NEW ELK COAL COMPANY

February 15, 2018

Rob Zuber
Division of Reclamation, Mining and Safety
1313 Sherman Street Rm. 215
Denver, Colorado 80203

RE: New Elk Mine
Permit C-1981-012
2017 Annual Reclamation Report

Dear Mr. Zuber:

The New Elk Mine annual Hydrologic Monitoring Requirements are summarized by Table 27 Hydrologic Monitoring Requirements- New Elk Mine and Table 28 Water Quality Laboratory Analysis- New Elk Mine attached to this letter report. Table 27 includes monitoring sites (***) that have been installed but not implemented as the technical/permit revision requiring them have been withdrawn or not implemented (bonded) at this time. New Elk Coal Company plans to submit a revision for Table 27 to the Division to update the table clarifying the requirements for the wells which are not implemented.

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NPDES Discharge Monitoring

All NPDES discharges were monitored and reported to CDPHE on Discharge Monitoring Report forms (DMRs). Copies of these reports have already been submitted to the Division (DRMS) and are not duplicated herein.

Discharge Monitoring Site 001 did not discharge during 2017. Water flow to/from is managed by a system of pumps with a gravity flow discharge through the primary if the water level exceeds the discharge elevation of the primary decant spillway. No water was pumped to or withdrawn from pond 001. Evaporate losses were tracked and reported to the Pueblo District of the Colorado Division of Water Resources. These losses were compensated to the stream by water New Elk has under lease from the Hill Ranch.

Discharge Monitoring of Site 004 (Pond 4) is no longer a requirement of the NPDES permit. Throughout the year water levels were minimal and no discharges occurred. Several times during the year, water was pumped to Pond 004 from Pond 006 and Pond 007 to control water levels.

Discharge Monitoring of Site 007 (Pond 7) held considerable water throughout most of 2017 and eventually experienced a discharge through the emergency spillway on September 28, the principal spillway was opened 30 minutes later after notifying CDPHE. The pond discharged through the principal spillway until October 2. The discharge sample results from September 28 and October 2 as well as a sample taken on May 15 are shown in Appendix A. The sample results showed an exceedance in Total Suspended Solids and Iron. The ponds water levels have decreased by pumping water to temporary storage in Pond 006.

Discharge Monitoring of Site 008 (Pond 8) held considerable water through the first half of 2017 and eventually experienced a discharge on September 1. On September 12 pond water was pumped from Pond 008 to Pond 006 to decrease levels. A second discharge event occurred on September 28. This discharge event ended the same day, when Pond 008 water was pumped to Pond 006. The discharges samples for September

12 and September 28 are shown in Appendix B. There have been no discharges since these events. Starting in November, Pond 008 water was pumped to Pond 006 and Pond 007 to remove the water and allow sediment to be cleaned in 2018. The water level at the end of the year was very low.

Discharge Monitoring of Site 010 (SAE south of Pond 7) had minimal flow throughout the year with two discharges. The discharge sample results from June 7 are shown in Appendix C. The other discharge occurred on September 1. No sample was taken for this discharge because it discharged overnight.

RDA Monitoring Wells

Three monitoring wells, **Th-201, TH-202,** and **TH-203**, area located on the three lower reclaimed benches of the mine's Refuse Disposal Area. These wells penetrate the compacted refuse down to the contact with the basal bedrock of the disposal area.

The intent is to monitor ground water at the refuse/bedrock contact and alert the operator to potential problems that could arise from accumulation of ground water. The monitoring plan calls for recording depths to water for these sites on a quarterly basis.

Readings were taken March 22, June 7, September 20, and November 16, 2017. This data is summarized in table 1 following this report. No significant changes were noted at any of the wells.

Surface and Groundwater Monitoring

Surface and Ground Water Monitoring is required for field parameters in the second quarter and field and laboratory analysis in the fourth quarter. This data is summarized in Table 2 following this report. The analytical results for these samples are shown in Appendix D. This data was compared to the historical information available in previous AHRs (see 2008 for best tabulation): All observed data fell within the historical range of each parameter. The field notes are shown in Appendix E.

Analysis of Alluvial Groundwater Data

PAW-1 and PAW-2 showed very small changes in data from 2016 to 2017. Almost all data remains consistent with the previous year's data. Total dissolved Iron and total recoverable Iron both decreased from 2016 to 2017. Total Manganese decreased for PAW-1 but increased for PAW-2. However, all data for both PAW-1 and PAW-2 fell within the historical data range.

Rain Water Monitoring

In 2017 New Elk Mine experienced an unusual amount of rain. Precipitation remained minimal through the first half of the year with few rain storms that never resulted in more than one inch of rain in a day. On August 1 there was a storm that resulted in 2 inches of rain over a 24-hour period. Through the rest of August rain was once again minimal. On September 1 the rain for a 24-hour period was 2.8 inches. On September 19 there once again a storm resulting in 2 inches of rain over 24 hours. Starting on September 25 lasting until September 29 there was stretch of heavy rain. The water on a per 24-hour basis for the five day stretch was 1.6, 1.0, 2.3, 1.9, and 1.1 inches. The 10-year 24-hour rainfall event for New Elk Mine is rated at 2.9 inches. The water gauge monitoring report is expressed in Table 3.

Comments

New Elk plans on updating Table 27 in 2018 with a revision to the Division changing the monitoring requirements for wells NE1-10, NE6-10a, NE6-10b, NM-20, NM-21, NM-22, NM-23, and SF-20. The permit revision including these wells was never implemented.

Please advise me if any additional information is needed

Regards,

Nicholas Mason

Table 1				
	Depth to Water in Feet			
Quarter	Q1	Q2	Q3	Q4
Date	22-Mar	7-Jun	20-Sep	16-Nov
Th-01	45	44.9	44.9	42.2
Th-02	70.9	70.8	69.6	69.6
Th-03	93.3	93.4	93.3	93.3

Table 2									
Second Quarter 2017	**Surface Water**		**Groundwater Wells**				**Mine Water**		
	PRS-1	**PRS-4**	**PAW-1**	**PAW-2**	**PAW-8**	**PAW-9**	**NEW-2**	**NEW-4**	**NEW-3**
Date	21-Jun	21-Jun	22-Jun	13-Jun	13-Jun	22-Jun	13-Jun	13-Jun	23-Jun
Field Measurements									
Water Level (ft)	3.75	3.50	7.3	15.7	32.6	14.7	357.7	364.6	421.65
Flow Rate (cfs)	-	-	-	-	-	-	-	-	-
Ph (S.U.)	7.52	8.30	8.58	7.17	7.05	7.69	-	-	-
Conductivity (μohms/cm^2)	247.0	176.0	244.0	113.7	150.0	107.8	-	-	-
Temperature (°C)	8.8	9.8	14.8	12.4	14.0	13.6	-	-	-

Fourth Quarter 2017	**Surface Water**		**Groundwater Wells**				**Mine Water**	
	PRS-1	**PRS-4**	**PAW-1**	**PAW-2**	**PAW-8**	**PAW-9**	**NEW-2**	**NEW-4**
Date	13-Nov	13-Nov	5-Dec	14-Dec	19-Dec	5-Dec	14-Dec	19-Dec
Field Measurements								
Water Level (ft)	0.71	0.75	7.4	16.9	33.2	15.6	355.1	361.0
Flow Rate (cfs)	28	33	-	-	-	-	-	-
Ph (S.U.)	8.47	8.74	8.10	7.59	7.38	7.33	7.86	8.37
Conductivity (μohms/cm^2)	355.0	341.0	255.0	1668.0	1880.0	1020.0	50.4	2.1
Temperature (°C)	9.1	8.8	9.4	11.1	11.8	12.4	15.1	16.8

	Surface Water		**Groundwater Wells**				**Mine Water**	
	PRS-1	**PRS-4**	**PAW-1**	**PAW-2**	**PAW-8**	**PAW-9**	**NEW-2**	**NEW-4**
Date	13-Nov	13-Nov	22-Jun	14-Dec	19-Dec	22-Jun	14-Dec	19-Dec
Laboratory Analysis								
Total Suspension Solids (TSS) (mg/l)	<5	<5	111.0	220.0	44.0	5.0	<5	5.0
Carbonate (mg/l)	<2	3.3	<2	<2	<2	<2	41.3	70.9
Bicarbonate (mg/l)	111	111	106	474	610	446	932	1090
Chloride (mg/l)	5	2.5	8.1	36.0	45.9	18.8	14.3	15.5
Sulfate (mg/l)	41	40.2	<1	239.0	355.0	85.6	184.0	42.2
Manganese total (Mn) (mg/l)	0.02	0.025	0.16	2.23	0.293	0.105	0.061	0.007
Manganese dissolved (Mn) (mg/l)	<0.005	0.005	0.009	1.82	<0.005	<0.005	0.052	<0.005
Calcium (Ca) (mg/l)	45.7	45.4	15.6	135.0	188.0	67.5	13.3	5.0
Magnesium (Mg) (mg/l)	7.9	7.9	8.6	26.4	14.2	18.4	5.8	2.3
Potassium (K) (mg/l)	4.5	1.6	2.1	4.8	2.2	2.1	9.5	5.2
Sodium (Na) (mg/l)	6.6	7.1	14.7	139.0	202.0	126.0	492.0	522.0
Iron (Fe) (mg/l), Total Disolved	<0.02	0.09	0.32	1.06	<0.02	0.06	0.07	<0.02
Iron (Fe) (mg/l), Total Recoverable	0.08	0.07	22.00	43.70	2.44	1.05	0.39	0.26
Sodium Absorption Rate (SAR)	0.24	0.26	0.75	2.90	3.50	3.50	29.00	49.00

Table 3 New Elk Rain Gauge Data					
Date	Rain Fall(in)	Date	Rain Fall(in)	Date	Rain Fall(in)
30-May	0.1	25-Jul	0.0	14-Sep	0.0
31-May	<0.1	26-Jul	0.2	19-Sep	2.0
1-Jun	0.2	27-Jul	0.3	20-Sep	0.0
7-Jun	0.6	1-Aug	2.0	21-Sep	0.0
8-Jun	0.0	2-Aug	0.0	25-Sep	1.6
12-Jun	0.0	3-Aug	0.0	26-Sep	1.0
13-Jun	0.0	4-Aug	0.3	27-Sep	2.3
20-Jun	0.0	7-Aug	0.2	28-Sep	1.9
21-Jun	0.0	8-Aug	1.0	29-Sep	1.1
22-Jun	0.0	9-Aug	0.0	30-Sep	0.1
23-Jun	0.0	10-Aug	0.0	1-Oct	0.1
26-Jun	0.0	15-Aug	0.1	2-Oct	0.0
27-Jun	0.0	16-Aug	0.0	3-Oct	0.0
28-Jun	0.0	17-Aug	0.0	4-Oct	0.0
29-Jun	0.0	18-Aug	0.0	5-Oct	0.2
5-Jul	0.0	21-Aug	0.2	9-Oct	0.2
6-Jul	0.0	22-Aug	<0.1	10-Oct	0.1
7-Jul	0.0	23-Aug	0.3	11-Oct	0.0
10-Jul	0.2	24-Aug	0.3	12-Oct	0.0
11-Jul	0.0	29-Aug	<0.1	13-Oct	0.0
12-Jul	1.1	30-Aug	0.0	16-Oct	0.0
13-Jul	0.1	31-Aug	0.0	17-Oct	0.0
14-Jul	0.3	1-Sep	2.8	18-Oct	0.0
18-Jul	0.5	2-Sep	0.0	19-Oct	0.0
19-Jul	0.2	3-Sep	0.0	23-Oct	0.0
20-Jul	0.0	4-Sep	0.0	24-Oct	0.0
21-Jul	0.0	12-Sep	0.1	25-Oct	0.0
24-Jul	0.0	13-Sep	0.0	26-Oct	0.0

Table 28 Water Quality Analysis Parameters	
Field Measurements	**Units**
Flow rate/water level	cfs/feet below top of casing
pH	
Conductivity	
Temperature	
Laboratory Analysis (both Surface and FW unless noted)	**Units**
Total Suspended Solids (TSS)	mg/l
Total Dissolved Solids (TDS)	mg/l
Carbonate	mg/l
Bicarbonate	mg/l
Chloride	mg/l
Sulfate	mg/l
Manganese (Mn)	mg/l total and dissolved
Potassium (K)	mg/l
Sodium (Na)	mg/l
Calcium (Ca)	mg/l
Magnesium (Mg)	mg/l
Iron (fe)	mg/l total, diss, total recoverable [1]
Hardness (calculated)	calculated
Sodium Absorption Ratio	unit
Sediment Ponds	
Frequency and analysis in accordance with NPDES permit	
[1] surface water only	

Table 27 Hydrologic Monitoring Frequency Requirements				
Site	Water level or flow	Field Measurements	Laboratory Analysis	NPDES List
PRS-1	S	S	A	
PRS-1a***	Q	Q	Q	
PRS-4 (aka NE080)	S	S	A	
PRS-4a**	Q (then S)	Q (then S)	Q (then A)	
TH-201	Q			
TH-202	Q			
TH-203	Q			
PAW-1	S	S	S	
PAW-1a**	Q (then s)	Q (then s)	Q (then s)	
PAW-2	S	S	A	
PAW-8	S	S	A	
PAW-9	S	S	S	
NEW-2	S	A	A	
NEW-3	S			
NEW-4	S	A	A	
NE-1-10	Q	Q	Q	
NE-6-10a	Q	Q	Q	
NE-6-10b	Q	Q	Q	
NM-20	Q	Q	Q	
NM-21	Q	Q	Q	
NM-22	Q	Q	Q	
NM-23	Q	Q	Q	
SF-2	Q	Q	Q	
NPDES Stations				
NE 001 (mine water pond)				+
NE 004 (Pond 4)				+
NE 007 (Pond 7)				+
NE 008 (Pond 8)				+
NE 080 (PRS-4)				+

KEY S=Semiannually (2nd and 4th quarters) Q=quarterly A=Annually(4th quarter)
** Monitor quarterly for one year, then frequency will change as indicated in table
+see NPDES permit for frequency and required analysis
Note: If the coal shipping facilities become active, the Division will be notified in writing and the frequency of monitoring reviewed and increased, if operational parameters warrant.

