C/041/002 Incoming

Canyon Fuel Company, LLC
A Subsidiary of Bowie Resources Holdings, LLC

Sufco Mine
597 South SR24
Salina, Utah 84654
(435) 286-4880
Fax (435) 286-4499

March 09, 2016

Utah Coal Regulatory Program
1594 West North Temple, Suite 1210
P. O. Box 145801
Salt Lake City, UT 84114-5801

Re: 2015 Annual Report for Canyon Fuel Company LLC, Sufco Mine
C/041/0002, Sevier County, Utah

Dear Permit Supervisor:

Enclosed is a disc containing Sufco's 2015 subsidence information and a memory stick containing the 2015 annual report for the Canyon Fuel Company, Sufco Mine. The information included is thought to be complete as requested.

Questions should be referred to Amanda Richard at (435) 286-4489 or arichard@bowieresources.com.

Sincerely,
CANYON FUEL COMPANY, LLC
SUFCO Mine

Kenneth E. May
General Manager

Enclosures

cc: Division of Oil, Gas and Mining Correspondence File

SUFPUB\GOVT2016\DOGMCORR\2015 Annual Report Cover ltr.doc

RECEIVED
MAR 15 2016
DIV. OF OIL, GAS & MINING

Print Form | Submit by Email | Reset Form

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	SUFCO Mine
Permit Number	C/041/0002	Permit expiration Date	5/21/2017
Operator Name	Canyon Fuel Company- Sufco Mine	Phone Number	+1 (435) 286-4480
Mailing Address	597 South SR 24	Email	arichard@bowieresources.com
City	Salina		
State	Utah	Zip Code	84654

		DOGM File Location or Annual Report Location
Excess Spoil Piles	☐ Required ☒ Not Required	
Refuse Piles	☒ Required ☐ Not Required	Certified reports previously submitted.
Impoundments	☒ Required ☐ Not Required	Certified reports previously submitted.
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: RAPTOR SURVEYS
Objective: To determine existence and status of raptor nests within 1/2 miles of surface mining activities or areas that may be impacted by subsidence. Any raptor nest that has the potential to be disturbed by subsidence will be evaluated with DWR and FWS and an appropriate plan of action will be developed on a case by case basis.
Frequency: Annually using aerial or ground surveys near the end of May.
Status: Ongoing
Reports: Annual
Citation: MRP, Volume 1, Chapter 3, page 3-9

Operator Comments

Raptor Survey report is included in the annual report under Confidential Information.

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
Citation: MRP, Volume 1, Chapter 5, page 5-29

Operator Comments

Report and map is included on a disc labeled 2015 Sufco Subsidence.

Reviewer Comments ☐ Met Requirements ☐ Did Not Meet Requirements

Title: CLIMATOLOGICAL DATA
Objective: Collect climatological data to aid in determining the impact to runoff, stream flow and local springs from mining.
Frequency: Annually
Status: Ongoing
Reports: Annual
Citation: MRP, Volume 2, page 7-51E

Operator Comments

The climatological report is included in the annual report under Climatological Data.

Reviewer Comments ☐ Met Requirements ☐ Did Not Meet Requirements

Title: Refuse Sampling
Objective: To determine chemical characteristics of the waste and ensure burial beneath four feet of non-toxic, non-acidic material and protect surface and groundwater.
Frequency: Quarterly, during periods of deposition at the waste rock site.
Status: Ongoing
Reports: Annual, indicate frequency of sampling (#samples/volume).
Citation: Vol. 3. Chap. 5 Sec. 528.

Operator Comments

Results are included in the annual report under Waste Rock Samples.

Reviewer Comments ☐ Met Requirements ☐ Did Not Meet Requirements

Title: NORTHWATER SPRING MITIGATION
Objective: Mitigation for water loss
Frequency: Annual
Status: Ongoing. By 2017, a perpetual maintenance agreement needs to be constructed between the Division, USFS and Sufco.
Reports: A report will describe conditions of water systems and future mitigation will be evaluated.
Citation: Vol. 3. Chap. 5 Sec. 528.

Operator Comments

According to the permit, "Upon completion of all mining activities at Sufco, perpetual maintenance of the system will be discussed and agreed on between the Division, the Forest Service and Sufco. Furthermore, Sufco will negotiate with the Forest to perform mitigation activities at another site within the Muddy or Quitchupah drainages that may include vegetation enhancement, spring collection improvement, fencing or sensitive areas, etc. The negotiations and mitigation project will by completed before the end of year 2017."

Negotiations between Sufco and the Forest have occurred and the mitigation project has been completed by Sufco in 2014/2015. A report on the Northwater water system and mitigation project, along with a mitigation completion letter from the Forest have been included in the annual report under Northwater Spring Mitigation.

Reviewer Comments ☐ Met Requirements ☐ Did Not Meet Requirements

Title: Topsoil Sampling during Waste Rock construction
Objective: To determine soil chemistry and nutrient status prior to disturbance. During each phase of construction, "a composite sample will be taken [of each soil map unit] during each phase and analyzed for the pH; % Saturation; EC; Soluble Na, K, Mg, Ca; Available N03-N; Available Phosphorus; Particle Size% very fine sand, sand, silt, clay; Organic Matter%; CaC03%; and Extractable Potassium."
Frequency: During each Phase of construction prior to soil salvage.
Status: During construction of each Phase of the Waste Rock site.
Reports: Appendix V
Citation: MRP Vol 3 Chap 2 Sec 222.400

Operator Comments

Topsoil sampling is in progress. Samples have been taken and sent off to the lab for analysis. Once the results have been delivered to Sufco, the information will be incorporated into Appendix V.

Reviewer Comments ☐ Met Requirements ☐ Did Not Meet Requirements

Title: Topsoil Salvage

Objective: Topsoil and subsoil salvage will be under the direction of a qualified person and will utilize pits or trenches to determine depth of salvage. "The quantity of topsoil/subsoil salvaged during the construction of the expanded WRDS will be determined by surveying the phased area prior to salvage and post salvage. The M&RP will be updated with as-built drawings, cross sections and a table(s) listing volumes of subsoil and topsoil stockpiles."

Frequency: During each Phase of construction within six months of completion of salvage

Status: During construction of each Phase of the Waste Rock site.

Reports: As Built drawings and updated narrative listing volumes salvaged

Citation: Vol 3. Chap 2. Sec. 231.100 and 242.100 page 2-22.

Operator Comments

As-built drawings and updated narrative listing volumes salvaged will be incorporated into the M&RP and will be submitted as completed.

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: COLOR INFRARED PHOTOGRAPHY
Objective: To assess changes in vegetation due to mining. Photos submitted after 2008 must include an analysis between 2008 and current photos to assess changes in vegetation due to subsidence.
Frequency: Once every 5 years beginning in 2008.
Status: Due in 2018.
Reports: Annual
Citation: MRP, Volume 1, Chapter 3, page 3-45, Chapter 5, page 5-29

Title: PROTECTION OF WILDLIFE DURING EXCLUSIONARY PERIODS
Objective: To avoid disturbance to wildlife during critical periods of their life cycle. Surface activities are curtailed from Nov. 1-April 1,& May 1 and July 1 in the calving area, except in the portal areas, for wintering elk. Any maintenance requiring heavy equipt will require monitoring from Dec.1 -April 15 for big game winter range and from Jan.1-Aug15 for raptors.
Frequency: During surface disturbing activity
Status: When construction or mitigation activities during wildlife exclusionary periods
Reports: Not Required, Contact DOGM if disturbance occurs during exclusion period
Citation: MRP, Vol. 1, Ch.3, Pg. 3-42 through 3-44 and 3-9

Title: VEGETATION SURVEY OF SOUTH FORK QUITCHUPAH
Objective: To provide sufficient data to make a determination of the degree of impacts of subsidence on riparian vegetation.
Frequency: Surveys will be conducted the fifth year following undermining (2018)
Status: Ongoing, Reports were provided in 2013. Next report due 2018.
Reports: 2018, (Reports shall provide information and data collected before the area is mined, throughout the mining period, and after mining is past. Monitoring and data collection will continue until the mine, Division and Forest agree that mining impacts, if any, have occurred, have been mitigated, and no further impacts are anticipated. Two reports shall be provided and the Division will provide the second copy to the Fishlake National Forest.)
Citation: MRP, Volume 5, appendix 3-14 page 5

Title: Topsoil sampling at reclamation
Objective: "The topsoil will be tested for need of nutrients and soil amendments following application and grading at the rate of one sample/acre. The depth of sampling should be the surface six inches of distributed topsoil. Parameters for testing will include plant available nitrogen, phosphorus and potassium. Section 528 contains the sampling commitments for the placed waste rock. Application will be on an as needed basis as determined by the tests."
Frequency: Reclamation
Status: Reclamation
Reports: Confer with the Division and include in the Annual Report (where easily found at bond release)
Citation: Vol 3. Chap 2. Sec. 231.300 and Section 243.

OPERATOR COMMENTS (OPTIONAL)

REVIEWER COMMENTS

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:

Reviewer Comments

MAPS

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

Map Name	Map Number	Included		Confidential	
		Yes	No	Yes	No
Annual subsidence map	1	☒	☐	☐	☒
Mine Map	1	☒	☐	☐	☒
		☐	☐	☐	☐
		☐	☐	☐	☐
		☐	☐	☐	☐

Reviewer Comments ☐ Met Requirements ☐ Did Not Meet Requirements

Sufco Mine
Subsidence Map

AREA	AREA STATUS	MAXIMUM SUBSIDENCE
1	DORMANT	8.5 feet
2	DORMANT	2.0 feet
3	DORMANT	2.0 feet
4	DORMANT	5.0 feet
5	DORMANT	5.0 feet
6	DORMANT	7.0 feet
7	DORMANT	7.0 feet
8	DORMANT	5.0 feet
9	DORMANT	5.0 feet
10	DORMANT	7.0 feet
11	DORMANT	6.0 feet
12	DORMANT	9.0 feet
13	ACTIVE	7.0 feet
14	ACTIVE	5.0 feet
15	ACTIVE	12.0 feet
16	ACTIVE	6.0 feet
17	ACTIVE	N/A
18	ACTIVE	N/A

LEGEND

- COAL OUTCROP
- OVERBURDEN CONTOUR (600)
- PERENNIAL STREAM
- ESCARPMENT
- FOREST ACCESS ROAD
- TENSION CRACKS
- SUBSIDENCE LIMITS
- EXTERIOR LEASE LINE (U-28297)
- INTERIOR LEASE LINE (SL-062583)
- AERIAL TARGET
- S-18 DRAW ANGLE
- 4L50 SURVEY STATION
- −1' SUBSIDENCE CONTOUR
- −2' SUBSIDENCE CONTOUR
- −3' SUBSIDENCE CONTOUR
- −4' SUBSIDENCE CONTOUR
- −5' SUBSIDENCE CONTOUR
- −6' SUBSIDENCE CONTOUR
- −7' SUBSIDENCE CONTOUR
- −8' SUBSIDENCE CONTOUR
- −9' SUBSIDENCE CONTOUR
- −10' SUBSIDENCE CONTOUR
- −11' SUBSIDENCE CONTOUR
- −12' SUBSIDENCE CONTOUR
- PERENNIAL STREAM BUFFER ZONE
- ONE YEAR PROJECTION
- MONITORED SPRING
- RUNOFF POND

PROFESSIONAL LAND SURVEYOR — No. 6714204 — Jason Kary Monroe — 12/22/15 — STATE OF UTAH

I CERTIFY THIS MAP TO BE CORRECT TO THE BEST OF MY KNOWLEDGE.

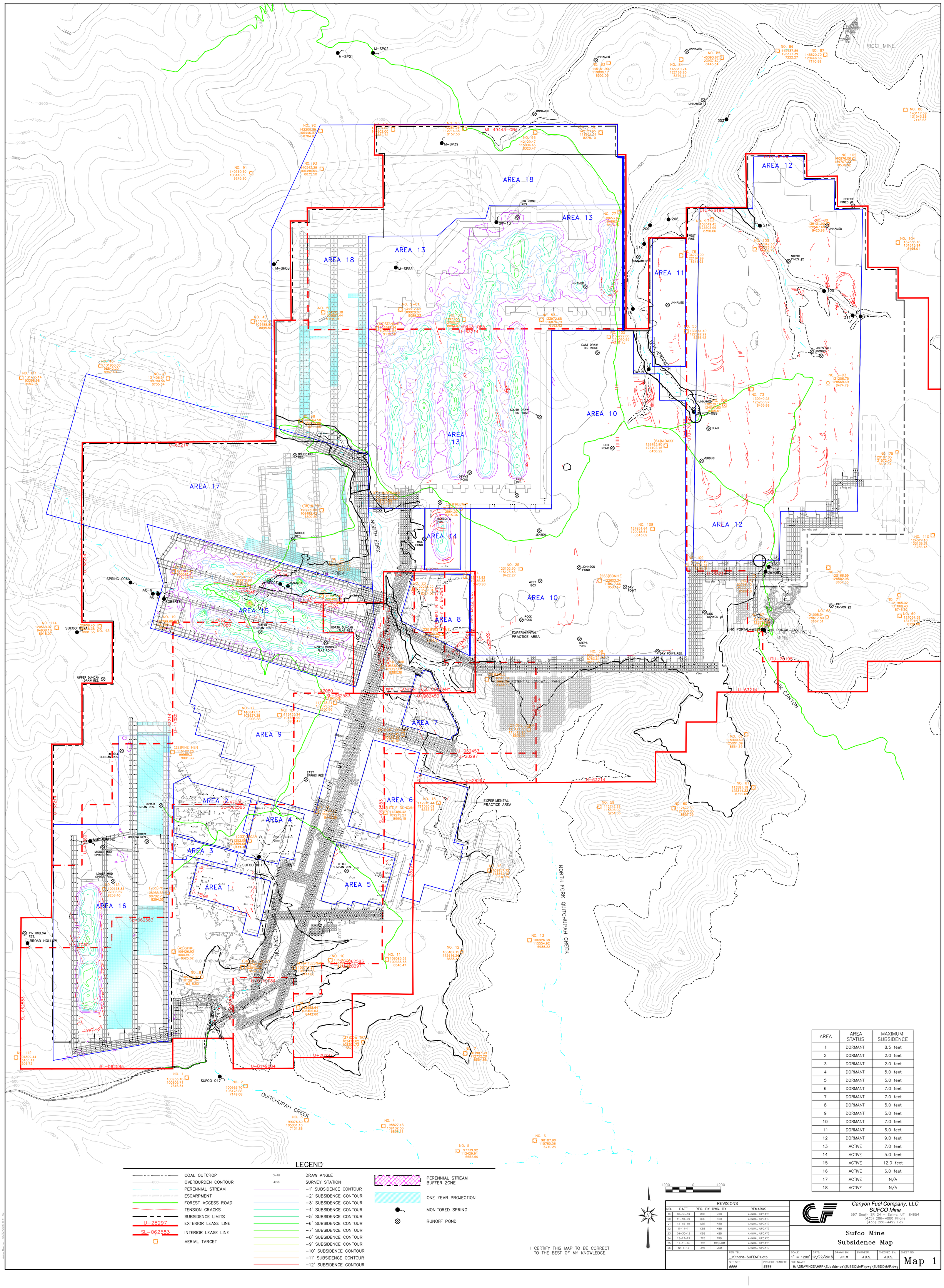
1200 0 1200

REVISIONS				
NO.	DATE	REQ. BY	DWG. BY	REMARKS
19	01-31-09	KBB	KBB	ANNUAL UPDATE
20	11-30-09	KBB	KBB	ANNUAL UPDATE
21	12-15-10	KBB	KBB	ANNUAL UPDATE
22	11-14-11	KBB	KBB	ANNUAL UPDATE
23	09-30-12	KBB	KBB	ANNUAL UPDATE
24	12-13-13	TRB	TRB	ANNUAL UPDATE
25	12-11-14	TRB	TRB/JKM	ANNUAL UPDATE
26	12-8-15	JKM	JKM	ANNUAL UPDATE

