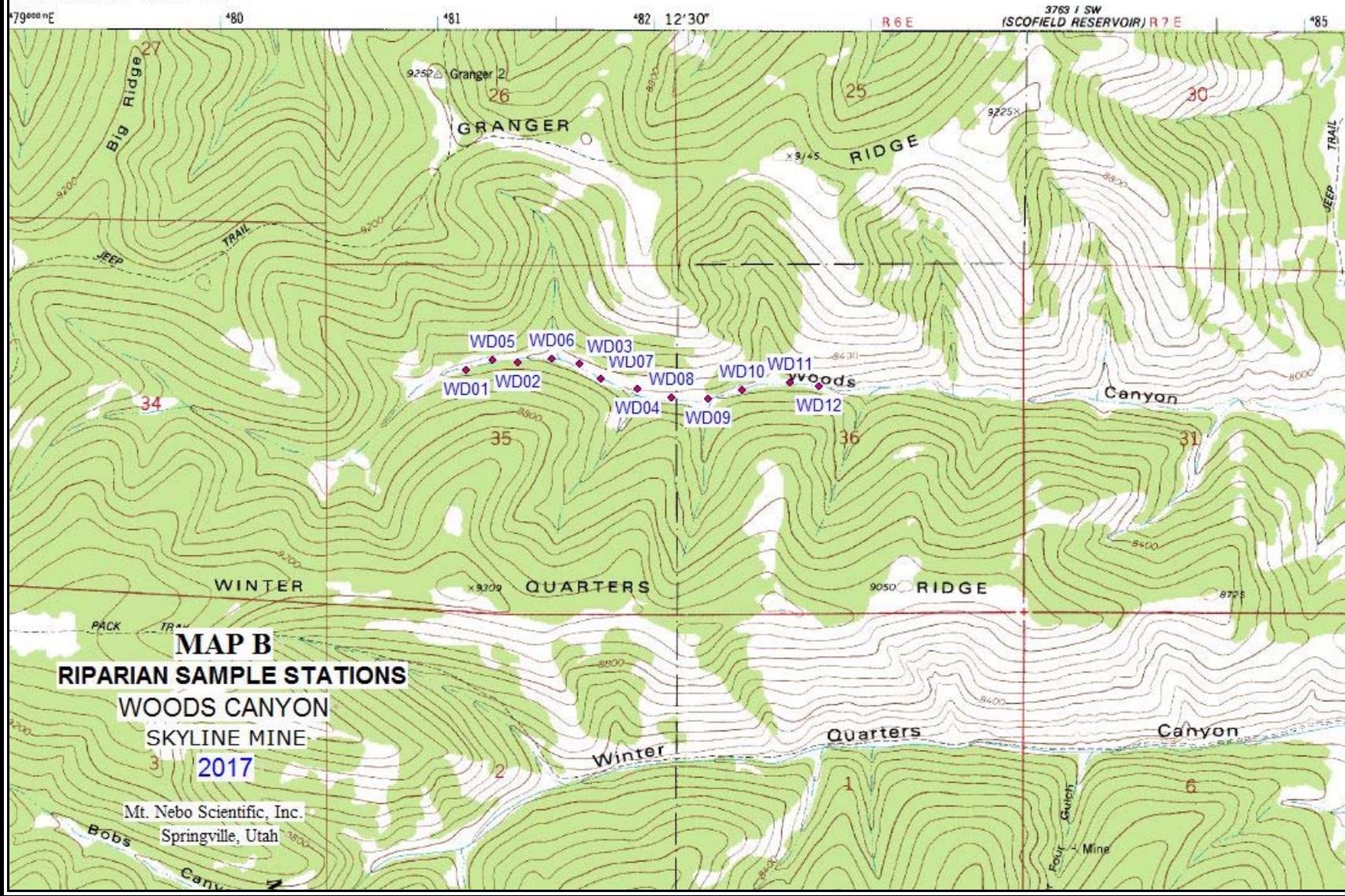
Mt. Nebo Scientific, Inc.
Springville, Utah
20 February 2017



This map showing recent past and future mining was created from a map provided by G. Galecki. It was used to plan the 2015-2016 riparian field study.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF UTAH
UTAH GEOLOGICAL AND MINERAL SURVEY



RIPARIAN COMPLEX DATA SHEET
2017

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *WD-01*

WATERBODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 29, 2017*

OBSERVER(S): *P. Collins*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STEAM ASPECT: *ENE*

STREAM GRADIENT: *1-2 °*

ELEVATION: *8,475 ft*

SIZE OF COMPLEX: *(see quantitative data)*

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Herbland*

Right: *Blue Spruce*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Stable*

ESTIMATED FORAGE PRODUCTION: *1,500 lbs/acre*

BEAVER ACTIVITY: *No*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Picea pungens</i>		<i>Achillea millefolium</i>	<i>Agrostis stolonifera</i>
		<i>Geranium richardsonii</i>	<i>Carex hoodii</i>
		<i>Ranunculus cymbalaria</i>	<i>Elymus canadensis</i>
		<i>Senecio serra</i>	<i>Hordeum brachyantherum</i>
		<i>Urtica dioica</i>	<i>Phragmites australis</i>

POOL ATTRIBUTES

% area in pools: *50*
 % pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*
 % stream margin with rooted aquatic: *30*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *0*
 % bank length gently sloping (>135°): *100 of riparian community*
 % bank length with overhanging vegetation: *0 (herbaceous)*

BANK CONDITION

% bank length vegetated, stable: *98*
 % bank length unvegetated, stable: *2*
 % bank length vegetated, unstable: *0*
 % bank length unvegetated, unstable: *0*

