
J. E. STOVER & ASSOCIATES, INC.

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MINE ENGINEERING
MINE RECLAMATION

CIVIL ENGINEERING
CONST. MANAGEMENT

March 11, 2019

Mr. Clayton Wein
Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, CO 80203

RE: Snowcap Coal Company, Inc.
Annual Hydrology Report – 2018WY
Permit No. C-1981-041

Dear Mr. Wein:

On behalf of Snowcap Coal Company, Inc., enclosed is a copy of its annual hydrology report for the 2018 water year. This submission is designed to supplement previous submissions and should be added to the 3-ring binder provided in 1993. The index pages should replace the previous index pages; the report, diagrams, tables and map should be inserted following the 2018 tab page; and the data pages should be added to or replace existing pages in the data pages binder.

Sincerely,

Tonya K. Hammond

Tonya K. Hammond
Owner's Representative
Snowcap Coal Company, Inc.

Enclosures

cc: SCC File

SNOWCAP COAL COMPANY, INC.
ANNUAL HYDROLOGY REPORT INDEX

<u>Item</u>	<u>Description</u>
	Location Map - Location of surface and ground water monitoring locations.
1986	1986 Annual Hydrologic Report and Mine Inflows Study
1987	1987 Annual Hydrologic Report and Mine Inflows Study
1988	1988 Annual Hydrologic Report and Mine Inflows Study
1989	1989 Annual Hydrologic Report and Mine Inflows Study
1990	1990 Annual Hydrologic Report and Mine Inflows Study
1991	1991 Annual Hydrologic Report and Mine Inflows Study
1992	1992 Annual Hydrologic Report and Mine Inflows Study
1993	1993 Annual Hydrologic Report and Mine Inflows Study
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2011	2011 Annual Hydrologic Report
2012	2012 Annual Hydrologic Report
2013	2013 Annual Hydrologic Report
2014	2014 Annual Hydrologic Report
2015	2015 Annual Hydrologic Report
2016	2016 Annual Hydrologic Report
2017	2017 Annual Hydrologic Report
2018	2018 Annual Hydrologic Report

Surface Water

SA-# - Rapid Creek, quality monitored near SWGS-04 (Discontinued 1986)
SB-# - Upper Colorado River, quality (Discontinued 1993)
SC-# - Lower Colorado River, quality (Discontinued 1993)
SD-# - Outfall 001, weekly and monthly field and lab data (Discontinued 2002)
SE-# - Outfall 002, weekly and monthly field and lab data (Discontinued 2002)
SF-# - Outfall 004, weekly and monthly field and lab data (Discontinued 2001)
SG-# - SWSG-01, Lower Rapid Creek, daily flows and hydrograph (Discontinued 2016)
SH-# - SWGS-02, Cottonwood Creek, daily flows and hydrographs (Discontinued 2016)
SI-# - SWGS-03, Upper Rapid Creek, daily flows and hydrographs (Discontinued 2016)
SJ-# - SWGS-04, Lower Rapid Creek, daily flows and hydrographs (Discontinued 1986)
SK-# - SWGS-05, Upper Cottonwood Creek, daily flows and hydrographs (Discontinued 1998)
SL-# - Outfalls 001, 002 & 016, WET test (Discontinued 2005)
SM-# - Outfall 004, WET test (Discontinued 1999)
SN-# - Outfall 001, quality (Discontinued 2001)
SO-# - Outfall 002, quality (Discontinued 2001)
SP-# - Outfall 004, quality (Discontinued 1999)
SQ-# - Colorado River, USGS station 09095500 data
SR-# - Coal Canyon Drainage, SWGS-06 & -07, flows (Discontinued 2016)
SS-# - Jerry Creek, SWGS-08 & -09, flows (Discontinued 2011)
ST-# - Spring and Seep Surveys (Discontinued 2005)
SU-# - Outfall 016, quality
SV-# - Outfall 016, Weekly and monthly field and laboratory data

Ground Water

GA-# - Cottonwood Creek and Rapid Creek Groundwater Levels GWMS 01A, 01B, 02A, 02, 03A, 03B (Discontinued 2016)
GB-# - Unit Train Loadout Groundwater Level UTL-01, 02, 03, 04 (Discontinued 2011)
GC-# - Cameo Refuse Disposal Area Ground Water CRDA & PZ #s (Discontinued 2016)
GD-# - Water Quality Data UTL-02 UTL-04 (Discontinued 2010)
GE-# - Rollins Sandstone Wells depth to water and water quality Rollins-1, 2, 3, 4 (Discontinued 2011)