Appendix A

Sample Results for Pond 007

New Elk Coal Co. , LLC
Project ID:
Sample ID: POND 7

ACZ Sample ID: ***L37208-01***
Date Sampled: *05/16/17 13:50*
Date Received: *05/17/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP								05/24/17 16:00	aeh
Total Recoverable Digestion	M200.2 ICP								05/23/17 21:18	aeh

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	13.4			mg/L	0.1	0.5	05/22/17 11:38	aeh
Iron, dissolved	M200.7 ICP	1	0.07			mg/L	0.02	0.05	05/22/17 11:38	aeh
Iron, total	M200.7 ICP	1	15.5			mg/L	0.02	0.05	05/25/17 19:55	gss
Iron, total recoverable	M200.7 ICP	1	15.9			mg/L	0.02	0.05	05/24/17 17:49	aeh
Magnesium, dissolved	M200.7 ICP	1	3.7			mg/L	0.2	1	05/22/17 11:38	aeh
Manganese, dissolved	M200.7 ICP	1	0.009	B		mg/L	0.005	0.03	05/22/17 11:38	aeh
Manganese, total	M200.7 ICP	1	0.213			mg/L	0.005	0.03	05/25/17 19:55	gss
Potassium, dissolved	M200.7 ICP	1	2.6			mg/L	0.2	1	05/22/17 11:38	aeh
Sodium, dissolved	M200.7 ICP	1	50.8			mg/L	0.2	1	05/22/17 11:38	aeh

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	121			mg/L	2	20	05/24/17 0:00	emk
Carbonate as CaCO3		1	5.4	B		mg/L	2	20	05/24/17 0:00	emk
Hydroxide as CaCO3		1		U		mg/L	2	20	05/24/17 0:00	emk
Total Alkalinity		1	126		*	mg/L	2	20	05/24/17 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			10.0			%			05/31/17 0:00	calc
Sum of Anions			2.7			meq/L			05/31/17 0:00	calc
Sum of Cations			3.3			meq/L			05/31/17 0:00	calc
Chloride	SM4500Cl-E	1	5.6		*	mg/L	0.5	2	05/26/17 9:33	bce
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		49			mg/L	0.2	5	05/31/17 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							05/25/17 9:09	che
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							05/18/17 14:45	gss
Residue, Filterable (TDS) @180C	SM2540C	2	692			mg/L	20	40	05/20/17 14:31	emk
Residue, Non-Filterable (TSS) @105C	SM2540D	1	260			mg/L	5	20	05/18/17 12:12	sck
Sodium Adsorption Ratio in Water	USGS - I1738-78		3.2						05/31/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	1		U	*	mg/L	1	5	05/30/17 12:37	spl

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L37208***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L37208-01	WG423639	Chloride	SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG423715	Sulfate	D516-02/-07 - Turbidimetric	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG423489	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.

Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: POND 7

ACZ Sample ID: ***L40187-02***
Date Sampled: *09/28/17 00:00*
Date Received: *09/29/17*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP								10/04/17 14:06	dcm
Total Recoverable Digestion	M200.2 ICP								10/05/17 14:29	dcm

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	10.6			mg/L	0.1	0.5	10/10/17 0:31	aeh
Iron, dissolved	M200.7 ICP	1	0.03	B		mg/L	0.02	0.05	10/10/17 0:31	aeh
Iron, total	M200.7 ICP	1	31.9			mg/L	0.02	0.05	10/05/17 23:55	dcm
Iron, total recoverable	M200.7 ICP	1	33.4		*	mg/L	0.02	0.05	10/06/17 13:29	dcm
Magnesium, dissolved	M200.7 ICP	1	2.5			mg/L	0.2	1	10/10/17 0:31	aeh
Manganese, dissolved	M200.7 ICP	1		U		mg/L	0.005	0.03	10/10/17 0:31	aeh
Manganese, total	M200.7 ICP	1	0.435			mg/L	0.005	0.03	10/05/17 23:55	dcm
Potassium, dissolved	M200.7 ICP	1	3.0			mg/L	0.2	1	10/10/17 0:31	aeh
Sodium, dissolved	M200.7 ICP	1	30.2			mg/L	0.2	1	10/10/17 0:31	aeh

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	84.4			mg/L	2	20	10/04/17 0:00	emk
Carbonate as CaCO3		1		U		mg/L	2	20	10/04/17 0:00	emk
Hydroxide as CaCO3		1		U		mg/L	2	20	10/04/17 0:00	emk
Total Alkalinity		1	84.4		*	mg/L	2	20	10/04/17 0:00	emk
Chloride	SM4500Cl-E	1	5.5		*	mg/L	0.5	2	10/09/17 10:04	las
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		37			mg/L	0.2	5	10/20/17 0:00	calc
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							10/06/17 17:25	sck
Residue, Filterable (TDS) @180C	SM2540C	5	1100		*	mg/L	50	100	10/03/17 15:31	ecc
Residue, Non-Filterable (TSS) @105C	SM2540D	4	136		*	mg/L	20	80	10/03/17 10:38	ecc
Sodium Adsorption Ratio in Water	USGS - I1738-78		2.2						10/20/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	1	19.4		*	mg/L	1	5	10/18/17 11:36	las

Suspended
Settleable

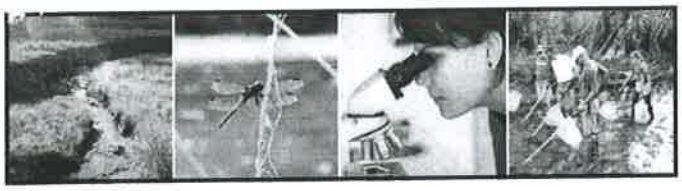
ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L40187***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L40187-01	WG433033	Chloride	SM4500Cl-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			SM4500Cl-E	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG432949	Iron, total recoverable	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG432682	Residue, Filterable (TDS) @180C	SM2540C	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG432651	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG433845	Sulfate	D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			D516-02/-07 - Turbidimetric	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG432683	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.
L40187-02	WG433033	Chloride	SM4500Cl-E	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG432949	Iron, total recoverable	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG432682	Residue, Filterable (TDS) @180C	SM2540C	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG432651	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG433845	Sulfate	D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			D516-02/-07 - Turbidimetric	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG432683	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.



Pond 7 Discharge
9-31-2017
Wet Test GEI Lab.

GEI Consultants

Geotechnical
Environmental
Water Resources
Ecological

Whole Effluent Toxicity Testing Report

New Elk Coal Company

Submitted to:
Jim Begano
New Elk Coal Company
34115 County Road 20.8
Trinidad, CO 81082

Submitted by:
GEI Consultants, Inc.
Ecological Division
4601 DTC Boulevard, Suite 900
Denver, CO 80237

November 3, 2017
Project 090020
PO #: 0566974
Report prepared by: AR

1.0 Test Summary

Enclosed are the results of the acute *Ceriodaphnia dubia* test performed October 3-5, 2017, and *Pimephales promelas* test performed October 3-7, 2017. Acute toxicity test procedures followed the methods described in EPA documentation (EPA 2002) and CDPHE guidelines (CDPHE 1998).

Surrogate chambers were included within the setup for both tests with temperatures taken daily. Temperatures on the final day of the test were taken in the actual test chambers.

No toxicity was detected in either test and control performance criteria were met.

Report approved by:

Sarah Skigen-Caird, Ecology Division Manager and QA/QC Officer

Natalie Love, Laboratory Director

2.0 Test Conditions

2.1 *Ceriodaphnia dubia* 48-hour acute toxicity test

Method: EPA-821-R-02-012 -- Methods for measuring the acute toxicity of effluents . . .

Test Duration: 48 hours

Sample Collection Procedure: grab

Sample Collection Date: 10/2/17

Dilution water: moderately hard reconstituted water

Acclimation: cultured in moderately hard reconstituted water

Age of organisms at start: <24 hr. old

Feeding: none

End Point: mortality

Start date and time: 10/3/17 14:20

End date and time: 10/5/17 14:05

Type of exposure chamber: 30 mL disposable plastic cup

Volume of exposure chamber: 25 mL

Number of animals exposed/chamber: 5

Number of replicates/treatment: 4

Test temperature: 20.5°C ± 0.8°C
EPA recommended range: 20.0°C ± 1.0°C

Standard toxicant used: NaCl

2.2 *Pimephales promelas* 96-hour acute toxicity test

Method: EPA-821-R-02-012 -- Methods for measuring the acute toxicity of effluents . . .

Test Duration: 96 hours

Sample Collection Procedure: grab

Sample Collection Date: 10/2/17

Dilution water: hard reconstituted water

Age of organisms at start: 7 day old

Feeding: before 48 hour solution renewal

End Point: mortality

Start date and time: 10/3/17 13:05

End Date and Time: 10/7/17 12:25

Type of exposure chamber: 9 oz. disposable plastic cup

Volume of exposure chamber: 200 mL

Number of animals exposed/chamber: 10

Number of replicates/treatment: 4

Test temperature: 18.8°C ± 1.0°C
EPA recommended range: 20.0°C ± 1.0°C

Aeration: None

Standard toxicant used: NaCl

3.0 QA/QC Summary

3.1 Sample QA/QC

Client: New Elk Coal Company

Date tests start: 10/3/17

Chain of custody received ..... Yes

Chain of custody completed ..... Yes

Samples received within holding times ..... Yes

Samples at correct temperature (0-6°C) ..... Yes

Samples used within 36 hours of collection ..... Yes

3.2 Test Acceptability

Control performance criteria met (Table 1) ..... Yes

Table 1: Control performance criteria requirements and test results by species.

Test Species	Test Substance	Survival	
		Test %	Acceptable %
C. dubia	Effluent	100	90
P. promelas	Effluent	100	90

Tests renewed within acceptable timeframe ..... Yes

Evaluation of concentration-response curve conducted for all endpoints (Figures 1-2 & Table 2)...Yes

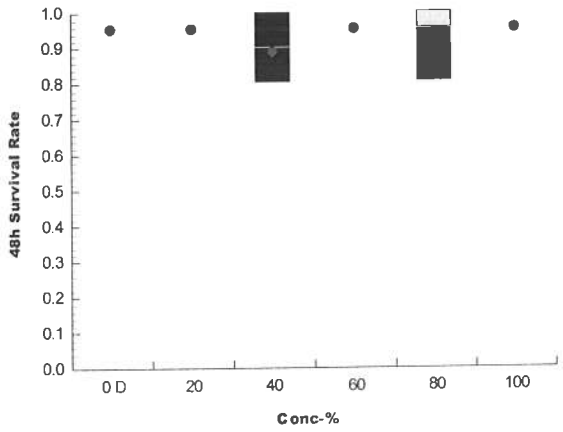


Figure 1: *C. dubia* survival

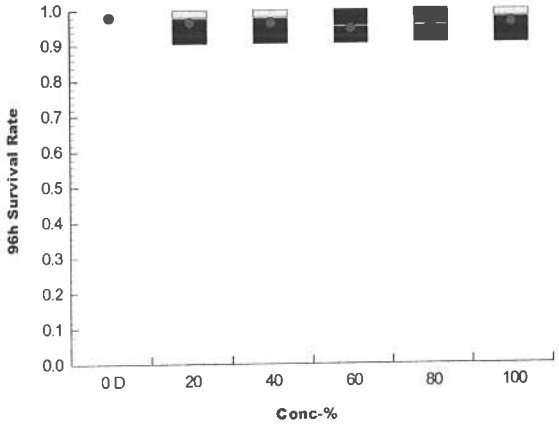


Figure 2: *P. promelas* survival

Table 2: Concentration-response curve evaluation summary

Species	Test Substance	Endpoint	Concentration-Response Pattern	Valid Curve	Data Acceptability
C. dubia	Effluent	Survival	Varied with no significant effects	Yes	Approved
P. promelas	Effluent	Survival	Flat	Yes	Approved

3.3 Reference Toxicant Summary

Most recent reference toxicant tests met performance requirements (Tables 3 and 4) ..... Yes

Most recent reference toxicant tests within control chart requirements ..... Yes

Table 3: Acute *Ceriodaphnia dubia* reference toxicant test with NaCl, conducted October 10 to 12, 2017.

g NaCl/L	Control	1.0	1.5	2.0	2.5	3.0
#alive/#exposed	20/20	19/20	15/20	11/20	1/20	0/20
% survival	100	95	75	55	5	0

Survival:
LC_{50} (Spearman-Kärber) = 1.85 g NaCl/L (95% C.I. 1.67 to 2.04)

Note: This is within our accepted performance range (1.84 to 3.03) determined by 20 previous reference tests performed.