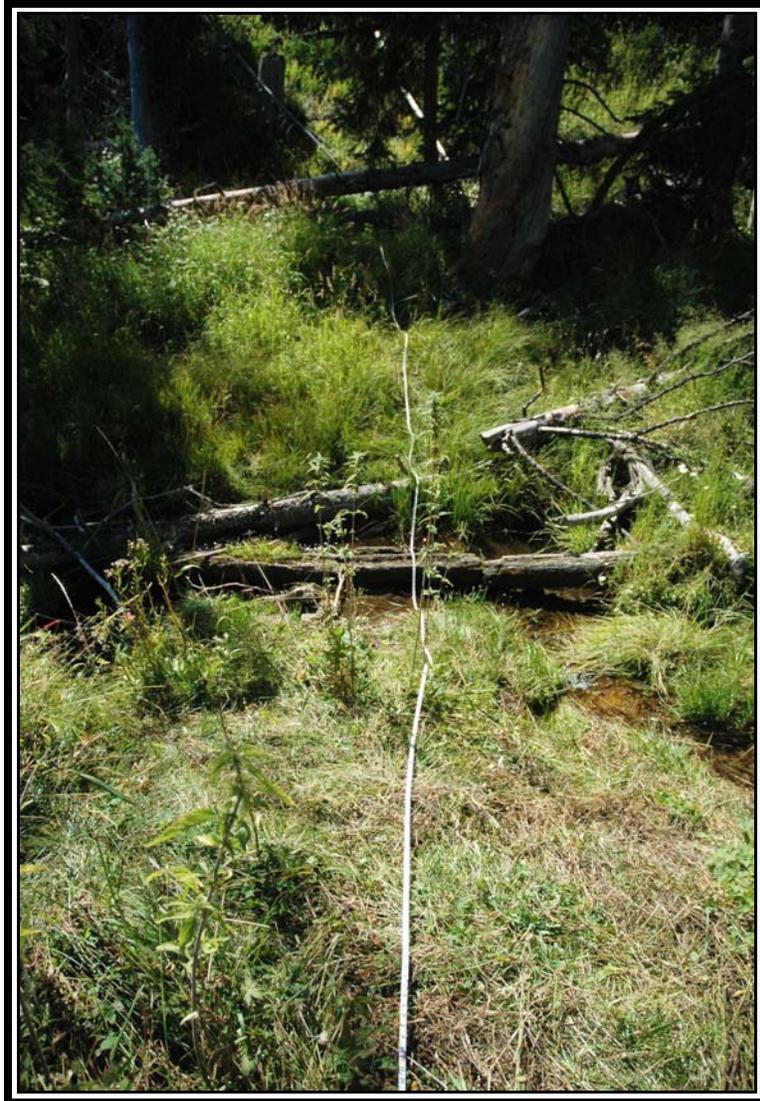
NOTES:

- 1) *In 2013 we found the original 2005 stakes. Also found them in 2014, 2015, 2016 and 2017.*
- 2) *Unlike previous year's, beginning in 2016 common reed was noted on the right side all the way to the stake rendering that side all riparian.*

DATA SUMMARY

<u>WD-01: Cover by community types in Woods Canyon (2017).</u>	
<u>USDA Forest Service Protocol (1992)</u>	
UPLAND VEGETATION	10.00
	0.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Carex hoodii</i>	5.00
<i>Agrostis stolonifera/Phragmites australis</i>	21.00
TOTAL COVER (Upland Species)	10.00
TOTAL COVER (Riparian Species)	26.00
ROCK (channel)	0.00
WATER (channel)	3.00
BAREGROUND/MUD (channel)	0.00
LITTER (channel)	1.00
MOSS (channel)	0.00
TOTAL COVER	40.00

PHOTOGRAPHIC DOCUMENTATION



RIPARIAN COMPLEX DATA SHEET
2017

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *WD-02*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 29, 2017*

OBSERVER(S): *P. Collins*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STEAM ASPECT: *E*

STREAM GRADIENT: *1-2°*

ELEVATION: *8,444 ft*

SIZE OF COMPLEX: *(see quantitative data)*

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Blue Spruce/Grass*

Right: *Blue Spruce/Grass*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Seral now due to debris and fallen trees*

ESTIMATED FORAGE PRODUCTION: *1,300 lbs/acre*

BEAVER ACTIVITY: *No*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
		<i>Achillea millefolium</i>	<i>Agrostis stolonifera</i>
		<i>Geranium richardsonii</i>	<i>Elymus canadensis</i>
		<i>Lathyrus sp.</i>	<i>Juncus longistylis</i>
		<i>Ranunculus cymbalaria</i>	
		<i>Senecio serra</i>	
		<i>Urtica dioica</i>	
		<i>Viguiera multiflora</i>	

POOL ATTRIBUTES

% area in pools: *25 (debris in creek)*

% pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*

% stream margin with rooted aquatic: *0*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *0 left; 0 right*

% bank length gently sloping (>135°): *50 (right side)*

% bank length with overhanging vegetation: *50 (herb)*

BANK CONDITION

% bank length vegetated, stable: *95*

% bank length unvegetated, stable: *2.5*

% bank length vegetated, unstable: *0*

% bank length unvegetated, unstable: *2.5*

NOTES:

1) *The location of this site was just down from red (\$1000 fine) sign.*

2) *A well-defined channel delineated the riparian comm.*

3) *Bank elevation went up ~ 3.5 ft above the stream.*

4) *We found the original 2005 stakes.*

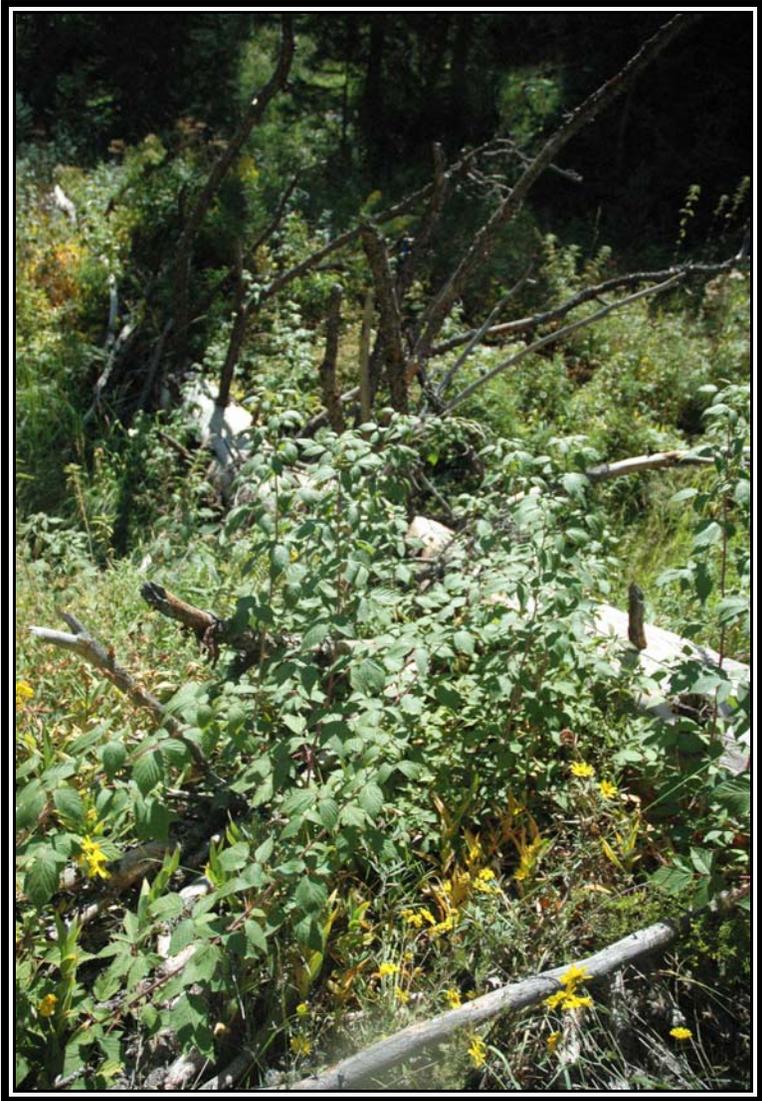
5) *Some trees had fallen in the creek since 2005.*