Canyon Fuel Company, LLC
SUFCO Mine
597 South SR 24 – Salina, UT 84654
(435) 286-4880 Phone
(435) 286-4499 Fax

PEN TBL:	SCALE:	DATE:	DRAWN BY:	ENGINEER:	CHECKED BY:	SHEET NO.
_1Stndrd-SUFENP1.ctb	1" = 1200'	12/22/2015	J.K.M.	J.D.S.	J.D.S.	Map 1
SHT SET: ####	PROJECT NUMBER: ####	FILE NAME: H:\DRAWINGS\MRP\Subsidence\SUBSIDMAP\dwg\SUBSIDMAP.dwg				

Jason Monroe 12/22/2015 8:42 AM



LEGEND

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16	ACTIVE	6.0 feet
17	ACTIVE	N/A
18	ACTIVE	N/A

REVISIONS

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20	11-30-09	KBB	KBB	ANNUAL UPDATE
21	12-15-10	KBB	KBB	ANNUAL UPDATE
22	11-14-11	KBB	KBB	ANNUAL UPDATE
23	09-30-12	KBB	KBB	ANNUAL UPDATE
24	12-13-13	TRB	TRB	ANNUAL UPDATE
25	12-11-14	TRB	TRB/JKM	ANNUAL UPDATE
26	12-8-15	JKM	JKM	ANNUAL UPDATE

Canyon Fuel Company, LLC
SUFCO Mine
597 South SR 24 – Salina, UT 84654
(435) 286-4880 Phone
(435) 286-4499 Fax

Sufco Mine
Subsidence Map

PEN TBL:	SCALE:	DATE:	DRAWN BY:	ENGINEER:	CHECKED BY:	SHEET NO:
_1Stndrd-SUFENP1.ctb	1" = 1200'	12/22/2015	J.K.M.	J.D.S.	J.D.S.	Map 1
SHT SET: ####	PROJECT NUMBER: ####	FILE NAME: H:\DRAWINGS\MRP\Subsidence\SUBSIDMAP\dwg\SUBSIDMAP.dwg				

Jason Monroe 12/22/2015 8:41 AM

Canyon Fuel Company, LLC
SUFCO Mine
597 South SR 24
Salina, Utah 84654
(435) 286-4880 Fax: (435) 286-4499

December 22, 2015

Mr. Steve Falk
Bureau of Land Management
125 South 600 West
Price, UT 84501

Re: Annual Subsidence Report

Dear Mr. Falk:

Enclosed is a copy of the annual subsidence report for Canyon Fuel Company's SUFCO Mine. This report was prepared from aerial photogrammetric data collected in 2015. If you have questions, please give me a call.

Sincerely,
CANYON FUEL COMPANY, LLC
SUFCO Mine

Jason K. Monroe
Survey Supervisor

JKM:kb

Enclosure: 2015 Subsidence Report (2)

SUFPUB\GOVT2015\BLM\SUBSIDENCE\SUBSIDE.LTR

2015 SUBSIDENCE REPORT

CANYON FUEL COMPANY, LLC

SUFCO MINE

by

Jason K. Monroe

INTRODUCTION

Canyon Fuel Company LLC, SUFCO Mine's 2015 subsidence report is an update of annual subsidence data that has been accumulated since 1976 as the former Southern Utah Fuel Company. Prior to 1985, the data was derived from conventional survey methods. Since then, photogrammetric surveys have been employed to monitor the ground movement.

During 1985, the entire SUFCO Mine property was flown to establish a set of baseline photography and a grid of surface elevations. Where possible, an elevation was photogrammetrically determined on an approximate 200-foot grid. These original x, y and z locations serve as a comparative base for determining ground movement in the succeeding years. Other lease holdings that are acquired are flown for similar baseline information. Lease U-63214 was flown in 1991 and the 150-acre modification to lease U-63214 and lease UTU-76195 were flown in 1999. Lease ML 49443-OBA was flown in 2006. The westerly modifications of Lease U-63214, Lease U-47080, and Lease SL-062583 were flown in 2011.

Once each year around the end of August, another set of aerial photography is obtained. A new elevation is then found at the same x and y coordinates as all the originals within all areas considered to be active. The new, or current, elevations are compared to the originals and the difference between the two is used to generate a contour map. The result is the subsidence contour map included with each annual subsidence report.

The mine subsidence map accompanying this report shows surface control monuments, overburden contours, subsidence contours, surface tension cracks, a current outline of the mine, a one year mining projection and other miscellaneous items as explained in the legend.

SUBSIDENCE HISTORY

SUFCO Mine began operations that cause surface subsidence in June 1976. Continuous miners were used to extract coal from pillars that were developed as part of a retreating panel. The panels were approximately 650 feet wide and varied in length up to 2,500 feet. The average mining height approached 11 feet and the extraction ratio averaged about 80%.

The resulting subsidence from these continuous miner panels averaged 4 feet in the plateau areas where overburden was 900 feet thick. In areas where panel boundaries were outside the escarpment and beyond the Castlegate Sandstone, subsidence increased with decreasing overburden thickness. The maximum subsidence measured in a continuous miner panel to date, 8.5 feet, occurred in one of these areas. The overburden was only 600 feet thick.

Retreat mining continued in this manner until October, 1985, when a retreating longwall system was added. Longwall panels have ranged from 550 feet to 1,110 feet wide and up to 18,500 feet in length. Mining heights have varied from 8.5 feet to 12.5 feet.

Subsidence above the longwall panels has averaged 5 to 6 feet in the center of the panels. The overburden thickness has been from 1,000 feet to 1,800 feet (except outside the escarpment where overburden rapidly decreases). The maximum measured subsidence caused by longwall mining until 2009 was seven feet. This occurred in two cases: 1. An area outside the escarpment very similar to the one mentioned above for the continuous miner panel and 2. Down the center of panels that are under plateaus with 1,000 feet of overburden, but this is not typical. In 2009 there was a small area on the north end of the last longwall panel in area 12 that maximum subsidence measured nine feet. This area has overburden of approximately 900 feet, and is relatively close to the escarpment. In 2015 there was a small area in Area 15 that had a maximum subsidence of twelve feet.

DORMANT AND ACTIVE AREAS

Dormant areas are those areas that have shown little or no movement for several consecutive years. Yearly digitizing of these areas will not be done, but photographic coverage can be obtained should the need arise for reevaluation. These areas may not be shown on the current subsidence map.

Active areas are those currently being mined or that have evidence of movement within a reasonable time period. Active areas are digitized and evaluated for subsidence yearly, until they meet the parameters of a dormant area.

2015 SUBSIDENCE

The 2015 subsidence map (Map 1) was updated using data from current photogrammetric monitoring. Each subsidence area is labeled as an independent block. A brief description of each follows:

AREA 1

This was SUFCO Mine's first subsidence area. Undermining began in June 1976, and continued into 1979. The area is composed of five continuous miner panels that averaged 650 feet in width. Mining height averaged 11 feet with about an 80% extraction ratio.

Subsidence ranged from 4.5 feet to a maximum of 8.5 feet. It was first detected in 1976 and continued until 1985. No surface movement was detected in this entire area from 1986 to 1989. Area 1 has not been digitized since the 1990 subsidence report and is considered dormant.

AREA 2

This is another continuous miner area. The panels here were irregular shaped and the extraction ratio was modest. Undermining ceased in 1984.

Maximum subsidence has been measured at 2 feet. The area has been stable since 1985 and has not been monitored since 1989. This area is dormant.

AREA 3

This area is another continuous miner section, but the extracted area is a portion of mains with protective barriers instead of a panel. Coal recovery was moderate with mined areas which were subcritical. Undermining ceased in 1983.

Maximum subsidence was measured at 2 feet. Because of the limited extraction and subcritical areas, the subsidence occurred slowly with small changes noticeable until 1987. The area appeared stable in 1988 and 1989. It has not been monitored since 1989 and is considered dormant.

AREA 4

This subsidence area is comprised of three continuous miner panels. The mining height averaged 11 feet with a good extraction ratio. Undermining ceased in 1985.

Maximum subsidence was 5 feet with no detectable change in 1989. This area was monitored

again in 1993, 1994 and 1995 with no detectable changes. This area was monitored for ten years after undermining ceased. The last detectable subsidence was in 1988. Therefore, this area is considered dormant.

AREA 5

The four continuous miner panels that make up this area were mined from September 1978, to November 1981. Mining height averaged 11 feet with an 80% extraction ratio.

Maximum subsidence was 5 feet with no detectable changes from 1985 through 1991. This area has not been monitored since 1991, and will also remain dormant.

AREA 6

Area 6 is SUFCO Mine's first longwall induced subsidence area. It is comprised of nine longwall panels varying from 540 feet to 700 feet in width and 1,700 feet to 3,900 feet in length. Also, there is a section of recovered mains between two of the longwall blocks. Undermining began in Area 6 during October, 1985, and continued through the mains recovery in March, 1990.

Maximum subsidence measured in areas bounded by the plateau is five feet. There is a location on the map that shows seven feet; but this area is outside the escarpment where the overburden is only 600 feet thick. The subsided escarpment is intentional and is part of a study agreed upon by SUFCO Mine, the Division of Oil, Gas and Mining, the Bureau of Land Management and the U.S. Forest Service. This particular section of escarpment was removed from the "no subsidence zone" to study the effects of longwall mining on the escarpment.

Area 6 has shown no significant changes since 1992. It has been determined that this area is dormant.

AREA 7

Area 7 was originally planned for no subsidence. Pillars were made to support the overburden but began to fail in the north end in 1984 when the underground workings were flooded. The failure progressed towards the south and by 1986 subsidence was detected over the area.

The map shows up to seven feet of subsidence. There was no additional subsidence movement detected from 1988 to 1994. Therefore, this area will also be considered dormant.

AREA 8

Undermining this area began in June 1983, and was sporadic until 1992. Continuous miners were used with extraction ratios over 80% and average mining heights of 10 feet. This area stayed active longer than most due to its proximity to an adjacent active longwall block.

Maximum subsidence is five feet. No noticeable vertical movement has been detected since 1993. This area is dormant.

AREA 9

This area is a longwall mining area that is composed of four panels. The first began in June 1989 and the block was finished in January 1992. The mining height averaged about 11 feet and the maximum subsidence is five feet. There has been no indication of movement since 1996. This area is determined to be dormant.

AREA 10

Area ten is a longwall mining block that began in January 1992. Mining was completed in August 2001. The entire surface area above this block was digitized for base-line elevations during 1991. Maximum subsidence shown to date is seven feet. This area has been mined out since 2001, and monitoring suggests that it has settled. It is now assumed to be dormant.

The experimental mining practice area discussed under "Area 6" was extended, with regulatory approval, to the east side of the canyon under the Southwest corner of "Area 10". An extensive pre-mining survey of this location was conducted late in 1992. A detailed survey of the post-mining subsidence effects was provided in the 1993 report.

AREA 11

Area eleven is an extension of the last longwall panel in Area ten. It extends into a 150-acre modification to lease U-63214. An elevation baseline was established in 1999. Mining under this area began in January 1999 with gateroad development. Longwall mining took place from May 2000 thru September 2000. Subsidence to date shows a maximum of six feet. This area has shown no significant movement since 2003 and is considered dormant.

AREA 12

Area twelve is the first longwall mining block on the acquired lease UTU-76195. Due to a mine plan change at the start of 2003, this area now consists of six longwall panels. An elevation baseline was established in 1999, and gateroad development began in March 2000. Longwall mining began in September 2001 and ended in February 2007. There has been no significant movement detected in this area since 2007. This area appears to have stabilized and is considered dormant.

AREA 13

Area thirteen is a longwall mining block that originally consisted of seven panels on lease U-63214 and lease ML 49443-OBA. Due to a mine plan change near the end of 2008, this area now consists of eight longwall panels. An elevation baseline for the area included on lease U-63214 was established in 1991 and the elevation baseline for the area included on lease ML

49443-OBA was established in 2006. Longwall mining began in March 2007 and ended in 2012. This area was considered active in 2007. 2015 will be the last year of monitoring. The boundary of area 13 was trimmed to more closely follow previous mining activities and to exclude future mining areas.

AREA 14

Area 14 consists of a short, single longwall panel on lease U-63214. An elevation baseline for this area was originally established in 1991, and the area was re-flown and checked for any discrepancies in 2011. Gateroad development began in 2010 and was completed in 2011. Longwall mining began and ended in 2012. This area has shown little change and 2015 will be the last year of monitoring.

AREA 15

Area 15 is a longwall mining area on lease U-63214, lease U-47080, and fee land. The previous mine plan included two panels. Due to a mine plan change in 2012, a third panel was added that extended into what was Area 17. Upon approval for the third panel, the boundary for Area 15 was adjusted North, to include the third panel. Gateroad development in this area began in 2010. Longwall mining began in 2012 and ended in 2015. Base elevation data for this area was partially obtained in previous years, but was completely flown and checked in 2011. Area 15 will continue being monitored for several years.

AREA 16

Area 16 is a longwall mining block currently planned for 3 panels. The westerly modifications of lease U-63214, lease U-47080, and lease SL-062583 for this area were obtained in 2009. Rehab of existing mine entries and development of gateroads began in 2011, and longwall mining began in 2015. An elevation baseline for this area was obtained in 2011.

AREA 17

Area 17 is a planned longwall mining block on lease U-63214, and future lease modifications and acquisitions. Gateroad development began in 2015 and longwall mining will be dependant on future lease holdings. An elevation baseline was obtained for the current mine plan area in 2011.

AREA 18

Area 18 is a planned longwall mining block on leases U-63214 and ML 49443-OBA. Gateroad development began in 2015 and longwall mining is scheduled to begin in 2017. An elevation baseline was obtained for the current mine plan area in 2015.

DRAW ANGLE SURVEYS

Several draw angle surveys have been performed during the past years. Completed surveys have been over continuous miner areas and have been oriented both parallel and perpendicular to the long axis of the panel. The average of all measurements is 15°. Individual measurements ranged from 10° to 21°.

New longwall draw angle data was obtained in 1995. Draw angle points were installed in May 1986, on the southern end of the first panel in "Area 6". As shown on the subsidence map, survey lines were placed parallel and perpendicular to the axis of the panel. Undermining of this panel was completed in June 1986. Measurements were taken in 1995 and indicate an angle 15.25° for the perpendicular line. An angle for the parallel line was not obtained because the mains underlying the survey line were partially extracted. These findings coincide with the average of 15° as stated above.

