



TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC.

HEADQUARTERS: P.O. BOX 33695 DENVER, COLORADO 80233-0695 303-452-6111

January 23, 2019

VIA Electronic Mail: brock.bowles@state.co.us

Mr. Brock Bowles
Division of Reclamation, Mining, & Safety
Coal Program Support Staff
1313 Sherman Street, RM 215
Denver, Colorado 80203

RE: December 2018 Discharge Monitoring Report Submittal
CDPS Permit #CO-0000213
Elk Ridge Mining and Reclamation, New Horizon Mine
DRMS Mine Permit #C-1981-008

Dear Mr. Bowles:

Enclosed are the Discharge Monitoring Reports (DMR) for the Elk Ridge Mining and Reclamation, LLC, New Horizon Mine CDPS Permit No. CO-0000213 for December 2018. Tri-State Generation and Transmission Association, Inc. (Tri-State) is the parent to Elk Ridge Mining and Reclamation. The enclosed December DMRs were submitted electronically through the EPA's NetDMR program.

If you have any questions about the enclosed reports, please contact Darlene Crosby at 303-254-3055.

Sincerely,

Daniel J. Casiraro
Senior Manager
Environmental Services

DJC:DC:

Enclosures

cc: Darlene Crosby (via email)
Tom Fry (via email)
Chantell Johnson (via email)
File G474-11.3(10)a-9a

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

A Touchstone Energy® Cooperative



CRAIG STATION
P.O. BOX 1307
CRAIG, CO 81626-1307
970-824-4411

ESCALANTE STATION
P.O. BOX 577
PREWITT, NM 87045
505-972-5200

NUCLA STATION
P.O. BOX 698
NUCLA, CO 81424-0698
970-864-7316

From: netdmr-notification@epa.gov
To: [Crosby, Darlene](#); [Johnson, Chantell](#); [Walz, Barbara](#)
Subject: [EXTERNAL] NetDMR DMR(s) Submittal Passed for: CO0000213
Date: Friday, January 25, 2019 8:30:11 AM

The following signed 10 DMR(s) were submitted to EPA and were successfully processed:

CDX Transaction ID: _55a9c983-fad6-45aa-8b46-4d8deb8e6a05
User ID: BARBARAWALZ1
Timestamp: 01/25/2019 09:47:01

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 012
Discharge: A - SR and Mine Drainage to Tuttle Draw
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 012
Discharge: Q - Quarterly Monitoring for 012A
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 012
Discharge: S - Semi-Annual Monitoring for 012A
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 013
Discharge: A - SR & Mine Drainage to Tuttle Draw
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 013
Discharge: Q - Quarterly Monitoring for 013A
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 013
Discharge: S - Semi-Annual Monitoring for 013A
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 013
Discharge: X - CHRONIC WET TESTING FOR 013A
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213

Permitted Feature: 016
Discharge: A - SR & Mine Drainage Tributary to Tuttle Draw
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 016
Discharge: Q - Quarterly Monitoring for 016A
Monitoring Period End Date: 12/31/18

Permitted Facility Name: NEW HORIZON MINE
Permit ID: CO0000213
Permitted Feature: 016
Discharge: S - Semi-Annual Monitoring for 016A
Monitoring Period End Date: 12/31/18

Thank you.

This notification was sent from the Colorado instance of "Production NetDMR" the official NPDES reporting environment for Colorado clean water discharge permits

DMR Copy of Record

Permit

Permit #:

CO0000213

Major:

No

Permittee:

Elk Ridge Mining and Reclamation LLC

Permittee Address:

PO Box 33695
Denver, CO 80233-0695

Facility:

NEW HORIZON MINE

Facility Location:

27646 W 5 AVE
NUCLA, CO 81424

Permitted Feature:

012
External Outfall

Discharge:

012-A
SR and Mine Drainage to Tuttle Draw

Report Dates & Status

Monitoring Period:

From 12/01/18 to 12/31/18

DMR Due Date:

01/28/19

Status:

NetDMR Validated

Considerations for Form Completion

TSS & Fe limits will be waived & settleable solids limit applied for 10YR/24HR precip event - see pp 8-9 for requirements.

Principal Executive Officer

First Name:

Barbara

Last Name:

Walz

Title:

SVP, Policy and Compliance, CCO

Telephone:

303-452-6111

No Data Indicator (NODI)

Form NODI:

--

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00400	pH	1 - Effluent Gross	0	--	Sample														02/30 - Twice Per Month	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	9 MAXIMUM	12 - SU			
					Value NODI							C - No Discharge				C - No Discharge				
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample														02/30 - Twice Per Month	GR - GRAB
					Permit Req.								<=	35 30DA AVG	<=	70 MX 7D AV	19 - mg/L			
					Value NODI									C - No Discharge		C - No Discharge				
00980	Iron, total recoverable	1 - Effluent Gross	0	--	Sample														02/30 - Twice Per Month	GR - GRAB
					Permit Req.								<=	3000 30DA AVG	<=	6000 DAILY MX	28 - ug/L			
					Value NODI									C - No Discharge		C - No Discharge				
03582	Oil and grease	1 - Effluent Gross	0	--	Sample														77/77 - Contingent	GR - GRAB
					Permit Req.										<=	10 INST MAX	19 - mg/L			
					Value NODI											C - No Discharge				
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Sample														01/30 - Monthly	IN - INSTAN
					Permit Req.	<=	1.09 30DA AVG		Req Mon DAILY MX	03 - MGD										
					Value NODI		C - No Discharge		C - No Discharge											
84066	Oil and grease visual	1 - Effluent Gross	0	--	Sample														01/07 - Weekly	VI - VISUAL
					Permit Req.				Req Mon INST MAX	9P - N=0;Y=1										
					Value NODI				C - No Discharge											

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:

dcrosby@tristategt.org

Name:

Darlene Crosby

E-Mail:

dcrosby@tristategt.org

Date/Time:

2019-01-21 11:38 (Time Zone: -07:00)

Report Last Signed By

User:

BARBARAWALZ1

Name:

Barbara Walz

E-Mail:

bwalz@tristategt.org

Date/Time:

2019-01-25 07:47 (Time Zone: -07:00)

DMR Copy of Record

Permit

Permit #:

CO0000213

Major:

No

Permittee:

Elk Ridge Mining and Reclamation LLC

Permittee Address:

PO Box 33695
Denver, CO 80233-0695

Facility:

NEW HORIZON MINE

Facility Location:

27646 W 5 AVE
NUCLA, CO 81424

Permitted Feature:

012
External Outfall

Discharge:

012-Q
Quarterly Monitoring for 012A

Report Dates & Status

Monitoring Period:

From 10/01/18 to 12/31/18

DMR Due Date:

01/28/19

Status:

NetDMR Validated

Considerations for Form Completion

Quarterly monitoring - see Appendix B, #29, pg 43.

Principal Executive Officer

First Name:

Barbara

Last Name:

Walz

Title:

SVP, Policy and Compliance, CCO

Telephone:

303-452-6111

No Data Indicator (NODI)

Form NODI:

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Edit Check Errors

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Comments

Attachments

No attachments.

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Elk Ridge Mining and Reclamation LLC

User:

dcrosby@tristategt.org

Name:

Darlene Crosby

E-Mail:

dcrosby@tristategt.org

Date/Time:

2019-01-21 11:38 (Time Zone: -07:00)

Report Last Signed By

BARBARAWALZ1

User:

BARBARAWALZ1

Name:

Barbara Walz

E-Mail:

bwalz@tristategt.org

Date/Time:

2019-01-25 07:47 (Time Zone: -07:00)

DMR Copy of Record

Permit

Permit #:CO0000213

Major:No

Permitted Feature:012
External Outfall

Permittee:Elk Ridge Mining and Reclamation LLC

Permittee Address:PO Box 33695
Denver, CO 80233-0695

Discharge:**012-S**
Semi-Annual Monitoring for 012A

Facility:NEW HORIZON MINE

Facility Location:27646 W 5 AVE
NUCLA, CO 81424

Report Dates & Status

Monitoring Period:From 07/01/18 to 12/31/18

DMR Due Date:01/28/19

Status:NetDMR Validated

Considerations for Form Completion

Principal Executive Officer

First Name:Barbara

Last Name:Walz

Title:SVP, Policy and Compliance, CCO

Telephone:303-452-6111

No Data Indicator (NODI)

Form NODI:--

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration						# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units		
01303	Zinc, potentially dissolved	1 - Effluent Gross	0	--	Sample													02/YR - Twice Per Year	GR - GRAB
					Permit Req.									Req Mon 30DA AVG		Req Mon DAILY MX	28 - ug/L		
					Value NODI									C - No Discharge		C - No Discharge			
04262	Chromium, trivalent total recoverable	1 - Effluent Gross	0	--	Sample													02/YR - Twice Per Year	GR - GRAB
					Permit Req.											Req Mon DAILY MX	28 - ug/L		
					Value NODI											C - No Discharge			
50092	Mercury, total low level	1 - Effluent Gross	0	--	Sample													02/YR - Twice Per Year	GR - GRAB
					Permit Req.											Req Mon DAILY MX	28 - ug/L		
					Value NODI											C - No Discharge			
51202	Sulfide-hydrogen sulfide [undissociated]	1 - Effluent Gross	0	--	Sample													02/YR - Twice Per Year	GR - GRAB
					Permit Req.											Req Mon DAILY MX	19 - mg/L		
					Value NODI											C - No Discharge			

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:dcrosby@tristategt.org

Name:Darlene Crosby

E-Mail:dcrosby@tristategt.org

Date/Time:2019-01-21 11:38 (Time Zone: -07:00)

Report Last Signed By

User:BARBARAWALZ1

Name:Barbara Walz

E-Mail:bwalz@tristategt.org

Date/Time:2019-01-25 07:47 (Time Zone: -07:00)

DMR Copy of Record

Permit

Permit #:

CO0000213

Major:

No

Permittee:

Elk Ridge Mining and Reclamation LLC

Permittee Address:

PO Box 33695
Denver, CO 80233-0695

Facility:

NEW HORIZON MINE

Facility Location:

27646 W 5 AVE
NUCLA, CO 81424

Permitted Feature:

013
External Outfall

Discharge:

013-A
SR & Mine Drainage to Tuttle Draw

Report Dates & Status

Monitoring Period:

From 12/01/18 to 12/31/18

DMR Due Date:

01/28/19

Status:

NetDMR Validated

Considerations for Form Completion

TSS & Fe limits will be waived & settleable solids limit applied for 10YR/24HR precip event - see pg 7 for requirements.

Principal Executive Officer

First Name:

Barbara

Last Name:

Walz

Title:

SVP, Policy and Compliance, CCO

Telephone:

303-452-6111

No Data Indicator (NODI)

Form NODI: --

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading				Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type	
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00400	pH	1 - Effluent Gross	0	--	Sample						=	6.7			=	7.74	12 - SU		01/07 - Weekly	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	9 MAXIMUM	12 - SU	0	02/30 - Twice Per Month	GR - GRAB
					Value NODI															
00978	Arsenic, total recoverable	1 - Effluent Gross	0	--	Sample								=	0.7			28 - ug/L		03/30 - Three Per Month	GR - GRAB
					Permit Req.									Req Mon 30DA AVG			28 - ug/L	0	02/30 - Twice Per Month	GR - GRAB
					Value NODI															
00980	Iron, total recoverable	1 - Effluent Gross	0	--	Sample								=	925	=	1080	28 - ug/L		03/30 - Three Per Month	GR - GRAB
					Permit Req.								<=	3000 30DA AVG	<=	6000 DAILY MX	28 - ug/L	0	02/30 - Twice Per Month	GR - GRAB
					Value NODI															
01303	Zinc, potentially dissolved	1 - Effluent Gross	0	--	Sample								=	7	=	22	28 - ug/L		03/30 - Three Per Month	GR - GRAB
					Permit Req.									Req Mon 30DA AVG		Req Mon DAILY MX	28 - ug/L	0	02/30 - Twice Per Month	GR - GRAB
					Value NODI															
01319	Manganese, potentially dissolvd	1 - Effluent Gross	0	--	Sample								=	833	=	970	28 - ug/L		03/30 - Three Per Month	GR - GRAB
					Permit Req.								<=	4120 30DA AVG	<=	4738 DAILY MX	28 - ug/L	0	01/30 - Monthly	GR - GRAB
					Value NODI															
01323	Selenium, potentially dissolvd	1 - Effluent Gross	0	--	Sample								<	0.5	<	0.5	28 - ug/L		03/30 - Three Per Month	GR - GRAB
					Permit Req.								<=	26 30DA AVG	<=	26 DAILY MX	28 - ug/L	0	02/30 - Twice Per Month	GR - GRAB
					Value NODI															
03582	Oil and grease	1 - Effluent Gross	0	--	Sample															
					Permit Req.										<=	10 INST MAX	19 - mg/L		77/77 - Contingent	GR - GRAB
					Value NODI											9 - Conditional Monitoring - Not Required This Period				
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Sample	=	0.73	=	0.819	03 - MGD									01/01 - Daily	IN - INSTAN
					Permit Req.	<=	1.44 30DA AVG		Req Mon DAILY MX	03 - MGD								0	01/30 - Monthly	IN - INSTAN
					Value NODI															
84066	Oil and grease visual	1 - Effluent Gross	0	--	Sample			=	0	AB - abst=0;prst=1									01/07 - Weekly	VI - VISUAL
					Permit Req.				Req Mon INST MAX	AB - abst=0;prst=1								0	02/30 - Twice Per Month	VI - VISUAL
					Value NODI															