Mine Inflows

MA-# - South Portal inflow and quality data (Discontinued 1999)
MB-# - North Portal inflow and quality data (Discontinued 1999)

Consumptive Use

CA-# - Palisade Domestic Water and Preparation Plant, meter readings (Discontinued 2000)

SNOWCAP COAL COMPANY, INC.
2018 ANNUAL HYDROLOGIC REPORT
OCTOBER 1, 2017 THROUGH SEPTEMBER 30, 2018

Introduction

During the 2018 Water Year, the Year, the mines were idle. Mining ceased at the Roadside Portals on December 2, 1999. The North Mine was sealed on February 10, 2000. The Roadside South Mine was sealed on April 12, 2000. The South Fan was sealed May 22, 2000. The 2 West Portals were sealed on April 24, 2000. Production at the Roadside North utilized room and pillar mining with a continuous miner and shuttle cars.

Reclamation of CRDA-2 was completed in 2002. The sediment retained by the drop structures in Coal Canyon was harvested for cover material. Material excavated during construction of the upper diversion ditch was also used as cover material. A small amount of cover material was obtained from CBA-1. Topsoil was obtained from Topsoil Stockpiles 2, 7, 8 and 9. Reclamation of CRDA-1 was also completed in 2002. Cover material was obtained from CBA-2. The road to CRDA-1 was left open to accept coal and refuse material from other ongoing reclamation activities. The road begins at the west end of Haul Rd No. 5 and extends to the top of CRDA-1.

The North Portal was regraded to approximate original contour during 2002. Backfill material came from areas filled near Coal Creek and around the coal stockpile area.

During 2002 the RSRDA was graded to final contours. The existing cover was graded off of the slope and used as cover below the first bench. Refuse material was cut from the pile to establish two 10' - 15' wide benches on 30' to 40' elevation intervals. This refuse material was placed in an extension of the pile to the north. Cover material was obtained from the RSRDA borrow area.

During 2003, a portion of the conveyor corridor was regraded and seeded. This work extended from the culvert under Excel's frontage road to the culvert under the railroad loop. The conveyor bridge over the Colorado River was removed during the year.

During 2004, the conveyor corridor, from the Xcel culvert south to Transfer Building #2 and east of the Colorado River where the conveyor tube crossed the river, was graded to approximate original contours and seeded.

No reclamation was performed in 2005 or 2006.

During 2007, a permit revision (PR3) was approved to change the land use at the South Portal from Fish and Wildlife to Industrial/Commercial. Final grading was completed for the approved reclamation plan.

During 2008, seeding was completed at the South Portal and the "G" Substation was removed, graded to approximate original contours and seeded.

During 2009, the rail spur lying south of I.9 Road was reclaimed, graded and seeded. A phase III bond release (SL5) was approved on the reclaimed conveyor corridor lying south of I.9 Road, and a permit revision (PR4) was approved to change the land use at the Unit Train Loadout from Fish and Wildlife to Industrial/Commercial. Halliburton Energy Services purchased the UTL and began construction of their commercial sand plant operations.

During 2010 coal fines from the UTL were hauled to CRDA-1 and reclamation of CRDA-1 road was finalized in September. Ponds 1 and 2, sewage lagoons, topsoil pile 4 along with other areas of the UTL were reclaimed, regraded and reseeded. A phase III bond release (SL6) was approved for the Commercial/Industrial portion of the South Portal.

During 2011 Pond 7, sumps and ditches at the North Decline and Pond 8 at the South Portal were reclaimed, regraded and reseeded. A phase III bond release (SL7) was approved for the UTL, Railroad Loop, the remainder of the conveyor corridor and the permanent flood control dike.

During 2012 Ponds 6, 10, 11 and 13, CBA#1 Sump and miscellaneous sedimentation control features at the North Portal and along Coal Creek were reclaimed, regraded and reseeded. A permit revision (PR5) was approved allowing Coal Creek and Coal Gulch to remain in their present alignment and allows for the North Portal upper diversion ditch and a portion of Topsoil Pile 2 to remain as permanent features.

During 2013 Pond 9 was reclaimed, regraded and reseeded.

No reclamation was performed in 2014.

No reclamation was performed in 2015.