SUBSIDENCE TENSION CRACKS

Tension cracks have occurred above most of the subsidence areas. Most have been located by survey and are shown on the map. Their lengths vary from a few feet to a couple thousand feet. Most are oriented either parallel to the natural jointing pattern or to the boundaries of the underground excavation. Vertical displacement along the cracks is uncommon and horizontal displacement varies from hairline to several inches in width depending on the surface topography (rock, hard packed or loose soil).

The U. S. Forest Service completed a tension crack study in 1978. They monitored twenty-two different cracks (located in Area 1) with widths varying from 1/8 inch to six inches. Results show that most cracks self-heal, or close, from 13% to 100% of their original width.

Longwall mining at the top of the 13L4E longwall panel caused some cracking in the escarpment sandstone of upper Box Canyon. The panel was mined parallel and down the center of a portion of the canyon. Subsidence thus created an inward pull on the canyon walls. These cracks are in the rock along the edge of the escarpment and vary in width and displacement. A monitoring program was initiated in 2004 to observe the behavior of these cracks. These cracks were checked in 2005 and again for the final time in 2008 and show no significant change in width or displacement.

DETAILED LONGWALL SUBSIDENCE PROFILE

In 1998 a project was initiated to monitor longwall subsidence in relation to the advancing face. Preparation consisted of first installing two monitoring points outside the subsidence area. Then two base lines were established one 3000 feet long running parallel down the center and the second 1300 feet long perpendicular across the 967 feet wide panel. Markers were installed along these lines on 100 feet spacing using approximately 2.5 feet long rebar with an aluminum cap or a hardened nail drilled into the exposed rock. Initial horizontal and vertical readings were

obtained by shooting each marker with a Topcon GTS-3 distance meter from the monitoring points.

Monitoring was done weekly to gather new readings on markers behind and up to 500 feet ahead of the advancing face. The data collected reveals that vertical movement starts approximately 150 feet ahead of the face with 15 hundredths of a foot of subsidence at the face. It then drops off quickly to 4 feet at 600 feet behind the face and gradually levels off at 4 to 5 feet. Horizontal readings indicate the ground initially moves about 30 hundredths of a foot away from the face, then back toward the face 80 hundredths of a foot.

CONCLUSION

Areas 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, are all considered to be dormant. Photographic coverage for these areas can be obtained if circumstances deem it necessary. Longwall mining in Area 13 and Area 14 was completed in 2012 with a maximum subsidence detected to date of 7 feet in Area 13 and 5 feet in Area 14. 2015 will be the last year of monitoring for areas 13 and 14, they will be considered dormant going forward. Longwall mining in Area 15 has been completed in 2015 with a maximum subsidence detected to date of 12 feet. Subsidence monitoring will continue for this area.

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2015 SUBSIDENCE REPORT

CANYON FUEL COMPANY, LLC

SUFCO MINE

by

Jason K. Monroe

INTRODUCTION

Canyon Fuel Company LLC, SUFCO Mine's 2015 subsidence report is an update of annual subsidence data that has been accumulated since 1976 as the former Southern Utah Fuel Company. Prior to 1985, the data was derived from conventional survey methods. Since then, photogrammetric surveys have been employed to monitor the ground movement.

During 1985, the entire SUFCO Mine property was flown to establish a set of baseline photography and a grid of surface elevations. Where possible, an elevation was photogrammetrically determined on an approximate 200-foot grid. These original x, y and z locations serve as a comparative base for determining ground movement in the succeeding years. Other lease holdings that are acquired are flown for similar baseline information. Lease U-63214 was flown in 1991 and the 150-acre modification to lease U-63214 and lease UTU-76195 were flown in 1999. Lease ML 49443-OBA was flown in 2006. The westerly modifications of Lease U-63214, Lease U-47080, and Lease SL-062583 were flown in 2011.

Once each year around the end of August, another set of aerial photography is obtained. A new elevation is then found at the same x and y coordinates as all the originals within all areas considered to be active. The new, or current, elevations are compared to the originals and the difference between the two is used to generate a contour map. The result is the subsidence contour map included with each annual subsidence report.

The mine subsidence map accompanying this report shows surface control monuments, overburden contours, subsidence contours, surface tension cracks, a current outline of the mine, a one year mining projection and other miscellaneous items as explained in the legend.

SUBSIDENCE HISTORY

SUFCO Mine began operations that cause surface subsidence in June 1976. Continuous miners were used to extract coal from pillars that were developed as part of a retreating panel. The panels were approximately 650 feet wide and varied in length up to 2,500 feet. The average mining height approached 11 feet and the extraction ratio averaged about 80%.

The resulting subsidence from these continuous miner panels averaged 4 feet in the plateau areas where overburden was 900 feet thick. In areas where panel boundaries were outside the escarpment and beyond the Castlegate Sandstone, subsidence increased with decreasing overburden thickness. The maximum subsidence measured in a continuous miner panel to date, 8.5 feet, occurred in one of these areas. The overburden was only 600 feet thick.

Retreat mining continued in this manner until October, 1985, when a retreating longwall system was added. Longwall panels have ranged from 550 feet to 1,110 feet wide and up to 18,500 feet in length. Mining heights have varied from 8.5 feet to 12.5 feet.

Subsidence above the longwall panels has averaged 5 to 6 feet in the center of the panels. The overburden thickness has been from 1,000 feet to 1,800 feet (except outside the escarpment where overburden rapidly decreases). The maximum measured subsidence caused by longwall mining until 2009 was seven feet. This occurred in two cases: 1. An area outside the escarpment very similar to the one mentioned above for the continuous miner panel and 2. Down the center of panels that are under plateaus with 1,000 feet of overburden, but this is not typical. In 2009 there was a small area on the north end of the last longwall panel in area 12 that maximum subsidence measured nine feet. This area has overburden of approximately 900 feet, and is relatively close to the escarpment. In 2015 there was a small area in Area 15 that had a maximum subsidence of twelve feet.

DORMANT AND ACTIVE AREAS

Dormant areas are those areas that have shown little or no movement for several consecutive years. Yearly digitizing of these areas will not be done, but photographic coverage can be obtained should the need arise for reevaluation. These areas may not be shown on the current subsidence map.

Active areas are those currently being mined or that have evidence of movement within a reasonable time period. Active areas are digitized and evaluated for subsidence yearly, until they meet the parameters of a dormant area.

2015 SUBSIDENCE

The 2015 subsidence map (Map 1) was updated using data from current photogrammetric monitoring. Each subsidence area is labeled as an independent block. A brief description of each follows:

AREA 1

This was SUFCO Mine's first subsidence area. Undermining began in June 1976, and continued into 1979. The area is composed of five continuous miner panels that averaged 650 feet in width. Mining height averaged 11 feet with about an 80% extraction ratio.

Subsidence ranged from 4.5 feet to a maximum of 8.5 feet. It was first detected in 1976 and continued until 1985. No surface movement was detected in this entire area from 1986 to 1989. Area 1 has not been digitized since the 1990 subsidence report and is considered dormant.

AREA 2

This is another continuous miner area. The panels here were irregular shaped and the extraction ratio was modest. Undermining ceased in 1984.

Maximum subsidence has been measured at 2 feet. The area has been stable since 1985 and has not been monitored since 1989. This area is dormant.

AREA 3

This area is another continuous miner section, but the extracted area is a portion of mains with protective barriers instead of a panel. Coal recovery was moderate with mined areas which were subcritical. Undermining ceased in 1983.

Maximum subsidence was measured at 2 feet. Because of the limited extraction and subcritical areas, the subsidence occurred slowly with small changes noticeable until 1987. The area appeared stable in 1988 and 1989. It has not been monitored since 1989 and is considered dormant.

AREA 4

This subsidence area is comprised of three continuous miner panels. The mining height averaged 11 feet with a good extraction ratio. Undermining ceased in 1985.

Maximum subsidence was 5 feet with no detectable change in 1989. This area was monitored

again in 1993, 1994 and 1995 with no detectable changes. This area was monitored for ten years after undermining ceased. The last detectable subsidence was in 1988. Therefore, this area is considered dormant.

AREA 5

The four continuous miner panels that make up this area were mined from September 1978, to November 1981. Mining height averaged 11 feet with an 80% extraction ratio.

Maximum subsidence was 5 feet with no detectable changes from 1985 through 1991. This area has not been monitored since 1991, and will also remain dormant.

AREA 6

Area 6 is SUFCO Mine's first longwall induced subsidence area. It is comprised of nine longwall panels varying from 540 feet to 700 feet in width and 1,700 feet to 3,900 feet in length. Also, there is a section of recovered mains between two of the longwall blocks. Undermining began in Area 6 during October, 1985, and continued through the mains recovery in March, 1990.

Maximum subsidence measured in areas bounded by the plateau is five feet. There is a location on the map that shows seven feet; but this area is outside the escarpment where the overburden is only 600 feet thick. The subsided escarpment is intentional and is part of a study agreed upon by SUFCO Mine, the Division of Oil, Gas and Mining, the Bureau of Land Management and the U.S. Forest Service. This particular section of escarpment was removed from the "no subsidence zone" to study the effects of longwall mining on the escarpment.

Area 6 has shown no significant changes since 1992. It has been determined that this area is dormant.

AREA 7

Area 7 was originally planned for no subsidence. Pillars were made to support the overburden but began to fail in the north end in 1984 when the underground workings were flooded. The failure progressed towards the south and by 1986 subsidence was detected over the area.

The map shows up to seven feet of subsidence. There was no additional subsidence movement detected from 1988 to 1994. Therefore, this area will also be considered dormant.

AREA 8

Undermining this area began in June 1983, and was sporadic until 1992. Continuous miners were used with extraction ratios over 80% and average mining heights of 10 feet. This area stayed active longer than most due to its proximity to an adjacent active longwall block.

Maximum subsidence is five feet. No noticeable vertical movement has been detected since 1993. This area is dormant.

AREA 9

This area is a longwall mining area that is composed of four panels. The first began in June 1989 and the block was finished in January 1992. The mining height averaged about 11 feet and the maximum subsidence is five feet. There has been no indication of movement since 1996. This area is determined to be dormant.

AREA 10

Area ten is a longwall mining block that began in January 1992. Mining was completed in August 2001. The entire surface area above this block was digitized for base-line elevations during 1991. Maximum subsidence shown to date is seven feet. This area has been mined out since 2001, and monitoring suggests that it has settled. It is now assumed to be dormant.

The experimental mining practice area discussed under "Area 6" was extended, with regulatory approval, to the east side of the canyon under the Southwest corner of "Area 10". An extensive pre-mining survey of this location was conducted late in 1992. A detailed survey of the post-mining subsidence effects was provided in the 1993 report.

AREA 11

Area eleven is an extension of the last longwall panel in Area ten. It extends into a 150-acre modification to lease U-63214. An elevation baseline was established in 1999. Mining under this area began in January 1999 with gateroad development. Longwall mining took place from May 2000 thru September 2000. Subsidence to date shows a maximum of six feet. This area has shown no significant movement since 2003 and is considered dormant.

AREA 12

Area twelve is the first longwall mining block on the acquired lease UTU-76195. Due to a mine plan change at the start of 2003, this area now consists of six longwall panels. An elevation baseline was established in 1999, and gateroad development began in March 2000. Longwall mining began in September 2001 and ended in February 2007. There has been no significant movement detected in this area since 2007. This area appears to have stabilized and is considered dormant.

AREA 13

Area thirteen is a longwall mining block that originally consisted of seven panels on lease U-63214 and lease ML 49443-OBA. Due to a mine plan change near the end of 2008, this area now consists of eight longwall panels. An elevation baseline for the area included on lease U-63214 was established in 1991 and the elevation baseline for the area included on lease ML

49443-OBA was established in 2006. Longwall mining began in March 2007 and ended in 2012. This area was considered active in 2007. 2015 will be the last year of monitoring. The boundary of area 13 was trimmed to more closely follow previous mining activities and to exclude future mining areas.

AREA 14

Area 14 consists of a short, single longwall panel on lease U-63214. An elevation baseline for this area was originally established in 1991, and the area was re-flown and checked for any discrepancies in 2011. Gateroad development began in 2010 and was completed in 2011. Longwall mining began and ended in 2012. This area has shown little change and 2015 will be the last year of monitoring.

AREA 15

Area 15 is a longwall mining area on lease U-63214, lease U-47080, and fee land. The previous mine plan included two panels. Due to a mine plan change in 2012, a third panel was added that extended into what was Area 17. Upon approval for the third panel, the boundary for Area 15 was adjusted North, to include the third panel. Gateroad development in this area began in 2010. Longwall mining began in 2012 and ended in 2015. Base elevation data for this area was partially obtained in previous years, but was completely flown and checked in 2011. Area 15 will continue being monitored for several years.

AREA 16

Area 16 is a longwall mining block currently planned for 3 panels. The westerly modifications of lease U-63214, lease U-47080, and lease SL-062583 for this area were obtained in 2009. Rehab of existing mine entries and development of gateroads began in 2011, and longwall mining began in 2015. An elevation baseline for this area was obtained in 2011.

AREA 17

Area 17 is a planned longwall mining block on lease U-63214, and future lease modifications and acquisitions. Gateroad development began in 2015 and longwall mining will be dependant on future lease holdings. An elevation baseline was obtained for the current mine plan area in 2011.

AREA 18

Area 18 is a planned longwall mining block on leases U-63214 and ML 49443-OBA. Gateroad development began in 2015 and longwall mining is scheduled to begin in 2017. An elevation baseline was obtained for the current mine plan area in 2015.

DRAW ANGLE SURVEYS

Several draw angle surveys have been performed during the past years. Completed surveys have been over continuous miner areas and have been oriented both parallel and perpendicular to the long axis of the panel. The average of all measurements is 15°. Individual measurements ranged from 10° to 21°.

New longwall draw angle data was obtained in 1995. Draw angle points were installed in May 1986, on the southern end of the first panel in "Area 6". As shown on the subsidence map, survey lines were placed parallel and perpendicular to the axis of the panel. Undermining of this panel was completed in June 1986. Measurements were taken in 1995 and indicate an angle 15.25° for the perpendicular line. An angle for the parallel line was not obtained because the mains underlying the survey line were partially extracted. These findings coincide with the average of 15° as stated above.

SUBSIDENCE TENSION CRACKS

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DETAILED LONGWALL SUBSIDENCE PROFILE

In 1998 a project was initiated to monitor longwall subsidence in relation to the advancing face. Preparation consisted of first installing two monitoring points outside the subsidence area. Then two base lines were established one 3000 feet long running parallel down the center and the second 1300 feet long perpendicular across the 967 feet wide panel. Markers were installed along these lines on 100 feet spacing using approximately 2.5 feet long rebar with an aluminum cap or a hardened nail drilled into the exposed rock. Initial horizontal and vertical readings were

obtained by shooting each marker with a Topcon GTS-3 distance meter from the monitoring points.

Monitoring was done weekly to gather new readings on markers behind and up to 500 feet ahead of the advancing face. The data collected reveals that vertical movement starts approximately 150 feet ahead of the face with 15 hundredths of a foot of subsidence at the face. It then drops off quickly to 4 feet at 600 feet behind the face and gradually levels off at 4 to 5 feet. Horizontal readings indicate the ground initially moves about 30 hundredths of a foot away from the face, then back toward the face 80 hundredths of a foot.