Table 4: Acute *Pimephales promelas* reference toxicant test with NaCl, conducted October 17 to 21, 2017.

g NaCl/L	Control	5.0	6.0	7.0	8.0	9.0
#alive/#exposed	39/40	38/40	36/40	31/40	13/40	0/40
% survival	97.5	95	90	77.5	32.5	0

Survival:
LC_{50} (Trimmed Spearman-Kärber) = 7.51 g NaCl/L (95% C.I. 7.27 to 7.75)

Note: This is within our accepted performance range (6.78 to 8.23) determined by 20 previous reference tests performed.

4.0 Results

4.1 *Ceriodaphnia dubia* Acute Toxicity Test

TEST: 48-hour acute with *Ceriodaphnia dubia* OPERATORS: AS, CL

Start: 10/3/17 14:20
End: 10/5/17 14:05
Test Substance: Effluent
Client/Project: New Elk Coal Company

Table 5: Summary results of *C. dubia* acute toxicity test

Treatment % Effluent	0	20	40	60	80	100
#alive/#exposed	20/20	20/20	18/20	20/20	19/20	20/20
% survival	100	100	90	100	95	100
Dissolved O_2 range (mg/L)	7.1 6.9	7.0 7.0	7.0 6.9	6.9 6.8	6.9 6.8	6.9 6.7
pH range	8.19 8.13	8.21 8.12	8.18 8.02	8.18 8.03	8.19 8.01	8.12 8.01
Conductivity range (µmho/cm)	348 344	335 327	317 305	299 284	278 264	255 241
Temperature in surrogate chambers (°C)	19.9	21.1	20.6	21.1	21.2	20.4
Temperature in test chambers on final day of test (°C)	19.7	20.3	20.0	20.4	20.3	19.7

Statistical Analysis:

LC_{50} (Probit) = >100% Effluent

4.2 *Pimephales promelas* Acute Toxicity Test

TEST: Acute 96-hour with *Pimephales promelas* OPERATORS: AS, CL, DAK, SR

Start: 10/3/17 13:05
End: 10/7/17 12:25
Test Substance: Effluent
Client/Project: New Elk Coal Company

Table 6: Summary results of *P. promelas* acute toxicity test

Treatment % Effluent	0	20	40	60	80	100
#alive/#exposed	40/40	39/40	39/40	38/40	38/40	39/40
% survival	100	97.5	97.5	95	95	97.5
Dissolved O_2 range (mg/L)	6.7 6.2	6.7 5.9	6.7 6.0	6.7 5.8	6.7 5.6	6.5 5.4
pH range	7.99 7.87	8.02 7.91	8.03 7.96	8.09 7.94	8.11 7.94	8.10 7.92
Conductivity range (µmho/cm)	362 348	357 337	330 311	296 289	281 270	251 246
Temperature in surrogate chambers (°C)	19.5 19.1	19.0 17.8	19.5 18.8	19.2 18.9	19.5 19.0	19.2 18.7
Temperature in test chambers on final day of test (°C)	18.9	18.8	19.3	19.5	19.2	19.7

Statistical Analysis:

LC_{50} (Probit) = >100% Effluent

4.3 Water Chemistry Results from Samples Received for Acute Toxicity Tests

Table 7: Wet chemistry on reconstituted water and effluent samples.

Measurement	MH Recon Water*	100% Effluent Received 10/2/17
Analysis Temperature °C	25.0	20.0
Total Hardness (mg $CaCO_3$/L)	96	58
pH	8.34	8.00
Alkalinity (mg $CaCO_3$/L)	70	94
Conductivity (µmho/cm)	337	236
Total Dissolved Solids (mg/L)	--	116
Dissolved Oxygen (mg/L)	6.9	8.6
Ammonia (mg NH_3/L)	--	0.02
Un-ionized Ammonia (mg NH_3/L)	--	<0.10
Total Residual Chlorine (mg/L)	--	0.11

*Represents the average of two reconstituted waters used.

5.0 References

Colorado Department of Public Health and Environment (CDPHE). 1998. Water Quality Control Division. Laboratory guidelines for conducting whole effluent toxicity tests. Denver, Colorado.

Tidepool Scientific Software. 2000-2015. CETIS - Comprehensive Environmental Toxicity Information System. V1.9.0.8. McKinleyville, CA.

U.S. Environmental Protection Agency (EPA). 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. EPA-821-R-02-012. Office of Water, Washington D.C.

Appendix A

Colorado CDPS WET test report forms

COLORADO – CDPS WET TEST REPORT FORM – ACUTE

PERMITEE NAME: New Elk Coal Company CDPS NO: CO-0000906 OUTFALL: 007

TYPE TEST: ROUTINE X ACCELERATED TEST SPECIES *Ceriodaphnia dubia*

Test Results: LC_{50} >100% STATISTICAL METHOD: NA

TEST DATE/TIME: START 10/3/17 14:20 END 10/5/17 14:05

DILUTIONS (%EFFLUENT)

NUMBER ALIVE	CONTROL	20%	40%	60%	80%	100%
START	20	20	20	20	20	20
AFTER 24 HR.	20	20	18	20	20	20
AFTER 48 HR.	20	20	18	20	19	20
AFTER 72 HR.						
AFTER 96 HR.						

RECEIVING WATER USED FOR DILUTIONS? (Y/N) N T. RES. CHLORINE (mg/L): 100% EFFLUENT: 0.11

HARDNESS (mg/L) RECEIVING WATER: NA EFFLUENT: 58 RECON WATER: 96

ALKALINITY (mg/L) RECEIVING WATER: NA EFFLUENT: 94 RECON WATER: 70

pH: INITIAL – CONTROL 8.34 100% 8.00 FINAL – CONTROL 8.19 100% 8.12

T. AMMONIA as N (mg/L) INITIAL EFFLUENT INITIAL 0.02 FINAL NA

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? (Y/N) Y

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS:

ANALYST: Danny McCausland SIGNATURE:

LABORATORY: GEI Consultants, Inc./Ecological Division DATE: 10/27/17

COMMENTS:

COLORADO – CDPS WET TEST REPORT FORM – ACUTE

PERMITEE NAME: New Elk Coal Company CDPS NO: CO-0000906 OUTFALL: 007

TYPE TEST: ROUTINE X ACCELERATED TEST SPECIES *Pimephales promelas*

Test Results: LC_{50} >100% STATISTICAL METHOD: NA

TEST DATE/TIME: START 10/3/17 13:05 END 10/7/17 12:25

DILUTIONS (%EFFLUENT)

NUMBER ALIVE	CONTROL	20%	40%	60%	80%	100%
START	40	40	40	40	40	40
AFTER 24 HR.	40	39	40	40	40	39
AFTER 48 HR.	40	39	40	39	40	39
AFTER 72 HR.	40	39	40	38	39	39
AFTER 96 HR.	40	39	39	38	38	39

RECEIVING WATER USED FOR DILUTIONS? (Y/N) N T. RES. CHLORINE (mg/L): 100% EFFLUENT: 0.11

HARDNESS (mg/L) RECEIVING WATER: NA EFFLUENT: 58 RECON WATER: 96

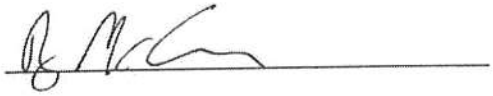
ALKALINITY (mg/L) RECEIVING WATER: NA EFFLUENT: 94 RECON WATER: 70

pH: INITIAL – CONTROL 8.34 100% 8.00 FINAL – CONTROL 7.99 100% 8.10

T. AMMONIA as N (mg/L) INITIAL EFFLUENT INITIAL 0.02 FINAL NA

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? (Y/N) Y

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS:

ANALYST: Danny McCausland SIGNATURE: 

LABORATORY: GEI Consultants, Inc./Ecological Division DATE: 10/27/17

COMMENTS:

Appendix B

Chain-of-custody forms and laboratory bench sheets from whole effluent toxicity tests

GEI Consultants, Inc./Ecological Division
4601 DTC BLVD., SUITE L100
DENVER, CO 80237
Main: (303) 662-0100 Lab: (303) 264-1120

NE1017

BIOASSAY LABORATORY CHAIN-OF-CUSTODY

CLIENT/PROJECT: New Elk Coal Co.
ADDRESS: 12250 U.S. Hwy. 12
CITY: Weston STATE: Colo
ZIP: 81091 PHONE #: 719-631-6143
PROJ. MANAGER: ~~Ron Thompson~~ SAMPLER: Jim Begano

SAMPLE TYPE/SITE	Date Collected	Time Collected	TESTS REQUIRED: ACUTE CERIO	ACUTE FATHEAD	ACUTE DAPHNIA	ACUTE TROUT	CHRONIC CERIO	CHRONIC FATHEAD	CHRONIC ALGAE	CHRONIC OTHER	CHLORINE (Measured by: Client ☐ Lab ☒) TRC (mg/L)	Date/Time Measured	COMMENTS
Pond 7 (Outfall 7)	10-2-17	2:30pm	✓	✓							0.11	10/3/17 1005	

PROJECT INFORMATION

COURIER: UPS

TOTAL NUMBER OF CONTAINERS: 1

COMMENTS: Please return cooler, bottles, ice bottles, and chain of custody forms.

LABORATORY RECEIVING INFORMATION

CONDITION: Good

TEMPERATURE (°C): 3.5

CLIENT RELINQUISHED BY: James F Begano

DATE/TIME: 10/2/2017 3:15 PM.

LABORATORY RECEIVED BY:

DATE/TIME: 10/3/17 955

1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524

Toll Free: 800/331-5916
Tel: 970/484-5091 Fax:970/484-2514

NE1017

ORGANISM HISTORY

DATE: 10/2/2017

SPECIES: *Pimephales promelas*

AGE: 6 day

LIFE STAGE: Larvae

HATCH DATE: 9/26/2017

BEGAN FEEDING: 9/27/2017

FOOD: *Artemia* sp.

Water Chemistry Record:	Current	Range
TEMPERATURE:	23°C	--
SALINITY/CONDUCTIVITY:	--	--
TOTAL HARDNESS (as $CaCO_3$):	112 mg/l	--
TOTAL ALKALINITY (as $CaCO_3$):	105 mg/l	--
pH:	7.96	--

Comments:

Facility Supervisor

INITIAL CHEMISTRY BENCH SHEET

Client/Project: New Elk NE1017 Samples Received: Date/Time 10/3/17 955

Test Substance: Effluent What test/s will samples be used in? Ac FIC Dilution Water: (lab water) or receiving water

SAMPLE TYPE LOG NUMBER DATE COLLECTED	DATE/TIME ANALYZED	DATES USED	ANALYSES TEMP °C	TOTAL HARDNESS mg/L	pH	TOTAL ALKALINITY mg/L	D O mg/L	COND µS	TDS mg/L	TRC mg/L	AMMONIA mg/L	ANALYST
Effluent NE1017-1 10/2/17	10/3/17 1520	10/3/17 – 10/6/17	20°	2.9| 58	8.00	47 94	8.6	236	116	0.11	0.02	AS

Site Daily measurements	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
pH / initials	8.00 /AS	8.01/ CC	7.91/CC	7.97 /DAK			
pH / initials							
pH / initials							
pH / initials							

COMMENTS:

Samples stored in refrigerator: K

Data Checked and Approved by Laboratory Manager (Initials): AJL

RECONSTITUTED SYNTHETIC LABORATORY WATER CHEMISTRY BENCH SHEET

Client/Project: New Elk NE1017

Test Substance: Effluent

What test/s will samples be used in? Ac FIC

Analyst: SR

Test/s Start Date: 10/3/17

BATCH #	ANALYSES TEMP. °C	TOTAL HARDNESS mg/L	pH	TOTAL ALKALINITY mg/L	D.O. mg/L	COND. µS
MH189	25.0	98	8.43	70	6.7	342
MH190	25.0	94	8.24	70	7.0	332
AVERAGE VALUE	25.0	96	8.34	70	6.9	337

COMMENTS:

Data Checked and Approved by Laboratory Manager (Initials): NL

ACUTE TOXICITY CHEMISTRY BENCH SHEET

START Date 10/3/17 FINISH Date 10/5/17

Dilution Water: MH Recon Test Substance: Effluent

Client/Project: New EIK NE1017 Organism: C. dubia

Test Concentration	Chemical Parameter	Day of Test 1	2	3	4	Comments:
0	DO (mg/L)	6.9	7.1			
	Cond. (µS)	348	344			
	pH	8.13	8.19			
	Temp. (°C)	19.9	19.7			
20	DO (mg/L)	7.0	7.0			
	Cond. (µS)	335	327			
	pH	8.12	8.21			
	Temp. (°C)	21.1	20.3			
40	DO (mg/L)	6.9	7.0			
	Cond. (µS)	317	305			
	pH	8.02	8.18			
	Temp. (°C)	20.6	20.0			
60	DO (mg/L)	6.8	6.9			
	Cond. (µS)	299	284			
	pH	8.03	8.18			
	Temp. (°C)	21.1	20.4			
80	DO (mg/L)	6.8	6.9			
	Cond. (µS)	278	264			
	pH	8.01	8.19			
	Temp. (°C)	21.2	20.3			
100	DO (mg/L)	6.7	6.9			
	Cond. (µS)	255	241			
	pH	8.01	8.12			
	Temp. (°C)	20.4	19.7			
	DO (mg/L)					
	Cond. (µS)					
	pH					
	Temp. (°C)					
Incubator Temperature (°C)		19.0	19.0			
ANALYST		AS	CL			
TIME ANALYZED		1620	1420			
ENVIRONMENTAL CHAMBER		T	T			