No reclamation was performed in 2016. Bond release application SL8 was approved on November 14, 2015. With this approval 128 surface disturbed acres achieved Phase III release; 136.5 surface disturbed acres achieved Phase II release and 22.2 surface disturbed acres achieved Phase I release. Also released with SL-8 were 1288.9 unaffected acres and 744 undisturbed acres overlying underground workings.

No reclamation was performed in 2017. A permit revision (PR6) was approved to change the land use at the Roadside North Portal Area from Fish and Wildlife to Industrial/Commercial. Bond release applications SL9 and SL10 were approved releasing 13.1 acres from Phase II liability and 13.6 acres from Phase III liability. Also released were 0.2 acres of undisturbed acres overlying underground workings.

No reclamation was performed in 2018.

The general format of this report is the same as in previous years.

Surface Water

Water flow and quality on the Colorado River is monitored by the U.S. Geologic Survey (USGS) at various locations. The closest location is Station No. 09095500, which is located upstream approximately 7 miles north east of the mine site. Water quality and flow from this site are used as a general representation of the Colorado River up gradient of the mining operation. There is a diversion to the Government Highline Canal, the addition of Plateau Creek and the addition of other minor drainages between the monitoring site and the mine site. Data Pages SQ-112 through SQ-113 includes information supplied by USGS on this site during the 2018 Water Year. The total flow at this site for the Year was 1,666,411 acre-feet which is 60% of the normal average flow for the period 1934 - 2018 (2,762,691). The estimated TDS load for the Year was 1.11 million tons. This estimate is made by converting values for conductivity reported on page SQ-113 to TDS per acre feet and multiplying by the monthly flow in acre feet. The low flow for the Year was recorded as 1180 CFS on January 17, 2018. The river was carrying approximately 0.99 tons of TDS per acre-foot on January 17, 2018, the closest data point. This flow and TDS load equates to approximately 2317 tons of Total Dissolved Solids, TDS, being carried by the river past the mine that day. The mine discharge on January 2, 2018 (the closest monthly analysis), was 268.0 gpm @ 1240 mg/l TDS; resulting in approximately 1.99 tons of TDS being discharged. Comparing the calculated TDS load in the River at low flow and the mine discharge near the same date, the maximum increase in the River's TDS as a result of mine discharge would have been 0.09%.

The surface water monitoring points on Cottonwood and Rapid Creeks were suspended from monitoring with the approval of TR67 on February 23, 2016, therefore no current or future monitoring will be conducted. Past monitoring of these points can be found on data pages SG-61, SG-62, SH-28 and SI-28. The Cottonwood and Rapid Creek flumes associated with SWGS 01, SWGS 02 and SWGS 03 were removed in August 2016.

Monitoring on Coal Creek and Jerry Creek started in 1995. The crest stage gages installed in Coal Canyon drainage and Jerry Creek in 1996 were destroyed by a storm in the summer of 1998. Discussions with DRMS indicated there was no need to monitor the upstream locations SWGS 07 and 09. The creeks were then only monitored at the lower monitoring points. The ephemeral flow in Coal Creek was measured at culverts located between the two refuse disposal areas, SWGS 06. These culverts provided a stable cross section and were accessible throughout the year. The intermittent flow in Jerry Creek was measured at the culvert near the Highline Canal, SWGS 08. Beginning July 1999, instantaneous flows were monitored monthly. Monitoring was suspended for Jerry Creek (SWGS 08) with the approval of TR62 on 11/8/11. Monitoring was suspended for Coal Creek (SWGS 06) with the approval of TR67 on February 23, 2016. Therefore, no monitoring was performed during the Year.

There were four seeps included in the hydrologic monitoring in 1995. The locations of the seeps are shown on the Hydrologic Monitoring Map. They are located adjacent to Coal Canyon drainage and Jerry Creek. They are primarily evident by the white staining on the hillsides from evaporation of the seeps. None of them flow to the creek channel but generally evaporate within a couple of hundred feet of the source. On April 19, 2006, Snowcap Coal Company

submitted a technical revision, TR50, requesting to discontinue seep monitoring. The request was approved by the Division on July 25, 2006. Therefore, no monitoring was performed during the Year.

There was no discharge from CDPS discharge points 005 thru 015 during the Year. These outfalls cover sediment pond discharges. Discharge point 015, now inactive, was permitted to allow pumping water from the south end of the Roadside South Portal out the 2 West portals. Discharge point 016 is permitted for gravity discharge from the northwest intake pool. It replaced outfalls 001 and 002 on March 31, 2002.