6) *There was one big tree that had fallen in the creek that made it difficult to sample. I did however find the original marker stakes in 2016 and 2017.*

DATA SUMMARY

<u>WD-02: Cover by community types in Woods Canyon (2017).</u>	
<u>USDA Forest Service Protocol (1992)</u>	
UPLAND VEGETATION	10.00
	7.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Geranium richardsonii/Equisetum arvense</i>	6.00
TOTAL COVER (Upland Species)	17.00
TOTAL COVER (Riparian Species)	6.00
ROCK (channel)	0.00
WATER (channel)	2.00
BAREGROUND (channel)	0.00
LITTER (channel)	3.00
ROOTED VEGETATION (channel)	0.00
<u>TOTAL COVER</u>	<u>28.00</u>

PHOTOGRAPHIC DOCUMENTATION



WD-02

RIPARIAN COMPLEX DATA SHEET
2017

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-03*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 29, 2017*

OBSERVER(S): *P. Collins*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STEAM ASPECT: *ESE*

STREAM GRADIENT: *1-2^o*

ELEVATION: *8,392 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Nettle/Grass*

Right: *Spruce/Fir*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Increasing*

ESTIMATED FORAGE PRODUCTION: *1,300 lbs/acre*

BEAVER ACTIVITY: *No*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Abies concolor</i>	<i>Fragaria vesca</i>	<i>Epilobium angustifolium</i>	<i>Agrostis stolonifera</i>
<i>Picea pungens</i>	<i>Rosa woodsii</i>	<i>Taraxacum officinale</i>	<i>Carex nebrascensis</i>
		<i>Vicia americana</i>	<i>Elymus canadensis</i>
		<i>Viguiera multiflora</i>	<i>Hordeum brachyantherum</i>
		<i>Urtica dioica</i>	<i>Juncus longistylis</i>
			<i>Carex hoodii</i>

POOL ATTRIBUTES

% area in pools: *50*

% pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*

% stream margin with rooted aquatic: *In 3 ft wide water 2 ft had rooted aquatic vegetation (Nebraska sedge).*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *0*

% bank length gently sloping (>135°): *100 right and 50 left*

% bank length with overhanging vegetation: *0*

BANK CONDITION

% bank length vegetated, stable: *95*

% bank length unvegetated, stable: *5*

% bank length vegetated, unstable: *0*

% bank length unvegetated, unstable: *0*

NOTES:

1) *This sample site was located 0.18 mile downstream (instead of 0.15 mi) because of the complexity of measuring the communities at 0.15 mile (it was near a drainage confluence).*

2) *A good well-defined riparian zone to monitor.*

3) *In 2013, we found the 2005 right stake so we marked the last distance recorded from that stake to place the position of the left side stake (33 ft).*

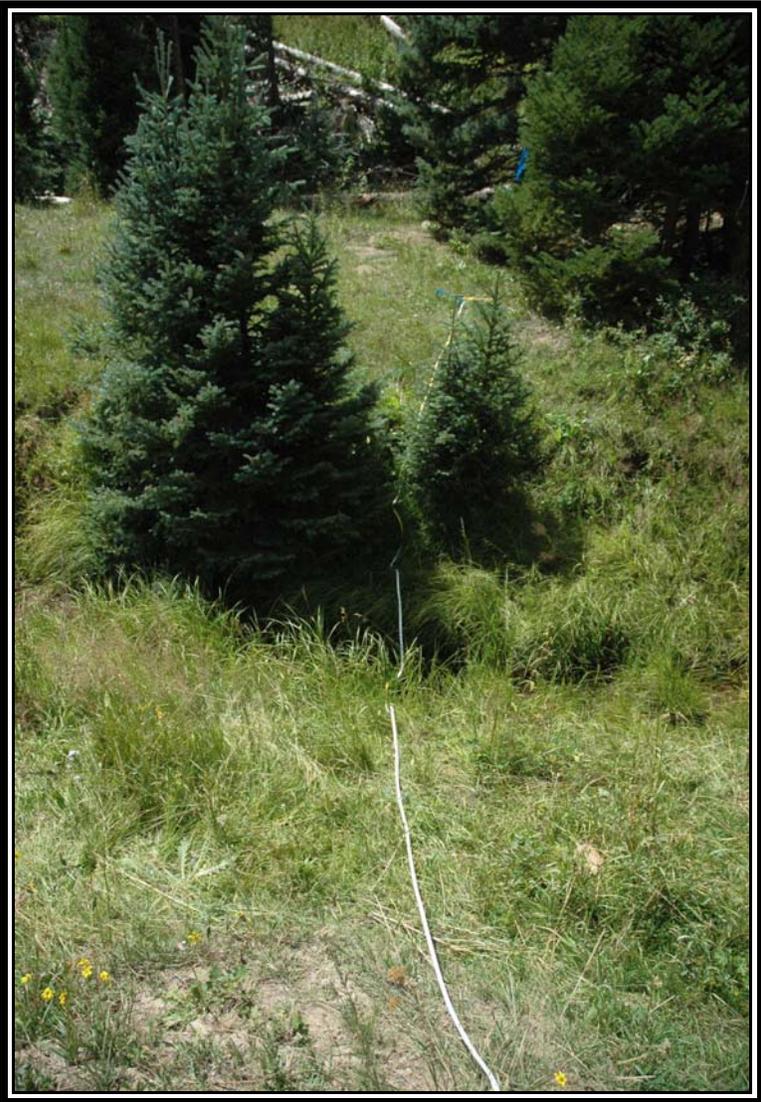
4) *We had to adjust the transect tape line due to slough-age, so it measured 34 ft in 2014, 2015 and 2016 (not 33 ft like 2013). In 2017 it was 33 ft again.*