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:

dcrosby@tristategt.org

Name:

Darlene Crosby

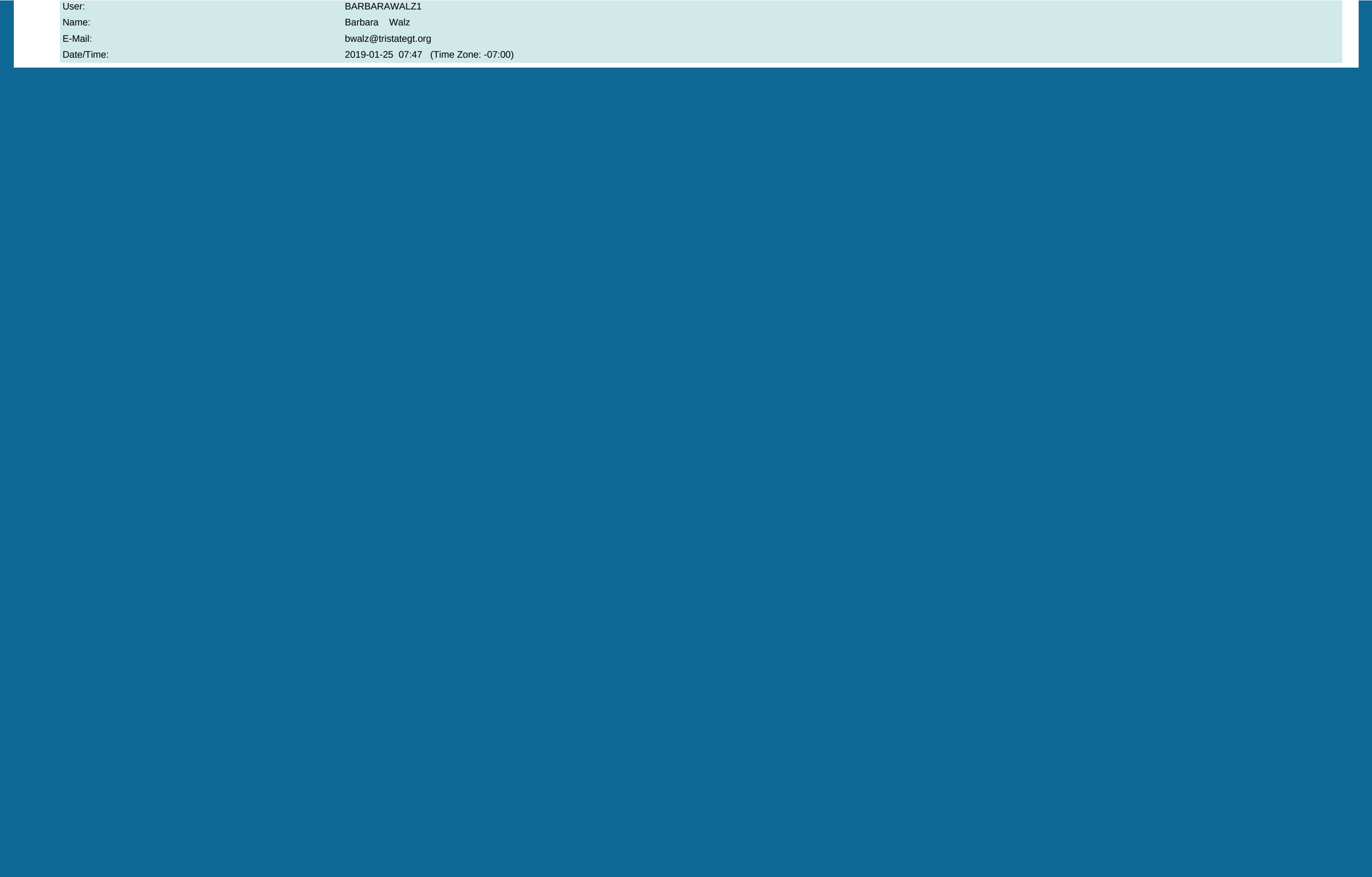
E-Mail:

dcrosby@tristategt.org

Date/Time:

2019-01-21 11:38 (Time Zone: -07:00)

Report Last Signed By



DMR Copy of Record

Permit

Permit #:

CO0000213

Major:

No

Permittee:

Elk Ridge Mining and Reclamation LLC

Permittee Address:

PO Box 33695
Denver, CO 80233-0695

Facility:

NEW HORIZON MINE

Facility Location:

27646 W 5 AVE
NUCLA, CO 81424

Permitted Feature:

013
External Outfall

Discharge:

013-Q
Quarterly Monitoring for 013A

Report Dates & Status

Monitoring Period:

From 10/01/18 to 12/31/18

DMR Due Date:

01/28/19

Status:

NetDMR Validated

Considerations for Form Completion

Quarterly Monitoring - see Appendix B, #29, pg 43

Principal Executive Officer

First Name:

Barbara

Last Name:

Walz

Title:

SVP, Policy and Compliance, CCO

Telephone:

303-452-6111

No Data Indicator (NODI)

Form NODI:

--

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

TSS frequency of analysis: October: 2/30; November: 2/30; December: 3/30

Attachments

No attachments.

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:

dcrosby@tristategt.org

Name:

Darlene Crosby

E-Mail:

dcrosby@tristategt.org

Date/Time:

2019-01-21 11:38 (Time Zone: -07:00)

Report Last Signed By

BARBARAWALZ1

User:

BARBARAWALZ1

Name:

Barbara Walz

E-Mail:

bwalz@tristategt.org

Date/Time:

2019-01-25 07:47 (Time Zone: -07:00)

DMR Copy of Record

Permit

Permit #:

CO0000213

Major:

No

Permittee:

Elk Ridge Mining and Reclamation LLC

Permittee Address:

PO Box 33695
Denver, CO 80233-0695

Facility:

NEW HORIZON MINE

Facility Location:

27646 W 5 AVE
NUCLA, CO 81424

Permitted Feature:

013
External Outfall

Discharge:

013-S
Semi-Annual Monitoring for 013A

Report Dates & Status

Monitoring Period:

From 07/01/18 to 12/31/18

DMR Due Date:

01/28/19

Status:

NetDMR Validated

Considerations for Form Completion

Principal Executive Officer

First Name:

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Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:

dcrosby@tristategt.org

Name:

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Name:

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E-Mail:

bwalz@tristategt.org

Date/Time:

2019-01-25 07:47 (Time Zone: -07:00)

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Permit

Permit #:

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Permittee:

Elk Ridge Mining and Reclamation LLC

Permittee Address:

PO Box 33695
Denver, CO 80233-0695

Facility:

NEW HORIZON MINE

Facility Location:

27646 W 5 AVE
NUCLA, CO 81424

Permitted Feature:

013
External Outfall

Discharge:

013-X
CHRONIC WET TESTING FOR 013A

Report Dates & Status

Monitoring Period:

From 10/01/18 to 12/31/18

DMR Due Date:

01/28/19

Status:

NetDMR Validated

Considerations for Form Completion

See Part I.D.1 of permit for details of test procedure. Report NOEC using test code "S". Report IC25 using test code "P". Report highest number between "P" and "S" at "T" for each parameter. IWC=100%.

Principal Executive Officer

First Name:

Barbara

Last Name:

Walz

Title:

SVP, Policy and Compliance, CCO

Telephone:

303-452-6111

No Data Indicator (NODI)

Form NODI:

--

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration					# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units	
TKP3B	Static Renewal 7 Day Chronic Ceriodaphnia dubia	P - See Comments	4	--	Sample						=	47.8					2G - tox chronic	0
					Permit Req.							Req Mon SINGSAMP					2G - tox chronic	
					Value NODI													
TKP3B	Static Renewal 7 Day Chronic Ceriodaphnia dubia	S - See Comments	4	--	Sample						=	60					2G - tox chronic	0
					Permit Req.							Req Mon MN VALUE					2G - tox chronic	
					Value NODI													
TKP3B	Static Renewal 7 Day Chronic Ceriodaphnia dubia	T - See Comments	4	--	Sample						=	60					2G - tox chronic	0
					Permit Req.							Req Mon MN VALUE					2G - tox chronic	
					Value NODI													
TKP6C	Static Renewal 7 Day Chronic Pimephales promelas	P - See Comments	4	--	Sample						>	100					2G - tox chronic	0
					Permit Req.							Req Mon SINGSAMP					2G - tox chronic	
					Value NODI													
TKP6C	Static Renewal 7 Day Chronic Pimephales promelas	S - See Comments	4	--	Sample						=	100					2G - tox chronic	0
					Permit Req.							Req Mon MN VALUE					2G - tox chronic	
					Value NODI													
TKP6C	Static Renewal 7 Day Chronic Pimephales promelas	T - See Comments	4	--	Sample						>	100					2G - tox chronic	0
					Permit Req.							Req Mon MN VALUE					2G - tox chronic	
					Value NODI													

Submission Note

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Edit Check Errors

No errors.

Comments

On December 20, 2018, Tri-State notified WQCD of Quarter 4 WET test results for Outfall 013, and initiated a targeted Toxicity Identification Evaluation (see attached).

Attachments

Name	Type	Size
181220_NHM_Notification_of_WET_Results_TIE_Evaluation_Walz_to_Mink.pdf	pdf	5865529
NH2_CDPS_CO0000213_Outfall013_WETresults_December2018_COC.pdf	pdf	919596

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:

dcrosby@tristategt.org

Name:

Darlene Crosby

E-Mail:

dcrosby@tristategt.org

Date/Time:

2019-01-21 11:38 (Time Zone: -07:00)

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Name:

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bwalz@tristategt.org

Date/Time:

2019-01-25 07:47 (Time Zone: -07:00)

DMR Copy of Record

Permit

Permit #:

CO0000213

Major:

No

Permittee:

Elk Ridge Mining and Reclamation LLC

Permittee Address:

PO Box 33695
Denver, CO 80233-0695

Facility:

NEW HORIZON MINE

Facility Location:

27646 W 5 AVE
NUCLA, CO 81424

Permitted Feature:

016
External Outfall

Discharge:

016-A
SR & Mine Drainage Tributary to Tuttle Draw

Report Dates & Status

Monitoring Period:

From 12/01/18 to 12/31/18

DMR Due Date:

01/28/19

Status:

NetDMR Validated

Considerations for Form Completion

TSS & Fe limits will be waived & settleable solids limits applied for 10YR/24HR precip event - see pp 8-9 for requirements.

Principal Executive Officer

First Name:

Barbara

Last Name:

Walz

Title:

SVP, Policy and Compliance, CCO

Telephone:

303-452-6111

No Data Indicator (NODI)

Form NODI:

--

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration							# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units			
00400	pH	1 - Effluent Gross	0	--	Sample														02/30 - Twice Per Month	GR - GRAB
					Permit Req.						>=	6.5 MINIMUM			<=	9 MAXIMUM	12 - SU			
					Value NODI							C - No Discharge				C - No Discharge				
00530	Solids, total suspended	1 - Effluent Gross	0	--	Sample														02/30 - Twice Per Month	GR - GRAB
					Permit Req.								<=	35 5 DA AVG	<=	70 MX 7D AV	19 - mg/L			
					Value NODI									C - No Discharge		C - No Discharge				
00980	Iron, total recoverable	1 - Effluent Gross	0	--	Sample														02/30 - Twice Per Month	GR - GRAB
					Permit Req.								<=	3000 30DA AVG	<=	6000 DAILY MX	28 - ug/L			
					Value NODI									C - No Discharge		C - No Discharge				
50050	Flow, in conduit or thru treatment plant	1 - Effluent Gross	0	--	Sample														01/30 - Monthly	IN - INSTAN
					Permit Req.	<=	3.123 30DA AVG		Req Mon DAILY MX 03 - MGD											
					Value NODI		C - No Discharge		C - No Discharge											

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:

dcrosby@tristategt.org

Name:

Darlene Crosby

E-Mail:

dcrosby@tristategt.org

Date/Time:

2019-01-21 11:38 (Time Zone: -07:00)

Report Last Signed By

BARBARAWALZ1

User:

BARBARAWALZ1

Name:

Barbara Walz

E-Mail:

bwalz@tristategt.org

Date/Time:

2019-01-25 07:47 (Time Zone: -07:00)

DMR Copy of Record

Permit

Permit #:

CO0000213

Major:

No

Permittee:

Elk Ridge Mining and Reclamation LLC

Permittee Address:

PO Box 33695
Denver, CO 80233-0695

Facility:

NEW HORIZON MINE

Facility Location:

27646 W 5 AVE
NUCLA, CO 81424

Permitted Feature:

016
External Outfall

Discharge:

016-Q
Quarterly Monitoring for 016A

Report Dates & Status

Monitoring Period:

From 10/01/18 to 12/31/18

DMR Due Date:

01/28/19

Status:

NetDMR Validated

Considerations for Form Completion

Quarterly monitoring - see Appendix B, #29, pg 43.