CONCLUSION

Areas 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, are all considered to be dormant. Photographic coverage for these areas can be obtained if circumstances deem it necessary. Longwall mining in Area 13 and Area 14 was completed in 2012 with a maximum subsidence detected to date of 7 feet in Area 13 and 5 feet in Area 14. 2015 will be the last year of monitoring for areas 13 and 14, they will be considered dormant going forward. Longwall mining in Area 15 has been completed in 2015 with a maximum subsidence detected to date of 12 feet. Subsidence monitoring will continue for this area.

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2015 SUBSIDENCE REPORT

CANYON FUEL COMPANY, LLC

SUFCO MINE

by

Jason K. Monroe

INTRODUCTION

Canyon Fuel Company LLC, SUFCO Mine's 2015 subsidence report is an update of annual subsidence data that has been accumulated since 1976 as the former Southern Utah Fuel Company. Prior to 1985, the data was derived from conventional survey methods. Since then, photogrammetric surveys have been employed to monitor the ground movement.

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Once each year around the end of August, another set of aerial photography is obtained. A new elevation is then found at the same x and y coordinates as all the originals within all areas considered to be active. The new, or current, elevations are compared to the originals and the difference between the two is used to generate a contour map. The result is the subsidence contour map included with each annual subsidence report.

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SUBSIDENCE HISTORY

SUFCO Mine began operations that cause surface subsidence in June 1976. Continuous miners were used to extract coal from pillars that were developed as part of a retreating panel. The panels were approximately 650 feet wide and varied in length up to 2,500 feet. The average mining height approached 11 feet and the extraction ratio averaged about 80%.

The resulting subsidence from these continuous miner panels averaged 4 feet in the plateau areas where overburden was 900 feet thick. In areas where panel boundaries were outside the escarpment and beyond the Castlegate Sandstone, subsidence increased with decreasing overburden thickness. The maximum subsidence measured in a continuous miner panel to date, 8.5 feet, occurred in one of these areas. The overburden was only 600 feet thick.

Retreat mining continued in this manner until October, 1985, when a retreating longwall system was added. Longwall panels have ranged from 550 feet to 1,110 feet wide and up to 18,500 feet in length. Mining heights have varied from 8.5 feet to 12.5 feet.

Subsidence above the longwall panels has averaged 5 to 6 feet in the center of the panels. The overburden thickness has been from 1,000 feet to 1,800 feet (except outside the escarpment where overburden rapidly decreases). The maximum measured subsidence caused by longwall mining until 2009 was seven feet. This occurred in two cases: 1. An area outside the escarpment very similar to the one mentioned above for the continuous miner panel and 2. Down the center of panels that are under plateaus with 1,000 feet of overburden, but this is not typical. In 2009 there was a small area on the north end of the last longwall panel in area 12 that maximum subsidence measured nine feet. This area has overburden of approximately 900 feet, and is relatively close to the escarpment. In 2015 there was a small area in Area 15 that had a maximum subsidence of twelve feet.

DORMANT AND ACTIVE AREAS

Dormant areas are those areas that have shown little or no movement for several consecutive years. Yearly digitizing of these areas will not be done, but photographic coverage can be obtained should the need arise for reevaluation. These areas may not be shown on the current subsidence map.

Active areas are those currently being mined or that have evidence of movement within a reasonable time period. Active areas are digitized and evaluated for subsidence yearly, until they meet the parameters of a dormant area.

2015 SUBSIDENCE

The 2015 subsidence map (Map 1) was updated using data from current photogrammetric monitoring. Each subsidence area is labeled as an independent block. A brief description of each follows:

AREA 1

This was SUFCO Mine's first subsidence area. Undermining began in June 1976, and continued into 1979. The area is composed of five continuous miner panels that averaged 650 feet in width. Mining height averaged 11 feet with about an 80% extraction ratio.

Subsidence ranged from 4.5 feet to a maximum of 8.5 feet. It was first detected in 1976 and continued until 1985. No surface movement was detected in this entire area from 1986 to 1989. Area 1 has not been digitized since the 1990 subsidence report and is considered dormant.

AREA 2

This is another continuous miner area. The panels here were irregular shaped and the extraction ratio was modest. Undermining ceased in 1984.

Maximum subsidence has been measured at 2 feet. The area has been stable since 1985 and has not been monitored since 1989. This area is dormant.

AREA 3

This area is another continuous miner section, but the extracted area is a portion of mains with protective barriers instead of a panel. Coal recovery was moderate with mined areas which were subcritical. Undermining ceased in 1983.

Maximum subsidence was measured at 2 feet. Because of the limited extraction and subcritical areas, the subsidence occurred slowly with small changes noticeable until 1987. The area appeared stable in 1988 and 1989. It has not been monitored since 1989 and is considered dormant.

AREA 4

This subsidence area is comprised of three continuous miner panels. The mining height averaged 11 feet with a good extraction ratio. Undermining ceased in 1985.

Maximum subsidence was 5 feet with no detectable change in 1989. This area was monitored

again in 1993, 1994 and 1995 with no detectable changes. This area was monitored for ten years after undermining ceased. The last detectable subsidence was in 1988. Therefore, this area is considered dormant.

AREA 5

The four continuous miner panels that make up this area were mined from September 1978, to November 1981. Mining height averaged 11 feet with an 80% extraction ratio.

Maximum subsidence was 5 feet with no detectable changes from 1985 through 1991. This area has not been monitored since 1991, and will also remain dormant.

AREA 6

Area 6 is SUFCO Mine's first longwall induced subsidence area. It is comprised of nine longwall panels varying from 540 feet to 700 feet in width and 1,700 feet to 3,900 feet in length. Also, there is a section of recovered mains between two of the longwall blocks. Undermining began in Area 6 during October, 1985, and continued through the mains recovery in March, 1990.

Maximum subsidence measured in areas bounded by the plateau is five feet. There is a location on the map that shows seven feet; but this area is outside the escarpment where the overburden is only 600 feet thick. The subsided escarpment is intentional and is part of a study agreed upon by SUFCO Mine, the Division of Oil, Gas and Mining, the Bureau of Land Management and the U.S. Forest Service. This particular section of escarpment was removed from the "no subsidence zone" to study the effects of longwall mining on the escarpment.

Area 6 has shown no significant changes since 1992. It has been determined that this area is dormant.

AREA 7

Area 7 was originally planned for no subsidence. Pillars were made to support the overburden but began to fail in the north end in 1984 when the underground workings were flooded. The failure progressed towards the south and by 1986 subsidence was detected over the area.

The map shows up to seven feet of subsidence. There was no additional subsidence movement detected from 1988 to 1994. Therefore, this area will also be considered dormant.

AREA 8

Undermining this area began in June 1983, and was sporadic until 1992. Continuous miners were used with extraction ratios over 80% and average mining heights of 10 feet. This area stayed active longer than most due to its proximity to an adjacent active longwall block.

Maximum subsidence is five feet. No noticeable vertical movement has been detected since 1993. This area is dormant.

AREA 9

This area is a longwall mining area that is composed of four panels. The first began in June 1989 and the block was finished in January 1992. The mining height averaged about 11 feet and the maximum subsidence is five feet. There has been no indication of movement since 1996. This area is determined to be dormant.

AREA 10

Area ten is a longwall mining block that began in January 1992. Mining was completed in August 2001. The entire surface area above this block was digitized for base-line elevations during 1991. Maximum subsidence shown to date is seven feet. This area has been mined out since 2001, and monitoring suggests that it has settled. It is now assumed to be dormant.

The experimental mining practice area discussed under "Area 6" was extended, with regulatory approval, to the east side of the canyon under the Southwest corner of "Area 10". An extensive pre-mining survey of this location was conducted late in 1992. A detailed survey of the post-mining subsidence effects was provided in the 1993 report.

AREA 11

Area eleven is an extension of the last longwall panel in Area ten. It extends into a 150-acre modification to lease U-63214. An elevation baseline was established in 1999. Mining under this area began in January 1999 with gateroad development. Longwall mining took place from May 2000 thru September 2000. Subsidence to date shows a maximum of six feet. This area has shown no significant movement since 2003 and is considered dormant.

AREA 12

Area twelve is the first longwall mining block on the acquired lease UTU-76195. Due to a mine plan change at the start of 2003, this area now consists of six longwall panels. An elevation baseline was established in 1999, and gateroad development began in March 2000. Longwall mining began in September 2001 and ended in February 2007. There has been no significant movement detected in this area since 2007. This area appears to have stabilized and is considered dormant.

AREA 13

Area thirteen is a longwall mining block that originally consisted of seven panels on lease U-63214 and lease ML 49443-OBA. Due to a mine plan change near the end of 2008, this area now consists of eight longwall panels. An elevation baseline for the area included on lease U-63214 was established in 1991 and the elevation baseline for the area included on lease ML

49443-OBA was established in 2006. Longwall mining began in March 2007 and ended in 2012. This area was considered active in 2007. 2015 will be the last year of monitoring. The boundary of area 13 was trimmed to more closely follow previous mining activities and to exclude future mining areas.

AREA 14

Area 14 consists of a short, single longwall panel on lease U-63214. An elevation baseline for this area was originally established in 1991, and the area was re-flown and checked for any discrepancies in 2011. Gateroad development began in 2010 and was completed in 2011. Longwall mining began and ended in 2012. This area has shown little change and 2015 will be the last year of monitoring.

AREA 15

Area 15 is a longwall mining area on lease U-63214, lease U-47080, and fee land. The previous mine plan included two panels. Due to a mine plan change in 2012, a third panel was added that extended into what was Area 17. Upon approval for the third panel, the boundary for Area 15 was adjusted North, to include the third panel. Gateroad development in this area began in 2010. Longwall mining began in 2012 and ended in 2015. Base elevation data for this area was partially obtained in previous years, but was completely flown and checked in 2011. Area 15 will continue being monitored for several years.

AREA 16

Area 16 is a longwall mining block currently planned for 3 panels. The westerly modifications of lease U-63214, lease U-47080, and lease SL-062583 for this area were obtained in 2009. Rehab of existing mine entries and development of gateroads began in 2011, and longwall mining began in 2015. An elevation baseline for this area was obtained in 2011.

AREA 17

Area 17 is a planned longwall mining block on lease U-63214, and future lease modifications and acquisitions. Gateroad development began in 2015 and longwall mining will be dependant on future lease holdings. An elevation baseline was obtained for the current mine plan area in 2011.

AREA 18

Area 18 is a planned longwall mining block on leases U-63214 and ML 49443-OBA. Gateroad development began in 2015 and longwall mining is scheduled to begin in 2017. An elevation baseline was obtained for the current mine plan area in 2015.

DRAW ANGLE SURVEYS

Several draw angle surveys have been performed during the past years. Completed surveys have been over continuous miner areas and have been oriented both parallel and perpendicular to the long axis of the panel. The average of all measurements is 15°. Individual measurements ranged from 10° to 21°.

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SUBSIDENCE TENSION CRACKS

Tension cracks have occurred above most of the subsidence areas. Most have been located by survey and are shown on the map. Their lengths vary from a few feet to a couple thousand feet. Most are oriented either parallel to the natural jointing pattern or to the boundaries of the underground excavation. Vertical displacement along the cracks is uncommon and horizontal displacement varies from hairline to several inches in width depending on the surface topography (rock, hard packed or loose soil).

The U. S. Forest Service completed a tension crack study in 1978. They monitored twenty-two different cracks (located in Area 1) with widths varying from 1/8 inch to six inches. Results show that most cracks self-heal, or close, from 13% to 100% of their original width.

Longwall mining at the top of the 13L4E longwall panel caused some cracking in the escarpment sandstone of upper Box Canyon. The panel was mined parallel and down the center of a portion of the canyon. Subsidence thus created an inward pull on the canyon walls. These cracks are in the rock along the edge of the escarpment and vary in width and displacement. A monitoring program was initiated in 2004 to observe the behavior of these cracks. These cracks were checked in 2005 and again for the final time in 2008 and show no significant change in width or displacement.

DETAILED LONGWALL SUBSIDENCE PROFILE

In 1998 a project was initiated to monitor longwall subsidence in relation to the advancing face. Preparation consisted of first installing two monitoring points outside the subsidence area. Then two base lines were established one 3000 feet long running parallel down the center and the second 1300 feet long perpendicular across the 967 feet wide panel. Markers were installed along these lines on 100 feet spacing using approximately 2.5 feet long rebar with an aluminum cap or a hardened nail drilled into the exposed rock. Initial horizontal and vertical readings were

obtained by shooting each marker with a Topcon GTS-3 distance meter from the monitoring points.

Monitoring was done weekly to gather new readings on markers behind and up to 500 feet ahead of the advancing face. The data collected reveals that vertical movement starts approximately 150 feet ahead of the face with 15 hundredths of a foot of subsidence at the face. It then drops off quickly to 4 feet at 600 feet behind the face and gradually levels off at 4 to 5 feet. Horizontal readings indicate the ground initially moves about 30 hundredths of a foot away from the face, then back toward the face 80 hundredths of a foot.

CONCLUSION

Areas 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, are all considered to be dormant. Photographic coverage for these areas can be obtained if circumstances deem it necessary. Longwall mining in Area 13 and Area 14 was completed in 2012 with a maximum subsidence detected to date of 7 feet in Area 13 and 5 feet in Area 14. 2015 will be the last year of monitoring for areas 13 and 14, they will be considered dormant going forward. Longwall mining in Area 15 has been completed in 2015 with a maximum subsidence detected to date of 12 feet. Subsidence monitoring will continue for this area.

JKM:kb
SUFSRV1\SUFPUB\GOVT2015\BLM\SUBSIDENCE\SUBSID2015.DOC

Comparison of Weather Data and Stream Discharge

At the Sufco Mine During 2015

Introduction

This report provides an analysis and discussion of the relationship between climatic variability and stream discharge rates in the Pines area at the Canyon Fuel Company, LLC, Sufco Mine during 2015. The information used in this analysis includes the information provided herein and information provided previously to the Utah Division of Oil, Gas and Mining.

Climate Data

A National Weather Service weather station (Salina 24E) is operated at the Sufco Mine surface facilities. This weather station is operated year-round and records precipitation amounts as direct rainfall and/or as snow-water equivalent. Information from this weather station is used in the flow comparisons presented in this report. A plot of yearly precipitation at the Salina 24E station for the period 1984 to 2015 as percentages of the station average is presented in Figure 1.

The Palmer Hydrologic Drought Index (PHDI) has also been used in the flow comparisons presented below. A plot of the PHDI for Utah Region 4 is included in this analysis as Figure

2. The PHDI is a monthly numerical value generated by the National Climatic Data Center that indicates the severity of wet and dry spells. The PHDI is calculated from various hydrologic parameters including precipitation, temperature, evapotranspiration, soil water recharge, soil water loss, and runoff. Consequently, it is useful for evaluating the relationship between climatic conditions and groundwater and surface water discharge.