DATA SUMMARY

WD-03: Cover by community types in Woods Canyon (2017).
USDA Forest Service Protocol (1992)

UPLAND VEGETATION	
	7.00
	9.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Agrostis stolonifera</i>	10.00
<i>Carex nebrascensis</i>	1.00
<i>Elymus canadensis</i>	4.00
TOTAL COVER (Upland Species)	16.00
TOTAL COVER (Riparian Species)	15.00
ROCK (channel)	0.00
WATER (channel)	2.00
BAREGROUND (channel)	0.00
LITTER (channel)	0.00
MOSS (channel)	0.00
<hr/>	
TOTAL COVER	33.00

PHOTOGRAPHIC DOCUMENTATION



WD-03

RIPARIAN COMPLEX DATA SHEET
2017

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-04*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 30, 2017*

OBSERVER(S): *P. Collins, K. Larson*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STREAM ASPECT: *E*

STREAM GRADIENT: *1-2^o*

ELEVATION: *8,321 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Woods Rose/Grass*

Right: *Spruce/Fir*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Stable*

ESTIMATED FORAGE PRODUCTION: *1,100 lbs/acre*

BEAVER ACTIVITY: *no*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Abies concolor</i>	<i>Ribes sp.</i>	<i>Artemisia dracunculus</i>	<i>Agrostis stolonifera</i>
<i>Picea pungens</i>		<i>Equisetum arvense</i>	<i>Elymus canadensis</i>
		<i>Fragaria vesca</i>	<i>Juncus longistylis</i>
		<i>Geranium richardsonii</i>	

POOL ATTRIBUTES

% area in pools: *25*

% pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*

% stream margin with rooted aquatic: *0*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *0, filled in now.*

% bank length gently sloping (>135°): *40*

% bank length with overhanging vegetation: *35*

BANK CONDITION

% bank length vegetated, stable: *90*

% bank length unvegetated, stable: *10*

% bank length vegetated, unstable: *0*

% bank length unvegetated, unstable: *0*

NOTES:

- 1) *We put this sample site 0.18 mi (not 0.15) from last site because of the spring at 0.15 mi on the left side would have made it difficult to measure accurately.*
- 2) *Both upland sides seemed to have hillside water influence.*
- 3) *In 2005, this was the final sample site in Woods Canyon. Therefore, there was a buffer at the top and bottom ends. It was located < 0.15 mile from the FS boundary.*
- 4) *In 2013, 2014, 2015, 2016 and 2017 we found all 2005 stakes.*
- 5) *There was a great deal of hillside influenced water (seeps), so it is a confusing site to monitor. In 2015, 2016, and 2017 the site was mostly dominated by redtop.*
- 6) *The transect length in 2017 was 31 ft, not 33 ft like 2016.*

DATA SUMMARY

WD-04: Cover by community types in Woods Canyon (2017).
USDA Forest Service Protocol (1992)

UPLAND VEGETATION

1.00
9.00

RIPARIAN VEGETATION

Dominant Woody Species

Dominant Herbaceous Species

Agrostis stolonifera

16.00

TOTAL COVER (Upland Species)

10.00

TOTAL COVER (Riparian Species)

16.00

ROCK (channel)

1.00

WATER (channel)

4.00

BAREGROUND (channel)

0.00

LITTER (channel)

0.00

ROOTED VEGETATION (channel)

0.00

TOTAL COVER

31.00

PHOTOGRAPHIC DOCUMENTATION



WD-04

RIPARIAN COMPLEX DATA SHEET
2017

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-05*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 29, 2017*

OBSERVER(S): *P. Collins*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STEAM ASPECT: *E*

STREAM GRADIENT: *1-2°*

ELEVATION: *8,460 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Herbland*

Right: *Conifer*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Stable*

ESTIMATED FORAGE PRODUCTION: *1,300 lbs/acre*

BEAVER ACTIVITY: *There was an old beaver dam 80-100 ft upstream.*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Picea pungens</i>		<i>Geranium richardsonii</i>	<i>Agrostis stolonifera</i>
		<i>Senecio serra</i>	<i>Carex nebrascensis</i>
			<i>Carex hoodii</i>
			<i>Elymus canadensis</i>
			<i>Juncus longistylis</i>
			<i>Phragmites australis</i>

POOL ATTRIBUTES

% area in pools: *75*
 % pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*
 % stream margin with rooted aquatic: *70 (see notes & photo)*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *0*
 % bank length gently sloping (>135°): *100 on left*
 % bank length with overhanging vegetation: *50 (herbaceous)*

BANK CONDITION

% bank length vegetated, stable: *95*
 % bank length unvegetated, stable: *5*
 % bank length vegetated, unstable: *0*
 % bank length unvegetated, unstable: *0*

NOTES:

- 1) In 2013, we did not find the stakes here. The GPS took us 100 ft adjacent the stream in the upland community, so we put the stake at that point but across the riparian community. I'm not sure when I recorded those coordinates.
- 2) In 2014 and 2015, we re-recorded the GPS coordinates.
- 3) In 2014 the length was 39 ft; 2015 it was 36 ft; in 2016 and 2017 it was 35 ft.

DATA SUMMARY

WD-05: Cover by community types in Woods Canyon (2017).