Data Checked and Approved by Laboratory Manager (Initials): NL

ACUTE TOXICITY CHEMISTRY BENCH SHEET

START Date 10/3/17 FINISH Date 10/7/17

Dilution Water: MH Recon Test Substance: Effluent

Client/Project: New Elk NE1017 Organism: P. promelas

Test Concentration	Chemical Parameter	Day of Test 1	2	3	4	Comments:
0	DO (mg/L)	6.3	6.2	6.3	6.7	
	Cond. (µS)	352	351	362	348	
	pH	7.90	7.90	7.87	7.99	
	Temp. (°C)	19.2	19.5	19.1	18.9	
20	DO (mg/L)	5.9	5.9	6.2	6.7	
	Cond. (µS)	338	338	357	337	
	pH	7.94	7.91	7.94	8.02	
	Temp. (°C)	19.0	18.6	17.8	18.8	
40	DO (mg/L)	6.1	6.0	6.3	6.7	
	Cond. (µS)	321	317	330	311	
	pH	8.00	7.96	7.98	8.03	
	Temp. (°C)	19.3	18.8	19.5	19.3	
60	DO (mg/L)	6.2	5.8	6.1	6.7	
	Cond. (µS)	291	287	296	289	
	pH	7.98	7.94	7.94	8.09	
	Temp. (°C)	19.0	18.9	19.2	19.5	
80	DO (mg/L)	5.7	5.6	6.1	6.7	
	Cond. (µS)	273	271	281	270	
	pH	7.96	7.94	7.94	8.11	
	Temp. (°C)	19.3	19.0	19.5	19.2	
100	DO (mg/L)	5.7	5.4	5.9	6.5	
	Cond. (µS)	248	251	249	246	
	pH	7.96	7.94	7.92	8.10	
	Temp. (°C)	19.2	18.7	19.0	19.7	
	DO (mg/L)					
	Cond. (µS)					
	pH					
	Temp. (°C)					
Incubator Temperature (°C)		19.0	19.0	19.0	19.0	
ANALYST		~~AS~~ AS	CL	~~SR~~	SR	
TIME ANALYZED		1415	1305	1505	1250	
ENVIRONMENTAL CHAMBER		T	T	T	T	

Data Checked and Approved by Laboratory Manager (Initials): NL

ACUTE TOXICITY TEST BENCH SHEET

START Date/Time 10/3/17 1420 FINISH Date/Time 10/5/17 1405

Dilution Water: MH Recon Test Substance: Effluent

Client/Project: New Elk NE1017 Species: C. dubia

CONCENTRATION & REPLICATE		Number alive/hour of test					# alive # exposed (percent survival)	COMMENTS
		Start	24 hr.	48 hr.	72 hr.	96 hr.		
0	A	5	5	5			20/20 100%	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
20	A	5	5	5			20/20 100%	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
40	A	5	4	4			18/20 90%	
	B	5	5	5				
	C	5	5	5				
	D	5	4	4				
60	A	5	5	5			20/20 100%	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
80	A	5	5	5			19/20 95%	
	B	5	5	4				
	C	5	5	5				
	D	5	5	5				
100	A	5	5	5			20/20 100%	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
	A							
	B							
	C							
	D							
ANALYST		AS	AS	CL				
TIME FED		645	—	—				
TIME RENEWED		1420	1525	1405				

Template Number 3

Data Checked and Approved by Laboratory Manager (Initials): NL

ACUTE TOXICITY TEST BENCH SHEET

START Date/Time 10/3/17 1305 FINISH Date/Time 10/7/17 1225

Dilution Water: MH Recon Test Substance: Effluent

Client/Project: New Elk NE1017 Species: P. promelas

CONCENTRATION & REPLICATE		Number alive/hour of test					# alive # exposed (percent survival)	COMMENTS
		Start	24 hr.	48 hr.	72 hr.	96 hr.		
0	A	10	10	10	10	10	40/40 100%	
	B	10	10	10	10	10		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
20	A	10	9	9	9	9	39/40 97.5%	
	B	10	10	10	10	10		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
40	A	10	10	10	10	9	39/40 97.5%	
	B	10	10	10	10	10		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
60	A	10	10	10	9	9	38/40 95%	
	B	10	10	9	9	9		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
80	A	10	10	10	10	10	38/40 95%	
	B	10	10	10	10	10		
	C	10	10	10	9	9		
	D	10	10	10	10	9		
100	A	10	10	10	10	10	39/40 97.5%	
	B	10	9	9	9	9		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
	A							
	B							
	C							
	D							
ANALYST		AS	AS	CL	DNK	SR		
TIME FED		810	--	755	-	-		
TIME RENEWED		1305	1130	1150	1310	1225		

Template Number 4

Data Checked and Approved by Laboratory Manager (Initials): NL

Appendix B

Sample Results for Pond 008

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: POND 8

ACZ Sample ID: ***L37209-01***
Date Sampled: *05/16/17 13:30*
Date Received: *05/17/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP								05/24/17 16:12	aeh
Total Recoverable Digestion	M200.2 ICP								05/23/17 21:30	aeh

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	5.2			mg/L	0.1	0.5	05/22/17 11:41	aeh
Iron, dissolved	M200.7 ICP	1	0.23			mg/L	0.02	0.05	05/22/17 11:41	aeh
Iron, total	M200.7 ICP	1	25.5			mg/L	0.02	0.05	05/25/17 19:58	gss
Iron, total recoverable	M200.7 ICP	1	18.4			mg/L	0.02	0.05	05/24/17 17:58	aeh
Magnesium, dissolved	M200.7 ICP	1	1.6			mg/L	0.2	1	05/22/17 11:41	aeh
Manganese, dissolved	M200.7 ICP	1	0.006	B		mg/L	0.005	0.03	05/22/17 11:41	aeh
Manganese, total	M200.7 ICP	1	0.163			mg/L	0.005	0.03	05/25/17 19:58	gss
Potassium, dissolved	M200.7 ICP	1	2.1			mg/L	0.2	1	05/22/17 11:41	aeh
Sodium, dissolved	M200.7 ICP	1	63.6			mg/L	0.2	1	05/22/17 11:41	aeh

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	118			mg/L	2	20	05/24/17 0:00	emk
Carbonate as CaCO3		1	4.3	B		mg/L	2	20	05/24/17 0:00	emk
Hydroxide as CaCO3		1		U		mg/L	2	20	05/24/17 0:00	emk
Total Alkalinity		1	123		*	mg/L	2	20	05/24/17 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			10.0			%			05/31/17 0:00	calc
Sum of Anions			2.7			meq/L			05/31/17 0:00	calc
Sum of Cations			3.3			meq/L			05/31/17 0:00	calc
Chloride	SM4500Cl-E	1	9.0		*	mg/L	0.5	2	05/26/17 10:37	bce
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		20			mg/L	0.2	5	05/31/17 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							05/25/17 9:14	che
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							05/18/17 14:45	gss
Residue, Filterable (TDS) @180C	SM2540C	2	912			mg/L	20	40	05/20/17 14:36	emk
Residue, Non-Filterable (TSS) @105C	SM2540D	6.7	480			mg/L	33.5	134	05/18/17 12:13	sck
Sodium Adsorption Ratio in Water	USGS - I1738-78		6.3						05/31/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	1		U	*	mg/L	1	5	05/30/17 12:37	spl

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Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L37209***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L37209-01	WG423648	Chloride	SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG423715	Sulfate	D516-02/-07 - Turbidimetric	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG423489	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.

New Elk Coal Co. , LLC
Project ID:
Sample ID: POND 8

ACZ Sample ID: ***L39651-01***
Date Sampled: *09/01/17 14:05*
Date Received: *09/06/17*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP				*				09/13/17 15:00	aeh
Total Recoverable Digestion	M200.2 ICP								09/12/17 21:09	dcm

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	6.1		*	mg/L	0.1	0.5	09/21/17 21:54	aeh
Iron, dissolved	M200.7 ICP	1	0.49		*	mg/L	0.02	0.05	09/21/17 21:54	aeh
Iron, total	M200.7 ICP	2	55.2			mg/L	0.04	0.1	09/18/17 22:16	aeh
Iron, total recoverable	M200.7 ICP	1	47.6		*	mg/L	0.02	0.05	09/14/17 0:24	aeh
Magnesium, dissolved	M200.7 ICP	1	1.9			mg/L	0.2	1	09/21/17 21:54	aeh
Manganese, dissolved	M200.7 ICP	1	0.012	B	*	mg/L	0.005	0.03	09/21/17 21:54	aeh
Manganese, total	M200.7 ICP	2	0.41			mg/L	0.01	0.05	09/18/17 22:16	aeh
Potassium, dissolved	M200.7 ICP	1	2.0			mg/L	0.2	1	09/21/17 21:54	aeh
Sodium, dissolved	M200.7 ICP	1	52.2			mg/L	0.2	1	09/21/17 21:54	aeh

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	103			mg/L	2	20	09/07/17 0:00	enb
Carbonate as CaCO3		1		U		mg/L	2	20	09/07/17 0:00	enb
Hydroxide as CaCO3		1		U		mg/L	2	20	09/07/17 0:00	enb
Total Alkalinity		1	103		*	mg/L	2	20	09/07/17 0:00	enb
Chloride	SM4500Cl-E	1	10.0		*	mg/L	0.5	2	09/12/17 14:05	jmm
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		23			mg/L	0.2	5	09/25/17 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							09/11/17 16:15	ecc
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							09/13/17 18:00	sck
Residue, Filterable (TDS) @180C	SM2540C	2	1410		*	mg/L	20	40	09/06/17 15:19	che
Residue, Non-Filterable (TSS) @105C	SM2540D	4	1580		*	mg/L	20	80	09/08/17 11:56	che
Sodium Adsorption Ratio in Water	USGS - I1738-78		4.8						09/25/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	1	40.0			mg/L	1	5	09/12/17 8:55	jmm

New Elk Coal Co. , LLC

ACZ Project ID: ***L39651***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L39651-01	WG431679	Calcium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG430989	Chloride	SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG431679	Iron, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG431187	Iron, total recoverable	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG431679	Manganese, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG430675	Residue, Filterable (TDS) @180C	SM2540C	RO	The duplicate originally assigned to this sample was not used for precision assessment because residue density exceeded the method limits. Another duplicate in the batch was used to assess precision. Method required duplicate frequency was not met.
	WG430823	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG430754	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.
	WG431101	Total Hot Plate Digestion	M200.2 ICP	DF	Sample required dilution due to high sediment.

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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: POND 8

ACZ Sample ID: ***L40187-01***
Date Sampled: *09/28/17 00:00*
Date Received: *09/29/17*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP								10/04/17 13:54	dcm
Total Recoverable Digestion	M200.2 ICP								10/05/17 14:18	dcm

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	3.9			mg/L	0.1	0.5	10/10/17 0:21	aeh
Iron, dissolved	M200.7 ICP	1	1.64			mg/L	0.02	0.05	10/10/17 0:21	aeh
Iron, total	M200.7 ICP	1	27.9			mg/L	0.02	0.05	10/05/17 23:52	dcm
Iron, total recoverable	M200.7 ICP	1	31.7		*	mg/L	0.02	0.05	10/06/17 13:26	dcm
Magnesium, dissolved	M200.7 ICP	1	1.1			mg/L	0.2	1	10/10/17 0:21	aeh
Manganese, dissolved	M200.7 ICP	1	0.008	B		mg/L	0.005	0.03	10/10/17 0:21	aeh
Manganese, total	M200.7 ICP	1	0.250			mg/L	0.005	0.03	10/05/17 23:52	dcm
Potassium, dissolved	M200.7 ICP	1	1.6			mg/L	0.2	1	10/10/17 0:21	aeh
Sodium, dissolved	M200.7 ICP	1	40.2			mg/L	0.2	1	10/10/17 0:21	aeh

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	81.8			mg/L	2	20	10/04/17 0:00	emk
Carbonate as CaCO3		1		U		mg/L	2	20	10/04/17 0:00	emk
Hydroxide as CaCO3		1		U		mg/L	2	20	10/04/17 0:00	emk
Total Alkalinity		1	81.8		*	mg/L	2	20	10/04/17 0:00	emk
Chloride	SM4500Cl-E	1	5.2		*	mg/L	0.5	2	10/09/17 10:28	las
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		14			mg/L	0.2	5	10/20/17 0:00	calc
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							10/06/17 17:25	sck
Residue, Filterable (TDS) @180C	SM2540C	5	750		*	mg/L	50	100	10/03/17 15:29	ecc
Residue, Non-Filterable (TSS) @105C	SM2540D	4	584		*	mg/L	20	80	10/03/17 10:35	ecc
Sodium Adsorption Ratio in Water	USGS - I1738-78		4.7						10/20/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	1	18.9		*	mg/L	1	5	10/18/17 11:36	las

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Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L40187***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L40187-01	WG433033	Chloride	SM4500Cl-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			SM4500Cl-E	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG432949	Iron, total recoverable	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG432682	Residue, Filterable (TDS) @180C	SM2540C	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG432651	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG433845	Sulfate	D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			D516-02/-07 - Turbidimetric	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG432683	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.
L40187-02	WG433033	Chloride	SM4500Cl-E	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG432949	Iron, total recoverable	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG432682	Residue, Filterable (TDS) @180C	SM2540C	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG432651	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG433845	Sulfate	D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			D516-02/-07 - Turbidimetric	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG432683	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.