As reflected in Figure 2, beginning in late 2009, the region began a transition from moderate drought conditions toward wetter than normal conditions that peaked in July 2011 with an extreme wet spell. Beginning in July 2011 and continuing into early 2012, the region experienced decreasing wetness, transitioning to drought conditions. The region experienced a prolonged continuous period of drought during the three and a half year period from March 2012 through September 2015. During this 42-month period, drought conditions ranged from mild to severe (Figure 2). Beginning in October 2015 and continuing through the last two months of 2015 the region experienced a period of mild to moderate wetness.

It is apparent in the yearly precipitation data from the Salina 24E station (Figure 1) that dry years have been dominant over wet years in the Sufco Mine area since 2000. Of the previous 16 years, 11 have been dry (shown in red) while only five have been wet (shown in blue). In contrast, during the preceding 15 year period, during 10 of those 15 years, precipitation was greater than normal (Figure 1). As indicated on Figure 1, the precipitation measured at the Salina 24E station during the 2014-2015 water year (15.86 inches) was above normal (116% of average).

It is noteworthy that, although the precipitation measured at the Salina 24E station was above the station average for the 2014-2015 water year, the PHDI information indicates that most of 2015 was a period of drought for the region. This may be a result of the fact that the determination of the monthly PHDI value takes factors other than precipitation totals in the calculation of the monthly PHDI value (such as temperature, evapotranspiration, soil water recharge, soil water loss, and runoff).

Pines 407

Pines 407 is a surface-water monitoring station on the Main Fork of Box Canyon Creek just above the confluence with the East Fork of Box Canyon (see Figure 3 for location). Discharge data have historically been measured at Pines 407 using a 3-inch Parshall flume that is installed at the site. During 2015, discharge was measured using a pipe and a calibrated container because it was apparent that some stream water was bypassing the flume through the underlying materials in the stream bed. The site is monitored quarterly for discharge rate and field water quality parameters. Discharge data at Pines 407 for 2015 are plotted together with precipitation data from the Salina 24E Weather Station and PHDI data for Utah Region 4 on Figure 4. Additionally, discharges from Pines 407 and Pines 408 are plotted together with a plot of the PHDI for Utah Region 4 for the period 2000-2015 in Figure 5.

Discharge measured at Pines 407 during 2015 ranged from 15.3 gpm during September to 28.5 gpm during late October. A discharge of 21.7 gpm was measured during June 2015. The discharge rates measured at Pines 407 during 2014 were somewhat lower than those

measured during 2014 (Figure 5). The decreased flows may be in response to the 42-month period of drought that prevailed in the area.

As is typical with surface water drainages in the area, the minimum discharge rates measured in the stream typically occur during the warm summer months when potential evapotranspiration is greatest (Figure 5).

The general lack of pronounced early season discharge peaks at Pines 407 suggests that either 1) substantial springtime snowmelt runoff events did not occur, or 2) the peak discharges occurred in the drainage prior to the first monitoring events of the year (usually in June). Because of the flat plateau surface adjacent to the Box Canyon drainage, the prevalence of sandy soils at the surface, and the typically scant winter snow accumulation in the Box Canyon area, it is not unanticipated that a substantial springtime snowmelt surface-water runoff event is not commonly observed. Periodic short-lived, high-intensity surface-water runoff events resulting from torrential monsoonal precipitation events are not uncommon, however.

It is noteworthy that immediate responses to previous significant wet spells in the region have generally not been observed at Pines 407 (Figure 5). This observation seems to support the conclusion that the groundwater systems that support baseflow in the creek are likely associated with long groundwater flowpaths, and/or slow groundwater migration rates and appreciable, multi-year groundwater storage in the groundwater system (i.e. a buffered system). Accordingly, large-scale seasonal variability is not generally noted in the discharge

at Pines 407 while longer term trends may be apparent. It is seems probable that if persistent wet climatic conditions prevail in the region in the future, baseflow discharge rates in the stream would increase in response to the cumulative effects of increased recharge to the bedrock groundwater systems that supply baseflow to the stream.

Pines 408

Pines 408 is a monitoring station on the East Fork of Box Canyon Creek just above the confluence with the main fork of Box Canyon Creek (see Figure 3 for location). Monitoring site Pines 408 is monitored quarterly for discharge and field water-quality parameters. Discharge data at Pines 408 for 2015 are plotted together with precipitation data from the Salina 24E Weather Station and the PHDI for Utah Region 4 in Figure 6. Additionally, discharges from Pines 407 and Pines 408 are plotted together with a plot of the PHDI for Utah Region 4 for the period 2000-2015 in Figure 5.

During 2015, discharge measured at Pines 408 ranged from no flow on 28 September 2015 to 0.15 gpm in late June (20 June 2015). On 31 October 2015 the stream channel was damp at the monitoring location, with some puddles a short distance up-gradient in the creek. The lack of flow measured during the September monitoring event is likely attributable to the high evapotranspiration rates occurring during the warm summer season. It is noteworthy that immediate responses to previous significant wet spells in the region have generally not been observed at Pines 408 (Figure 5). This observation seems to support the conclusion that the groundwater systems that support baseflow in the creek are likely associated with long

groundwater flowpaths, and/or slow groundwater migration rates and appreciable, multi-year groundwater storage in the groundwater system (i.e. a buffered system). Accordingly, appreciable seasonal variability is not generally noted in the discharge at Pines 408 while variability associated with longer term climatic trends may be apparent. Discharge data collected at Pines 408 may be used to determine whether discharge rates in the stream respond to future periods of increased groundwater recharge associated with long-term wet climatic cycles in the drainage.

FP-1

FP-1 is a monitoring site on a specified reach of the stream channel in the upper west fork of the Main Fork of Box Canyon located between monitoring sites SUFCO 089 and GW-20 (See Figure 3). Monitoring at FP-1 occurs on or near October 1 of each year. Monitoring at FP-1 consists of the identification of the location of the first (uppermost) discharge in the stream on that date. A discharge measurement is also performed at this location. On 31 October 2015 and 24 September 2015 monitoring events there was no flow in the FP-1 stream section.

The first occurrence of continuous flow in the main fork of Box Canyon Creek on 31 October 2015 occurred at the approximate location as shown on Figure 3. A discharge of 0.14 gpm was measured at that time in the creek a short distance downstream. At locations higher in the stream drainage, zones of intermittent wetness were sometimes present during 2015. These conditions are generally similar to those measured during the previous year (2014).

FP-2

FP-2 is a monitoring site on a specified reach of stream in the North Water Canyon tributary of the East Fork of Box Canyon Creek between Pines 105 and the confluence with the East Fork of Box Canyon Creek (See Figure 3 for location). Monitoring at FP-2 occurs on or near October 1 of each year. Monitoring at FP-2 consists of the identification of the location of the perennial portion of the stream. There was no perennial stream flow at the confluence with the East Fork of Box Canyon Creek when the site was visited on 31 October 2015. Discharge at FP-2 was also not present when the site was visited on 24 September 2015.

Pines 106

Pines 106 is a monitoring station which is part of Sufco's regular quarterly water monitoring plan. Pines 106 is located at the approximate location of site EFB-6, which is a flow-only monitoring site on the East Fork of Box Canyon Creek added to the monitoring plan in conjunction with the undermining of the stream with the 3 Left Pines East longwall panel. The location of Pines 106 is approximately coincident with the historical uppermost occurrence of perennial flow in the East Fork of Box Canyon Creek. Above this location, in most reaches the stream has usually been dry historically.

Discharge measured at stations Pines 106 and Pines 408 are plotted together with the annual precipitation measured at the Salina 24E weather station on Figure 7. No discharge was measured at Pines 106/EFB-6 during 2015. However, discharge continued to be observed in

the creek beginning near the nearby EFB-7 location. The discharge at EFB-7 is perennial in nature and the modest discharge at that location does not exhibit appreciable seasonal variability. As indicated above, during previous years, it was common for sustained discharge in the East Fork to begin near the Pines 106/EFB-6 location with isolated zones of wetness higher in the drainage. The somewhat stratigraphically lower occurrence of the first sustained water in the drainage may be related to subsidence effects associated with mining in the underlying 4 Left Pines East longwall panel (i.e. a local depression of water levels in the shallow groundwater system). However, the fact that sustained perennial stream discharge still occurs a short distance below EFB-6 demonstrates that the water has not been entirely diverted away from the site or into deep rock strata underlying the creek.

Groundwater systems that support baseflow in the East Fork of Box Canyon creek are likely associated with long groundwater flowpaths, and/or slow groundwater migration rates and appreciable, multi-year groundwater storage in the groundwater system (i.e. buffered groundwater systems). The perennial discharges from the bedrock groundwater systems in the East Fork of Box Canyon (below EFB-7), which do not exhibit large-scale seasonal variability in discharge rates, seem to support this conclusion. Based on this conceptual model, at a time when persistent wet climatic conditions again prevail in the region in the future, baseflow discharge rates in the stream may increase correspondingly in response to the cumulative effects of increased recharge to bedrock groundwater systems. The discharge response in the stream during future periods of prolonged wetness will be useful in validating this conclusion. We recommend that monitoring of stream discharge rates at Pines 407, Pines 408, and Pines 106 in the Box Canyon Creek drainage be continued during 2016.

USFS 109

USFS 109 is routinely monitored as part of Sufco's quarterly water monitoring program. The site is located in the upper middle fork of the Main Fork of Box Canyon. There was no discharge measured during 2015 at USFS 109.

USFS 110

USFS 110 is routinely monitored as part of Sufco's quarterly water monitoring program. The site is located in the upper main fork of Box Canyon Creek. There was no discharge measured during 2015 at USFS 110.

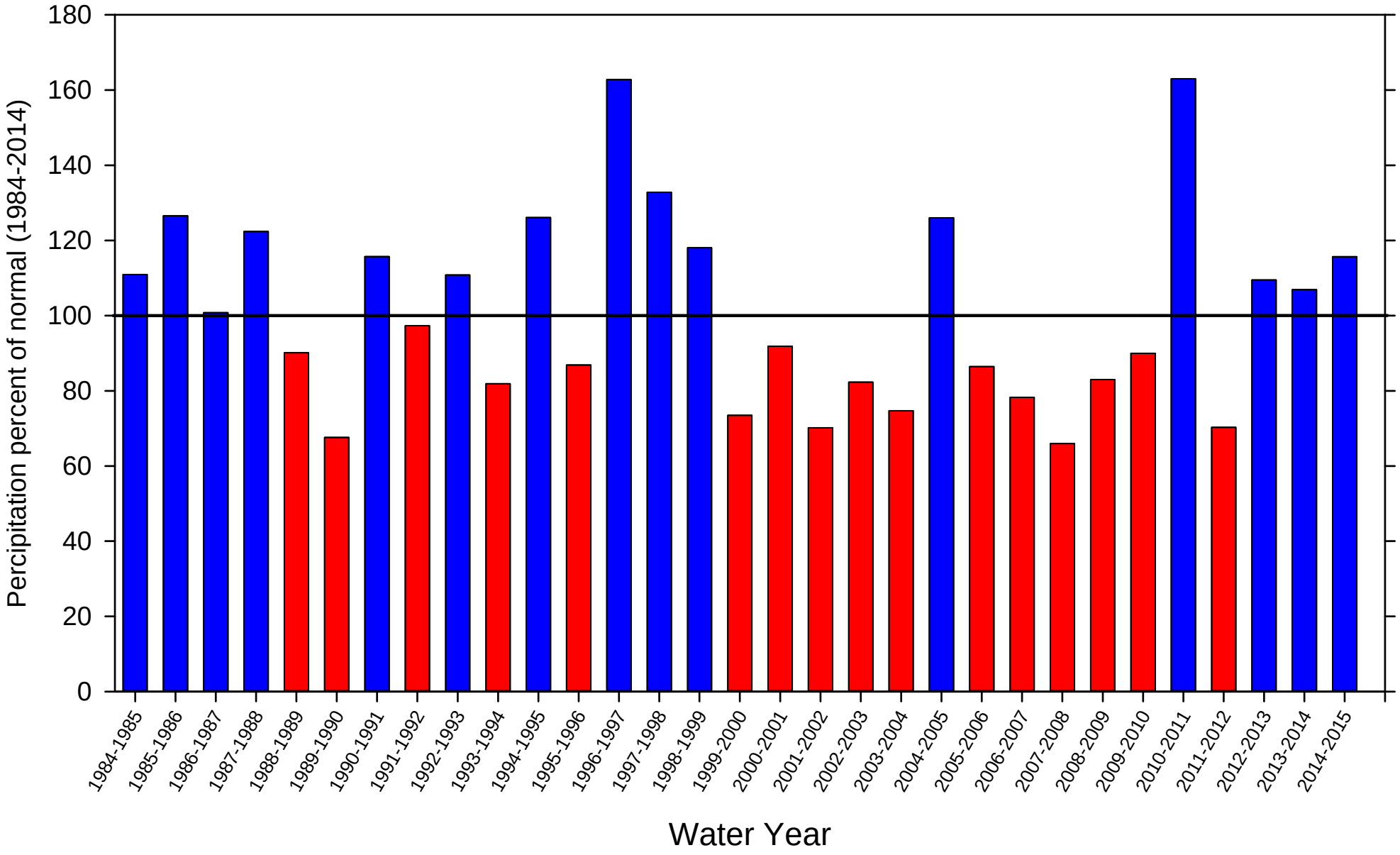

Figure 1 Sufco Mine Weather Station Precipitation.

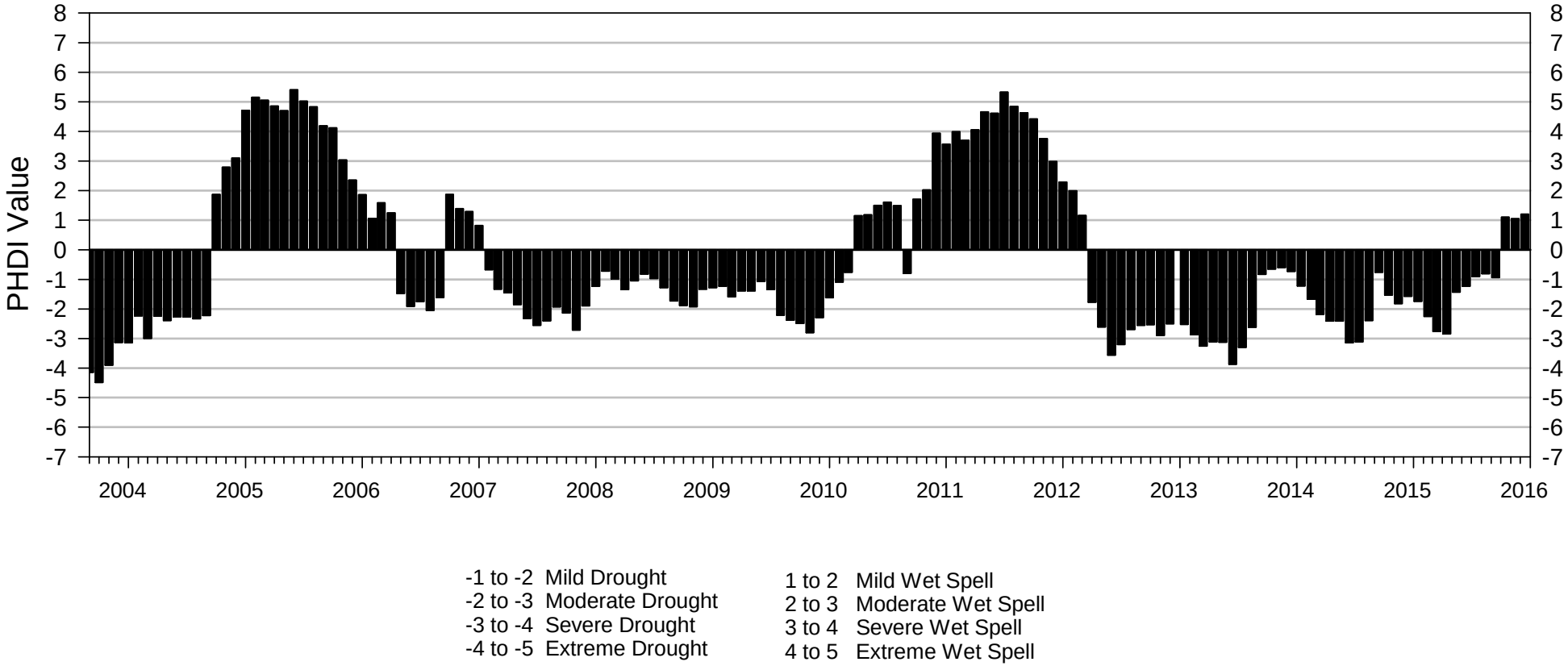

Figure 2 Plot of Palmer Hydrologic Drought Index for Utah Region 4.