USDA Forest Service Protocol (1992)

UPLAND VEGETATION

10.00
10.00

RIPARIAN VEGETATION

Dominant Woody Species

Dominant Herbaceous Species

<i>Carex nebrascensis</i>	5.00
<i>Carex hoodii</i>	2.00
<i>Equisetum arvense</i>	3.00
<i>Geranium richardsonii/Equisetum arvense</i>	2.00

TOTAL COVER (Upland Species)	20.00
TOTAL COVER (Riparian Species)	12.00
ROCK (channel)	1.00
WATER (channel)	1.00
BAREGROUND (channel)	0.00
LITTER (channel)	1.00
ROOTED VEGETATION (channel)	0.00

TOTAL COVER	35.00
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PHOTOGRAPHIC DOCUMENTATION



WD-05

RIPARIAN COMPLEX DATA SHEET
2017

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-06*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 29, 2017*

OBSERVER(S): *P. Collins*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STREAM ASPECT: *E*

STREAM GRADIENT: *1-2°*

ELEVATION: *8,420 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Herbland*

Right: *Spruce/Fir*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Stable*

ESTIMATED FORAGE PRODUCTION: *1,200 lbs/acre*

BEAVER ACTIVITY: *no*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Picea pungens</i>		<i>Geranium richardsonii</i>	<i>Agrostis stolonifera</i>
			<i>Carex hoodii</i>
			<i>Carex nebrascensis</i>
			<i>Elymus canadensis</i>

POOL ATTRIBUTES

% area in pools: *0*
 % pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*
 % stream margin with rooted aquatic: *0*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *0*
 % bank length gently sloping (>135°):
 % bank length with overhanging vegetation: *100 (herbaceous)*

BANK CONDITION

% bank length vegetated, stable: *90*
 % bank length unvegetated, stable: *10*
 % bank length vegetated, unstable: *0*
 % bank length unvegetated, unstable: *0*

NOTES:

- 1) *In 2014, we did not find old stakes, but found them in 2015, 2016 and 2017.*
- 2) *We staked the location exactly where GPS put the site. This was in a well-defined channel.*
- 3) *It appeared that the right hillside moisture was augmenting the riparian community.*
- 4) *3 ft length of water had rooted vegetation in 2015 but not 2016 or 2017.*

DATA SUMMARY

<u>WD-06: Cover by community types in Woods Canyon (2017).</u>	
<u>USDA Forest Service Protocol (1992)</u>	
UPLAND VEGETATION	
	7.00
	8.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Agrostis stolonifera/Carex hoodii</i>	13.50
<i>Geranium richardsonii/Equisetum arvense</i>	7.00
TOTAL COVER (Upland Species)	15.00
TOTAL COVER (Riparian Species)	20.50
ROCK (channel)	0.00
WATER (channel)	2.50
BAREGROUND (channel)	0.00
LITTER (channel)	0.00
ROOTED VEGETATION (channel)	0.00
TOTAL COVER	38.00

PHOTOGRAPHIC DOCUMENTATION



WD-06

RIPARIAN COMPLEX DATA SHEET
2017

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-07*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 29, 2017*

OBSERVER(S): *P. Collins*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STEAM ASPECT: *E*

STREAM GRADIENT: *1-2°*

ELEVATION: *8,356 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Blue Spruce/Herbland*

Right: *Aspen/Fir*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Stable*

ESTIMATED FORAGE PRODUCTION: *1,000 lbs/acre*

BEAVER ACTIVITY: *no*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Abies concolor</i>		<i>Achillea millefolium</i>	<i>Agrostis stolonifera</i>
<i>Picea pungens</i>		<i>Epilobium angustifolium</i>	<i>Elymus canadensis</i>
<i>Populus tremuloides</i>		<i>Ranunculus cymbalaria</i>	
		<i>Rudbeckia occidentalis</i>	

POOL ATTRIBUTES

% area in pools: *50*
 % pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*
 % stream margin with rooted aquatic: *0*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *0 (right side was close to being undercut)*
 % bank length gently sloping (>135°): *50 (right and left sides)*
 % bank length with overhanging vegetation: *35*

BANK CONDITION

% bank length vegetated, stable: *95*
 % bank length unvegetated, stable: *5*
 % bank length vegetated, unstable: *0*
 % bank length unvegetated, unstable: *0*

NOTES:

- 1) Like WD-06, in 2014 we did not find old stakes but found them in 2015, 2016 and 2017.
- 2) This was in a well-defined channel.
- 3) In 2014, 2015, 2016 and 2017 the left side where we had called "upland" before seems more mesic, but we left it upland to be consistent.
- 4) There is probably a lot of hillside moisture influence at this site.

DATA SUMMARY

<u>WD-07: Cover by community types in Woods Canyon (2017).</u>	
<u>USDA Forest Service Protocol (1992)</u>	
UPLAND VEGETATION	
	9.00
	7.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Elymus canadensis</i>	4.00
<i>Agrostis stolonifera</i> / <i>Geranium richardsonii</i>	6.00
TOTAL COVER (Upland Species)	16.00
TOTAL COVER (Riparian Species)	10.00
ROCK (channel)	3.00
WATER (channel)	4.00
BAREGROUND (channel)	0.00
LITTER (channel)	0.00
MOSS (channel)	0.00
TOTAL COVER	33.00

PHOTOGRAPHIC DOCUMENTATION



WD-07

**RIPARIAN COMPLEX DATA SHEET
2017**

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-08 (new site in 2014)*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 30, 2017*

OBSERVER(S): *P. Collins, K. Larson*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STEAM ASPECT: *E*

STREAM GRADIENT: *1-2°*

ELEVATION: *8,312 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Grass/Snowberry/Sagebrush*

Right: *Conifer/Aspen*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Stable*

ESTIMATED FORAGE PRODUCTION: *1,200 lbs/acre*

BEAVER ACTIVITY: *no*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Picea pungens</i>	<i>Artemisia tridentata</i>	<i>Achillea millefolium</i>	<i>Agrostis stolonifera</i>
<i>Populus tremuloides</i>	<i>Chrysothamnus nauseosus</i>	<i>Geranium richardsonii</i>	<i>Carex hoodii</i>
	<i>Symphoricarpos oreophilus</i>	<i>Osmorhiza depauperata</i>	<i>Elymus canadensis</i>
		<i>Ranunculus cymbalaria</i>	
		<i>Rudbeckia occidentalis</i>	

POOL ATTRIBUTES

% area in pools: *20*

% pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*

% stream margin with rooted aquatic: *0*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *100 (left)*

% bank length gently sloping (>135°): *100 (right)*

% bank length with overhanging vegetation:

BANK CONDITION

% bank length vegetated, stable: *95*

% bank length unvegetated, stable: *5*

% bank length vegetated, unstable: *0*

% bank length unvegetated, unstable: *0*

NOTES:

- 1) *On the left side, the riparian community goes up to the slope.*
- 2) *The flat bottom is a good place to monitor.*

DATA SUMMARY

WD-08: Cover by community types in Woods Canyon (2017).
USDA Forest Service Protocol (1992)