Discharge point 001 was primarily used as an overflow to a mine water system for the preparation plant during mine operations. During March and April 2000, a discharge pipe was installed from the No. 2 South Mains sump to outfall 001. The routing of this 4-inch diameter pipe is presented on permit Figure 14-6. The capacity of this discharge pipe was about 75 gpm. Flow ceased at discharge point 001 on March 31, 2002. Discharge point 001 was reclaimed during the 1st quarter of 2008 and is no longer operational.

Discharge point 002 was water siphoned from the reclaimed Northwest Intake Portal at the Roadside South Portals. Mine inflows that were not pumped to the preparation plant were routed to an abandoned portion of the mine for discharge from this point. The preparation plant was shut down during December 1999 so all mine inflows in excess of those handled by outfall 001, flow north to the lower portion of the mine where they were handled by the siphon, outfall 002. Flow ceased at discharge point 002 on March 31, 2002.

The following table presents the total dissolved solids concentration in Outfall 002.

Average TDS from Pages SE-8 = SE-11 Outfall 002				
Water Year	1999	2000	2001	2002
TDS (mg/l)	1558	1560	1500	1500

Discharge point 016 was put into service April 1, 2002. Discharge began April 3, 2002. This gravity discharge point handles all of the water that flows into the sealed South Portal. Since it is a gravity discharge point, the flow discharged will equal the flow into the mine. Table M18-1 presents a summary of the monthly flow from the mine. Data page SV-17 presents a listing of flow and water quality monitoring performed at this site during the Year. Data page SU-6 includes a full suite analysis performed on a sample collected during the Year. The average TDS value at discharge point 016 for the Year was 1235 mg/l.

Whole Effluent Toxicity (WET) tests were not performed during the Year. On May 3, 2005,

Snowcap Coal Company requested, via letter to the CDPHE, the WET tests be terminated. This request was granted and the CDPS Permit was amended on June 27, 2005, becoming effective on August 1, 2005.

Ground Water

The ground water monitoring points on Cottonwood and Rapid Creeks were suspended from monitoring with the approval of TR67 on February 23, 2016, therefore no monitoring was conducted for the Year. The monitoring wells associated with GWMS01 A&B, GWMS02 A&B, and GWMS03 A&B were plugged and abandoned on August 24, 2016. A copy of the abandonment report was included in the 2016 AHR.

Piezometers CRDA-01 thru 06 at the Cameo Refuse Disposal Areas (CRDA) No. 1 and No. 2 were not monitored during the Year. The monitoring was suspended for these piezometers with the approval of TR67 on February 23, 2016. The piezometers were removed and backfilled in May 2016 as specified on page 14-31 of SCC's permit document. Past monitoring shows the water levels in the piezometers were consistently below their critical depths and information can be found on data pages GC-1 through GC-25.

The past results of water level measurements at the unit train loadout are listed on Data page GB-2. Monitoring of these piezometers was discontinued with the approval of SL7 in April 2011 and the UTL-01, UTL-02, UTL-03 and UTL-04 piezometers were sealed and reclaimed on May 17, 2011. The Well Abandonment Reports were included in DRMS's quarterly report dated July 7, 2011. No monitoring was performed during the Year.

A former mine dewatering hole (N-1) located at the North Decline area of the mine is used to monitor the water level in the abandoned portions of the Roadside South Portal. Since discharge point 016 was put into service, the water level in N-1 is virtually constant and it is expected to stay at an elevation of about 4758. The results of monitoring N-1 are presented in Table M18-2.

In order to characterize the Rollins Sandstone two surface and two underground wells were installed during June 1997. The surface wells, Rollins-2 and Rollins-3, were installed at the unit train loadout and the north decline respectively. The underground wells, Rollins-1 and Rollins-4, were installed in the North and South Portals respectively. Depth to water ranged from 56.5 feet below grade in the North Decline well to artesian in the North Portal well. Monitoring of these wells was performed in accordance with permit requirements. Prior depth to water data is presented on data page GE-1-1. Rollins-1 was sealed in December 1999 and Rollins-4 was sealed in April 2000. Rollins-2 and 3, with the approval of SL-7, were sealed in May 2011. The Well Abandonment Reports were included in DRMS's quarterly report dated July 7, 2011. No monitoring was performed during the Year.