Appendix C

Sample Results for Site 010

ACZ Laboratories, Inc.
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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: OUTFALL 10

ACZ Sample ID: ***L37665-01***
Date Sampled: *06/07/17 15:55*
Date Received: *06/08/17*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								06/12/17 15:45	enb
Total Hot Plate Digestion	M200.2 ICP				*				06/19/17 19:48	gss
Total Recoverable Digestion	M200.2 ICP-MS								06/12/17 12:55	mfm
Total Recoverable Digestion	M200.2 ICP								06/16/17 15:25	aeh

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.0079	7.9 µg/L		mg/L	0.0002	0.001	06/13/17 15:00	enb
Boron, total	M200.7 ICP	2	0.05	B [redacted]		mg/L	0.02	0.1	06/23/17 9:50	aeh
Cadmium, potentially dissolved	M200.8 ICP-MS	1	0.0006	0.6		mg/L	0.0001	0.0005	06/13/17 18:10	mfm
Chromium, total recoverable	M200.8 ICP-MS	1	0.0763	76.3		mg/L	0.0005	0.002	06/13/17 15:00	enb
Copper, potentially dissolved	M200.8 ICP-MS	1	0.037	37		mg/L	0.0004	0.002	06/13/17 18:10	mfm
Iron, total recoverable	M200.7 ICP	1	83.1	83100	*	mg/L	0.02	0.05	06/19/17 15:24	aeh
Manganese, potentially dissolved	M200.8 ICP-MS	1	0.490	490		mg/L	0.0004	0.002	06/13/17 18:10	mfm
Mercury, total	M245.1 CVAA	10		U	*	mg/L	0.002	0.01	06/14/17 15:47	sck
Selenium, potentially dissolved	M200.8 ICP-MS	1	0.0011	11.1		mg/L	0.0001	0.0003	06/13/17 18:10	mfm
Zinc, potentially dissolved	M200.8 ICP-MS	1	0.104	104		mg/L	0.002	0.005	06/13/17 18:10	mfm

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Chloride	SM4500Cl-E	1	3.2	[redacted]	*	mg/L	0.5	2	06/20/17 10:33	spl
Lab Filtration (0.45um filter)	SOPWC050	1							06/22/17 11:28	jnp
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							06/13/17 10:30	sck
pH (lab)	SM4500H+ B									
pH		1	7.9	H	*	units	0.1	0.1	06/13/17 0:00	abd
pH measured at		1	22.3			C	0.1	0.1	06/13/17 0:00	abd
Residue, Non-Filterable (TSS) @105C	SM2540D	20	2820			mg/L	100	400	06/14/17 12:41	emk

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Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L37665***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L37665-01	WG425063	Chloride	SM4500Cl-E	ZU	Analysis date/time preceeds filter date/time. A portion of sample was filtered and analyzed prior to the creation of a Filter workgroup.
	WG424993	Iron, total recoverable	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG424727	Mercury, total	M245.1 CVAA	DF	Sample required dilution due to high sediment.
	WG424596	pH	SM4500H+ B	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.
	WG425031	Total Hot Plate Digestion	M200.2 ICP	DF	Sample required dilution due to high sediment.

Appendix D

Surface and Groundwater Sample Results

ACZ Laboratories, Inc.
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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: PAW 1

ACZ Sample ID: ***L38041-01***
Date Sampled: *06/22/17 14:10*
Date Received: *06/23/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP								06/29/17 21:18	dcm
Total Recoverable Digestion	M200.2 ICP								07/03/17 14:30	gss

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	15.6			mg/L	0.1	0.5	07/05/17 18:35	aeh
Iron, dissolved	M200.7 ICP	1	0.32			mg/L	0.02	0.05	07/05/17 18:35	aeh
Iron, total	M200.7 ICP	1	17.4			mg/L	0.02	0.05	07/03/17 18:29	aeh
Iron, total recoverable	M200.7 ICP	1	22.0		*	mg/L	0.02	0.05	07/05/17 20:02	aeh
Magnesium, dissolved	M200.7 ICP	1	8.6			mg/L	0.2	1	07/05/17 18:35	aeh
Manganese, dissolved	M200.7 ICP	1	0.009	B		mg/L	0.005	0.03	07/05/17 18:35	aeh
Manganese, total	M200.7 ICP	1	0.160			mg/L	0.005	0.03	07/03/17 18:29	aeh
Potassium, dissolved	M200.7 ICP	1	2.1			mg/L	0.2	1	07/05/17 18:35	aeh
Sodium, dissolved	M200.7 ICP	1	14.7			mg/L	0.2	1	07/05/17 18:35	aeh

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	106			mg/L	2	20	06/29/17 0:00	emk
Carbonate as CaCO3		1		U		mg/L	2	20	06/29/17 0:00	emk
Hydroxide as CaCO3		1		U		mg/L	2	20	06/29/17 0:00	emk
Total Alkalinity		1	106		*	mg/L	2	20	06/29/17 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-4.3			%			07/14/17 0:00	calc
Sum of Anions			2.4			meq/L			07/14/17 0:00	calc
Sum of Cations			2.2			meq/L			07/14/17 0:00	calc
Chloride	SM4500Cl-E	1	8.1		*	mg/L	0.5	2	07/10/17 15:05	bce
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		74			mg/L	0.2	5	07/14/17 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							07/03/17 13:44	jnp
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							06/27/17 9:40	sck
Residue, Filterable (TDS) @180C	SM2540C	1	108			mg/L	10	20	06/28/17 13:11	emk
Residue, Non-Filterable (TSS) @105C	SM2540D	1	111		*	mg/L	5	20	06/28/17 12:07	che
Sodium Adsorption Ratio in Water	USGS - I1738-78		0.75						07/14/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	1		U	*	mg/L	1	5	07/13/17 10:25	jmm

ACZ Laboratories, Inc.
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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: PAW 9

ACZ Sample ID: ***L38041-02***
Date Sampled: *06/22/17 14:25*
Date Received: *06/23/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP								06/29/17 21:30	dcm
Total Recoverable Digestion	M200.2 ICP								07/06/17 21:44	gss

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	67.5			mg/L	0.1	0.5	07/05/17 18:38	aeh
Iron, dissolved	M200.7 ICP	1	0.06			mg/L	0.02	0.05	07/05/17 18:38	aeh
Iron, total	M200.7 ICP	1	0.85			mg/L	0.02	0.05	07/03/17 18:32	aeh
Iron, total recoverable	M200.7 ICP	1	1.05			mg/L	0.02	0.05	07/07/17 14:41	gss
Magnesium, dissolved	M200.7 ICP	1	18.4			mg/L	0.2	1	07/05/17 18:38	aeh
Manganese, dissolved	M200.7 ICP	1		U		mg/L	0.005	0.03	07/05/17 18:38	aeh
Manganese, total	M200.7 ICP	1	0.105			mg/L	0.005	0.03	07/03/17 18:32	aeh
Potassium, dissolved	M200.7 ICP	1	2.1			mg/L	0.2	1	07/05/17 18:38	aeh
Sodium, dissolved	M200.7 ICP	1	126			mg/L	0.2	1	07/05/17 18:38	aeh

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	446			mg/L	2	20	06/29/17 0:00	emk
Carbonate as CaCO3		1		U		mg/L	2	20	06/29/17 0:00	emk
Hydroxide as CaCO3		1		U		mg/L	2	20	06/29/17 0:00	emk
Total Alkalinity		1	446			mg/L	2	20	06/29/17 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			0.0			%			07/14/17 0:00	calc
Sum of Anions			11			meq/L			07/14/17 0:00	calc
Sum of Cations			11			meq/L			07/14/17 0:00	calc
Chloride	SM4500Cl-E	1	18.8		*	mg/L	0.5	2	07/10/17 15:05	bce
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		244			mg/L	0.2	5	07/14/17 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							07/03/17 13:47	jnp
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							06/27/17 9:40	sck
Residue, Filterable (TDS) @180C	SM2540C	1	602			mg/L	10	20	06/28/17 13:13	emk
Residue, Non-Filterable (TSS) @105C	SM2540D	1	5.0	B	*	mg/L	5	20	06/28/17 12:09	che
Sodium Adsorption Ratio in Water	USGS - I1738-78		3.5						07/14/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	5	85.6		*	mg/L	5	25	07/13/17 10:32	jmm

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Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L38041***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L38041-01	WG426472	Chloride	SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG426167	Iron, total recoverable	M200.7 ICP	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG425696	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG426718	Sulfate	D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG425745	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.
L38041-02	WG426472	Chloride	SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG425696	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG426718	Sulfate	D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

New Elk Coal Co. , LLC
Project ID:
Sample ID: PRS 1

ACZ Sample ID: ***L41168-01***
Date Sampled: *11/13/17 15:00*
Date Received: *11/14/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								11/16/17 14:25	mfm
Total Hot Plate Digestion	M200.2 ICP								11/17/17 14:22	scp
Total Recoverable Digestion	M200.2 ICP								11/29/17 10:50	aeh
Total Recoverable Digestion	M200.2 ICP-MS								11/22/17 8:06	bsu/mfm

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1		U		mg/L	0.0002	0.001	11/27/17 18:05	mfm
Boron, total	M200.7 ICP	1	0.01	B		mg/L	0.01	0.05	11/27/17 11:25	dcm
Cadmium, potentially dissolved	M200.7 ICP	1		U		mg/L	0.005	0.02	11/28/17 22:45	aeh
Calcium, dissolved	M200.7 ICP	1	45.7			mg/L	0.1	0.5	11/29/17 16:05	dcm
Chromium, total recoverable	M200.8 ICP-MS	1		U		mg/L	0.0005	0.002	11/27/17 18:05	mfm
Copper, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	11/28/17 22:45	aeh
Iron, dissolved	M200.7 ICP	1		U		mg/L	0.02	0.05	11/29/17 16:05	dcm
Iron, total	M200.7 ICP	1	0.09		*	mg/L	0.02	0.05	11/20/17 14:59	dcm
Iron, total recoverable	M200.7 ICP	1	0.08			mg/L	0.02	0.05	11/30/17 11:27	aeh
Magnesium, dissolved	M200.7 ICP	1	7.9			mg/L	0.2	1	11/29/17 16:05	dcm
Manganese, dissolved	M200.7 ICP	1		U		mg/L	0.005	0.03	11/29/17 16:05	dcm
Manganese, potentially dissolved	M200.7 ICP	1	0.014	B		mg/L	0.005	0.03	11/28/17 22:45	aeh
Manganese, total	M200.7 ICP	1	0.020	B		mg/L	0.005	0.03	11/20/17 14:59	dcm
Mercury, total	M245.1 CVAA	1		U		mg/L	0.0002	0.001	12/01/17 15:59	sck
Potassium, dissolved	M200.7 ICP	1	4.5			mg/L	0.2	1	11/29/17 16:05	dcm
Sodium, dissolved	M200.7 ICP	1	6.6			mg/L	0.2	1	11/29/17 16:05	dcm
Zinc, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	11/28/17 22:45	aeh

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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: PRS 1

ACZ Sample ID: ***L41168-01***
Date Sampled: *11/13/17 15:00*
Date Received: *11/14/17*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	111			mg/L	2	20	11/21/17 0:00	enb
Carbonate as CaCO3		1		U		mg/L	2	20	11/21/17 0:00	enb
Hydroxide as CaCO3		1		U		mg/L	2	20	11/21/17 0:00	enb
Total Alkalinity		1	112			mg/L	2	20	11/21/17 0:00	enb
Cation-Anion Balance	Calculation									
Cation-Anion Balance			1.5			%			12/11/17 0:00	calc
Sum of Anions			3.2			meq/L			12/11/17 0:00	calc
Sum of Cations			3.3			meq/L			12/11/17 0:00	calc
Chloride	SM4500Cl-E	1	5.0		*	mg/L	0.5	2	11/21/17 17:01	las
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		147			mg/L	0.2	5	12/11/17 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							11/21/17 9:50	ecc
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							11/20/17 19:40	sck
Residue, Filterable (TDS) @180C	SM2540C	1	206		*	mg/L	10	20	11/16/17 16:22	emk
Residue, Non-Filterable (TSS) @105C	SM2540D	1		U	*	mg/L	5	20	11/17/17 15:42	ecc
Sodium Adsorption Ratio in Water	USGS - I1738-78		0.24						12/11/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	5	41.0			mg/L	5	25	11/29/17 9:40	jmm

** Please refer to Qualifier Reports for details.*

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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: PRS 4

ACZ Sample ID: ***L41168-02***
Date Sampled: *11/13/17 15:00*
Date Received: *11/14/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								11/16/17 14:29	mfm
Total Hot Plate Digestion	M200.2 ICP								11/17/17 14:35	scp
Total Recoverable Digestion	M200.2 ICP								11/29/17 11:02	aeh
Total Recoverable Digestion	M200.2 ICP-MS								11/22/17 8:17	bsu/mfm