Principal Executive Officer

First Name:

Barbara

Last Name:

Walz

Title:

SVP, Policy and Compliance, CCO

Telephone:

303-452-6111

No Data Indicator (NODI)

Form NODI:

--

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:

dcrosby@tristategt.org

Name:

Darlene Crosby

E-Mail:

dcrosby@tristategt.org

Date/Time:

2019-01-21 11:38 (Time Zone: -07:00)

Report Last Signed By

BARBARAWALZ1

User:

BARBARAWALZ1

Name:

Barbara Walz

E-Mail:

bwalz@tristategt.org

Date/Time:

2019-01-25 07:47 (Time Zone: -07:00)

DMR Copy of Record

Permit

Permit #:CO0000213

Major:No

Permitted Feature:016
External Outfall

Permittee:Elk Ridge Mining and Reclamation LLC

Permittee Address:PO Box 33695
Denver, CO 80233-0695

Discharge:**016-S**
Semi-Annual Monitoring for 016A

Facility:NEW HORIZON MINE

Facility Location:27646 W 5 AVE
NUCLA, CO 81424

Report Dates & Status

Monitoring Period:From 07/01/18 to 12/31/18

DMR Due Date:01/28/19

Status:NetDMR Validated

Considerations for Form Completion

Principal Executive Officer

First Name:Barbara

Last Name:Walz

Title:SVP, Policy and Compliance, CCO

Telephone:303-452-6111

No Data Indicator (NODI)

Form NODI:--

Parameter		Monitoring Location	Season #	Param. NODI		Quantity or Loading					Quality or Concentration						# of Ex.	Frequency of Analysis	Sample Type
Code	Name					Qualifier 1	Value 1	Qualifier 2	Value 2	Units	Qualifier 1	Value 1	Qualifier 2	Value 2	Qualifier 3	Value 3	Units		
01303	Zinc, potentially dissolved	1 - Effluent Gross	0	--	Sample													02/YR - Twice Per Year	GR - GRAB
					Permit Req.									Req Mon 30DA AVG		Req Mon DAILY MX	28 - ug/L		
					Value NODI									C - No Discharge		C - No Discharge			
04262	Chromium, trivalent total recoverable	1 - Effluent Gross	0	--	Sample													02/YR - Twice Per Year	GR - GRAB
					Permit Req.											Req Mon DAILY MX	28 - ug/L		
					Value NODI											C - No Discharge			
50092	Mercury, total low level	1 - Effluent Gross	0	--	Sample													02/YR - Twice Per Year	GR - GRAB
					Permit Req.											Req Mon DAILY MX	28 - ug/L		
					Value NODI											C - No Discharge			
51202	Sulfide-hydrogen sulfide [undissociated]	1 - Effluent Gross	0	--	Sample													02/YR - Twice Per Year	GR - GRAB
					Permit Req.											Req Mon DAILY MX	19 - mg/L		
					Value NODI											C - No Discharge			

Submission Note

If a parameter row does not contain any values for the Sample nor Effluent Trading, then none of the following fields will be submitted for that row: Units, Number of Excursions, Frequency of Analysis, and Sample Type.

Edit Check Errors

No errors.

Comments

Attachments

No attachments.

Report Last Saved By

Elk Ridge Mining and Reclamation LLC

User:dcrosby@tristategt.org

Name:Darlene Crosby

E-Mail:dcrosby@tristategt.org

Date/Time:2019-01-21 11:38 (Time Zone: -07:00)

Report Last Signed By

User:BARBARAWALZ1

Name:Barbara Walz

E-Mail:bwalz@tristategt.org

Date/Time:2019-01-25 07:47 (Time Zone: -07:00)

**TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC.**

HEADQUARTERS: P.O. BOX 33695 DENVER, COLORADO 80233-0695 303-452-6111

December 20, 2018

Submitted via email eric.mink@state.co.us

Mr. Eric Mink
Water Quality Control Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

RE: CDPS Permit #CO-0000213
New Horizon Mine (Outfall 013)
Notification of 4th Quarter Chronic WET Results for Outfall 013 and
Commencement of a TIE (targeted)

Dear Mr. Mink:

On December 13, 2018, the third party laboratory, The Seacrest Group, provided the enclosed analytical report to Tri-State Generation and Transmission Association (Tri-State) containing the fourth quarter Whole Effluent Toxicity (WET) testing results for Outfall 013 at the Elk Ridge Mining and Reclamation, LLC (Elk Ridge) New Horizon Mine (CDPS Permit #CO-0000213). Tri-State is the parent of Elk Ridge. Therefore, we are providing the required notification of WET results, in accordance with Part I.D.1b of the permit.

Outfall	Species	Reproduction/Growth Results		IWC
		NOEC*	IC25**	
013	<i>Ceriodaphnia dubia</i>	60%	47.8%	100%

*NOEC means “no observed effect concentration” at which concentration there are no observable adverse effects on the organisms.

**IC25 means inhibition concentration causing a 25% reduction in the biological measurement.

The fourth and first quarter WET testing is “report only” at Outfall 013 until September 30, 2020 (delayed effective date). While the NOEC and IC25 are reported, results below the instream waste concentration (IWC) are not a permit violation.

In accordance with the automatic compliance response requirements of the permit and our discussions in September 2018, the facility is planning to commence a targeted Toxicity Identification Evaluation (TIE) for *Ceriodaphnia dubia* for this outfall location. We will report these results to the Division when available and in accordance with the 60-day and 120-day status reports and 180-day final report.

We will also be submitting the initial WET test summary and chains of custody with the December 2018 Discharge Monitoring Report (DMR) by January 28, 2019.





Mr. Eric Mink, WQCD
December 20, 2018
Page 2

If you have any questions on this submittal, please contact Chantell Johnson at 303-254-3185 (cjohnson@tristategt.org) or Chris Gilbreath at 303-254-3291 (cgilbreath@tristategt.org).

Sincerely,

Barbara A. Walz
Senior Vice President
Policy and Compliance
Chief Compliance Officer

BAW:CJ:der

Enclosure

cc: Chris Gilbreath (via email)
Chantell Johnson (via email)
File G474-11.3(10)a-5





December 14, 2018

Mr. Thomas Fry
Elk Ridge Mining and Reclamation
27646 W 5th Ave.
Nucla, CO 81424

Dear Mr. Fry:

Enclosed is the report for chronic biomonitoring tests performed for Elk Ridge Mining and Reclamation on effluent from the New Horizon Mine NPDES 013 discharge. There were statistically significant sublethal toxicity effects to the *Ceriodaphnia dubia* species and significant lethal toxicity to the Fathead minnow species.

If you have any questions or concerns, please do not hesitate to contact me at (303) 661-9324.

Best regards,

Kara Olivarria
Laboratory Supervisor
Enclosure(s): Invoice
Report



500 S Arthur Ave. Suite 450
Louisville, CO 80027-3065
(303) 661-9324 Phone
(303) 661-9325 Fax

Invoice
Invoice Number:
418812.B
Invoice Date:
December 14, 2018

BILL TO:

Elk Ridge Mining and Rec.
27646 W. 5th Ave.
Nucla, CO 81424

Customer Contact	Customer PO#	Terms	Customer ID
Mr. Thomas Fry	NHM 013	Payable Upon Receipt	Elk Ridge

QTY	Description	Unit Price	Extended Price
1	Chronic biomonitoring tests conducted on effluent from the New Horizon Mine 013 discharge using <i>Ceriodaphnia dubia</i> and Fathead Minnow	\$1,905.00	\$1,905.00

Total: \$1,905.00

*All invoices are due and payable upon receipt.
Outstanding balances over 30-days are subject to a finance charge of 1.5% per month.*

THANK YOU FOR YOUR BUSINESS!

**RESULTS OF CHRONIC BIOMONITORING TESTS
CONDUCTED FOR ELK RIDGE MINING AND RECLAMATION
ON THE
NEW HORIZON MINE OUTFALL 013 SITE**

Prepared for:

Mr. Thomas Fry
Elk Ridge Mining and Reclamation
P.O. Box 628
Nucla, CO 81424

Prepared by:

SeaCrest Group
500 S Arthur Ave. Suite 450
Louisville, Colorado 80027-3065
(303) 661-9324

December 14, 2018

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Chronic Toxicity Test Summary

Test:

- 7-day static renewal using *Ceriodaphnia dubia*.
- 7-day static renewal using Fathead minnow (*Pimephales Promelas*).

Client: Elk Ridge Mining and Reclamation

Test Procedure Followed:

- *Ceriodaphnia dubia*: EPA/821/R-02-013. Method 1002.0 (2002)
- Fathead minnow: EPA/821/R-02-013. Method 1000.0 (2002)

Sample Number: 418812.B

Sample	Time of Collection	Date of Collection	Time of Receipt	Date of Receipt
Effluent 1	1130	11-26-2018	1318	11-27-2018
Effluent 2	1155	11-28-2018	1000	11-29-2018
Effluent 3	1010	11-30-2018	1040	12-01-2018

	<i>Ceriodaphnia dubia</i>	Fathead minnow
Test Initiation Time	1500	1610
Test Initiation Date	11-27-2018	11-27-2018
Test Completion Time	1545	1600
Test Completion Date	12-03-2018	12-04-2018

Dilution Water:

- Moderately hard laboratory reconstituted water

Test Organism Source:

- *Ceriodaphnia dubia*
SeaCrest Group
- Fathead minnow
Aquatic Biosystems, Inc.

Reference Toxicant:

- Sodium Chloride/ Potassium Chloride

Abstract of Results

Test Concentrations:	Control (0%), 20%, 40%, 60%, 80%, 100%
Number of Organisms/Concentration:	10 for <i>Ceriodaphnia dubia</i> 40 for Fathead minnow
Replicates at each Concentration:	10 for <i>Ceriodaphnia dubia</i> 4 for Fathead minnow

	<i>Ceriodaphnia dubia</i>	Fathead minnow
Test vessel size	30ml	500ml
Exposure volume	15ml	250ml
Pass/Fail Status	FAIL	FAIL
Temperature Range (°C)	24.1 – 25.6	24.1 – 25.9
Dissolved Oxygen Range (mg/L)	5.5 – 8.4	4.1 – 8.3
pH Range	6.6 – 8.1	6.8 – 8.1
	CONTROL (<i>Cerio</i>/FHM)	100%
Alkalinity (mg/L as CaCO ₃)	57/58	452/470/398
Hardness (mg/L as CaCO ₃)	82/82	2135/2100/1790
Total residual chlorine (mg/L)	<0.01	0.01/<0.01/<0.01
Total ammonia (mg/L as NH ₃)	<0.03	0.97/1.04/1.86

INTRODUCTION

Biomonitoring provides an effective means by which the toxicity of discharges from municipal, industrial and mining operations can be tested. Among the advantages of biomonitoring is the ability to test complex effluents containing a broad range of contaminants. Biomonitoring, when used in conjunction with chemical analyses, can generate data capable of identifying a much wider range of contaminants.

The Colorado Water Quality Control Division requires certain NPDES permittees to perform acute and/or chronic biomonitoring tests. The chronic test measures significant differences in lethality and in reproduction (*Ceriodaphnia dubia*) or growth (Fathead minnow – *Pimephales promelas*) between control and exposed organisms.

The present report discusses the results of chronic biomonitoring tests conducted on effluent from Elk Ridge Mining and Reclamation New Horizon Mine 013 discharge. These tests were conducted in November and December 2018.

MATERIALS AND METHODS

Sample Collection

Four gallons of effluent were collected on three separate dates. Samples were delivered chilled to the SeaCrest lab where they were held at 0-6°C. Chain of custody forms showing sample collection and lab arrival times are included in Appendix 1.

Dilution Water

Laboratory reconstituted water was used as both the dilution water source and the control for the tests. Reconstituted water for the *Ceriodaphnia dubia* test was produced by adding sodium bicarbonate, calcium sulfate, magnesium sulfate, potassium chloride, and sodium selenate to deionized water. Reconstituted water for the Fathead minnow test was produced by adding sodium bicarbonate, calcium sulfate, magnesium sulfate, and potassium chloride to deionized water.