Mine Water

There was no annual mine inflow study performed this Year since one was performed during December 1999 and reported in the 1999 report. Since the North and South Portals have been sealed, there will not be any additional mine inflow studies.

Discharge Monitoring Reports (DMRs)

DMRs are submitted monthly to the Colorado Department of Public Health and Environment with copies to the Division of Reclamation Mining and Safety and are included herein by reference.

Consumptive Use

There was no consumptive use during the 2018 water year.

Impacts

The average total dissolved solids for the mine discharges calculated with total flow for the Year yields the tons of TDS discharged for the year. Outfall 016 discharged a total of 737 tons of TDS to the river during the Year.

The 2018 TDS discharge represents 0.067% of the 1.11 million tons calculated to be carried by the River. At the Roadside South Portal, water is expected to perpetually discharge through outfall 016.

There are no detectable effects of mining on flows in Cottonwood and Rapid Creeks. Mining ceased at the Roadside Portals on December 2, 1999. No further mining from either portal is anticipated in the foreseeable future.

Consumptive use will be insignificant in the future because mining and washing of coal has ceased. Consumptive use will be for seeding and dust control during reclamation operations.

ROADSIDE SOUTH PORTAL DISCHARGE

2018 WATER YEAR

OUTFALL 016

DATE	DAYS	METER	K-GAL.	GPM
9/13/2017		95110		
10/3/17	20	102,997	7887	273.9
10/11/17	8	106,080	3083	267.6
11/6/17	26	116,086	10006	267.3
11/14/17	8	119,297	3211	278.7
12/4/17	20	127,140	7843	272.3
12/12/17	8	130,245	3105	269.5
1/2/18	21	138,348	8103	268.0
1/10/18	8	141,470	3122	271.0
2/5/18	26	151,645	10175	271.8
2/13/18	8	154,836	3191	277.0
3/5/18	20	162,864	8028	278.8
3/13/18	8	166,057	3193	277.2
4/2/18	20	174,249	8192	284.4
4/10/18	8	177,492	3243	281.5
5/2/18	22	186,225	8733	275.7
5/14/18	12	190,887	4662	269.8
6/4/18	21	198,995	8108	268.1
6/12/18	8	202,095	3100	269.1
7/2/18	20	209,931	7836	272.1
7/10/18	8	212,985	3054	265.1
8/6/18	27	223,399	10414	267.8
8/20/18	14	228,773	5374	266.6
9/4/18	15	234,687	5914	273.8
9/12/18	8	237,819	3132	271.9
Total	364		142709	272.3

File TM3

Snowcap Coal Company, Inc.

N-1 Monitoring Well
North Decline
2018

N-1 Top of Pipe - Elevation 4833

Date	Depth to Water	Elevation
10/3/2017	75.41	4757.59
10/11/2017	75.42	4757.58
11/14/2017	75.45	4757.55
12/4/2017	75.42	4757.58
12/12/2017	75.45	4757.55
1/2/2018	75.44	4757.56
1/10/2018	75.37	4757.63
2/5/2018	75.36	4757.64
2/13/2018	75.35	4757.65
3/5/2018	75.35	4757.65
3/13/2018	75.34	4757.66
4/2/2018	75.33	4757.67
4/10/2018	75.32	4757.68
5/2/2018	75.37	4757.63
5/14/2018	75.40	4757.60
6/4/2018	75.43	4757.57
6/12/2018	75.42	4757.58
7/2/2018	75.44	4757.56
7/10/2018	75.45	4757.55
8/6/2018	75.46	4757.54
8/20/2018	75.45	4757.55
9/4/2018	75.45	4757.55
9/12/2018	75.46	4757.54
Min	75.32	4757.54
Max	75.46	4757.68
Average	75.41	4757.59
Desired Range	4755 to 4762	