UPLAND VEGETATION	
	7.00
	12.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Agrostis stolonifera/Carex hoodii</i>	5.50
<i>Agrostis stolonifera</i>	16.00
<i>Agrostis hoodii/Carex nebrascensis</i>	16.00
TOTAL COVER (Upland Species)	19.00
TOTAL COVER (Riparian Species)	37.50
ROCK (channel)	2.50
WATER (channel)	2.00
BAREGROUND (channel)	0.00
LITTER (channel)	0.00
MOSS (channel)	0.00
<u>TOTAL COVER</u>	<u>59.00</u>

PHOTOGRAPHIC DOCUMENTATION



WD-08

**RIPARIAN COMPLEX DATA SHEET
2017**

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-09 (new site in 2014)*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 30, 2017*

OBSERVER(S): *P. Collins, K. Larson*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STEAM ASPECT: *E*

STREAM GRADIENT: *1-2 °*

ELEVATION: *8,280 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Sagebrush/Grass*

Right: *Aspen/Conifer*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Decreasing do to grazing pressure*

ESTIMATED FORAGE PRODUCTION: *1,100 lbs/acre*

BEAVER ACTIVITY: *no*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Pinus edulis</i>	<i>Artemisia tridentata</i>	<i>Taraxacum officinale</i>	<i>Agrostis stolonifera</i>
<i>Populus tremuloides</i>	<i>Chrysothamnus nauseosus</i>		<i>Carex nebrascensis</i>
			<i>Juncus ensifolius</i>
			<i>Poa pratensis</i>

POOL ATTRIBUTES

- % area in pools: *0*
- % pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

- % streambed with filamentous algae: *0*
- % stream margin with rooted aquatic: *0 (1 ft of Cane rooted on left side)*

BANK TYPE & VEGETATION OVERHANG

- % bank length undercut (<90°): *0*
- % bank length gently sloping (>135°): *0*
- % bank length with overhanging vegetation: *3 ft on left side; herbaceous on right*

BANK CONDITION

- % bank length vegetated, stable: *95*
- % bank length unvegetated, stable: *5*
- % bank length vegetated, unstable: *0*
- % bank length unvegetated, unstable: *0*

NOTES:

- 1) *Good, well-defined channel of riparian zone to monitor.*
- 2) *There was a lot of grazing pressure due to topography,*
- 3) *There was some redtop on the right upper areas (maybe due to upper meadow moisture).*

DATA SUMMARY

<u>WD-09: Cover by community types in Woods Canyon (2017).</u>	
<u>USDA Forest Service Protocol (1992)</u>	
UPLAND VEGETATION	3.00
	5.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Agrostis stolonifera</i>	19.00
<i>Carex nebrascensis</i>	4.50
TOTAL COVER (Upland Species)	8.00
TOTAL COVER (Riparian Species)	23.50
ROCK (channel)	0.00
WATER (channel)	1.50
BAREGROUND (channel)	0.00
LITTER (channel)	0.00
MOSS (channel)	0.00
<hr/> TOTAL COVER <hr/>	<hr/> 33.00 <hr/>

PHOTOGRAPHIC DOCUMENTATION



WD-09

**RIPARIAN COMPLEX DATA SHEET
2017**

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-10 (new site in 2014)*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 30, 2017*

OBSERVER(S): *P. Collins, K. Larson*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STREAM ASPECT: *E*

STREAM GRADIENT: *1-2 °*

ELEVATION: *8,252 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Grass to Sagebrush*

Right: *Conifer*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Left bank has previously been relatively unstable due to grazing pressure but it appeared more stable in 2016 and 2017.*

ESTIMATED FORAGE PRODUCTION: *1,300 lbs/acre*

BEAVER ACTIVITY: *no*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Pinus edulis</i>		<i>Geranium richardsonii</i>	<i>Agrostis stolonifera</i>
<i>Populus tremuloides</i>		<i>Osmorhiza depauperata</i>	<i>Carex hoodii</i>
		<i>Ranunculus cymbalaria</i>	<i>Elymus canadensis</i>
		<i>Rudbeckia occidentalis</i>	<i>Juncus ensifolius</i>
		<i>Urtica dioica</i>	
		<i>Mimulus guttatus</i>	

POOL ATTRIBUTES

% area in pools: *0*
 % pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*
 % stream margin with rooted aquatic: *100; Right margin with rooted vegetation (added to riparian vegetation data cover)*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *0*
 % bank length gently sloping (>135°): *00*
 % bank length with overhanging vegetation:

BANK CONDITION

% bank length vegetated, stable: *98*
 % bank length unvegetated, stable: *2*
 % bank length vegetated, unstable: *0*
 % bank length unvegetated, unstable: *0*

NOTES:

- 1) *The right side had 2 levels of riparian zones; the upper may have hillside moisture influence, but I doubt it's much. A good well-defined channel to monitor however.*
- 2) *The channel bottom had lots of dry bareground and rock cover.*
- 3) *An old dead tree had fallen across the stream channel in 2016 (see photographs).*

DATA SUMMARY

WD-10: Cover by community types in Woods Canyon (2017).
USDA Forest Service Protocol (1992)

UPLAND VEGETATION	10.00
	6.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Agrostis stolonifera</i>	8.00
<i>Carex nebrascensis</i>	21.00
TOTAL COVER (Upland Species)	16.00
TOTAL COVER (Riparian Species)	29.00
ROCK (channel)	2.00
WATER (channel)	0.00
BAREGROUND (channel)	0.00
LITTER (channel)	2.00
MOSS (channel)	0.00
<u>TOTAL COVER</u>	<u>49.00</u>

PHOTOGRAPHIC DOCUMENTATION



WD-10

**RIPARIAN COMPLEX DATA SHEET
2017**

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-11 (new site in 2014)*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 30, 2017*

OBSERVER(S): *P. Collins, K. Larson*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STREAM ASPECT: *E*

STREAM GRADIENT: *1-2 °*

ELEVATION: *8,223 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Grass to Rabbitbrush*

Right:

Conifer

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Stable (in the riparian area)*

ESTIMATED FORAGE PRODUCTION: *1,100 lbs/acre*

BEAVER ACTIVITY: *no*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Picea pungens</i>	<i>Chrysothamnus nauseosus</i>	<i>Achillea millefolium</i>	<i>Agrostis stolonifera</i>
		<i>Geranium richardsonii</i>	<i>Carex hoodii</i>
		<i>Mimulus guttatus</i>	<i>Elymus canadensis</i>
		<i>Urtica dioica</i>	