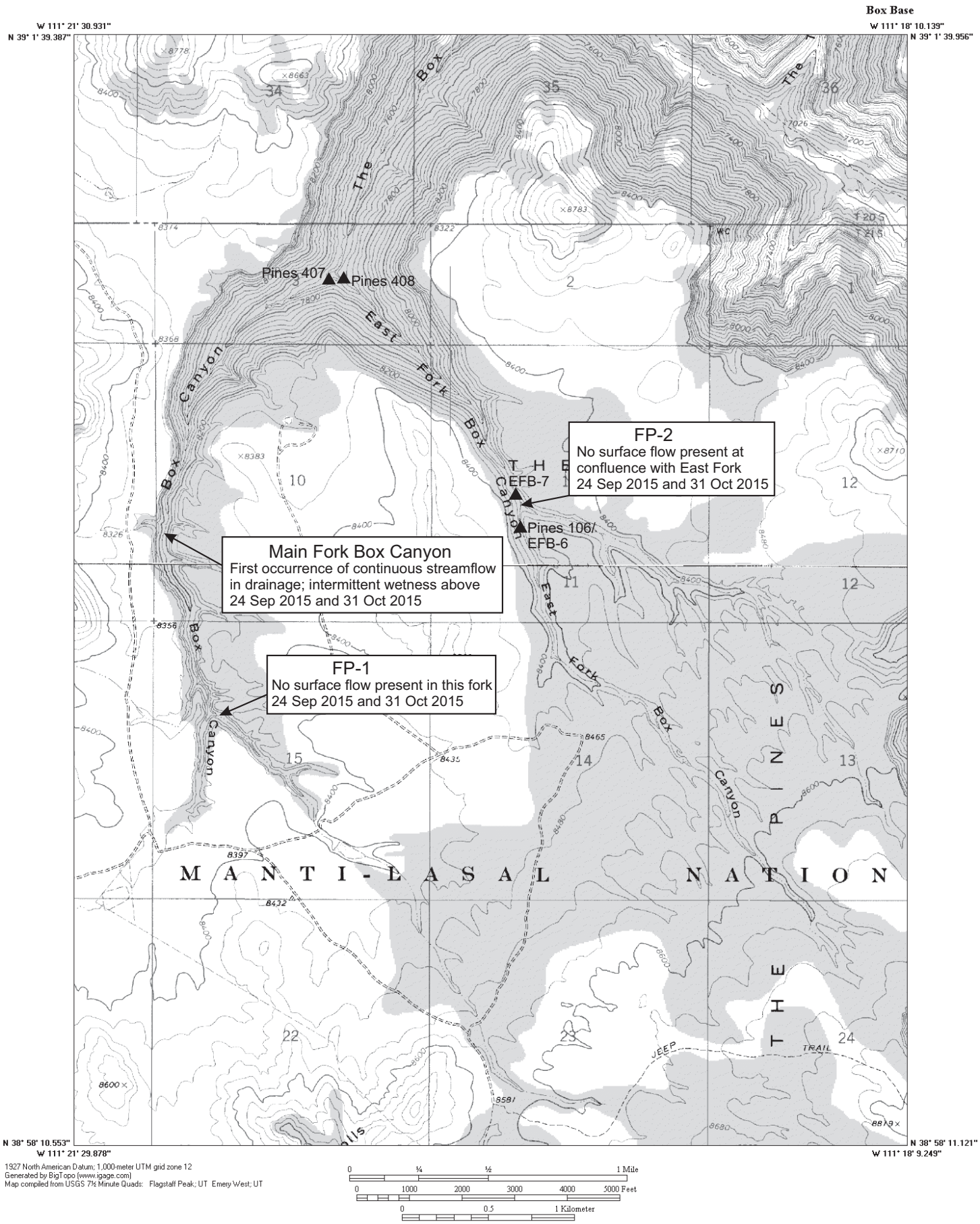

Figure 3 Stream locations.

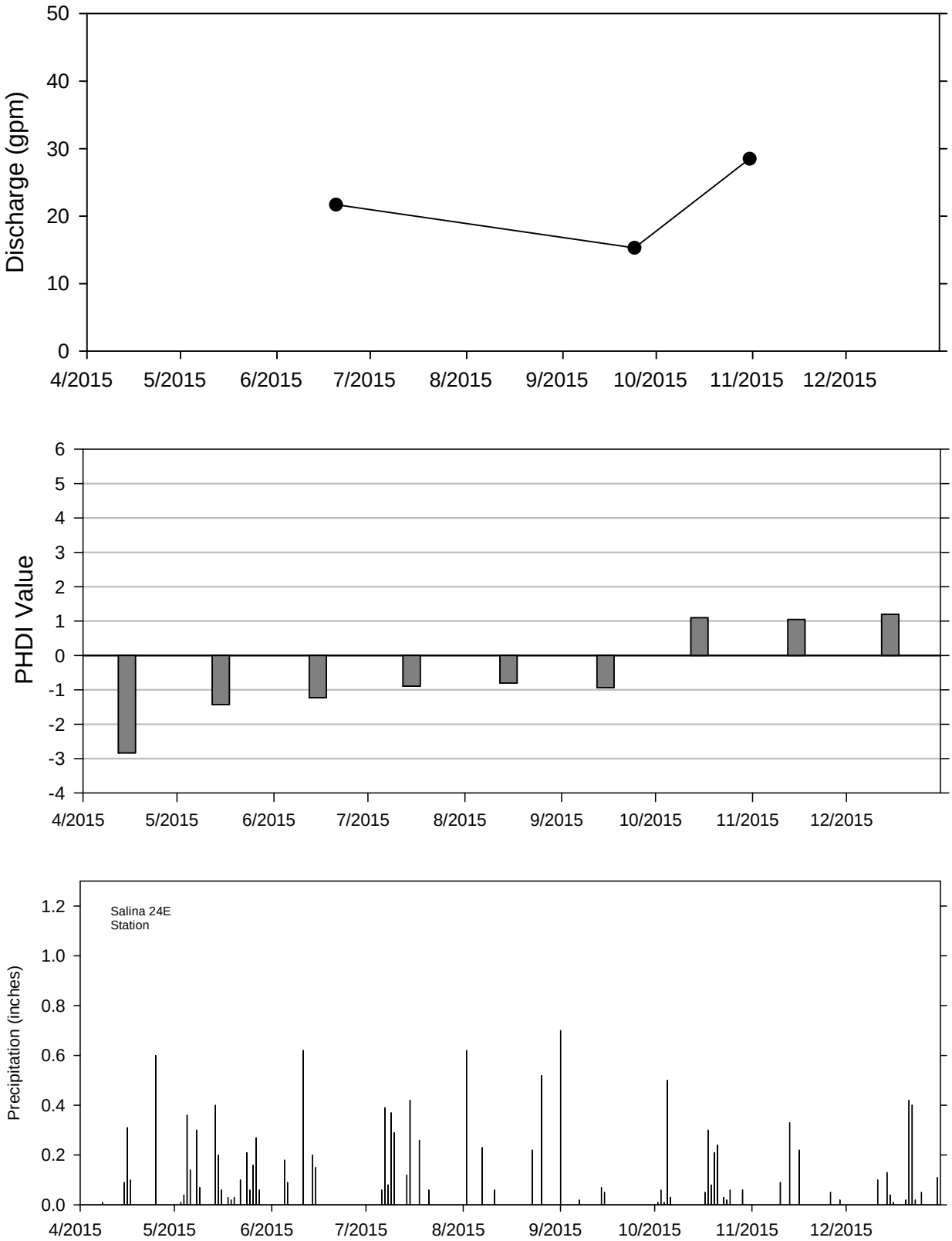

Figure 4 Pines 407 discharge and climate comparison.

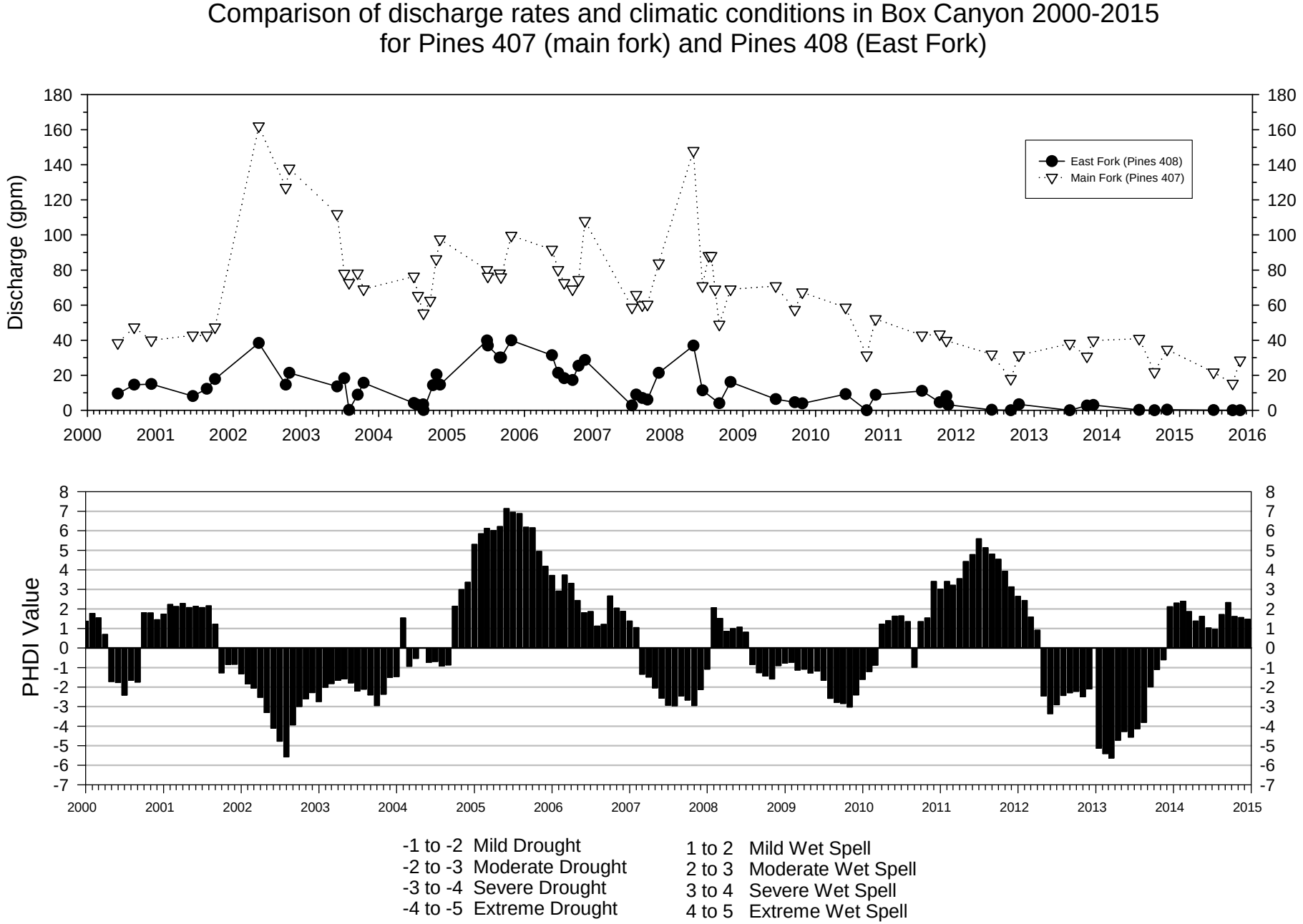

Figure 5 Discharge hydrographs for Pines 407 and Pines 408 and PHDI for Utah Region 4.

Pines 408 (East Fork of Box Canyon Creek)
discharge and climate comparison

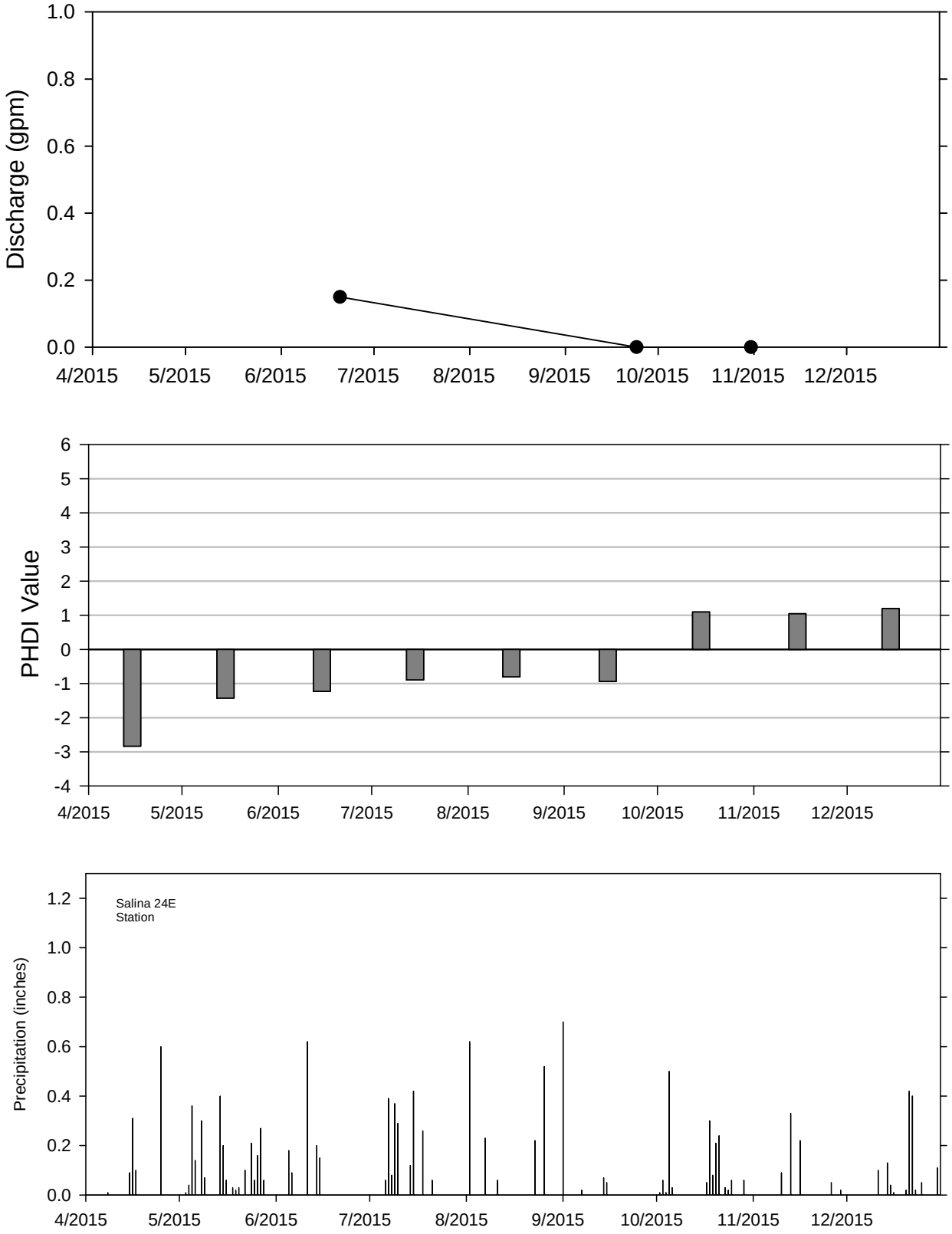

Figure 6 Pines 408 discharge and climate comparison.