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1		U		mg/L	0.0002	0.001	11/27/17 18:09	mfm
Boron, total	M200.7 ICP	1		U		mg/L	0.01	0.05	11/27/17 11:29	dcm
Cadmium, potentially dissolved	M200.7 ICP	1		U		mg/L	0.005	0.02	11/28/17 22:49	aeh
Calcium, dissolved	M200.7 ICP	1	45.4			mg/L	0.1	0.5	11/29/17 16:15	dcm
Chromium, total recoverable	M200.8 ICP-MS	1		U		mg/L	0.0005	0.002	11/27/17 18:09	mfm
Copper, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	11/28/17 22:49	aeh
Iron, dissolved	M200.7 ICP	1		U		mg/L	0.02	0.05	11/29/17 16:15	dcm
Iron, total	M200.7 ICP	1	0.09		*	mg/L	0.02	0.05	11/20/17 15:02	dcm
Iron, total recoverable	M200.7 ICP	1	0.07			mg/L	0.02	0.05	11/30/17 11:30	aeh
Magnesium, dissolved	M200.7 ICP	1	7.9			mg/L	0.2	1	11/29/17 16:15	dcm
Manganese, dissolved	M200.7 ICP	1	0.005	B		mg/L	0.005	0.03	11/29/17 16:15	dcm
Manganese, potentially dissolved	M200.7 ICP	1	0.020	B		mg/L	0.005	0.03	11/28/17 22:49	aeh
Manganese, total	M200.7 ICP	1	0.025	B		mg/L	0.005	0.03	11/20/17 15:02	dcm
Mercury, total	M245.1 CVAA	1		U		mg/L	0.0002	0.001	12/01/17 16:00	sck
Potassium, dissolved	M200.7 ICP	1	1.6			mg/L	0.2	1	11/29/17 16:15	dcm
Sodium, dissolved	M200.7 ICP	1	7.1			mg/L	0.2	1	11/29/17 16:15	dcm
Zinc, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	11/28/17 22:49	aeh

New Elk Coal Co. , LLC
Project ID:
Sample ID: PRS 4

ACZ Sample ID: ***L41168-02***
Date Sampled: *11/13/17 15:00*
Date Received: *11/14/17*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	111			mg/L	2	20	11/21/17 0:00	enb
Carbonate as CaCO3		1	3.3	B		mg/L	2	20	11/21/17 0:00	enb
Hydroxide as CaCO3		1		U		mg/L	2	20	11/21/17 0:00	enb
Total Alkalinity		1	114			mg/L	2	20	11/21/17 0:00	enb
Cation-Anion Balance	Calculation									
Cation-Anion Balance			1.5			%			12/11/17 0:00	calc
Sum of Anions			3.2			meq/L			12/11/17 0:00	calc
Sum of Cations			3.3			meq/L			12/11/17 0:00	calc
Chloride	SM4500Cl-E	1	2.5		*	mg/L	0.5	2	11/21/17 17:01	las
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		146			mg/L	0.2	5	12/11/17 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							11/21/17 9:55	ecc
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							11/20/17 19:40	sck
Residue, Filterable (TDS) @180C	SM2540C	1	190		*	mg/L	10	20	11/16/17 16:24	emk
Residue, Non-Filterable (TSS) @105C	SM2540D	1		U	*	mg/L	5	20	11/17/17 15:44	ecc
Sodium Adsorption Ratio in Water	USGS - I1738-78		0.26						12/11/17 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	5	40.2			mg/L	5	25	11/29/17 9:40	jmm

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Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L41168***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L41168-01	WG436629	Chloride	SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG436484	Iron, total	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG436281	Residue, Filterable (TDS) @180C	SM2540C	RO	The duplicate originally assigned to this sample was not used for precision assessment because residue density exceeded the method limits. Another duplicate in the batch was used to assess precision. Method required duplicate frequency was not met.
	WG436385	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L41168-02	WG436629	Chloride	SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG436484	Iron, total	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG436281	Residue, Filterable (TDS) @180C	SM2540C	RO	The duplicate originally assigned to this sample was not used for precision assessment because residue density exceeded the method limits. Another duplicate in the batch was used to assess precision. Method required duplicate frequency was not met.
	WG436385	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: PAW-2

ACZ Sample ID: ***L41797-01***
Date Sampled: *12/14/17 14:10*
Date Received: *12/15/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/15/17 16:21	scp
Total Hot Plate Digestion	M200.2 ICP								12/27/17 11:24	dcm/scp
Total Recoverable Digestion	M200.2 ICP								12/22/17 12:18	dcm
Total Recoverable Digestion	M200.2 ICP-MS								12/27/17 12:48	msh

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.0036			mg/L	0.0002	0.001	12/29/17 18:30	mfm
Boron, total	M200.7 ICP	1	0.01	B		mg/L	0.01	0.05	01/03/18 1:15	aeh
Cadmium, potentially dissolved	M200.7 ICP	1		U		mg/L	0.005	0.02	12/22/17 13:31	aeh
Calcium, dissolved	M200.7 ICP	1	135			mg/L	0.1	0.5	12/22/17 0:30	dcm
Chromium, total recoverable	M200.8 ICP-MS	1	0.0077			mg/L	0.0005	0.002	12/29/17 18:30	mfm
Copper, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	12/22/17 13:31	aeh
Iron, dissolved	M200.7 ICP	1	1.06			mg/L	0.02	0.05	12/22/17 0:30	dcm
Iron, total	M200.7 ICP	1	44.8			mg/L	0.02	0.05	01/03/18 1:15	aeh
Iron, total recoverable	M200.7 ICP	1	43.7			mg/L	0.02	0.05	01/03/18 11:21	aeh
Magnesium, dissolved	M200.7 ICP	1	26.4			mg/L	0.2	1	12/22/17 0:30	dcm
Manganese, dissolved	M200.7 ICP	1	1.82			mg/L	0.005	0.03	12/22/17 0:30	dcm
Manganese, potentially dissolved	M200.7 ICP	1	2.05		*	mg/L	0.005	0.03	12/22/17 13:31	aeh
Manganese, total	M200.7 ICP	1	2.23			mg/L	0.005	0.03	01/03/18 1:15	aeh
Mercury, total	M245.1 CVAA	1		U		mg/L	0.0002	0.001	01/02/18 18:07	sck
Potassium, dissolved	M200.7 ICP	1	4.8			mg/L	0.2	1	12/22/17 0:30	dcm
Sodium, dissolved	M200.7 ICP	1	139			mg/L	0.2	1	12/22/17 0:30	dcm
Zinc, potentially dissolved	M200.7 ICP	1	0.02	B		mg/L	0.01	0.05	12/22/17 13:31	aeh

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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: PAW-2

ACZ Sample ID: ***L41797-01***
Date Sampled: *12/14/17 14:10*
Date Received: *12/15/17*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	474			mg/L	2	20	12/20/17 0:00	enb
Carbonate as CaCO3		1		U		mg/L	2	20	12/20/17 0:00	enb
Hydroxide as CaCO3		1		U		mg/L	2	20	12/20/17 0:00	enb
Total Alkalinity		1	474		*	mg/L	2	20	12/20/17 0:00	enb
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-3.2			%			01/03/18 0:00	calc
Sum of Anions			16			meq/L			01/03/18 0:00	calc
Sum of Cations			15			meq/L			01/03/18 0:00	calc
Chloride	SM4500Cl-E	1	36.0		*	mg/L	0.5	2	12/18/17 15:11	jmm
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		446			mg/L	0.2	5	01/03/18 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/17/17 13:17	ecc
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							12/17/17 12:20	sck
Residue, Filterable (TDS) @180C	SM2540C	2	928			mg/L	20	40	12/18/17 13:30	mh
Residue, Non-Filterable (TSS) @105C	SM2540D	4	220		*	mg/L	20	80	12/19/17 15:49	che
Sodium Adsorption Ratio in Water	USGS - I1738-78		2.9						01/03/18 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	10	239		*	mg/L	10	50	12/19/17 12:18	jmm

New Elk Coal Co. , LLC
Project ID:
Sample ID: NEW-2

ACZ Sample ID: ***L41797-02***
Date Sampled: *12/14/17 14:25*
Date Received: *12/15/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/15/17 16:25	scp
Total Hot Plate Digestion	M200.2 ICP								12/27/17 11:36	dcm/scp
Total Recoverable Digestion	M200.2 ICP								12/22/17 12:29	dcm
Total Recoverable Digestion	M200.2 ICP-MS								12/27/17 13:00	msh

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.0004	B		mg/L	0.0002	0.001	12/29/17 18:33	mfm
Boron, total	M200.7 ICP	1	0.03	B		mg/L	0.01	0.05	01/03/18 1:18	aeh
Cadmium, potentially dissolved	M200.7 ICP	1		U		mg/L	0.005	0.02	12/22/17 13:41	aeh
Calcium, dissolved	M200.7 ICP	1	13.3			mg/L	0.1	0.5	12/22/17 0:39	dcm
Chromium, total recoverable	M200.8 ICP-MS	1		U		mg/L	0.0005	0.002	12/29/17 18:33	mfm
Copper, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	12/22/17 13:41	aeh
Iron, dissolved	M200.7 ICP	1	0.07			mg/L	0.02	0.05	12/22/17 0:39	dcm
Iron, total	M200.7 ICP	1	0.41			mg/L	0.02	0.05	01/03/18 1:18	aeh
Iron, total recoverable	M200.7 ICP	1	0.39			mg/L	0.02	0.05	01/03/18 11:24	aeh
Magnesium, dissolved	M200.7 ICP	1	5.8			mg/L	0.2	1	12/22/17 0:39	dcm
Manganese, dissolved	M200.7 ICP	1	0.052			mg/L	0.005	0.03	12/22/17 0:39	dcm
Manganese, potentially dissolved	M200.7 ICP	1	0.054		*	mg/L	0.005	0.03	12/22/17 13:41	aeh
Manganese, total	M200.7 ICP	1	0.061			mg/L	0.005	0.03	01/03/18 1:18	aeh
Mercury, total	M245.1 CVAA	1		U		mg/L	0.0002	0.001	01/02/18 18:08	sck
Potassium, dissolved	M200.7 ICP	1	9.5			mg/L	0.2	1	12/22/17 0:39	dcm
Sodium, dissolved	M200.7 ICP	1	492			mg/L	0.2	1	12/22/17 0:39	dcm
Zinc, potentially dissolved	M200.7 ICP	1	0.01	B		mg/L	0.01	0.05	12/22/17 13:41	aeh

New Elk Coal Co. , LLC
Project ID:
Sample ID: NEW-2

ACZ Sample ID: ***L41797-02***
Date Sampled: *12/14/17 14:25*
Date Received: *12/15/17*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	932			mg/L	2	20	12/20/17 0:00	enb
Carbonate as CaCO3		1	41.3			mg/L	2	20	12/20/17 0:00	enb
Hydroxide as CaCO3		1		U		mg/L	2	20	12/20/17 0:00	enb
Total Alkalinity		1	973		*	mg/L	2	20	12/20/17 0:00	enb
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-2.1			%			01/03/18 0:00	calc
Sum of Anions			24			meq/L			01/03/18 0:00	calc
Sum of Cations			23.0			meq/L			01/03/18 0:00	calc
Chloride	SM4500Cl-E	1	14.3		*	mg/L	0.5	2	12/18/17 15:11	jmm
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		57			mg/L	0.2	5	01/03/18 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/17/17 13:25	ecc
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							12/17/17 12:20	sck
Residue, Filterable (TDS) @180C	SM2540C	1	1340			mg/L	10	20	12/18/17 13:31	mh
Residue, Non-Filterable (TSS) @105C	SM2540D	1		U	*	mg/L	5	20	12/19/17 15:51	che
Sodium Adsorption Ratio in Water	USGS - I1738-78		29						01/03/18 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	5	184		*	mg/L	5	25	12/19/17 12:11	jmm

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2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L41797***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L41797-01	WG438394	Chloride	SM4500Cl-E	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG438750	Manganese, potentially dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG438548	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG438407	Sulfate	D516-02/-07 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG438645	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.
L41797-02	WG438394	Chloride	SM4500Cl-E	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG438750	Manganese, potentially dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG438548	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG438407	Sulfate	D516-02/-07 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG438645	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: PAW-8

ACZ Sample ID: ***L41866-01***
Date Sampled: *12/19/17 13:28*
Date Received: *12/20/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/21/17 15:42	scp
Total Hot Plate Digestion	M200.2 ICP								12/27/17 14:48	dcm/scp
Total Recoverable Digestion	M200.2 ICP-MS								01/02/18 10:30	bsu
Total Recoverable Digestion	M200.2 ICP								12/22/17 14:25	dcm

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.0003	B		mg/L	0.0002	0.001	01/02/18 17:53	bsu
Boron, total	M200.7 ICP	1	0.01	B		mg/L	0.01	0.05	01/03/18 2:23	aeh
Cadmium, potentially dissolved	M200.7 ICP	1		U		mg/L	0.005	0.02	01/03/18 21:55	aeh
Calcium, dissolved	M200.7 ICP	1	188			mg/L	0.1	0.5	01/04/18 2:11	dcm
Chromium, total recoverable	M200.8 ICP-MS	1	0.0028			mg/L	0.0005	0.002	01/02/18 17:53	bsu
Copper, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	01/03/18 21:55	aeh
Iron, dissolved	M200.7 ICP	1		U		mg/L	0.02	0.05	01/04/18 20:23	dcm
Iron, total	M200.7 ICP	1	2.45			mg/L	0.02	0.05	01/03/18 2:23	aeh
Iron, total recoverable	M200.7 ICP	1	2.44			mg/L	0.02	0.05	01/03/18 12:00	aeh
Magnesium, dissolved	M200.7 ICP	1	41.2			mg/L	0.2	1	01/04/18 2:11	dcm
Manganese, dissolved	M200.7 ICP	1		U		mg/L	0.005	0.03	01/04/18 2:11	dcm
Manganese, potentially dissolved	M200.7 ICP	1	0.246			mg/L	0.005	0.03	01/03/18 21:55	aeh
Manganese, total	M200.7 ICP	1	0.293			mg/L	0.005	0.03	01/03/18 2:23	aeh
Mercury, total	M245.1 CVAA	1		U		mg/L	0.0002	0.001	01/03/18 18:28	sck
Potassium, dissolved	M200.7 ICP	1	2.2			mg/L	0.2	1	01/04/18 2:11	dcm
Sodium, dissolved	M200.7 ICP	1	202			mg/L	0.2	1	01/04/18 2:11	dcm
Zinc, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	01/03/18 21:55	aeh