Test Organisms

The biomonitoring tests were conducted with *Ceriodaphnia dubia* and Fathead minnow. *Ceriodaphnia dubia* is cultured in the SeaCrest laboratory. Stock cultures are maintained in 5-gallon aquaria. Brood females are cultured in individual plastic beakers on brood boards for a period of up to 14-days. Neonates less than 24-hours old released from third or subsequent broods of eight or more within an 8-hour period are removed from the brood chambers and used in tests. Brood and stock organisms are fed daily with a mixture of Yeast, Cereal Leaves, and Trout Chow (YCT). This is supplemented with an equal volume of green algae (*Selenastrum capricornutum*).

Less than one-day-old Fathead minnow, cultured in Aquatic BioSystems, Inc., were also used in the test. The larval fish are fed newly hatched Brine shrimp (*Artemia* sp.) at least twice per day.

In-house organisms are tested at least monthly in a reference toxicant test using sodium chloride to monitor overall health and test reproducibility.

Test Procedures

Upon receipt at the lab, samples are analyzed for alkalinity, hardness, conductivity, dissolved oxygen, ammonia, chlorine, and pH. Alkalinity and hardness are determined titrimetrically according to methods described in Hach Chemical Company¹. Ammonia is measured by a Thermo Orion ion-selective electrode according to the procedures in APHA/AWWA/WEF². Conductivity, dissolved oxygen, and pH probes were used to take these measurements.

The test followed the procedures in EPA³ and CDPHE⁴ guidelines. Exposure concentrations included control (0%), 20%, 40%, 60%, 80% and 100% mixtures, diluted with moderately hard laboratory reconstituted water.

Individual *Ceriodaphnia dubia* were placed in 30ml plastic containers containing approximately 15ml of exposure medium. Ten replicates at each concentration were used. The animals were fed daily with the YCT mixture and an equal volume of the green algae (*Selenastrum capricornutum*). The exposure medium was changed daily in each container and the number of young released overnight were counted and recorded. Young were removed from the containers daily and discarded. Routine measurements were made each day of temperature, dissolved oxygen and pH before and after the water changes.

Fathead minnow were exposed in 500ml plastic cups to which 250ml of media was added and replaced daily. Four replicates were used at each concentration. Ten fish, less than 24-hours old, were placed in each cup. The fish were monitored daily for survival and fed live Brine shrimp at least twice per day. After seven days, the fish were removed from the cups, euthanized, and then placed in aluminum pans and dried in an oven for a minimum of six hours at 100°C. The pans were then weighed on a five-place analytical balance to determine the average dry weight of the fish from each replicate.

Data Analysis

Data from the test(s) were analyzed on a personal computer using the TOXCALC package developed by Tidepool Scientific Software. Statistical tests used in the analyses are shown in Table 1. Test acceptability was determined using control survival and performance criteria, concentration-response relationships and percent minimum significant differences (USEPA^{5,6}).

Table 1. Statistics methods used in testing for significant differences in test parameters.

Species	Normality		Homogeneity	
<i>Ceriodaphnia dubia</i>	Kolmogorov Test		Bartlett's Test	
Fathead minnow	Shapiro – Wilk's Test		Bartlett's Test	
Statistical Difference				
	Survival	Growth	Reproduction	IC ₂₅
<i>Ceriodaphnia dubia</i>	Fisher's Exact Test	N/A	Steel's Many-One Rank Test	ICp
Fathead minnow	Steel's Many-One Rank Test	Dunnett's Test	N/A	ICp

RESULTS

Ceriodaphnia dubia Test Results

Test results for the *Ceriodaphnia dubia* are summarized in Table 2 and provided on the data sheets located in Appendix 2. Survival was 100% in the 100% effluent concentration and ranged from 90% - 100% in the remaining effluent concentrations. Control survival was 90%. No statistically significant mortality was measured any effluent concentration when compared to the control. The No Observable Effect Concentration (NOEC) for lethality was 100%. The IC₂₅ for lethality was >100%.

Table 2. Summary of *Ceriodaphnia dubia* test results. Ten animals were exposed at each concentration. An asterisk (*) denotes a statistically significant difference from the control.

Concentration	No. Surviving	Mean Births	Min.	Max.	Control (0%)	Effluent (100%)
Control (0%)	9	23.8	10	31		
20%	10	21.5	15	27		
40%	10	19.6	11	25		
60%	10	15.1	4	20		
80%	9	8.8	0	20		*
100%	10	5.6	0	12		*

Average numbers of neonates was 5.6 in the 100% effluent concentration and ranged from 8.8 – 21.5 in the remaining effluent concentrations. Average number of neonates in the control was 23.8 for statistical analyses and 25.3 for test acceptability criteria. A statistically significant difference in the number of neonates was found between the control and the 80% and 100% effluent concentrations. The NOEC for reproduction was 60%. The IC₂₅ for reproduction was 47.8%.

Fathead minnow Test Results

Fathead minnow results are summarized in Table 3 and are provided on data sheets in Appendix 3. Survival was 85% in the 100% effluent concentration and ranged from 85% - 100% in the remaining effluent concentrations. Control survival was 100%. Statistically significant mortality was measured in the 100% effluent concentration when compared to the control. The NOEC for lethality was 80%. The IC₂₅ for lethality was >100%.

Table 3. Summary of Fathead minnow test results. Forty fish were exposed at each concentration. An asterisk (*) denotes a statistically significant difference from the control.

Concentration	No. Alive	Avg. Wt. (mg)	Min.	Max.	Significant Difference	
					Lethality	Growth
Control (0%)	40	0.331	0.286	0.377		
20%	40	0.344	0.326	0.371		
40%	39	0.333	0.319	0.351		
60%	39	0.368	0.304	0.438		
80%	34	0.339	0.299	0.366		
100%	34	0.340	0.325	0.366	*	

Average weight in the 100% effluent concentration was 0.340mg per individual and ranged from 0.333mg - 0.368mg per individual in the remaining effluent concentrations. Average weight for the control fish was 0.331mg for statistical analyses and for test acceptability criteria. No statistically significant differences were measured for growth in any effluent concentration when compared to the control. The NOEC for growth was 100%. The IC₂₅ for growth was >100%.

Test Acceptability

Acceptable control survival was achieved in both tests. Similarly, *Ceriodaphnia dubia* reproduction and Fathead minnow growth in control organisms met required levels. PMSD was within the required limits for an acceptable test (Table 4).

Table 4. PMSD for chronic test parameters.

PMSD (% Minimum significant difference)	Survival		Growth		Reproduction		Result Test parameters deemed to be acceptable if numbers fall within limits for the test.
	<i>Ceriodaphnia dubia</i>	Fathead Minnow	Lower bound	Upper bound	Lower bound	Upper bound	
			12	30	13	47	
	N/A	N/A	17.1		23.6		

DISCUSSION

A chronic WET test is considered a violation of a permit limitation when both the NOEC and the IC25 are at any effluent concentration less than the IWC. A chronic WET test is considered to have failed one of the two statistical endpoints when either the NOEC or the IC25 are at any effluent concentration less than the IWC. The IWC for this permit has been determined to be 100% effluent.

REFERENCES

1. **Hach Chemical Company.** 2008. *Hach's Water Analysis Handbook*. Fifth Edition. Hach Chemical Company, Loveland, Colorado. Digital Medium.
2. **APHA/AWWA/WEF.** 1998. *Standard Methods for the Examination of Water and Wastewater*. 20th Edition. American Public Health Association, Washington, D.C.
3. **USEPA.** 2002. *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. EPA-821-R-02-013. 335 pp.
4. **CDPHE (Colorado Department of Public Health and Environment).** 1998. *Laboratory Guidelines for Conducting Whole Effluent Toxicity Tests*. Water Quality Control Division.
5. **USEPA.** 2000. *Method of Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing* (40 CFR Part 136). EPA/821/B-00/004.
6. **USEPA.** 2000. *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System Program*. EPA/833/R-00/003.

Appendix 1 – Chain of Custody Form



500 S. Arthur Avenue, Unit 450 - Louisville, CO 80027
(303) 661.9324 - FAX (303) 661.9325

[illegible]

Sample Receipt Form

Project #: 418812.3

Date: 112718

Sample #: 1

Initials: ju

Samples Were:

1. Shipped Hand Delivered Messengered (circle one)

Notes: X. UPS

2. Chilled to Ship

Notes:

Ambient Chilled (circle one)

Wet Ice Blue Ice (circle one)

3. Cooler Received Broken or Leaking

Notes:

Y N NA

4. Sample Received Broken or Leaking

Notes:

Y N NA

5. Received Within Holding Times

Notes:

Y N

6. Aeration necessary

Notes:

Y N NA

7. Sample Received at Temperature between 0-6°C

Notes:

Y N NA

8. Description of Sample (Color, Odor, and/or Presence of Particulate Matter):
eff:

rec'g

						Aeration			
	Temp	DO (mg/L)	DO (%Sat)	pH	Cond	Time	DO (mg/L)	DO (%Sat)	pH
	3.9	5.5	86.0	6.6	3050				

Custody Seals:

1. Present on Outer Package

Y N

2. Unbroken on Outer Package

Y N NA

3. Present on Sample

Y N

4. Unbroken on Sample

Y N NA

Custody Documentation:

1. Present Upon Receipt of Sample

Y N

Sample Receipt Form

Project #: 418 812.B

Sample #: 2

Date: 11/29/8

Initials: TR

Samples Were:

1. ☒ Shipped ☐ Hand Delivered ☐ Messengered (circle one)

Notes: UPS

2. Chilled to Ship

Ambient ☒ Chilled (circle one)

Notes:

☒ Wet Ice ☐ Blue Ice (circle one)

3. Cooler Received Broken or Leaking

Y ☒ N NA

Notes:

4. Sample Received Broken or Leaking

☒ Y N NA

Notes: one jug leaked 1/5 of contents

5. Received Within Holding Times

☒ Y N

Notes:

6. Aeration necessary

Y ☒ N NA

Notes:

7. Sample Received at Temperature between 0-6°C.

Y N ☒ NA

Notes: Temp within range less than 24 hrs

8. Description of Sample (Color, Odor, and/or Presence of Particulate Matter):

eff: yellow, some PM (orange)

rec'g

	Temp	DO (mg/L)	DO (%Sat)	pH	Cond	Aeration			
						Time	DO (mg/L)	DO (%Sat)	pH
	<u>7.6</u>	<u>6.5</u>	<u>92.7</u>	<u>6.9</u>	<u>3020</u>				

Custody Seals:

1. Present on Outer Package Y ☒ N

2. Unbroken on Outer Package Y N ☒ NA

3. Present on Sample Y ☒ N

4. Unbroken on Sample Y N ☒ NA

Custody Documentation:

1. Present Upon Receipt of Sample ☒ Y N



CHAIN OF CUSTODY

500 S. Arthur Avenue, Unit 450 - Louisville, CO 80027
(303) 661.9324 - FAX (303) 661.9325

Client/Project Name: <u>Elk Ridge Meadows Reclamation</u>			
P.O./Project Number: <u>New Horizon Mine</u>			
Contact: <u>TFRY</u>			
Address: <u>27646 W 5th</u>		Unit <u>6081424</u>	
Phone # <u>970 864 073</u>		E-Mail: <u>TFRY@TRISTARCOG</u>	
Fax #		Sampler: <u>TFRY</u>	
Report By: ☐ Mail ☒ PDF ☐ FAX			
Sample Location or ID	Date	Time	Grab/Comp
<u>NPD28013</u>	<u>11.30.08</u>	<u>1010</u>	<u>G</u>
Lab ID (Lab Use Only)		<u>418813.B#3</u>	
Analysis (Check all applicable)			
WET: Acute (Indicate Below)			
WET: Chronic (Indicate Below)			
WET: Accelerated (Indicate Below)			
WET: PTI/TIE/TRE (Indicate Below)			
Metals (List Below)			
Solids (TS/TDS/TSS) (Circle)			
Anions (List Below)			
Chromium III/VI (Circle)			
Oil and Grease			
Coliform (Total/Fecal/E-Coli) (Circle)			
BOD/COD (Circle)			
Other Analysis (List Below)			
Number of Containers			
Total Volume			
<u>4 G</u>			
Test Species: ☒ Fathead Minnow ☐ Cerio daphnia ☐ Daphnia magna ☐ Other (List Below)			
Turnaround Requirements (Analytical Testing Only)			
Standard (10 days) <u>6-9 Day</u>			
3-5 Day <u>1-2 Day</u>			
Special Instructions/Comments:			
Requested Report Date:			
Relinquished By (1)		Received By (1)	
Signature <u>[Signature]</u>		Signature <u>UPS</u>	
Date/Time <u>11.30.08</u>		Date/Time <u>11.30.08</u>	
Relinquished By (2)		Received By (2)	
Signature <u>[Signature]</u>		Signature <u>[Signature]</u>	
Date/Time <u>11.30.08</u>		Date/Time <u>11.30.08</u>	