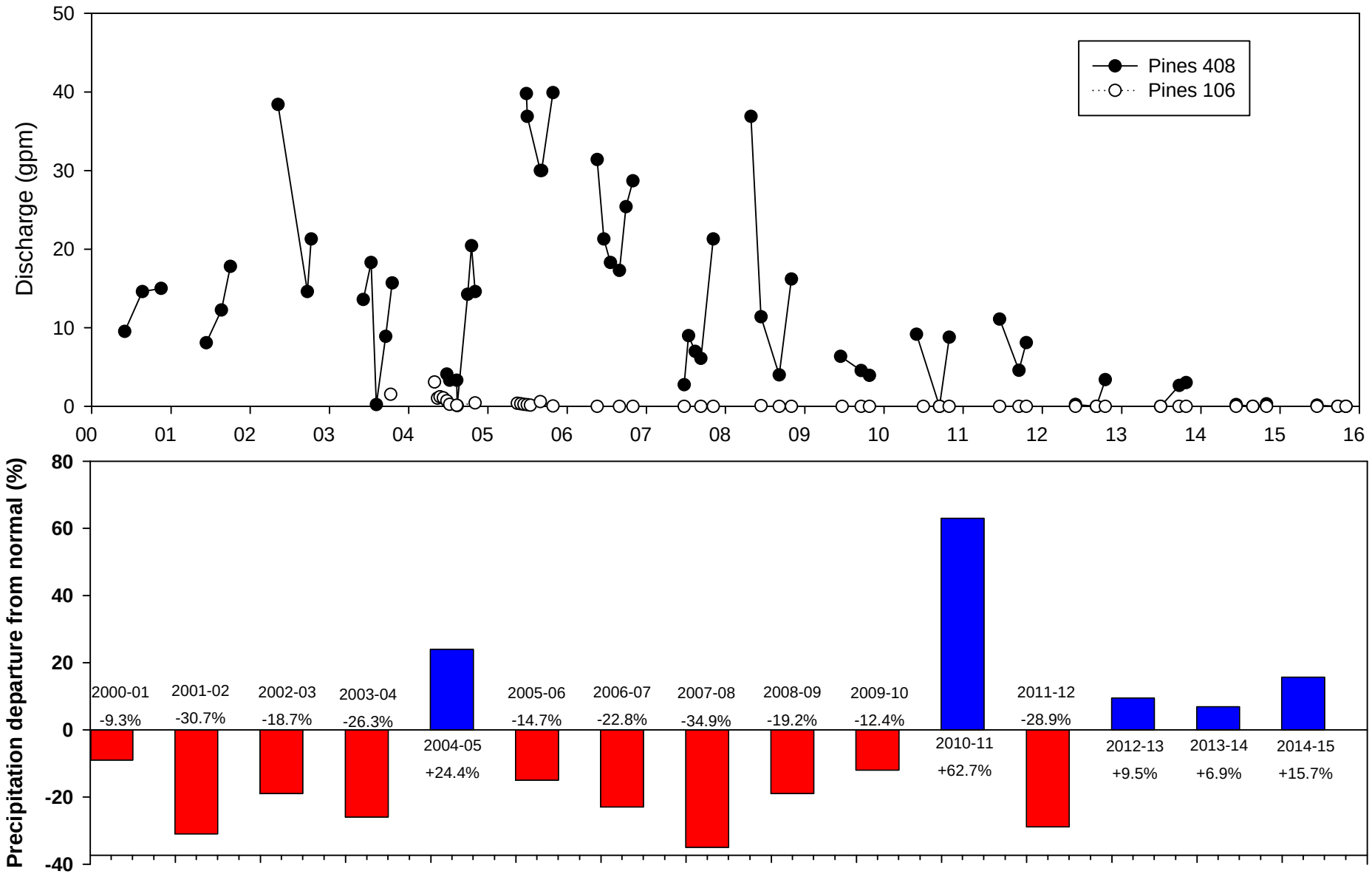

Figure 7 Pines 408 and Pines 106 discharge and Sufco Mine weather station data 2000-2015.

Sufco Mine

Northwater Mitigation Plan Summary Report

2016 Annual Report

Spring SP89

During the 2015 season, we were not required to operate the MSP-89 pump system as the Pines Pasture was rested from grazing. However, we did make several improvements to the system and tested the system to ensure reliable operation.

When removing solar cells from their structures following the 2014 grazing season, we noticed that several cells on one of the structures were failing prematurely. Although we do not know the exact cause of the failures, we suspect that either the panels were defective or perhaps a meteorological event (i.e., lightning) caused the damage. We purchased new cells to replace those that were damaged, and we also purchased additional cells to mount on two new solar structures. The new structures were installed in late July of 2015, adjacent to the existing structures. The fence surrounding the old structures was extended to accommodate the new structures in order to protect the equipment from livestock. All four pumps now have the ability to run on either DC solar or AC generator power and were tested with no issues.

We observed that with four pumps running simultaneously, we were drawing water out of the spring box faster than it could recharge. A close inspection of the spring box revealed that it was still capturing the majority of the flow being discharged from the spring, but the flow from the spring appears to have decreased since last year. This variation in flow could be the result of seasonal flow fluctuation or drought conditions.

Changes to the pipe line took place during the fall of 2014 and included: (1) the replacement of 1.2 miles of 1'' pipe with 2'' pipe between troughs at EFB-11 and Joe's Mill; and (2) the addition of a 2'' tee and ball valve at Joe's Mill pond. These changes were made to allow for increased flow to Joe's Mill pond and troughs.

Following the removal of the solar panels at the end of the season, we replaced the pump manifold with stainless steel pipe and fittings for increased life and durability. Shrouds were also installed on each pump to extend pump life. Further, we installed a metal container near the spring box to house the pumps and tools when the pumps are not being used.

Other Mitigation Work

During the fall of 2016, Sufco coordinated with the Manti-La Sal Forest Service to determine appropriate mitigation activities to be performed at another site within the Quitchupah or Muddy drainages. Instead of completing the single mitigation project required of us, we completed three projects which included the following improvements:

MSP08 – Fenced directly around spring area, improved the development of the spring, and installed two durable water troughs.

GW13 – Fenced directly around spring area, developed the spring, and installed two durable water troughs.

Pines 310 – Developed the spring and fenced more than an acre of sensitive riparian vegetation. Projects began during the fall of 2014 and were complete during late summer of 2015.

USDA United States Department of Agriculture | Forest Service | Manti-La Sal National Forest

Ferron Ranger District
115 West Canyon Road
Ferron, UT 84523
435-384-2372
FAX: 435-384-3296

File Code: 2820
Date: January 21, 2016

Vicki Miller
Canyon Fuel Company, LLC
Sufco Mine
597 South SR24
Salina, Utah 84654

Dear Mrs. Miller,

The Ferron/Price Ranger District of the Manti-La Sal National Forest would like to express our appreciation for the habitat improvement work performed by the Sufco Mine in 2014 and 2015. As stated on page 5 in Appendix 7-24 North Water Mitigation Plan, in addition to the mitigation requirement of developing spring MSP-89 Sufco was also required to coordinate with the Forest Service in order to determine appropriate mitigation activities to be performed at another site. These coordination efforts and mitigation project work was to be completed before the end of year 2017. Sufco fulfilled and surpassed their obligation to the Forest Service by completing three habitat improvement projects rather than the single project requirement stated in the mitigation plan. Further, it is commendable that Sufco finished the projects sooner than what was required of them.

The three projects took place within the Muddy drainage and included the following improvements: (1) fencing more than an acre of sensitive riparian vegetation as well as fencing directly around spring locations, (2) spring development improvements, and (3) the installation of durable watering troughs. At one location Sufco went the extra mile by using their resources to remove old dilapidated fencing and troughs that had cluttered an open meadow. We recognize and appreciate the considerable effort made by Sufco to improve conditions for wildlife and plant communities, as well as for livestock on our Forest.

We also appreciate the willingness of Sufco to assist the forest in accomplishing work projects and tasks such as enabling winter access for transporting wildlife, field data sharing, mine tours, formal presentations on mining activities, and helicopter assistance, just to name a few.

We look forward to working with you in the future as a partner to create healthier ecosystems in the area of your mining operation.

Sincerely,

Darren Olsen
District Ranger
Ferron/Price Ranger District, Manti-La Sal National Forest


APPROX. 500 FT. OFFSET FAULT CROSSING
MINING LEGEND
REMAINING 2015
1ST QUARTER 2016
2ND QUARTER 2016
3RD QUARTER 2016
4TH QUARTER 2016
2017
2018
2019
2020
MINED-OUT AREAS
STREAM
ESCARPMENT
OUTCROP
FAULT/W PROJECTION
12.0 SEAM THICKNESS
1900 OVERBURDEN DEPTH
PRESENT LEASES BOUNDARY
PRESENT LEASES INTERIOR DIVISIONS
GREENS HOLLOW LEASE BOUNDARY
SITLA LEASE LOWER HIAWATHA BOUNDARY
PROFESSIONAL ENGINEER
3/7/16
No. 9073281
JACOB D. SMITH
STATE OF UTAH
LOWER HIAWATHA SEAM PLYS
UH 1 UPPER HIAWATHA SEAM BENCH 1
ORANGE PARTING (0.5 FT LINE)
LH 3 LOWER HIAWATHA SEAM BENCH 3
RED PARTING (0.5 FT LINE)
LH 2 LOWER HIAWATHA SEAM BENCH 2
PURPLE PARTING (0.5 FT LINE)
LH 1 LOWER HIAWATHA SEAM BENCH 1
NOTE: TICKS ON THICKENING SIDE OF PARTING
UPPER HIAWATHA PARTING LOCATIONS
±1.5'
±3.0'
±4.0'
±5.0'
RECEIVED
MAR 15 2016
DIV. OF OIL, GAS & MINING
REVISIONS OR UP-DATES
NO. DATE BY
DATE: Nov. 23, 2015
DESIGNED BY: AMR
DRAWN BY: AMR
CHECKED BY:
SCALE: 1" = 1300'
Canyon Fuel Company, LLC
SUFCO Mine
SUFCO MINE PLAN
BUDGET 2016
397 SOUTH 800 WEST
SALINA, UTAH 84654
DRAWING OR MAP NUMBER
1
FILENAME:
H:\Mine Plans\2016\Budget\BaseCase\SufBudProd16Base.dwg

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

Your Environmental Monitoring Partner

Date: 2/26/2015

CLIENT: Canyon Fuel Company, LLC.
Project: Quarterly Wasterock
Lab Order: S1502197

CASE NARRATIVE

Report ID: S1502197001

Sample WRDS 1st Quarter 2015 was received on February 16, 2015.

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

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

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1502197001

Project: Quarterly Wasterock

Date Received: 2/16/2015

Date Reported: 2/26/2015

Work Order: S1502197

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	PE Calcium	PE Magnesium	PE Sodium	SAR	Alkalinity PE	Boron	Selenium
		s.u.	%	dS/m	meq/L	meq/L	meq/L		ppm	ppm	ppm
S1502197-001	WRDS 1st Quarter 2015	7.5	37.5	10.0	33.6	72.2	12.5	1.72	79	5.68	<0.02

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1502197001

Project: Quarterly Wasterock

Date Received: 2/16/2015

Date Reported: 2/26/2015

Work Order: S1502197

Lab ID	Sample ID	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyriticS AB t/1000t	PyriticS ABP t/1000t
S1502197-001	WRDS 1st Quarter 2015	0.68	21.4	431	410	0.43	0.08	0.17	2.52	429

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs

Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

Page 1 of 1

All shaded fields must be completed.

This is a legal document; any misrepresentation may be construed as fraud.

#WEB Sufco021615

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Canyon Fuel Sufco Mine	P.O. 330543	* A Quay Mecham	(435) 286-4489

Report Address	Contact Name	Email	Phone
597 South SR 24 Salina, UT 84654	Amanda Richard	arichard@bowieresources.com	(435) 286-4489

Invoice Address	Purchase Order #	Quote #
597 South SR 24 Salina, UT 84654		

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Soil Alkalinity	Calcium Chloride Boron/Selenium	Electrical Conductivity	Neutralization Potential	pH	Saturated Paste Cation by EPA	Saturated Percent	Sulfur Forms	REMARKS
1	S1502197	*2-12-15	*0830	WRDS 1st Quarter 2015	WR	1	X	X	X	X	X	X	X	X	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

ANALYSES / PARAMETERS

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	* A. QUAY MECHAM	*2-12-15	*0830	Karen Lecon	2/16/15	

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ? Y / N	
☐ FedEx	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ USPS	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ URGENT - < 2 Working Days	Chlorinated? Y / N	
☐ Other	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab / Client	

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

Your Environmental Monitoring Partner

Date: 2/12/2015

CLIENT: Canyon Fuel Company, LLC.
Project: Quarterly Wasterock
Lab Order: S1501281

CASE NARRATIVE

Report ID: S1501281001

Sample WRDS 1st Quarter 2015 was received on January 28, 2015.

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

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

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

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

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1501281001

Project: Quarterly Wasterock

Date Received: 1/28/2015

Date Reported: 2/12/2015

Work Order: S1501281

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	PE Calcium	PE Magnesium	PE Sodium	SAR	Alkalinity PE	Boron	Selenium
		s.u.	%	dS/m	meq/L	meq/L	meq/L		ppm	ppm	ppm
S1501281-001	WRDS 1st Quarter 2015	7.5	28.1	13.3	56.8	146	19.0	1.89	395	6.44	0.02

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1501281001

Project: Quarterly Wasterock

Date Received: 1/28/2015

Date Reported: 2/12/2015

Work Order: S1501281

Lab ID	Sample ID	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyriticS AB t/1000t	PyriticS ABP t/1000t
S1501281-001	WRDS 1st Quarter 2015	1.15	36.0	369	333	0.72	0.19	0.25	5.86	363

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs

Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

All shaded fields must be completed.