New Elk Coal Co. , LLC
Project ID:
Sample ID: PAW-8

ACZ Sample ID: ***L41866-01***
Date Sampled: *12/19/17 13:28*
Date Received: *12/20/17*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	610			mg/L	2	20	12/22/17 0:00	emk
Carbonate as CaCO3		1		U		mg/L	2	20	12/22/17 0:00	emk
Hydroxide as CaCO3		1		U		mg/L	2	20	12/22/17 0:00	emk
Total Alkalinity		1	610			mg/L	2	20	12/22/17 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			2.3			%			01/08/18 0:00	calc
Sum of Anions			21			meq/L			01/08/18 0:00	calc
Sum of Cations			22			meq/L			01/08/18 0:00	calc
Chloride	SM4500Cl-E	1	45.9			mg/L	0.5	2	12/29/17 15:10	jmm
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		639			mg/L	0.2	5	01/08/18 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/21/17 14:45	mh
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							01/02/18 14:00	scp
Residue, Filterable (TDS) @180C	SM2540C	1	1240			mg/L	10	20	12/21/17 16:08	mh
Residue, Non-Filterable (TSS) @105C	SM2540D	1	44.0		*	mg/L	5	20	12/21/17 9:36	mh
Sodium Adsorption Ratio in Water	USGS - I1738-78		3.5						01/08/18 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	10	355		*	mg/L	10	50	12/29/17 11:27	jmm

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Inorganic Analytical Results

New Elk Coal Co. , LLC
Project ID:
Sample ID: NEW-4

ACZ Sample ID: ***L41866-02***
Date Sampled: *12/19/17 13:00*
Date Received: *12/20/17*
Sample Matrix: *Ground Water*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/21/17 15:48	scp
Total Hot Plate Digestion	M200.2 ICP								12/27/17 15:00	dcm/scp
Total Recoverable Digestion	M200.2 ICP-MS								01/02/18 10:45	bsu
Total Recoverable Digestion	M200.2 ICP								12/22/17 14:36	dcm

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1		U		mg/L	0.0002	0.001	01/02/18 17:56	bsu
Boron, total	M200.7 ICP	1	0.03	B		mg/L	0.01	0.05	01/03/18 2:26	aeh
Cadmium, potentially dissolved	M200.7 ICP	1		U		mg/L	0.005	0.02	01/03/18 21:58	aeh
Calcium, dissolved	M200.7 ICP	1	5.0			mg/L	0.1	0.5	01/04/18 2:20	dcm
Chromium, total recoverable	M200.8 ICP-MS	1		U		mg/L	0.0005	0.002	01/02/18 17:56	bsu
Copper, potentially dissolved	M200.7 ICP	1		U		mg/L	0.01	0.05	01/03/18 21:58	aeh
Iron, dissolved	M200.7 ICP	1		U		mg/L	0.02	0.05	01/04/18 20:32	dcm
Iron, total	M200.7 ICP	1	0.27			mg/L	0.02	0.05	01/03/18 2:26	aeh
Iron, total recoverable	M200.7 ICP	1	0.26			mg/L	0.02	0.05	01/03/18 12:04	aeh
Magnesium, dissolved	M200.7 ICP	1	2.3			mg/L	0.2	1	01/04/18 2:20	dcm
Manganese, dissolved	M200.7 ICP	1		U		mg/L	0.005	0.03	01/04/18 2:20	dcm
Manganese, potentially dissolved	M200.7 ICP	1	0.010	B		mg/L	0.005	0.03	01/03/18 21:58	aeh
Manganese, total	M200.7 ICP	1	0.007	B		mg/L	0.005	0.03	01/03/18 2:26	aeh
Mercury, total	M245.1 CVAA	1		U		mg/L	0.0002	0.001	01/03/18 18:29	sck
Potassium, dissolved	M200.7 ICP	1	5.2			mg/L	0.2	1	01/04/18 2:20	dcm
Sodium, dissolved	M200.7 ICP	1	522			mg/L	0.2	1	01/04/18 2:20	dcm
Zinc, potentially dissolved	M200.7 ICP	1	0.01	B		mg/L	0.01	0.05	01/03/18 21:58	aeh

New Elk Coal Co. , LLC
Project ID:
Sample ID: NEW-4

ACZ Sample ID: ***L41866-02***
Date Sampled: *12/19/17 13:00*
Date Received: *12/20/17*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	1090			mg/L	2	20	12/22/17 0:00	emk
Carbonate as CaCO3		1	70.9			mg/L	2	20	12/22/17 0:00	emk
Hydroxide as CaCO3		1		U		mg/L	2	20	12/22/17 0:00	emk
Total Alkalinity		1	1160			mg/L	2	20	12/22/17 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-2.0			%			01/08/18 0:00	calc
Sum of Anions			25			meq/L			01/08/18 0:00	calc
Sum of Cations			24			meq/L			01/08/18 0:00	calc
Chloride	SM4500Cl-E	1	15.5			mg/L	0.5	2	12/29/17 15:10	jmm
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		22.0			mg/L	0.2	5	01/08/18 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/21/17 14:49	mh
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A	1							01/02/18 14:00	scp
Residue, Filterable (TDS) @180C	SM2540C	1	1340			mg/L	10	20	12/21/17 16:12	mh
Residue, Non-Filterable (TSS) @105C	SM2540D	1	5.0	B	*	mg/L	5	20	12/21/17 9:39	mh
Sodium Adsorption Ratio in Water	USGS - I1738-78		49						01/08/18 0:00	calc
Sulfate	D516-02/-07 - Turbidimetric	5	42.2		*	mg/L	5	25	12/29/17 10:34	jmm

Inorganic Extended Qualifier Report

New Elk Coal Co. , LLC

ACZ Project ID: ***L41866***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L41866-01	WG438705	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG439013	Sulfate	D516-02/-07 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L41866-02	WG438705	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG439013	Sulfate	D516-02/-07 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

Appendix E

Field Notes for 2017

New Elk Mine - HYDROLOGIC MONITORING - FIELD DATA

Date: March 22, 2017 Weather: Sunny & Windy 67°F

Site ID	Time	Depth	pH	Conductivity	Temperature Degrees C	Sample (Y/N)	Sampled By	Notes
TH 03	1:06 P.M.	93.3'	—	—	—	N	Jim Begano	Rob Zuber (DRMS) Vince Massaroth assisted
TH 02	1:15 P.M.	70.9'	—	—	—	N	Jim Begano	" "
TH 01	1:27 P.M.	45.0'	—	—	—	N	Jim Begano	" "

New Elk Mine - HYDROLOGIC MONITORING - FIELD DATA

Date: May 10, 2017 Weather: Cloudy 64° F.

Site ID	Time	Depth	pH	Conductivity	Temperature Degrees C	Sample (Y/N)	Sampled By	Notes
Pond #7	—	—	—	—	—	N	JB	21" Below Top Decant No Discharge
Pond #8	—	—	—	—	—	N	JB	33" Below Top Decant No Discharge Meter= 14.542 X.00,
#10 Pond	—	—	—	—	—	N	JB	No Discharge
Pond #4	—	—	—	—	—	N	JB	Pool 120yd x 30yd 10" Deep No Discharge
Pond #1	—	—	—	—	—	N	JB	Meter 54.917 No Discharge

New Elk Mine - HYDROLOGIC MONITORING - FIELD DATA

Date: May 16, 2017 Weather: Sunny 72°

Site ID	Time	Depth	pH	Conductivity	Temperature Degrees C	Sample (Y/N)	Sampled By	Notes
Pond 8	1:30 P.M.		8.53	381 us	19.3°	Y	JB	36" Below Top Decant - Meter 14.542 No Discharge
Pond 7	1:50 P.M.		8.50	346 us	19.9°	Y	JB	22" Below Top Decant No Discharge
Pond 10						N		Dry No Discharge
Pond 1						N		Meter 54.917 NO Discharge
Pond 4						N		Pool ≈ 120yd x 30yd - 8" Deep No Discharge

NEW ELK MINE HYDROLOGIC ' NITORING FIELD REPORT

DATE: 5-24-2017 WEATHER: Sunny 64° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	8:40 A.M					No		Meter 14.542 No Discharge
Pond 7	8:55 A.M					No		No Discharge
Outflow 10	9:05 A.M					No		Dry No Discharge
Pond 1	9:15 A.M					No		meter 54.917 No Discharge
Pond 4	9:30 A.M.					No		Small Pool No Discharge

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: 5-30-2017 WEATHER: Sunny

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	7:30 A.M					No	JB	Meter 14.542 No Discharge Started pumping water to Pond 6
Pond 7	9:05 A.M.					No	JB	No Discharge
Pond 1	7:05 A.M					No	JB	No Discharge Meter 54.917
Pond 4	9:40 A.M.					No	JB	No Discharge Small Pool
Outfall 10	9:15 A.M.					No	JB	Dry No Discharge

New Elk Mine - HYDROLOGIC MONITORING - FIELD DATA

Date: 6-7-2017 Weather: Sunny 54°F

Site ID	Time	Depth	pH	Conductivity	Temperature Degrees C	Sample (Y/N)	Sampled By	Notes
TH01	7:20 A.M	44.9'	—	—	—	No	—	—
TH02	7:35A.M	70.8'	—	—	—	No	—	—
TH03	7:55A.M	93.4'	—	—	—	No	—	—
Pond 8	8:20A.M	—	—	—	—	No		Meter 14.552 No Discharge
Pond 7		—	—	—	—	No	—	No Discharge
Pond 1		—	—	—	—	No	—	Meter 54.417 No Discharge
Pond 4		—	—	—	—	No	—	No Discharge
outFlow 10		—	—	—	—	No	—	No Discharge
outFlow 10	3:55P.M	—	8.6	118.8uS	13.9°C	Yes	JB	Discharging due to Rain 1gal. in 57sec.

New Elk Mine - HYDROLOGIC MONITORING - FIELD DATA

Date: June 13, 2017 Weather: Sunny 64° JB.

Site ID	Time	Depth	pH	Conductivity	Temperature Degrees C	Sample (Y/N)	Sampled By	Notes
New-4	8:45 A.M.	364.6'	—	—	—	No	—	Semi Annual
New-2	9:04 A.M.	357.7'	—	—	—	No	—	Semi Annual
PAW-2	12:40 P.M.	15.7'	7.17	113.7 µS	12.4°C	No	—	Semi Annual
PAW-8	1:03 P.M.	32.6'	7.05	150.0 µS	14.0°C	NO	—	Semi Annual

NEW ELK MINE HYDROLOGIC M ITORING FIELD REPORT

DATE: June 21, 2017 WEATHER: Sunny 72° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
PRS 1	8:05 A.M.	3.75'	7.52	247 uS	8.8°C	No	—	3.75' Deep x 18' wide = 67.5 ft² 50 ft in 4 sec = 12.5 ft/sec 12.5 x 67.5 = 844 ft³/sec
PRS 4	8:45 A.M.	3.5'	8.3	176.2 uS	9.8°C	No	—	3.5' Deep x 24' wide = 84 ft² 50 ft in 5 sec = 10 ft/sec 10 x 84 = 840 ft³/sec

NEW ELK MINE HYDROLOGIC M NITORING FIELD REPORT

DATE: June 22, 2017 WEATHER: Sunny 84°F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
PAW 1	14:10	7.3ft	8.58	244 uS	14.8°C	Yes	Jim Begano	Sample sent to ACZ Labs
PAW 9	14:25	14.7 ft	7.69	107.8 uS	13.6°C	Yes	Jim Begano	Sample Sent to ACZ Labs

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: June 23, 2017 WEATHER: Cloudy 54°F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
New 3	8:05 A.M.	421.65 Ft.	—	—	—	No	—	Semi Annual Requirement.