Sample Receipt Form

Project #: 418 8/2.8

Date: 12/18

Sample #: 3

Initials: TLR

Samples Were:

1. Shipped Hand Delivered Messengered (circle one)

Notes: UPS

2. Chilled to Ship

Notes:

Ambient Chilled (circle one)

Wet Ice Blue Ice (circle one)

3. Cooler Received Broken or Leaking

Notes:

Y N NA

4. Sample Received Broken or Leaking

Notes:

Y N NA

5. Received Within Holding Times

Notes:

Y N

6. Aeration necessary

Notes:

Y N NA

7. Sample Received at Temperature between 0-6° C .

Notes:

Y N NA

8. Description of Sample (Color, Odor, and/or Presence of Particulate Matter):

eff: yellow, no PM

rec'g

	Temp	DO (mg/L)	DO (%Sat)	pH	Cond	Time	Aeration		
							DO (mg/L)	DO (%Sat)	pH
	3.8	8.3	126.1	7.1	2970				

Custody Seals:

1. Present on Outer Package

Y N

2. Unbroken on Outer Package

Y N NA

3. Present on Sample

Y N

4. Unbroken on Sample

Y N NA

Custody Documentation:

1. Present Upon Receipt of Sample

Y N

Appendix 2 – Data Sheets for the *Ceriodaphnia dubia* Test

WET TEST REPORT FORM – CHRONIC

Permittee: Elk Ridge Mining and Reclamation

Outfall: 013

Permit No.: CO-0000213

Test Type: Routine ☒ Accelerated ☐

Test Species: *Ceriodaphnia dubia*

IWC: 100%

Test Start Time	Test Start Date	Test End Time	Test End Date
1500	11-27-2018	1545	12-03-2018

Test Results	Lethality	Reproduction
NOEC	100%	60%
	PASS	FAIL
IC ₂₅	>100%	47.8%
	PASS	FAIL

Dilution(s) - % Effluent

Measurements	Control (0%)	20%	40%	60%	80%	100%
% Survival for day 1	100	100	100	100	100	100
% Survival for day 2	100	100	100	100	100	100
% Survival for day 3	100	100	100	100	100	100
% Survival for day 4	100	100	100	100	95	100
% Survival for day 5	95	100	100	100	95	100
% Survival for day 6	95	100	100	100	95	100
Mean 3 Brood Total	23.8	21.5	19.6	15.1	8.8	5.6

Hardness (mg/L) – Receiving Water: N/A Effluent: 2135/2100/1790 Recon Water: 82

Alkalinity (mg/L) – Receiving Water: N/A Effluent: 452/470/398 Recon Water: 57

Chlorine (mg/L) – Effluent: 0.01/<0.01/<0.01 pH (initial/final) – Control: 7.8/7.8 100%: 6.6/7.8

Total Ammonia as NH₃ (mg/L) - Effluent: 0.97/1.04/1.86

Were all Test Conditions in Conformance with Division Guidelines? YES ☒ NO ☐

If **NO**, list deviations from test specifications:

Laboratory: SeaCrest Group

Comments:

Analyst's Name: Jacquelyn Weaver, Taylor Couillard-Rodak, and Daniel Hillenburg

Signature *Kara Olin*

Date 12/18/2018

Permittee: Elk Ridge Lab #: 418812.8 Site: NPDES 013
IWC %: 100 Template #: 5 Dilution Water: MH18-024 Sample Date: 112618
Age & Source: cerio 112718 2025 Test Start: 112718 1500 Test End: 120318 1545
Test Conditions:

	0	1	2	3	4	5	6	7	8	Total		
(C)	0	0	0	0	6	7	0			13		
	0	0	0	0	5	11	12			28		
	0	0	0	0	6	11	11			28		
	0	0	0	5	5	10				10		
0	0	0	0	5	0	10	16			31		
	0	0	0	0	5	10	0			15		
	0	0	0	4	0	9	13			26		
	0	0	0	5	0	10	13			31		
	0	0	0	4	0	10	15			29		
	0	0	0	4	0	10	13			27		
DO	6.8	7.2	7.3	6.8	7.0	6.3	6.9	6.5	7.1	7.1	STAT	
Temp	25.6	24.3	24.2	24.1	24.1	24.3	24.1	25.1	24.1	24.6	24.1	25.3
pH	7.8	7.9	8.0	8.0	8.0	7.7	7.8	7.7	7.7	7.7	8.1	7.8
Cond	311	305		298	302	308	293					
(1)	0	0	0	0	6	10	9			25		
	0	0	0	0	7	8	8			23		
	0	0	0	0	5	12	0			15		
	0	0	0	5	8	0	12			25		
	0	0	0	0	4	7	8			19		
20	0	0	0	0	9	6	0			15		
	0	0	0	5	0	11	7			24		
	0	0	0	6	0	10	9			25		
	0	0	0	5	5	8	9			18		
	0	0	0	7	0	10	10			27		
DO	6.5	7.2	7.2	6.8	6.9	6.3	6.8	6.5	7.1	7.1	7.2	7.4
Temp	25.6	24.3	24.2	24.1	24.1	24.3	24.1	25.1	24.1	24.6	24.1	25.3
pH	7.0	7.9	7.3	8.0	7.3	7.7	7.1	7.7	7.5	7.7	7.4	7.8
Cond	1005	964		997	1083	921	914					
	0	1	2	3	4	5	6	7	8	Total		
(2)	0	0	0	0	7	12	0	10		19		
	0	0	0	0	6	5	10			21		
	0	0	0	0	6	9	10			25		
	0	0	0	4	9	0	9			22		
40	0	0	0	3	0	5	7			15		
	0	0	0	0	5	6	6			11		
	0	0	0	2	12	0	10	10		14		
	0	0	0	4	0	11	10			25		
	0	0	0	7	0	7	10			24		
	0	0	0	7	0	6	7			20		
DO	6.3	7.3	7.1	6.8	6.8	6.3	6.8	6.5	7.3	7.2	7.3	7.6
Temp	25.6	24.4	24.2	24.1	24.1	24.3	24.1	25.1	24.1	24.6	24.1	25.3
pH	6.8	7.9	7.1	8.0	7.1	7.7	7.0	7.8	7.3	7.7	7.3	7.8
Cond	1548	1535		1545	1569	1542	1585					
(3)	0	0	0	0	6	5	9			20		
	0	0	0	0	5	6	7			18		
	0	0	0	0	0	4	0			4		
	0	0	0	0	0	7	7			14		
60	0	0	0	4	1	0	9			20		
	0	0	0	0	4	6	0			10		
	0	0	0	5	0	7	7			19		
	0	0	0	3	0	8	13			14		
	0	0	0	3	0	6	8			17		
	0	0	0	3	0	6	10			15		
DO	6.0	7.3	7.0	6.9	6.7	6.3	6.7	6.6	7.3	7.4	7.9	
Temp	25.6	24.5	24.1	24.1	24.1	24.3	24.1	25.1	24.1	24.6	24.1	25.3
pH	6.7	7.9	7.1	8.0	7.0	7.8	7.0	7.8	7.3	7.6	7.3	7.8
Cond	1927	1954		1910	1905	1896	1753					

66.3
25.3

21.5

19.16

15.1

	0	1	2	3	4	5	6	7	8	Total
(4)	0	0	0	0	0	2	0			2
	0	0	0	0	2	4	5			11
	0	0	0	0	2	4	0			8
	0	0	0	2	0	6	7			15
8.0	0	0	0	0	0	5	0			5
	0	0	0	0	3	4	0			7
	0	0	0	0	0	4	5			9
	0	0	0	3	0	8	9			20
	0	0	0	0	1	4	6			11
	0	0	0	0	0					0
DO	5.8	7.4	6.9	6.9	6.6	6.3	6.6	7.4	7.5	8.1
Temp	25.6	24.6	24.1	24.1	24.1	24.3	24.1	25.1	24.1	25.3
pH	6.7	7.1	7.0	8.0	6.9	7.8	7.0	7.9	7.3	7.6
Cond	2580	2520	2540	2570	2500	1974				8.8
(5)	0	0	0	0	0	3	0			3
	0	0	0	0	0	1	0			1
	0	0	0	0	1	4	0			5
	0	0	0	0	0	4+3	0			7
100	0	0	0	0	3+1	0	0			4
	0	0	0	0	0	0	0			0
	0	0	0	0	2	4+3	0			9
	0	0	0	0	0	4+1	0			5
	0	0	0	2	0	5	5			12
	0	0	0	3	0	3	4			10
DO	5.5	7.4	6.9	6.9	6.5	6.3	6.5	6.6	7.4	8.4
Temp	25.6	24.6	24.1	24.1	24.1	24.3	24.1	25.1	24.1	25.3
pH	6.6	7.1	6.9	8.0	6.9	7.8	7.0	7.9	7.3	7.6
Cond	3050	2970	3020	3030	3000	2560				5.6
Algae	ABS/ARO	ABS/ARO	ABS/ARO	ABS/ARO	ABS/ARO	ABS/ARO				
YCT	1808	1808	1808	1808	1808	1808				
H ₂ O	1	1	2	2	3	3				
Initials	SW	TH	TLR	TLR	TLR	SW	SW			
	Eff #1	Eff #2	Eff #3	Recg #1	Recg #2	Recg #3	Recon #1	Recon #2	Recon #3	
Hardness	2135	2100	1790				82			
Alkalinity	452	470	378				57			
Chlorine	2.01	2.01	2.01				2.01			
Ammonia	0.97	1.04	1.86				2.02			

1. Exposure Chamber

Total Capacity: 30 ml
 Test Solution Surface Area: cm²

Test Solution Volume: 15 ml
 Water Depth (constant): cm
 (cyclic): to cm

2. Feeding Schedule

Not fed:
 Fed Irregularly:

Fed Daily: X
 Food Used: YCT, algae

3. Aeration

#1 None:
 #2 None:
 #3 None:

Before Use: minutes @ ~100 bubbles/min
 Before Use: minutes @ ~100 bubbles/min
 Before Use: minutes @ ~100 bubbles/min

4. Screened Animal Enclosures

Not Used: X

Used: cm diameter

5. Condition/appearance of surviving organisms at end of test (i.e., alive but immobile; loss of orientation; erratic movement; etc.):

Active and mobile

6. Comments:

1	2	3	4	5	6	7	8	9	10
A1	A4	A7	A8	A9	B5	B8	B10	C7	C10

x:y:z = board #:row:column

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date: 11/27/2018	Test ID: 418812cd	Sample ID: EFFFIN-Effluent Final
End Date: 12/3/2018	Lab ID: SCG-Seacrest Group	Sample Type: EFF1-POTW
Sample Date:	Protocol: EPAF 94	Test Species: CD-Ceriodaphnia dubia
Comments:		

Conc-%	1	2	3	4	5	6	7	8	9	10
ON-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
SN--Control	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
ON-Control	1.0000	1.1111	0	10	10	10	0.5619	
SN--Control	0.9000	1.0000	1	9	10	10	*	
20	1.0000	1.1111	0	10	10	10	0.5000	0.0500
40	1.0000	1.1111	0	10	10	10	0.5000	0.0500
60	1.0000	1.1111	0	10	10	10	0.5000	0.0500
80	0.9000	1.0000	1	9	10	10	0.7632	0.0500
100	1.0000	1.1111	0	10	10	10	0.5000	0.0500

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1
Treatments vs SN--Control				

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date: 11/27/2018	Test ID: 418812cd	Sample ID: EFFFIN-Effluent Final
End Date: 12/3/2018	Lab ID: SCG-Seacrest Group	Sample Type: EFF1-POTW
Sample Date:	Protocol: EPAF 94	Test Species: CD-Ceriodaphnia dubia
Comments:		

Conc-%	1	2	3	4	5	6	7	8	9	10
ON-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
SN--Control	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
40	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
80	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Isotonic	
			Mean	Min	Max	CV%	N	Mean	N-Mean
ON-Control	1.0000	1.1111	1.0472	1.0472	1.0472	0.000	10		
SN--Control	0.9000	1.0000	0.9948	0.5236	1.0472	16.644	10	0.9750	1.0000
20	1.0000	1.1111	1.0472	1.0472	1.0472	0.000	10	0.9750	1.0000
40	1.0000	1.1111	1.0472	1.0472	1.0472	0.000	10	0.9750	1.0000
60	1.0000	1.1111	1.0472	1.0472	1.0472	0.000	10	0.9750	1.0000
80	0.9000	1.0000	0.9948	0.5236	1.0472	16.644	10	0.9500	0.9744
100	1.0000	1.1111	1.0472	1.0472	1.0472	0.000	10	0.9500	0.9744