POOL ATTRIBUTES

% area in pools: *30*
 % pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

% streambed with filamentous algae: *0*
 % stream margin with rooted aquatic: *0*

BANK TYPE & VEGETATION OVERHANG

% bank length undercut (<90°): *50 on left side*
 % bank length gently sloping (>135°): *100 on right side*
 % bank length with overhanging vegetation: *0*

BANK CONDITION

% bank length vegetated, stable: *98*
 % bank length unvegetated, stable: *2*
 % bank length vegetated, unstable: *0*
 % bank length unvegetated, unstable: *0*

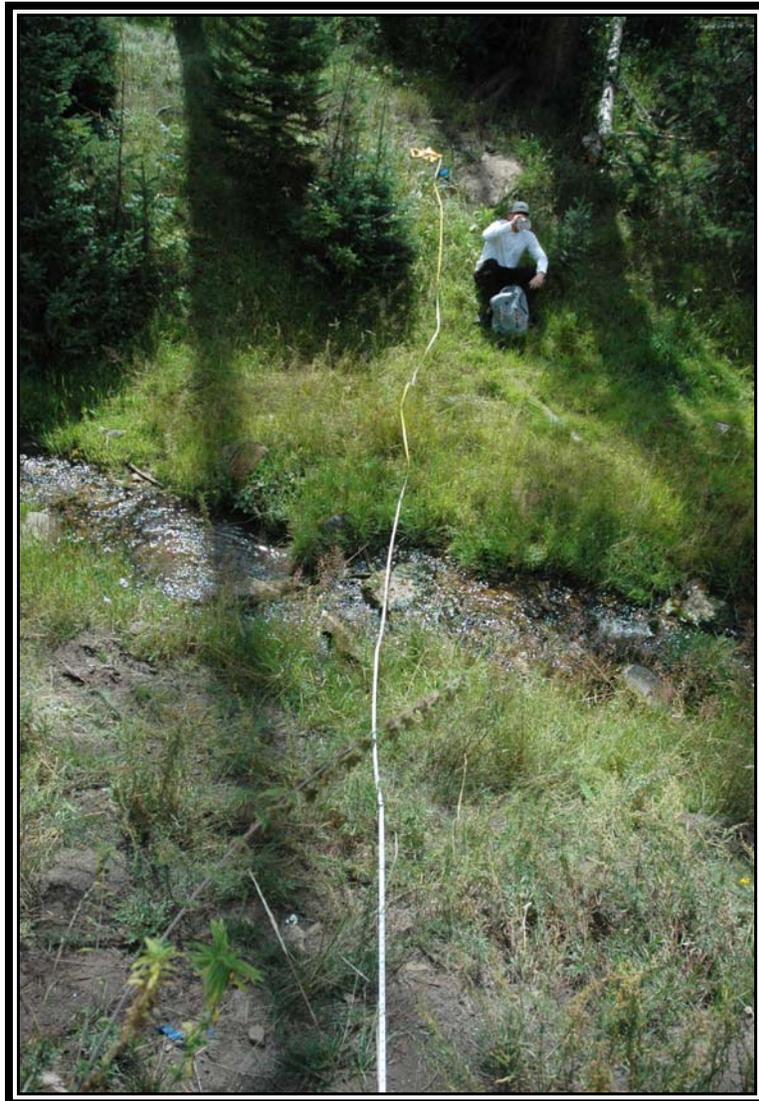
NOTES:

- 1) *A well-defined riparian zone on the right side to monitor; a good, straightforward monitoring station.*
- 2) *The left upland bank was unstable possibly due to grazing pressure.*

DATA SUMMARY

<u>WD-11: Cover by community types in Woods Canyon (2017).</u>	
<u>USDA Forest Service Protocol (1992)</u>	
UPLAND VEGETATION	
	8.00
	6.00
RIPARIAN VEGETATION	
<u>Dominant Woody Species</u>	
<u>Dominant Herbaceous Species</u>	
<i>Agrostis stolonifera</i>	16.00
TOTAL COVER (Upland Species)	14.00
TOTAL COVER (Riparian Species)	16.00
ROCK (channel)	1.00
WATER (channel)	3.00
BAREGROUND (channel)	0.00
LITTER (channel)	0.00
MOSS (channel)	0.00
<u>TOTAL COVER</u>	<u>34.00</u>

PHOTOGRAPHIC DOCUMENTATION



WD-11

**RIPARIAN COMPLEX DATA SHEET
2017**

CLIENT: *Canyon Fuel Company, Skyline Mines*

COMPLEX: *Number WD-12 (new site in 2014)*

WATER BODY NAME: *Woods Canyon Creek*

LOCATION: *Wasatch Plateau, Utah*

DATE: *August 30, 2017*

OBSERVER(S): *P. Collins, K. Larson*

QUAD NAME: *Scofield, Utah*

GEOLOGIC PARENT MATERIAL: *Blackhawk Formation*

STREAM ASPECT: *E*

STREAM GRADIENT: *1-2 °*

ELEVATION: *8,194 ft*

SIZE OF COMPLEX: (see quantitative data)

ADJACENT UPLAND VEGETATION (looking downstream)

Left: *Grass to Snowberry*

Right: *Grass to Conifer*

VEGETATIVE DESCRIPTION (Dominance by Community Types)

Community Name	% of Complex
<i>(refer to quantitative data results for this information)</i>	

SUCCESSIONAL STATUS: *Climax*

APPARENT FORAGE TREND: *Stable*

ESTIMATED FORAGE PRODUCTION: *1,100 lbs/acre*

BEAVER ACTIVITY: *no*

PHOTOGRAPH TAKEN: *Yes*

LAND USE ACTIVITIES THAT COULD INFLUENCE RIPARIAN AREA: *Mining, grazing, hunting, recreation.*

SPECIES OBSERVED:

Trees	Shrubs	Forbs	Grasses (or grasslike)
<i>Pinus ponderosa</i>	<i>Chrysothamnus nauseosus</i>	<i>Urtica dioica</i>	<i>Agrostis stolonifera</i>
<i>Picea pungens</i>	<i>Chrysothamnus viscidiflorus</i>		<i>Carex nebrascensis</i>
	<i>Rosa woodsii</i>		<i>Poa pratensis</i>
	<i>Symphoricarpos oreophilus</i>		

POOL ATTRIBUTES

- % area in pools: *0*
- % pool area made up of pools > 2' deep: *0*

AQUATIC VEGETATION

- % streambed with filamentous algae: *0*
- % stream margin with rooted aquatic: *0*

BANK TYPE & VEGETATION OVERHANG

- % bank length undercut (<90°): *100 left side*
- % bank length gently sloping (>135°): *100 right side*
- % bank length with overhanging vegetation:

BANK CONDITION

- % bank length vegetated, stable: *95*
- % bank length unvegetated, stable: *5*
- % bank length vegetated, unstable: *0*
- % bank length unvegetated, unstable: *0*

NOTES:

1) A good straightforward well-defined riparian zone for monitoring.