This is a legal document; any misrepresentation may be construed as fraud.

#WEB Sufco012815

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Canyon Fuel Sufco Mine	P.O. 330543	A. Quay Mecham	(435) 286-4489

Report Address	Contact Name	Email	Phone
597 South SR 24 Salina, UT 84654	Amanda Richard	arichard@bowieresources.com	(435) 286-4489

Invoice Address	Purchase Order #	Quote #
597 South SR 24 Salina, UT 84654		

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Soil Alkalinity	Calcium Chloride Boron/Selenium	Electrical Conductivity	Neutralization Potential	pH	Saturated Paste Cation by EPA	Saturated Percent	Sulfur Forms	REMARKS
1	S1501281-001	1-26-15	0750	WRDS 1st Quarter 2015	WR	1	X	X	X	X	X	X	X	X	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

ANALYSES / PARAMETERS

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	A. QUAY MECHAM	1-26-15	0800	Kara Asch	1/28/15	

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ? Y / N	
☐ FedEx	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ USPS	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ URGENT - < 2 Working Days	Chlorinated? Y / N	
☐ Other	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab Client	

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

Your Environmental Monitoring Partner

Date: 4/14/2015

CLIENT: Canyon Fuel Company, LLC.
Project: Quarterly Wasterock
Lab Order: S1503321

CASE NARRATIVE

Report ID: S1503321001

Sample WRDS 1st Quarter 2015 was received on March 24, 2015.

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

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

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1503321001

Project: Quarterly Wasterock

Date Received: 3/24/2015

Date Reported: 4/14/2015

Work Order: S1503321

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	PE Calcium	PE Magnesium	PE Sodium	SAR	Alkalinity PE	Boron	Selenium
		s.u.	%	dS/m	meq/L	meq/L	meq/L		ppm	ppm	ppm
S1503321-001	WRDS 1st Quarter 2015	7.5	41.6	4.21	25.6	25.6	11.9	2.35	110	3.32	0.13

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1503321001

Project: Quarterly Wasterock

Date Received: 3/24/2015

Date Reported: 4/14/2015

Work Order: S1503321

Lab ID	Sample ID	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyriticS AB t/1000t	PyriticS ABP t/1000t
S1503321-001	WRDS 1st Quarter 2015	0.51	16.0	138	122	0.11	0.15	0.25	4.74	133

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs

Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

Page 1 of 1

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#WEBSufco032415

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Canyon Fuel Sufco Mine	P.O. 330543	A Quay Mecham	(435) 286-4489

Report Address	Contact Name	Email	Phone
597 South SR 24 Salina, UT 84654	Amanda Richard	arichard@bowieresources.com	(435) 286-4489

Invoice Address	Purchase Order #	Quote #
597 South SR 24 Salina, UT 84654		

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Soil Alkalinity	Calcium Chloride Boron/Selenium	Electrical Conductivity	Neutralization Potential	pH	Saturated Paste Cation by EPA	Saturated Percent	Sulfur Forms	REMARKS
1	S1503321-001	*3-20-15	*0800	WRDS 1st Quarter 2015	WR	1	X	X	X	X	X	X	X	X	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

ANALYSES / PARAMETERS

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	*A-QUAY MECHAM	*3-20-15	*0800	Karen Sean	3/24/15	

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ? Y / N	
☐ FedEx	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ USPS	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ URGENT - < 2 Working Days	Chlorinated? Y / N	
☐ Other	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab Client	

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

Your Environmental Monitoring Partner

Date: 8/4/2015

CLIENT: Canyon Fuel Company, LLC.
Project: Quarterly Wasterock
Lab Order: S1507040

CASE NARRATIVE

Report ID: S1507040001

Sample WRDS 2nd Quarter 2015 was received on July 1, 2015.

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

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

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1507040001

Project: Quarterly Wasterock

Date Received: 7/1/2015

Date Reported: 8/4/2015

Work Order: S1507040

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	PE Calcium	PE Magnesium	PE Sodium	SAR	Alkalinity PE	Boron	Selenium
		s.u.	%	dS/m	meq/L	meq/L	meq/L		ppm	ppm	ppm
S1507040-001	WRDS 2nd Quarter 2015	7.6	74.0	1.40	10.5	7.38	1.84	0.61	127	2.79	0.02

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1507040001

Project: Quarterly Wasterock

Date Received: 7/1/2015

Date Reported: 8/4/2015

Work Order: S1507040

Lab ID	Sample ID	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyriticS AB t/1000t	PyriticS ABP t/1000t
S1507040-001	WRDS 2nd Quarter 2015	0.51	16.0	67.5	51.5	0.02	0.16	0.33	4.96	62.6

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs

Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

Page 1 of 1

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#WEB Sufco 070115

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Canyon Fuel Sufco Mine	P.O. 330543	x A Quay Mecham	(435) 286-4489

Report Address	Contact Name	
597 South SR 24 Salina, UT 84654	Amanda Richard	
	Email	arichard@bowieresources.com
Invoice Address	Phone	(435) 286-4489
597 South SR 24 Salina, UT 84654	Purchase Order #	Quote #

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Soil Alkalinity	Calcium Chloride Boron/Selenium	Electrical Conductivity	Neutralization Potential	pH	Saturated Paste Cation by EPA	Saturated Percent	Sulfur Forms	REMARKS
1	S1507040001	x 6-29-15	x 0730	WRDS 2nd Quarter 2015	WR	1	X	X	X	X	X	X	X	X	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	x A. Quay MECHAM	x 6-29-15	x 0800	Karen A Secor	7/1/15	0945

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ? Y / N	
☐ FedEx	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ USPS	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ URGENT - < 2 Working Days	Chlorinated? Y / N	
☐ Other	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab Client	

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

Your Environmental Monitoring Partner

Date: 8/4/2015

CLIENT: Canyon Fuel Company, LLC.
Project: Quarterly Wasterock
Lab Order: S1507176

CASE NARRATIVE

Report ID: S1507176001

Sample WRDS 3rd Quarter 2015 was received on July 8, 2015.

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

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

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1507176001

Project: Quarterly Wasterock

Date Received: 7/8/2015

Date Reported: 8/4/2015

Work Order: S1507176

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	PE Calcium	PE Magnesium	PE Sodium	SAR	Alkalinity PE	Boron	Selenium
		s.u.	%	dS/m	meq/L	meq/L	meq/L		ppm	ppm	ppm
S1507176-001	WRDS 3rd Quarter 2015	7.3	39.6	6.93	42.6	36.1	23.1	3.68	95	3.23	0.04

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1507176001

Project: Quarterly Wasterock

Date Reported: 8/4/2015

Date Received: 7/8/2015

Work Order: S1507176

Lab ID	Sample ID	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyriticS AB t/1000t	PyriticS ABP t/1000t
S1507176-001	WRDS 3rd Quarter 2015	0.43	13.4	231	217	0.09	0.09	0.25	2.75	228

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs

Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

All shaded fields must be completed.

This is a legal document; any misrepresentation may be construed as fraud.

#WEB Sufco 070815

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Canyon Fuel Sufco Mine	P.O. 330543	* A. Quay Mecham	(435) 286-4489

Report Address	Contact Name	Email	Phone
597 South SR 24 Salina, UT 84654	Amanda Richard	arichard@bowieresources.com	(435) 286-4489

Invoice Address	Purchase Order #	Quote #
597 South SR 24 Salina, UT 84654		

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Soil Alkalinity	Calcium Chloride Boron/Selenium	Electrical Conductivity	Neutralization Potential	pH	Saturated Paste Cation by EPA	Saturated Percent	Sulfur Forms	REMARKS
1	S1507176	*7-6-15	*0830	WRDS 3rd Quarter 2015	WR	1	X	X	X	X	X	X	X	X	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

ANALYSES / PARAMETERS

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	* A. Quay Mecham	*7-6-15	*0950	Kaye Allen	7/8/15	1045

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ? Y / N	
☐ FedEx	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ USPS	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ URGENT - < 2 Working Days	Chlorinated? Y / N	
☐ Other	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab / Client	

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

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Date: 9/23/2015

CLIENT: Canyon Fuel Company, LLC.
Project: Quarterly Wasterock
Lab Order: S1508333

CASE NARRATIVE

Report ID: S1508333001

Sample WRDS 3rd Quarter 2015 was received on August 20, 2015.

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

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

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1508333001

Project: Quarterly Wasterock

Date Received: 8/20/2015

Date Reported: 9/23/2015

Work Order: S1508333

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	PE Calcium	PE Magnesium	PE Sodium	SAR	Alkalinity PE	Boron	Selenium
		s.u.	%	dS/m	meq/L	meq/L	meq/L		ppm	ppm	ppm
S1508333-001	WRDS 3rd Quarter 2015	7.6	51.1	1.06	5.74	5.54	0.99	0.42	174	1.32	0.06

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1508333001

Project: Quarterly Wasterock

Date Received: 8/20/2015

Date Reported: 9/23/2015

Work Order: S1508333

Lab ID	Sample ID	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyriticS AB t/1000t	PyriticS ABP t/1000t
S1508333-001	WRDS 3rd Quarter 2015	0.52	16.4	62.9	46.6	0.02	0.23	0.27	7.19	55.7

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

Page 1 of 1

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#WEBSufco082015

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Canyon Fuel Sufco Mine	P.O. 330543		(435) 286-4489

Report Address	Contact Name	Email	Phone
597 South SR 24 Salina, UT 84654	Amanda Richard	arichard@bowieresources.com	(435) 286-4489

Invoice Address	Purchase Order #	Quote #
597 South SR 24 Salina, UT 84654		

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Soil Alkalinity	Calcium Chloride Boron/Selenium	Electrical Conductivity	Neutralization Potential	pH	Saturated Paste Cation by EPA	Saturated Percent	Sulfur Forms	REMARKS
1	S1508333001	*	*	WRDS 3rd Quarter 2015	WR	1	X	X	X	X	X	X	X	X	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

ANALYSES / PARAMETERS

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	*	*	*	Kate Spica	8/20/15	

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ? Y / N	
☐ FedEx	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ USPS	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ URGENT - < 2 Working Days	Chlorinated? Y / N	
☐ Other	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab Client	

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

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Date: 10/29/2015

CLIENT: Canyon Fuel Company, LLC.
Project: Quarterly Wasterock
Lab Order: S1509312

CASE NARRATIVE

Report ID: S1509312001

Sample WRDS 3rd Quarter 2015 was received on September 16, 2015.

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

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

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1509312001

Project: Quarterly Wasterock

Date Received: 9/16/2015

Date Reported: 10/29/2015

Work Order: S1509312

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	PE Calcium	PE Magnesium	PE Sodium	SAR	Alkalinity PE	Boron	Selenium
		s.u.	%	dS/m	meq/L	meq/L	meq/L		ppm	ppm	ppm
S1509312-001	WRDS 3rd Quarter 2015	7.9	41.6	4.17	33.5	19.4	7.45	1.45	63	4.42	<0.02

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1509312001

Project: Quarterly Wasterock

Date Received: 9/16/2015

Date Reported: 10/29/2015

Work Order: S1509312

Lab ID	Sample ID	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyriticS AB t/1000t	PyriticS ABP t/1000t
S1509312-001	WRDS 3rd Quarter 2015	0.57	17.9	146	128	0.09	0.26	0.22	8.12	138

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs

Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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#WEB Sufco091615

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Canyon Fuel Sufco Mine	P.O. 330543	A Quay Mecham	(435) 286-4489

Report Address	Contact Name	Email	Phone
597 South SR 24 Salina, UT 84654	Amanda Richard	arichard@bowieresources.com	(435) 286-4489

Invoice Address	Purchase Order #	Quote #
597 South SR 24 Salina, UT 84654		

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Soil Alkalinity	Calcium Chloride Boron/Selenium	Electrical Conductivity	Neutralization Potential	pH	Saturated Paste Cation by EPA	Saturated Percent	Sulfur Forms	REMARKS
1	5150931 2	9-14-15	0800	WRDS 3rd Quarter 2015	WR	1	X	X	X	X	X	X	X	X	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

ANALYSES / PARAMETERS

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	A. QUAY MECHAM	9-14-15	0815	Kara A Seco	9/16/15	1030

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ? Y / N	
☐ FedEx	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ USPS	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ URGENT - < 2 Working Days	Chlorinated? Y / N	
☐ Other	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab / Client	

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

Your Environmental Monitoring Partner

Date: 1/6/2016

CLIENT: Canyon Fuel Company, LLC.
Project: Quarterly Wasterock
Lab Order: S1512195

CASE NARRATIVE

Report ID: S1512195001

Sample WRDS 4th Quarter 2015 was received on December 11, 2015.

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

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

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1512195001

Project: Quarterly Wasterock

Date Received: 12/11/2015

Date Reported: 1/6/2016

Work Order: S1512195

Lab ID	Sample ID	pH	Saturation	Electrical Conductivity	PE Calcium	PE Magnesium	PE Sodium	SAR	Alkalinity PE	Boron	Selenium
		s.u.	%	dS/m	meq/L	meq/L	meq/L		ppm	ppm	ppm
S1512195-001	WRDS 4th Quarter 2015	7.1	40.3	29.8	116	188	33.1	2.68	158	4.32	0.29

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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

Your Environmental Monitoring Partner

Soil Analysis Report

Canyon Fuel Company, LLC.

397 South 800 West
Salina, UT 84654

Report ID: S1512195001

Project: Quarterly Wasterock

Date Received: 12/11/2015

Date Reported: 1/6/2016

Work Order: S1512195

Lab ID	Sample ID	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyriticS AB t/1000t	PyriticS ABP t/1000t
S1512195-001	WRDS 4th Quarter 2015	0.48	15.1	228	213	0.12	0.16	0.21	4.99	223

These results apply only to the samples tested.

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

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs

Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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#WEBSufco12115

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Canyon Fuel Sufco Mine	P.O. 345791	x A Quay Mecham	(435) 286-4489

Report Address	Contact Name		
597 South SR 24 Salina, UT 84654	Amanda Richard		
	Email	arichard@bowieresources.com	
	Phone	(435) 286-4489	
Invoice Address	**Purchase Order #**	**Quote #**	
597 South SR 24 Salina, UT 84654			

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Soil Alkalinity	Calcium Chloride Boron/Selenium	Electrical Conductivity	Neutralization Potential	pH	Saturated Paste Cation by EPA	Saturated Percent	Sulfur Forms	REMARKS
1	5151295-001	x12-9-15	x0910	WRDS 4th Quarter 2015	WR	1	X	X	X	X	X	X	X	X	
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

ANALYSES / PARAMETERS

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	x A-Quay Mecham	x12-9-15	x0910	Karen Alecon	12/11/15	

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ? Y / N	
☐ FedEx	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ USPS	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #	
☐ Hand Carried	Filter	FT	☐ URGENT - < 2 Working Days	Chlorinated? Y / N	
☐ Other	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab Client	