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution ($p \leq 0.05$)	3.66133	0.895	-4.7381	23.3311
Equality of variance cannot be confirmed				
The control means are not significantly different ($p = 0.33$)	1	2.10092		

Point	%	SD	Linear Interpolation (200 Resamples)	
			95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: 11/27/2018	Test ID: 418812cd	Sample ID: EFFFIN-Effluent Final
End Date: 12/3/2018	Lab ID: SCG-Seacrest Group	Sample Type: EFF1-POTW
Sample Date:	Protocol: EPAF 94	Test Species: CD-Ceriodaphnia dubia

Conc-%	1	2	3	4	5	6	7	8	9	10
ON-Control	13.000	28.000	28.000	10.000	31.000	15.000	26.000	31.000	29.000	27.000
SN--Control	13.000	28.000	28.000	31.000	15.000	26.000	31.000	29.000	27.000	
20	25.000	23.000	15.000	25.000	19.000	15.000	23.000	25.000	18.000	27.000
40	19.000	21.000	25.000	22.000	15.000	11.000	14.000	25.000	24.000	20.000
60	20.000	18.000	4.000	14.000	20.000	10.000	19.000	14.000	17.000	15.000
80	2.000	11.000	8.000	15.000	5.000	7.000	9.000	20.000	11.000	0.000
100	3.000	1.000	5.000	7.000	4.000	0.000	9.000	5.000	12.000	10.000

Conc-%	Mean	N-Mean	Transform: Untransformed					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
ON-Control	23.800	0.9395	23.800	10.000	31.000	33.309	10	*	
SN--Control	25.333	1.0000	25.333	13.000	31.000	26.258	9		
20	21.500	0.8487	21.500	15.000	27.000	20.480	10	85.50	75.00
40	19.600	0.7737	19.600	11.000	25.000	24.786	10	81.50	75.00
60	15.100	0.5961	15.100	4.000	20.000	33.252	10	77.00	75.00
*80	8.800	0.3474	8.800	0.000	20.000	67.292	10	62.50	75.00
*100	5.600	0.2211	5.600	0.000	12.000	69.518	10	56.50	75.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution ($p \leq 0.05$)	0.95435	0.895	-0.5745	-0.1281
Bartlett's Test indicates equal variances ($p = 0.32$)	5.86432	15.0863		
The control means are not significantly different ($p = 0.66$)	0.45374	2.10982		
Hypothesis Test (1-tail, 0.05)				
	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	60	80	69.282	1.66667
Treatments vs ON-Control				

Ceriodaphnia Survival and Reproduction Test-Reproduction					
Start Date:	11/27/2018	Test ID:	418812cd	Sample ID:	EFFFIN-Effluent Final
End Date:	12/3/2018	Lab ID:	SCG-Seacrest Group	Sample Type:	EFF1-POTW
Sample Date:		Protocol:	EPAF 94	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-%	1	2	3	4	5	6	7	8	9	10
ON-Control	13.000	28.000	28.000	10.000	31.000	15.000	26.000	31.000	29.000	27.000
SN--Control	13.000	28.000	28.000	31.000	15.000	26.000	31.000	29.000	27.000	
20	25.000	23.000	15.000	25.000	19.000	15.000	23.000	25.000	18.000	27.000
40	19.000	21.000	25.000	22.000	15.000	11.000	14.000	25.000	24.000	20.000
60	20.000	18.000	4.000	14.000	20.000	10.000	19.000	14.000	17.000	15.000
80	2.000	11.000	8.000	15.000	5.000	7.000	9.000	20.000	11.000	0.000
100	3.000	1.000	5.000	7.000	4.000	0.000	9.000	5.000	12.000	10.000

Conc-%	Mean	N-Mean	Transform: Untransformed					t-Stat	1-Tailed	
			Mean	Min	Max	CV%	N		Critical	MSD
ON-Control	23.800	0.9395	23.800	10.000	31.000	33.309	10		*	
SN--Control	25.333	1.0000	25.333	13.000	31.000	26.258	9			
20	21.500	0.8487	21.500	15.000	27.000	20.480	10	0.936	2.287	5.621
40	19.600	0.7737	19.600	11.000	25.000	24.786	10	1.709	2.287	5.621
*60	15.100	0.5961	15.100	4.000	20.000	33.252	10	3.539	2.287	5.621
*80	8.800	0.3474	8.800	0.000	20.000	67.292	10	6.102	2.287	5.621
*100	5.600	0.2211	5.600	0.000	12.000	69.518	10	7.404	2.287	5.621

Auxiliary Tests					Statistic	Critical	Skew	Kurt						
Kolmogorov D Test indicates non-normal distribution (p <= 0.05)					0.95435	0.895	-0.5745	-0.1281						
Bartlett's Test indicates equal variances (p = 0.32)					5.86432	15.0863								
The control means are not significantly different (p = 0.66)					0.45374	2.10982								
Hypothesis Test (1-tail, 0.05)					NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test					40	60	48.9898	2.5	5.62084	0.23617	528.867	30.2111	2.9E-10	5, 54
Treatments vs ON-Control														

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: 11/27/2018	Test ID: 418812cd	Sample ID: EFFFIN-Effluent Final
End Date: 12/3/2018	Lab ID: SCG-Seacrest Group	Sample Type: EFF1-POTW
Sample Date:	Protocol: EPAF 94	Test Species: CD-Ceriodaphnia dubia

Conc-%	1	2	3	4	5	6	7	8	9	10
ON-Control	13.000	28.000	28.000	10.000	31.000	15.000	26.000	31.000	29.000	27.000
SN--Control	13.000	28.000	28.000	31.000	15.000	26.000	31.000	29.000	27.000	
20	25.000	23.000	15.000	25.000	19.000	15.000	23.000	25.000	18.000	27.000
40	19.000	21.000	25.000	22.000	15.000	11.000	14.000	25.000	24.000	20.000
60	20.000	18.000	4.000	14.000	20.000	10.000	19.000	14.000	17.000	15.000
80	2.000	11.000	8.000	15.000	5.000	7.000	9.000	20.000	11.000	0.000
100	3.000	1.000	5.000	7.000	4.000	0.000	9.000	5.000	12.000	10.000

Conc-%	Transform: Untransformed							Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
ON-Control	23.800	0.9395	23.800	10.000	31.000	33.309	10	23.800	1.0000
SN--Control	25.333	1.0000	25.333	13.000	31.000	26.258	9		
20	21.500	0.8487	21.500	15.000	27.000	20.480	10	21.500	0.9034
40	19.600	0.7737	19.600	11.000	25.000	24.786	10	19.600	0.8235
60	15.100	0.5961	15.100	4.000	20.000	33.252	10	15.100	0.6345
80	8.800	0.3474	8.800	0.000	20.000	67.292	10	8.800	0.3697
100	5.600	0.2211	5.600	0.000	12.000	69.518	10	5.600	0.2353

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution ($p \leq 0.05$)	0.95435	0.895	-0.5745	-0.1281
Bartlett's Test indicates equal variances ($p = 0.32$)	5.86432	15.0863		
The control means are not significantly different ($p = 0.66$)	0.45374	2.10982		

Linear Interpolation (200 Resamples)					
Point	%	SD	95% CL	Skew	
IC05*	10.348	11.669	3.815	43.204	0.8905
IC10	20.842	12.644	7.631	46.454	0.3512
IC15	33.368	12.665	11.446	51.119	-0.0797
IC20	42.489	11.774	15.262	57.650	-0.4396
IC25	47.778	10.551	19.077	61.610	-0.7274
IC40	62.603	6.472	49.221	72.152	-0.6109
IC50	70.159	5.609	60.329	82.568	0.2026

* indicates IC estimate less than the lowest concentration

Appendix 3 – Data Sheets for Fathead minnow Test

WET TEST REPORT FORM – CHRONIC

Permittee: Elk Ridge Mining and Reclamation

Outfall: 013

Permit No.: CO-0000213

Test Type: Routine ☒ Accelerated ☐

Test Species: Fathead minnow

IWC: 100%

Test Start Time	Test Start Date	Test End Time	Test End Date
1610	11-27-2018	1600	12-04-2018

Test Results	Lethality	Growth
NOEC	80%	100%
	FAIL	PASS
IC ₂₅	>100%	>100%
	PASS	PASS

Dilution(s) - % Effluent

Measurements	Control (0%)	20%	40%	60%	80%	100%
% Survival for day 1	100	100	100	100	93	100
% Survival for day 2	100	100	100	100	90	100
% Survival for day 3	100	100	98	100	88	93
% Survival for day 4	100	100	98	98	85	90
% Survival for day 5	100	100	98	98	85	90
% Survival for day 6	100	100	98	98	85	85
% Survival for day 7	100	100	98	98	85	85
Mean Dry Wt. (mg)	0.331	0.344	0.333	0.368	0.339	0.340

Hardness (mg/L) – Receiving Water: N/A Effluent: 2135/2100/1790 Recon Water: 82
Alkalinity (mg/L) – Receiving Water: N/A Effluent: 452/470/398 Recon Water: 58
Chlorine (mg/L) – Effluent: pH (initial/final) – Control: 7.9/7.5 100%: 7.0/7.6
0.01/<0.01/<0.01

Total Ammonia as NH₃ (mg/L) – Effluent: 0.97/1.04/1.86

Were all Test Conditions in Conformance with Division Guidelines? YES ☒ NO ☐

If **NO**, list deviations from test specifications:

Laboratory: SeaCrest Group

Comments:

Analyst's Name: Nicole Denkinger, Taylor Couillard-Rodak, and Daniel Hillenburg

Signature *Kara Quinn*

Date *12/18/2018*

Test Start 11/27/18 - 6:30										Test End 12/04/18 - 16:00										Species Info A85H-M-1127										Sample Date 4/18/2018										IWC 100										Dilution H ₂ O M/H18-048									
Conc		Read		0		1		2		3		4		5		6		7		Template		Test Conditions										Condition/appearance of surviving organisms and Comments																											
C		DO	7.3	6.0	7.3	5.5	7.5	7.2	4.1	7.2	5.1	7.5	4.5	7.5	4.9	7	0	1	2	3	4	5	6	7	#	Fish & Tare	Tare	Fish Wt mg	Ave Wt mg	STAT																													
		Temp	24.1	24.1	25.3	24.1	25.7	24.2	25.6	24.1	24.1	24.1	24.1	24.1	25.9	10	10	10	10	10	10	10	10	10	10	#1	7.154.1	7.156.4	0.351	0.351	0.331																												
		pH	7.9	7.8	8.0	8.1	7.7	7.9	7.3	7.7	7.5	7.8	7.3	7.8	7.5	10	10	10	10	10	10	10	10	10	10	#2	1.132.7	1.129.6	0.311	0.311	0.331																												
		Cond	318	312	306	311			313	307	307	307	307	307	7.5	10	10	10	10	10	10	10	10	10	10	#3	1.153.66	1.150.72	0.348	0.348	0.331																												
20		DO	7.0	5.9	7.3	5.4	7.2	7.1	3.9	7.4	5.1	7.6	4.4	7.6	4.7	10	10	10	10	10	10	10	10	10	10	#4	1.133.640	1.133.54	0.286	0.286	0.331																												
		Temp	24.4	24.4	25.2	24.1	25.6	24.2	25.0	24.1	24.2	24.1	24.1	24.1	25.9	10	10	10	10	10	10	10	10	10	10	#5	1.133.056	1.126.98	0.357	0.357	0.331																												
		pH	7.7	7.7	7.9	8.0	7.9	7.6	7.3	7.4	7.5	7.7	7.3	7.7	7.5	10	10	10	10	10	10	10	10	10	10	#6	1.143.556	1.140.24	0.326	0.326	0.331																												
		Cond	998	999	953	980			1030	945	945	945	945	945	7.5	10	10	10	10	10	10	10	10	10	10	#7	1.133.20	1.129.49	0.351	0.351	0.331																												
40		DO	6.7	5.9	7.2	5.3	7.0	5.6	3.7	7.7	5.1	7.7	4.3	7.6	4.7	10	10	10	10	10	10	10	10	10	10	#8	1.158.88	1.155.60	0.328	0.328	0.331																												
		Temp	24.6	24.4	24.3	25.2	24.1	25.6	24.2	25.0	24.1	24.1	24.1	24.1	25.7	10	10	10	10	10	10	10	10	10	10	#9	1.141.114	1.107.88	0.326	0.326	0.331																												
		pH	7.7	7.7	7.7	8.0	7.6	7.6	7.2	7.2	7.6	7.6	7.4	7.6	7.5	10	10	10	10	10	10	10	10	10	10	#10	1.145.49	1.141.98	0.351	0.351	0.331																												
		Cond	1543	1543	1542	1524			1560	1557	1557	1557	1557	1557	7.5	10	10	10	10	10	10	10	10	10	10	#11	1.143.20	1.140.01	0.394	0.394	0.331																												
60		DO	6.3	5.8	7.2	5.2	6.7	6.9	3.6	7.9	5.1	7.9	4.3	7.7	4.4	10	10	10	10	10	10	10	10	10	10	#12	1.137.10	1.133.75	0.383	0.383	0.331																												
		Temp	24.8	24.4	25.1	24.2	25.5	24.1	25.0	24.1	24.2	24.1	24.1	24.1	25.8	10	10	10	10	10	10	10	10	10	10	#13	1.124.54	1.120.16	0.458	0.458	0.331																												
		pH	7.4	7.6	7.5	8.0	7.3	7.2	7.2	7.2	7.6	7.4	7.4	7.6	7.6	10	10	10	10	10	10	10	10	10	10	#14	1.142.83	1.139.79	0.309	0.309	0.331																												
		Cond	2100	1978	1970	1960			1918	1975	1975	1975	1975	1975	7.6	10	10	10	10	10	10	10	10	10	10	#15	1.125.61	1.121.18	0.383	0.383	0.331																												
80		DO	6.6	5.8	7.1	5.0	6.3	6.7	3.5	8.1	5.1	8.0	4.2	7.7	4.2	10	10	10	10	10	10	10	10	10	10	#16	1.136.61	1.133.13	0.347	0.347	0.331																												
		Temp	25.1	24.4	24.5	25.1	24.2	25.5	24.1	25.0	24.1	24.1	24.1	24.1	25.7	10	10	10	10	10	10	10	10	10	10	#17	1.144.98	1.146.99	0.299	0.299	0.331																												
		pH	7.2	7.6	7.3	8.0	7.1	7.0	7.1	7.1	7.7	7.3	7.5	7.5	7.6	10	10	10	10	10	10	10	10	10	10	#18	1.153.7	1.151.89	0.348	0.348	0.331																												
		Cond	2590	2660	2550	2540			2540	2540	2540	2540	2540	2540	7.6	10	10	10	10	10	10	10	10	10	10	#19	1.147.27	1.145.84	0.345	0.345	0.331																												
100		DO	5.6	5.7	7.1	4.4	6.2	6.2	3.3	8.3	5.1	8.1	4.1	7.8	4.1	10	10	10	10	10	10	10	10	10	10	#20	1.131.26	1.127.54	0.366	0.366	0.331																												
		Temp	25.4	24.4	24.6	25.0	24.2	25.4	24.1	25.0	24.1	24.1	24.1	24.1	25.7	10	10	10	10	10	10	10	10	10	10	#21	1.143.93	1.140.64	0.319	0.319	0.331																												
		pH	7.0	7.5	7.1	8.0	6.8	7.4	6.8	7.1	7.1	7.7	7.2	7.4	7.6	10	10	10	10	10	10	10	10	10	10	#22	1.135.23	1.121.98	0.325	0.325	0.331																												
		Cond	2410	2460	2410	2410			2410	2410	2410	2410	2410	2410	7.6	10	10	10	10	10	10	10	10	10	10	#23	1.148.66	1.145.22	0.338	0.338	0.331																												
		DO														10	10	10	10	10	10	10	10	10	10	#24	1.146.75	1.137.09	0.361	0.361	0.331																												
		Temp														10	10	10	10	10	10	10	10	10	10																																		
		pH														10	10	10	10	10	10	10	10	10	10																																		
		Cond														10	10	10	10	10	10	10	10	10	10																																		
Initials		DH		ND		DH																																																					
Water #		1		1		2																																																					
CO ₂																																																											
Condition/appearance of surviving organisms and Comments																																																											

Larval Fish Growth and Survival Test-7 Day Survival

Start Date: 11/27/2018	Test ID: 418812fhm	Sample ID: XX9999999-NPDES Permit #
End Date: 12/4/2018	Lab ID:	Sample Type: EFF1-POTW
Sample Date:	Protocol: EPAFW02-EPA/821/R-02-01	Test Species: PP-Pimephales promelas
Comments:		

Conc-%	1	2	3	4
D-Control	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000
40	1.0000	1.0000	0.9000	1.0000
60	1.0000	1.0000	1.0000	0.9000
80	0.6000	0.9000	0.9000	1.0000
100	0.9000	0.9000	0.7000	0.9000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%	N		
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4		
20	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
40	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00
60	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00
80	0.8500	0.8500	1.1990	0.8861	1.4120	18.543	4	12.00	10.00
*100	0.8500	0.8500	1.1846	0.9912	1.2490	10.885	4	10.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ($p \leq 0.05$)	0.80125	0.918	-1.3707	3.72358
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	80	100	89.4427	1.25
Treatments vs D-Control				

Larval Fish Growth and Survival Test-7 Day Survival

Start Date: 11/27/2018	Test ID: 418812fhm	Sample ID: XX9999999-NPDES Permit #
End Date: 12/4/2018	Lab ID:	Sample Type: EFF1-POTW
Sample Date:	Protocol: EPAFW02-EPA/821/R-02-01	Test Species: PP-Pimephales promelas
Comments:		

Conc-%	1	2	3	4
D-Control	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000
40	1.0000	1.0000	0.9000	1.0000
60	1.0000	1.0000	1.0000	0.9000
80	0.6000	0.9000	0.9000	1.0000
100	0.9000	0.9000	0.7000	0.9000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Isotonic	
			Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	1.0000	1.0000
20	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	1.0000	1.0000
40	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	0.9750	0.9750
60	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	0.9750	0.9750
80	0.8500	0.8500	1.1990	0.8861	1.4120	18.543	4	0.8500	0.8500
100	0.8500	0.8500	1.1846	0.9912	1.2490	10.885	4	0.8500	0.8500

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution ($p \leq 0.05$)	0.80125	0.916	-1.3707	3.72358
Equality of variance cannot be confirmed				

Point	%	SD	Linear Interpolation (200 Resamples)		
			95% CL(Exp)	Skew	
IC05	64.000	7.762	41.600	89.600	0.0402
IC10	72.000				
IC15	>100				
IC20	>100				
IC25	>100				
IC40	>100				
IC50	>100				

Larval Fish Growth and Survival Test-7 Day Growth

Start Date: 11/27/2018	Test ID: 418812fhm	Sample ID: XX9999999-NPDES Permit #
End Date: 12/4/2018	Lab ID:	Sample Type: EFF1-POTW
Sample Date:	Protocol: EPAFW02-EPA/821/R-02-01	Test Species: PP-Pimephales promelas
Comments:		

Conc-%	1	2	3	4
D-Control	0.3770	0.3110	0.3480	0.2860
20	0.3520	0.3260	0.3710	0.3280
40	0.3260	0.3510	0.3190	0.3350
60	0.4380	0.3040	0.3830	0.3470
80	0.2990	0.3480	0.3430	0.3660
100	0.3290	0.3250	0.3380	0.3660

Conc-%	Mean	N-Mean	Transform: Untransformed					t-Stat	1-Tailed	
			Mean	Min	Max	CV%	N		Critical	MSD
D-Control	0.3305	1.0000	0.3305	0.2860	0.3770	12.139	4			
20	0.3443	1.0416	0.3443	0.3260	0.3710	6.214	4	-0.585	2.410	0.0566
40	0.3327	1.0068	0.3327	0.3190	0.3510	4.152	4	-0.096	2.410	0.0566
60	0.3680	1.1135	0.3680	0.3040	0.4380	15.421	4	-1.595	2.410	0.0566
80	0.3390	1.0257	0.3390	0.2990	0.3660	8.389	4	-0.362	2.410	0.0566
100	0.3395	1.0272	0.3395	0.3250	0.3660	5.445	4	-0.383	2.410	0.0566

Auxiliary Tests					Statistic	Critical	Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)					0.9832	0.916	0.12803	0.67036		
Bartlett's Test indicates equal variances (p = 0.21)					7.10863	15.0863				
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.05664	0.17139	0.00073	0.0011	0.65723	5, 18
Treatments vs D-Control										

Larval Fish Growth and Survival Test-7 Day Growth

Start Date: 11/27/2018	Test ID: 418812fhm	Sample ID: XX9999999-NPDES Permit #
End Date: 12/4/2018	Lab ID:	Sample Type: EFF1-POTW
Sample Date:	Protocol: EPAFW02-EPA/821/R-02-01	Test Species: PP-Pimephales promelas
Comments:		

Conc-%	1	2	3	4
D-Control	0.3770	0.3110	0.3480	0.2860
20	0.3520	0.3260	0.3710	0.3280
40	0.3260	0.3510	0.3190	0.3350
60	0.4380	0.3040	0.3830	0.3470
80	0.2990	0.3480	0.3430	0.3660
100	0.3290	0.3250	0.3380	0.3660

Conc-%	Mean	N-Mean	Transform: Untransformed					Isotonic	
			Mean	Min	Max	CV%	N	Mean	N-Mean
D-Control	0.3305	1.0000	0.3305	0.2860	0.3770	12.139	4	0.3439	1.0000
20	0.3443	1.0416	0.3443	0.3260	0.3710	6.214	4	0.3439	1.0000
40	0.3327	1.0068	0.3327	0.3190	0.3510	4.152	4	0.3439	1.0000
60	0.3680	1.1135	0.3680	0.3040	0.4380	15.421	4	0.3439	1.0000
80	0.3390	1.0257	0.3390	0.2990	0.3660	8.389	4	0.3392	0.9866
100	0.3395	1.0272	0.3395	0.3250	0.3660	5.445	4	0.3392	0.9866

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.9832	0.916	0.12803	0.67036
Bartlett's Test indicates equal variances ($p = 0.21$)	7.10863	15.0863		

Linear Interpolation (200 Resamples)				
Point	%	SD	95% CL(Exp)	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			

Appendix 4 – QA/QC and Reference Toxicant Test Chart

Quality Assurance Check List – Chronic Whole Effluent Toxicity Test

Client: Elk Ridge Mining and Reclamation

SeaCrest Sample No.: 418812.B

Species Tested: *Ceriodaphnia dubia* and Fathead minnow

Start Date of Test (<i>Ceriodaphnia dubia</i>)	Start Date of Test (Fathead minnow)
11-27-2018	11-27-2018

Sample received in lab properly preserved (0-6°C)?	N*
Sample delivered on ice or equivalent?	Y
Test initiated within 36-hours of collection?	Y
Test protocol conforms to CDPHE guidelines (<i>Ceriodaphnia dubia</i>)?	Y
Test protocol conforms to CDPHE guidelines (Fathead minnow)?	Y
Average test temp. $\pm 1^{\circ}\text{C}$ (<i>Ceriodaphnia dubia</i>)?	Y
Average test temp. $\pm 1^{\circ}\text{C}$ (Fathead minnow)?	Y
DO level $\geq 4.0\text{mg/L}$; no super-saturation (<i>Ceriodaphnia dubia</i>)?	Y
DO level $\geq 4.0\text{mg/L}$; no super-saturation (Fathead minnow)?	Y
Survival in control $\geq 90\%$, $\geq 80\%$ for chronic (<i>Ceriodaphnia dubia</i>)?	Y
Survival in control $\geq 90\%$, $\geq 80\%$ for chronic (Fathead minnow)?	Y
<i>Ceriodaphnia dubia</i> neonates <24-hours old?	Y
Fathead minnow larvae <24-hours old?	Y
Appropriate reference toxicity test conducted?	Y
Lab. Ref. Tox. test results within the confidence limits for the lab?	Y

*Sample #2 was hand delivered at 7.6°C within 24 hours of sampling.