DATA SUMMARY

**WD-12: Baseline plant community cover types in
 Woods Canyon riparian areas (2017).**
USDA Forest Service Protocol (1992)

UPLAND VEGETATION

9.00
 8.00

RIPARIAN VEGETATION

Dominant Woody Species

Dominant Herbaceous Species

<i>Agrostis stolonifera</i>	5.00
<i>Agrostis stolonifera/Carex nebrascensis</i>	10.50
<i>Carex hoodii</i>	3.00

TOTAL COVER (Upland Species)	17.00
TOTAL COVER (Riparian Species)	18.50
ROCK (channel)	0.00
WATER (channel)	2.50
BAREGROUND/MUD (channel)	0.00
LITTER (channel)	0.00
MOSS (channel)	0.00

<u>TOTAL COVER</u>	<u>38.00</u>
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PHOTOGRAPHIC DOCUMENTATION



WD-12



Date: 2/26/2018

CLIENT: Canyon Fuel Company
Project: Skyline Mine - Utah Table 3
Lab Order: S1801255

CASE NARRATIVE
Report ID: S1801255001

Sample WRS2017-1 was received on January 24, 2018.

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.

Karen A Secor



Soil Analysis Report
Canyon Fuel Company

HC 35 Box 380
Helper, UT 84526

Report ID: S1801255001

Project: Skyline Mine - Utah Table 3

Date Reported: 2/26/2018

Date Received: 1/24/2018

Work Order: S1801255

Lab ID	Sample ID	pH	Saturation	Electrical	Organic Matter	Calcium	Magnesium	Potassium	Sodium	SAR	
		s.u.	%	Conductivity	LOI	CaCO3	PE	PE	PE		PE
				dS/m	%	%	meq/L	meq/L	meq/L	meq/L	
S1801255-001	WRS2017-1	9.5	35.6	1.34	19.2	9.0	9.06	0.90	0.23	5.97	2.68

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= 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

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



**Soil Analysis Report
Canyon Fuel Company**

HC 35 Box 380
Helper, UT 84526

Report ID: S1801255001

Project: Skyline Mine - Utah Table 3

Date Reported: 2/26/2018

Date Received: 1/24/2018

Work Order: S1801255

Lab ID	Sample ID	Sand %	Silt %	Clay %	Texture	Very Fine		Available	
						Sand %	Phosphorus ppm	Nitrate(as N) ppm	Potassium meq/100g
S1801255-001	WRS2017-1	56.0	28.0	16.0	Sandy Loam	3.3	8	1.9	0.27

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= 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

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



Canyon Fuel
Company, LLC

A Subsidiary of Bowie Resource Holdings, LLC

Skyline Mine

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

January 22, 2018

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

RE: One (1) 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 one (1) sample (WRS2017-1) 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
Environmental Engineer – Skyline Mines
Canyon Fuel Company, LLC.
(435) 448-2636
ggalecki@bowieresources.com

Rec'd 1/24/18
Karen A Seco
51801255



Date: 3/27/2018

CLIENT: Canyon Fuel Company
Project: Skyline Mine Utah Table 3
Lab Order: S1803005

CASE NARRATIVE
Report ID: S1803005001

Samples WRS2017-2, WRS2017-3, WRS2017-4, WRS2017-5, WRS2017-6, WRS2017-7 and WRS2017-8 were received on February 28, 2018.

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



Soil Analysis Report
Canyon Fuel Company

HC 35 Box 380
Helper, UT 84526

Report ID: S1803005001

Project: Skyline Mine Utah Table 3

Date Reported: 3/27/2018

Date Received: 2/28/2018

Work Order: S1803005

Table with 12 columns: Lab ID, Sample ID, pH, Saturation, Electrical Conductivity, Organic Matter (LOI, CaCO3), Calcium PE, Magnesium PE, Potassium PE, Sodium PE, SAR. Rows include sample IDs S1803005-001 through S1803005-007.

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= 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

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



**Soil Analysis Report
Canyon Fuel Company**

HC 35 Box 380
Helper, UT 84526

Report ID: S1803005001

Project: Skyline Mine Utah Table 3

Date Reported: 3/27/2018

Date Received: 2/28/2018

Work Order: S1803005

Lab ID	Sample ID	Sand %	Silt %	Clay %	Texture	Very Fine		Available	
						Sand %	Phosphorus ppm	Nitrate(as N) ppm	Potassium meq/100g
S1803005-001	WRS2017-2	85.0	11.0	4.0	Loamy Sand	1.2	1	0.7	0.11
S1803005-002	WRS2017-3	80.0	17.0	3.0	Loamy Sand	<0.1	2	0.3	0.11
S1803005-003	WRS2017-4	81.0	17.0	2.0	Loamy Sand	<0.1	1	0.2	0.23
S1803005-004	WRS2017-5	79.0	17.0	4.0	Loamy Sand	<0.1	2	0.5	0.09
S1803005-005	WRS2017-6	81.3	16.3	2.5	Loamy Sand	<0.1	2	0.8	0.10
S1803005-006	WRS2017-7	83.8	13.8	2.5	Loamy Sand	<0.1	2	0.8	0.10
S1803005-007	WRS2017-8	77.5	20.0	2.5	Loamy Sand	<0.1	1	0.6	0.07

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= 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

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



Canyon Fuel
Company, LLC

A Subsidiary of Bowie Resource Holdings, LLC

Skyline Mine

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

February 22, 2018

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

RE: Seven (7) Samples for Analysis following 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 seven (7) samples (WRS2017-2 thru WRS2017-8) 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
Environmental Engineer – Skyline Mines
Canyon Fuel Company, LLC.
(435) 448-2636
ggalecki@bowieresources.com

Rec'd 2/28/18
Karen Secor
51803005