09095500 COLORADO RIVER NEAR CAMEO, CO

Daily Mean Discharge, cubic feet per second

DATE	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	Jun 2018	Jul 2018	Aug 2018	Sep 2018
1	2,790	2,030	1,700	1,460	1,410	1,400	1,610	3,390	5,400	1,990	2,070	2,110
2	3,150	1,970	1,680	1,360	1,410	1,350	1,680	3,240	5,560	1,890	1,970	2,030
3	3,330	1,890	1,680	1,300	1,440	1,360	1,740	3,050	5,400	1,950	1,990	1,880
4	3,030	1,890	1,690	1,200	1,430	1,400	1,810	2,960	5,210	1,870	2,240	1,900
5	2,940	1,900	1,680	1,210	1,430	1,420	1,830	2,700	5,290	1,930	2,350	1,900
6	3,040	1,890	1,530	1,270	1,440	1,400	1,790	2,720	5,200	1,960	2,380	1,990
7	3,040	1,930	1,340	1,340	1,420	1,360	1,760	3,030	4,780	2,030	2,310	2,000
8	2,940	1,930	1,290	1,390	1,370	1,350	2,340	3,510	4,460	2,080	2,230	1,930
9	2,840	1,960	1,380	1,380	1,380	1,420	2,740	4,160	4,300	2,050	2,170	1,900
10	2,810	1,930	1,340	1,460	1,430	1,410	2,540	4,920	4,150	2,050	2,200	1,830
11	2,610	1,920	1,250	1,550	1,410	1,360	2,440	5,560	4,020	1,990	2,190	1,800
12	2,560	1,910	1,230	1,490	1,310	1,350	2,310	6,210	3,760	2,010	2,200	1,750
13	2,530	1,880	1,250	1,410	1,460	1,350	2,190	6,450	3,430	2,010	2,150	1,700
14	2,480	1,880	1,330	1,370	1,550	1,350	2,290	6,500	3,280	2,000	2,120	1,680
15	2,490	1,870	1,480	1,360	1,550	1,380	2,290	6,310	3,250	2,050	2,080	1,640
16	2,490	1,730	1,330	1,310	1,500	1,480	2,150	6,060	3,180	1,980	2,010	1,770
17	2,490	1,860	1,280	1,180	1,380	1,500	2,050	6,360	3,340	1,930	2,000	1,680
18	2,480	1,830	1,240	1,180	1,430	1,460	2,090	6,650	3,970	1,880	2,150	1,660
19	2,430	1,820	1,280	1,250	1,460	1,420	2,110	6,400	4,170	2,000	2,180	1,650
20	2,460	1,690	1,290	1,480	1,530	1,420	2,050	5,910	3,830	1,900	2,170	1,650
21	2,470	1,700	1,310	1,590	1,400	1,410	2,270	5,490	3,420	1,890	2,280	1,570
22	2,500	1,790	1,330	1,520	1,320	1,410	2,160	5,450	3,190	1,890	2,410	1,500
23	2,450	1,820	1,310	1,310	1,440	1,660	2,010	5,590	3,010	2,100	2,620	1,420
24	2,450	1,860	1,270	1,300	1,460	1,850	1,980	5,740	2,770	2,110	2,540	1,370
25	2,460	1,850	1,320	1,300	1,400	2,050	2,220	5,870	2,520	2,110	2,460	1,340
26	2,380	1,800	1,340	1,290	1,330	1,910	2,290	6,430	2,370	2,070	2,320	1,320
27	2,330	1,790	1,410	1,340	1,280	1,810	2,430	6,490	2,330	2,070	2,270	1,360
28	2,300	1,770	1,340	1,280	1,390	1,760	2,480	6,110	2,180	2,070	2,250	1,390
29	2,210	1,760	1,360	1,330		1,700	2,760	5,850	2,090	2,130	2,210	1,390
30	2,150	1,730	1,370	1,430		1,750	3,120	5,190	1,990	2,130	2,170	1,400
31	2,090		1,410	1,400		1,690		4,950		2,090	2,150	
Total	80,720	55,580	43,040	42,040	39,760	45,590	65,530	159,250	111,850	62,210	68,840	50,510
Mean												
Mean	2604	1853	1388	1356	1420	1520	2184	5137	3728	2007	2221	1684
Max	3330	2030	1700	1590	1550	2050	3120	6650	5560	2130	2620	2110
Min	2090	1690	1230	1180	1280	1350	1610	2700	1990	1870	1970	1320
A-F	160,106	113,916	85,369	83,385	87,312	93,441	134,309	315,868	229,246	123,392	136,542	103,525
Total A-F	1,666,411											
Min Flow	1,180	Jan 17 & 18										

Snowcap Coal Company, Inc.