NEW ELK MINE HYDROLOGIC ONITORING FIELD REPORT

DATE: 7-10-2017 WEATHER: Cloudy 66°F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	7:40 A.M.					No		Meter 14.552 No Discharge
Pond 7	7:55 A.M.					No		No Discharge
Pond 1	8:10 A.M					No		Meter 54.917 No Discharge
Pond 4	8:20 A.M.					No		No Discharge
Out Fall 10	8:00 A.M.					No		No Discharge

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: July 13, 2017 WEATHER: Raining

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Out Fall 10	3:05 P.M.					No		No Discharge
Pond 7	3:10 P.M.					No		No Discharge
Pond 1	3:20 P.M.					No		Meter 54.917 No Discharge
Pond 4	3:30 P.M.					No		No Discharge
Pond 8	3:40 P.M.					No		Meter 14.552 No Discharge

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: July 18, 2017 WEATHER: Sunny 70° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	8:20 A.M.					No		Meter 14.552 No Discharge
Pond 4	8:30 A.M.					No		No Discharge
Pond 1	8:40 A.M.					No		Meter 54.917 No Discharge
Pond 7	8:50 A.M.					No		No Discharge
Out Fall 10	8:55 A.M.					No		No Discharge

NEW ELK MINE HYDROLOGIC ONITORING FIELD REPORT

DATE: July 26, 2017 WEATHER: Sunny

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	7:25 A.M					No		Meter 14.552 No Discharge
Pond 4	7:35 A.M.					No		No Discharge
Pond 1	7:47 A.M.					No		Meter 54.917 No Discharge
Pond 7	8:02 A.M.					No		No Discharge
Out Fall 10						No		No Discharge

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: 8-1-2017 WEATHER: SUNNY 68°F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	7:10 A.M.					No		Meter 14.552 No Discharge
Pond 4	7:20 A.M.					No		No Discharge
Pond 1	7:30 A.M.					No		Meter 54.917 No Discharge
Pond 7	7:45 A.M.					No		No Discharge
Out Fall 10	7:55 A.M.					No		No Discharge

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: August 7, 2017 WEATHER: Cloudy

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 7	1:00 P.M.					No		No Discharge
Out Fall 10	1:05 P.M.					No		No Discharge
Pond 1	1:15 P.M.					No		Meter 54.917 No Discharge
Pond 4	1:20 P.M					No		No Discharge
Pond 8	1:30 P.M.					No		Meter 14.552 No Discharge

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: Aug 15, 2017 WEATHER: Sunny 64°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 7	8:15 A.M					No		No Discharge
Outfall 10	8:20 A.M.					No		No Discharge
Pond 1	8:30 A.M.					No		Meter 54.917 No Discharge
Pond 4	8:40 A.M.					No		No Discharge
Pond 8	8:55 A.M.					No		Meter 14.552 No Discharge

NEW ELK MINE HYDROLOGIC NITORING FIELD REPORT

DATE: AUG. 21, 2017 WEATHER: Clear 62°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	8:05 A.M.					NO		Meter 14,552 No Discharge
Pond 4	8:15 A.M.					NO		No Discharge
Pond 1	8:20 A.M.					No		Meter 54,917 No Discharge
Pond 7	8:30 A.M.					No		No Discharge
OutFall 10	8:35 A.M.					No		No Discharge

NEW ELK MINE HYDROLOGIC NITORING FIELD REPORT

DATE: Aug 29, 2017 WEATHER: Sunny 68°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	9:00 A.M.					No		Meter 14.552 No Discharge
Pond 4	9:10 A.M.					No		No Discharge
Pond 1	9:15 A.M.					No		Meter 54.917 No Discharge
Pond 7	9:25 A.M					No		No Discharge
Outfall 10	9:30 A.M					No		No Discharge

NEW ELK MINE HYDROLOGIC NITORING FIELD REPORT

DATE: 9-01-2017 WEATHER: Cloudy 52°F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	6:40 A.m					~~Yes~~ No	Jim Begano	Pond 8 Discharging Meter @ 6:40 A.M 16.042 received 2.8" Rain in less than 24 Hours.
Pond 4	6:55 A.M.					No		No Discharge
Pond 1	7:05 A.M.					No		Meter 54.917 No Discharge
Pond 7	7:10 A.M.					No		No Discharge
Out fall 10;	7:20 A.M.					No		Discharged during the night not discharging Now

NEW ELK MINE HYDROLOGIC NITORING FIELD REPORT

DATE: 9-1-17 WEATHER: Cloudy 77° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	2:05 P.M		8.79	327 µS	16.7°C	Yes	Jim Begano	Pond 8 is still discharging Meter 16.043 HAS discharged 655,059 gal. @ 2:05 P.M

NEW ELK MINE HYDROLOGIC `NITORING FIELD REPORT

DATE: 9-2-11 WEATHER: Sunny 72°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	8:40 A.M					No		Meter 16.043 No Discharge
Pond 4	8:55 A.M.					No		No Discharge
Pond 7	9:05 A.M.					No		No Discharge
Out Fall 10	9:10 A.M					No		No Discharge

NEW ELK MINE HYDROLOGIC NITORING FIELD REPORT

DATE: 9-3-17 WEATHER: Sunny 68°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	6:55 A.M.					No		Meter 16.043 No Discharge
Pond 4	7:10 A.M.					No		No Discharge
Pond 7	7:20 A.M.					No		No Discharge
Out Fall 10	7:25 A.M.					No		No Discharge

NEW ELK MINE HYDROLOGIC ' NITORING FIELD REPORT

DATE: 9/4/2017 WEATHER: Sunny 68°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	7:35 A.M.					No		Meter 16.043 No Discharge
Pond 4	7:40 A.M.					No		No Discharge
Pond 7	7:50 A.M.					No		No Discharge
Outfall 10	7:55 A.M.					No		No Discharge

NEW ELK MINE HYDRO GIC MONITORING FIELD REPORT

DATE: Sept. 5, 2017 WEATHER: Cloudy 64°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	8:05 A.M.					No		Meter 16.043 No Discharge
Pond 4	8:15 A.M.					No		No Discharge
Pond 1	8:20 A.M.							Meter 54.927 No Discharge
Pond 7	8:30 A.M.					No		No Discharge
Out Fall 10	8:35 A.M.					No		No Discharge

NEW ELK MINE HYDRO[illegible]IC MONITORING FIELD REPORT

DATE: 9-12-17 WEATHER: Sunny 64°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	8:30 A.M.					No		Meter 16.043 No Discharge
X	X							Pumping Pond 8 into Pond 6
Pond 4	8:40 A.M.					No		No Discharge Pumping Pond 6 to Pond 4
Pond 1	8:50 A.M.					No		Meter 54.927 No Discharge
Pond 7	8:58 A.M.					No		No Discharge
Out Fall 10	9:05 A.M.					No		No Discharge

NEW ELK MINE HYDRO `IC MONITORING FIELD REPORT

DATE: Sept. 19, 2017 WEATHER: Cloudy

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	8:15 A.M.					No		No Discharge Meter 16.043
Pond 4	8:24 A.M.					No		No Discharge
Pond 1	8:35 A.M.					No		Meter = 54.927 No Discharge
Pond 7	8:48 A.M.					No		No Discharge
Out Fall 10	8:54 A.M.					No		No Discharge

NEW ELK MINE HYDRO[illegible]IC MONITORING FIELD REPORT

DATE: SEPT. 20, 2017 WEATHER: SUNNY 44° F.

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
TH 201	7:15 A.M.	44.9'	–	–	–	No	–	Measurement consistent with previous readings.
TH 202	7:38 A.M.	69.6'	–	–	–	No	–	Measurement slightly higher but within normal.
TH 203	7:58 A.M.	93.3'	–	–	–	No	–	Measurement consistent with previous readings.

NEW ELK MINE HYDRO IC MONITORING FIELD REPORT

DATE: Sept. 27, 2017 WEATHER: Rainy 49°

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Out Fall 10	8:15 A.M.					No		No Discharge
Pond 7	8:20 A.M					NO		No Discharge Water close to emergency Spillway
Pond 1	8:35 A.M.					No		Meter = 54.927 No Discharge
Pond 4	8:45 A.M.					No		No Discharge
Pond 8	8:58 A.M.					No		No Discharge Meter = 16.043
X	Y							Only a few inches from decant

NEW ELK MINE HYDROL C MONITORING FIELD REPORT

DATE: Sept. 28, 2017 WEATHER: Rainy

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	7:20 A.M.	—	—	—	—	No	—	Pond 8 close to discharge and it is still raining Meter = 16.043
Pond 4	7:38 A.M	—	—	—	—	No	—	No Discharge
Pond 1	7:45 A.M.	—	—	—	—	No	—	No Discharge Meter = 54.927
Pond 7	8:00 A.M.	—	—	—	—	No	—	Water at emergency spill way ready to discharge
Out Fall 10	8:20 A.M.	—	—	—	—	No	—	No Discharge

NEW ELK MINE HYDRO IC MONITORING FIELD REPORT

DATE: Sept. 28, 2017 WEATHER: Rainy (Heavy) 46° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 7	9:30 A.M.	—	—	—	—	No	—	Pond 7 has discharged over emergency spill way. Notified Eric Mink of CDPHE @ 11:48 agreed to open main spillway.
X								
X								Opened spill way @ 12:12 Meter = 0.066
Pond 8	10:45 A.M.	—	—	—	—	No	—	Pond 8 has started discharging. Eric Mink of CDPHE Notified @ 11:48 A.M Meter = 16.043
X								
Pond 7	1:40 P.M.	—	8.7	246	12.4°C	Yes	Jim Begano	Main Spillway discharging Sample taken sent to ACZ Labs.
Pond 8	1:55 P.M.	—	8.81	232	11.4°C	Yes	Jim Begano	Pond 8 Not Discharging Took sample sent to ACZ Labs Pumping Pond 8 to Pond 6
X								Meter = 16.240

NEW ELK MINE HYDROL 'C MONITORING FIELD REPORT

DATE: Sept. 29, 2017 WEATHER: Rainy 47°F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 7	8:07 A.M.	—	—	—	—	No	—	Still discharging @ main spillway Water still @ dangerous level. Rain still falling.
X								
Pond 8	8:40 A.M.	—	—	—	—	No	—	Pond 8 Not discharging still pumping Pond 8 into Pond 6. Meter = 16.240
X								
Pond 4	8:56 A.M.	—	—	—	—	No	—	No Discharge
Pond 1	9:05 A.M	—	—	—	—	N	—	No Discharge

NEW ELK MINE HYDROL 'C MONITORING FIELD REPORT

DATE: Sept 30, 2017 WEATHER: Partly Cloudy 56°F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	8:36 A.M.	—	—	—	—	No	—	Not discharging Meter = 16.240
X								Water is 5inches below decant. Still pumping Pond 8 to Pond 6
Pond 7	9:04 A.M.	—	—	—	—	No	—	Still discharging from main spillway. Meter = 6.089 Decant not visible.

NEW ELK MINE HYDROL 'C MONITORING FIELD REPORT

DATE: Oct. 1, 2017 WEATHER: Sunny 63° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 8	10:33 A.M.	—	—	—	—	No	—	No Discharge Meter = 16.240 18" Below Decant Pumping into Pond 6
Pond 7	10:53 A.M.	—	—	—	—	No	—	Discharging Main Spillway Meter = 8.906
Pond 4	10:45 A.M.	—	—	—	—	No	—	No Discharge
Pond 1	11:05 A.M.	—	—	—	—	No	—	No Discharge Meter = 54.927
Out Fall 10	10:57 A.M.	—	—	—	—	No	—	No Discharge

NEW ELK MINE HYDROL 'C MONITORING FIELD REPORT

DATE: Oct. 2, 2017 WEATHER: Sunny 58° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 7	9:05 A.M.	—	—	—	—	No	—	Pond 7 Discharging main spillway
Out Fall 10	8:50 A.M.	—	—	—	—	No	—	No Discharge
Pond 1	9:20 A.M.	—	—	—	—	No	—	No Discharge Meter = 54.928
Pond 4	9:28 A.M.	—	—	—	—	No	—	No Discharge
Pond 8	9:41 A.M.	—	—	—	—	No	—	No Discharge Meter = 16.240
Pond 7	2:30 P.M.	—	8.69	~~248~~	~~12.3~~ 12.3° C	Yes	Jim Begano	Discharging Sample sent to GEI Labs.

NEW ELK MINE HYDROL 'C MONITORING FIELD REPORT

DATE: Oct. 3, 2017 WEATHER: Cloudy 46° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
Pond 7	8:20 A.M.	—	—	—	—	No	—	No Discharge meter = 10.643 Pond @ safe Level
Out Fall 10	8:33 A.M.	—	—	—	—	No	—	No Discharge
Pond 1	8:45 A.M.	—	—	—	—	No	—	No Discharge meter = 54.928
Pond 4	8:57 A.M.	—	—	—	—	No	—	No Discharge
Pond 8	9:10 A.M.	—	—	—	—	No	—	No Discharge meter = 16.240

NEW ELK MINE HYDRO' IC MONITORING FIELD REPORT

DATE: Nov. 13, 2017 WEATHER: Clear

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
PRS1	13:42		8.47	355 µS	9.1°C	Y	Jim Begeno	50 ft / 25 sec. 20 ft. wide 8.5 inch deep
PRS4	14:15		8.74	341 µS	8.8°C	Y	Jim Begeno	50 ft / 20 sec. 17.5 ft wide 9 inch deep

NEW ELK MINE HYDRO! 'C MONITORING FIELD REPORT

DATE: Nov. 16, 2017 WEATHER: Fair / Windy

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
TH01	12:20 P.M.	42.2'	—	—	—	No	—	
TH02	12:20 P.M.	69.6'	-	—	—	No	—	
TH03	12:20 P.M	93.3'	-	—	-	No	—	

NEW ELK MINE HYDROL C MONITORING FIELD REPORT

DATE: 12-5-2017 WEATHER: Sunny 31° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
PAW 1	14:05	7.4'	8.10	255 µS	9.4°C	Yes	Jim Begano	Annual Test sample sent to ACZ Labs
PAW 9	13:28	15.6'	7.33	1020 µS	12.4°C	Yes	Jim Begano	Annul Test sample sent to ACZ Labs

NEW ELK MINE HYDROLOG MONITORING FIELD REPORT

DATE: 12-14-17 WEATHER: Cloudy Lt. Snow 28°F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
PAW 28	14:10	16.9'	7.59	1668 uS	11.1°C	Yes	Jim Begeno	Sent to ACZ Labs for analysis.
New 2	14:25	355.1'	7.86	50.4 uS	15.1°C	Yes	Jim Begeno	Sent to ACZ Labs for analysis

NEW ELK MINE HYDROLOG' MONITORING FIELD REPORT

DATE: WEATHER:

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
New 4	13:00	361.0'	8.37	2.11 mS	16.8°C	Yes	Jim Begano	Sent to ACZ Labs for Analysis
PAW-8	13:28	33.2'	7.38	1880 uS	11.8°C	Yes	Jim Begano	Sent to ACZ Labs for Anaysis