SQ-113

Water-Data Report 2018
09095500 COLORADO RIVER NEAR CAMEO, CO -- Continued

**SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25
DEGREES CELSIUS
YEAR 2017-10-01 to 2018-09-30
DAILY MEAN VALUES**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018	2018	2018
1	777	1,030	1,170	1,250	1,270	1,280	989	745	487	904	916	925
2	765	1,060	1,190	1,240	1,250	1,250	999	691	461	929	915	934
3	776	1,080	1,190	1,280	1,240	1,260	1,000	662	458	957	922	959
4	745	1,110	1,200	1,320	1,240	1,270	1,000	651	462	961	941	1,010
5	743	1,120	1,210	1,370	1,230	1,260	989	647	469	973	915	995
6	766	1,120	1,200	1,410	1,230	1,250	977	648	464	964	896	983
7	772	1,120	1,270	1,370	1,230	1,240	966	654	477	940	887	962
8	772	---	1,340	1,300	---	1,250	953	639	499	927	896	960
9	782	---	1,400	1,270	1,250	1,280	934	559	519	913	899	984
10	819	1,050	1,400	1,260	1,260	1,230	903	471	536	897	913	997
11	832	1,080	1,370	1,260	---	1,240	867	433	549	886	934	1,010
12	868	1,080	1,440	1,190	---	1,250	837	397	565	885	959	1,020
13	886	1,090	1,460	1,200	1,250	1,270	814	382	592	913	980	1,050
14	891	1,100	1,410	1,240	1,260	1,270	802	376	620	1,040	975	1,050
15	900	1,100	1,390	1,260	1,230	1,280	796	378	631	948	944	1,060
16	906	1,110	1,330	1,280	1,210	---	792	394	638	911	936	1,080
17	912	1,140	1,330	1,300	1,210	---	790	402	656	900	951	1,050
18	912	1,120	1,410	1,370	1,230	---	793	394	643	932	974	1,070
19	913	1,140	1,420	1,390	1,240	---	803	394	582	961	960	1,070
20	919	1,140	1,420	1,410	1,240	---	810	413	567	947	949	1,060
21	920	1,180	1,400	1,300	1,210	1,220	802	435	603	994	948	1,050
22	916	1,170	1,400	1,260	1,220	1,210	791	455	647	995	978	1,070
23	915	1,160	1,360	1,250	1,270	1,130	776	453	671	984	979	1,100
24	917	1,140	1,350	1,300	1,260	1,090	787	450	692	920	914	1,160
25	917	1,120	1,340	1,380	1,240	1,030	807	447	726	897	909	1,200
26	920	1,120	1,340	1,360	1,250	925	815	436	777	891	869	1,210
27	921	---	1,330	1,370	1,260	924	811	416	807	898	870	1,240
28	934	---	1,300	1,350	1,310	936	797	428	825	902	887	1,240
29	959	1,150	1,300	1,350		960	786	431	855	893	885	1,240
30	981	1,160	1,300	1,340		958	777	456	876	896	906	1,250
31	1,010		1,290	1,280		973		487		898	917	
Max	1010		1460	1410			1000	745	876	1040	980	1250
Min	743		1170	1190			776	376	458	885	869	925
Mean	870		1330	1300			859	491	612	931	927	1070

NPDES POINT 016**Chemical Analysis****SU-6****Field Parameters****8/20/2018**

pH	SU	7.18
Conductivity	umhos/cm	2000
Temperature	(C)	20.9

Laboratory Results**8/20/2018**

Carbonate (CO_3^{-2})	mg/l	54.3
Aluminum, Dissolved	mg/l	<0.03
Arsenic, Dissolved	mg/l	<0.0002
Barium, Dissolved	mg/l	1.14
Boron, Dissolved	mg/l	0.82
Cadmium, Dissolved	mg/l	<0.0001
Calcium, Dissolved	mg/l	11.1
Chloride, Dissolved	mg/l	26.9
Chromium, Dissolved	mg/l	<0.0005
Copper, Dissolved	mg/l	<0.01
Fluoride, Dissolved	mg/l	1.8
Hardness, (as Ca Co3)	mg/l	28.0
Iron, Dissolved	mg/l	<0.02
Lead, Dissolved	mg/l	<0.0001
Magnesium, Dissolved	mg/l	5.6
Manganese, Dissolved	mg/l	0.027
Mercury, Dissolved	mg/l	<0.0002
Molybdenum, Dissolved	mg/l	<0.02
Nickel, Dissolved	mg/l	<0.008
Nitrate (NO_3^{-1})	mg/l	<0.02
Phosphate (PO_4^{-3} , as P)	mg/l	0.5
Potassium, Dissolved	mg/l	3.0
Selenium, Dissolved	mg/l	<0.0001
Sodium, Dissolved	mg/l	495
Solids, Total Dissolved	mg/l	1250
Solids, Total Suspended	mg/l	<5.0
Sulfate, SO_4	mg/l	38.6
Zinc, Dissolved	mg/l	<0.01
Ammonia, Nitrogen, NH_3	mg/l	0.66
Bicarbonate (HCO_3^{-1})	mg/l	1060
SAR	Ratio	31.0

ROADSIDE SOUTH PORTAL DISCHARGE
OUTFALL 016 - CPDS #CO - 0027146

DATE	METER	FLOW	PH	COND	TEMP C	TSS Month	TDS Qty	Iron (TR) Qty	ARSENIC AND COPPER				Lead (PD) 2/Mo	Selenium (PD) 2/Mo	Silver (PD) 2/Mo	Sulfide (H2S) 2/Mo
									Arsenic (T) 2/Mo	Cadmium (PD) 2/Mo	Copper (PD) 2/Mo	Cyanide (WAD) 2/Mo				
9/13/2017	95,110.000															
10/3/2017	102,997.000	273.9	7.2	2100	20.9	< 5.0	mg/l	19	< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
10/11/2017	106,080.000	267.6	7.3	2100	19.4				< 0.20	ug/l	< 0.10	ug/l	< 0.10	ug/l	< 0.05	ug/l
11/6/2017	116,086.000	267.3	7.1	2100	20.1	< 5.0	mg/l		< 0.20	ug/l	< 0.10	ug/l	< 0.10	ug/l	< 0.05	ug/l
11/14/2017	119,297.000	278.7	7.2	2100	19.2				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
12/4/2017	127,140.000	272.3	7.2	2100	20.1	< 5.0	mg/l		< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
12/12/2017	130,245.000	269.5	7.0	2100	20.2				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
1/2/2018	138,348.000	268.0	7.1	2100	20.1	< 5.0	mg/l	16	< 0.20	ug/l	< 0.10	ug/l	< 0.10	ug/l	< 0.05	ug/l
1/10/2018	141,470.000	271.0	7.0	2100	20.2				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
2/5/2018	151,645.000	271.8	7.1	2100	19.8	< 5.0	mg/l		< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
2/13/2018	154,836.000	277.0	7.4	2100	20.3				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
3/5/2018	162,884.000	278.8	7.3	2100	18.7	< 5.0	mg/l		< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
3/13/2018	166,057.000	277.2	7.5	2100	19.8				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
4/2/2018	174,249.000	284.4	7.5	2100	19.4	< 5.0	mg/l	15	< 0.20	ug/l	< 0.10	ug/l	< 0.10	ug/l	< 0.07	ug/l
4/10/2018	177,492.000	281.5	7.4	2100	19.4				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
5/2/2018	186,225.000	275.7	7.4	2100	20.7	< 5.0	mg/l		< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
5/14/2018	190,887.000	269.8	7.3	2000	20.9				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
6/4/2018	198,995.000	268.1	7.2	2100	20.8	< 5.0	mg/l		< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
6/12/2018	202,095.000	269.1	7.2	2100	20.9				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
7/2/2018	209,931.000	272.1	7.3	1990	22.3	5.0	mg/l	168	< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
7/10/2018	212,985.000	265.1	7.1	2100	20.8				< 0.20	ug/l	< 0.10	ug/l	< 0.10	ug/l	< 0.05	ug/l
8/6/2018	223,399.000	267.8	7.1	2100	20.9	7.0	mg/l		< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
8/20/2018	228,773.000	266.6	7.2	2000	20.9				> 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
9/4/2018	234,687.000	273.8	7.0	2000	20.3	< 5.0	mg/l		< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
9/12/2018	237,819.000	271.9	7.1	2100	21.2				< 0.20	ug/l	< 0.20	ug/l	< 0.20	ug/l	< 0.10	ug/l
2017	Averages	272.5	7.2	2083	20.3	< 5.2	mg/l	54.5	< 0.20	ug/l	< 0.18	ug/l	< 0.20	ug/l	< 0.09	ug/l
							1235.0						< 0.20			0.60

Effective February 1, 2012 monitoring frequencies were changed as follows:

Flow, pH, TSS - Monthly

TDS, Iron, Oil & Grease - Quarterly

Arsenic, Cadmium, Copper, Cyanide, Lead, Selenium, Silver & Sulfide - 2 Days/Month