Signature Kara Quinn
Position: Laboratory Supervisor

Date 12/14/2018

Method	Analyte	Date	LCS (rec)	%REC	%RPD	QC LIMITS
2320 B	Alkalinity - Total	11/17/2018	98.40%	97.63%	-1.57%	± 5.00%
2320 B	Alkalinity - Total	11/16/2018	98.40%	100.91%	-4.65%	± 5.00%
2320 B	Alkalinity - Total	11/23/2018	100.00%	97.30%	0.00%	± 5.00%
2320 B	Alkalinity - Total	11/29/2018	100.00%	99.79%	-0.48%	± 5.00%
4500 NH ₃ D	Ammonia	11/15/2018	104.80%	97.18%	-0.75%	± 10.00%
4500 NH ₃ D	Ammonia	11/14/2018	104.80%	99.35%	-3.75%	± 10.00%
4500 NH ₃ D	Ammonia	11/30/2018	104.00%	104.45%	-4.07%	± 10.00%
4500 NH ₃ D	Ammonia	11/26/2018	96.00%	98.62%	-1.45%	± 10.00%
4500 Cl D	Chlorine	11/23/2018	96.97%	96.97%	0.00%	± 5.00, ± 20.00%
2340 B	Hardness - Total	11/8/2018	96.49%	97.35%	2.20%	± 5.00%
2340 B	Hardness - Total	11/14/2018	96.49%	100.30%	-0.69%	± 5.00%
2340 B	Hardness - Total	11/20/2018	103.51%	99.33%	0.25%	± 5.00%
2340 B	Hardness - Total	11/27/2018	103.51%	98.82%	-0.65%	± 5.00%

Method	Analyte	Date	LCS (rec)	%REC M1	%REC M2	QC Limits
4500 O	DO - Winkler	11/8/2018	N/A	96.00%	98.63%	± 5.00%
4500 O	DO - Winkler	11/15/2018	N/A	97.14%	98.55%	± 5.00%
4500 O	DO - Winkler	11/20/2018	N/A	101.39%	102.82%	± 5.00%
4500 O	DO - Winkler	11/27/2018	N/A	95.95%	98.61%	± 5.00%

Method	Analyte	Date	Blank	%RPD	%REC MRS	QC Limits
2540 C	Dissolved Solids (TTL)	11/21/2018	99.9970%	1.74%	94.10%	±20%, ± 15%
2540 D	Suspended Solids (TTL)	11/21/2018	99.99934%	0.00%	85.88%	±20%, ± 15%

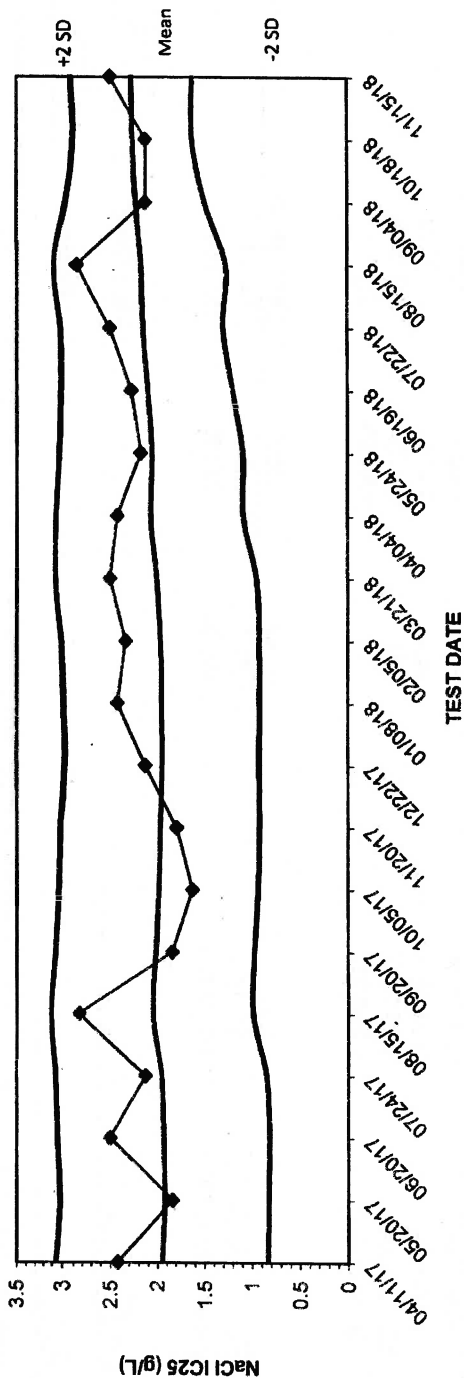
Signature: Kara Quinn

Date: 11/30/18

Signature: MPR

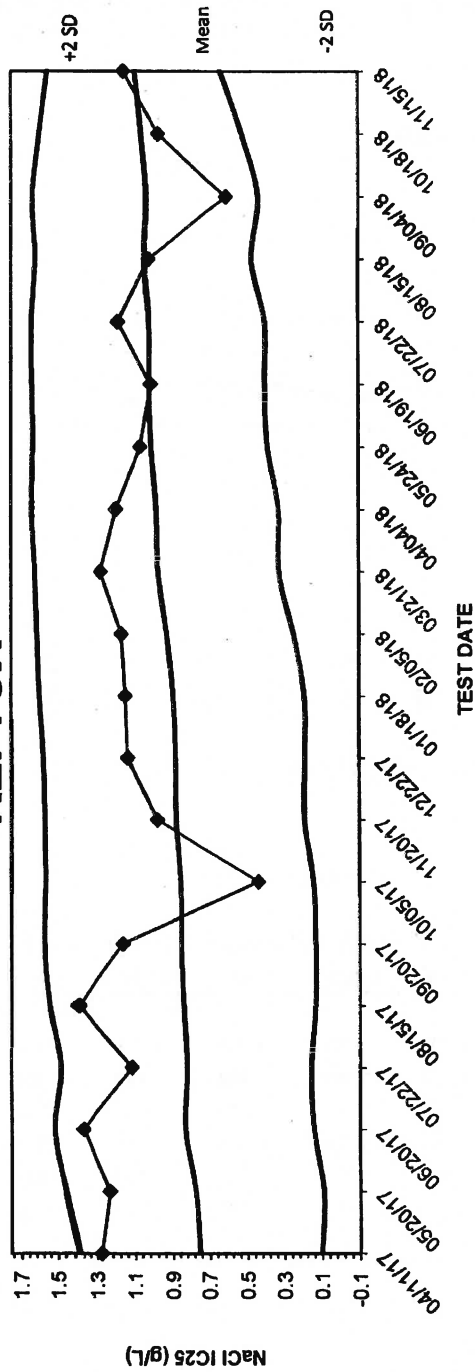
Date: 11/30/18

CERIODAPHNIA SURVIVAL IC25 NaCl REFTOX



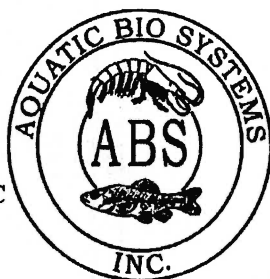
Date	IC25	Mean	-2 SD	+2 SD
04/11/17	2.4211	1.9448	0.8353	3.0543
05/20/17	1.8333	1.9210	0.8252	3.0169
06/20/17	2.5000	1.9290	0.8182	3.0397
07/24/17	2.1250	1.9528	0.8480	3.0576
08/15/17	2.8284	2.0438	0.9834	3.1042
09/20/17	1.8333	2.0121	0.9693	3.0548
10/05/17	1.6250	1.9783	0.9334	3.0233
11/20/17	1.7857	1.9622	0.9162	3.0081
12/22/17	2.1250	1.9462	0.9223	2.9700
01/08/18	2.4211	1.9503	0.9191	2.9815
02/05/18	2.3333	1.9609	0.9183	3.0035
03/21/18	2.5000	2.0023	0.9459	3.0587
04/04/18	2.4211	2.0652	1.0795	3.0510
05/24/18	2.1719	2.0499	1.0827	3.0171
06/19/18	2.2692	2.0957	1.1883	3.0032
07/22/18	2.5000	2.1497	1.2907	3.0086
08/15/18	2.8571	2.1726	1.2640	3.0812
09/04/18	2.1250	2.2258	1.4889	2.9627
10/18/18	2.1250	2.2599	1.6218	2.8979
11/15/18	2.5000	2.2725	1.6261	2.9188

CERIODAPHNIA REPRODUCTION IC25 NaCl REFTOX



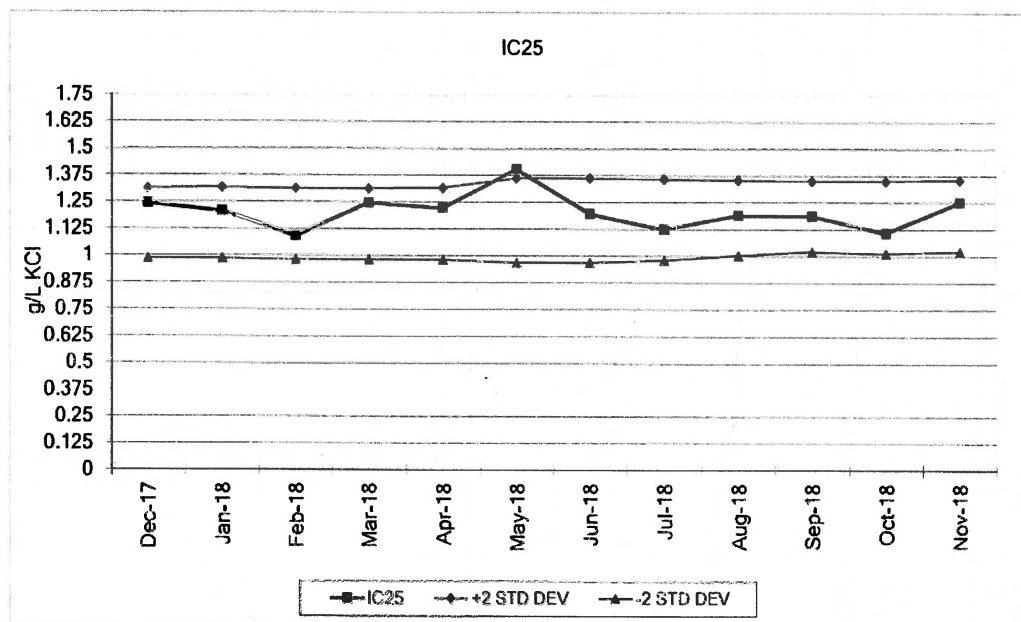
Date	IC25	Mean	-2 SD	+2 SD
04/11/17	1.2762	0.7495	0.1006	1.3985
05/20/17	1.2328	0.7742	0.0902	1.4581
06/20/17	1.3758	0.8305	0.1432	1.5178
07/22/17	1.1166	0.8209	0.1589	1.4848
08/15/17	1.3990	0.8376	0.1322	1.5430
09/20/17	1.1638	0.8516	0.1313	1.5718
10/05/17	0.4375	0.8546	0.1423	1.5669
11/20/17	0.9798	0.8800	0.1893	1.5707
12/22/17	1.1379	0.8836	0.1881	1.5791
01/18/18	1.1509	0.8962	0.1904	1.6019
02/05/18	1.1717	0.9318	0.2475	1.6161
03/21/18	1.2810	0.9761	0.3242	1.6281
04/04/18	1.1996	0.9861	0.3266	1.6456
05/24/18	1.0705	1.0122	0.3852	1.6393
06/19/18	1.0137	1.0217	0.4008	1.6425
07/22/18	1.1886	1.0234	0.4008	1.6460
08/15/18	1.0246	1.0483	0.4711	1.6255
09/04/18	0.6078	1.0377	0.4356	1.6398
10/18/18	0.9733	1.0632	0.5239	1.6026
11/15/18	1.1578	1.0979	0.6375	1.5584

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



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

Pimephales promelas



Chronic 7 Day Survival Test Data

Date	NOEC (g/L KCl)	LOEC (g/L KCl)
Jun-18	0.50	1.0
Jul-18	0.50	1.0
Aug-18	0.50	1.0
Sep-18	0.50	1.0
Oct-18	0.50	1.0
Nov-18	0.50	1.0

IC 25 for Growth Test

Date	IC25 g/L KCl	95% Confidence		Avg. IC25 g/L KCl	+2 STD DEV	-2 STD DEV
		(upper)	(lower)			
Jun-18	1.196	1.282	0.961	1.165	1.362	0.967
Jul-18	1.124	1.294	0.028	1.169	1.358	0.979
Aug-18	1.189	1.341	1.054	1.177	1.353	1.001
Sep-18	1.187	1.288	0.288	1.184	1.350	1.019
Oct-18	1.107	1.336	0.255	1.180	1.348	1.011
Nov-18	1.250	1.250	1.250	1.187	1.354	1.020

**Current Test Dates: 11/1-8/2018

Aquatic BioSystems, Inc • Quality Research Organisms

WET TEST REPORT FORM – CHRONIC

Permittee: Elk Ridge Mining and Reclamation

Outfall: 013

Permit No.: CO-0000213

Test Type: Routine ☒ Accelerated ☐

Test Species: *Ceriodaphnia dubia*

IWC: 100%

Test Start Time	Test Start Date	Test End Time	Test End Date
1500	11-27-2018	1545	12-03-2018

Test Results	Lethality	Reproduction
NOEC	100%	60%
	PASS	FAIL
IC ₂₅	>100%	47.8%
	PASS	FAIL

Dilution(s) - % Effluent

Measurements	Control (0%)	20%	40%	60%	80%	100%
% Survival for day 1	100	100	100	100	100	100
% Survival for day 2	100	100	100	100	100	100
% Survival for day 3	100	100	100	100	100	100
% Survival for day 4	100	100	100	100	95	100
% Survival for day 5	95	100	100	100	95	100
% Survival for day 6	95	100	100	100	95	100
Mean 3 Brood Total	23.8	21.5	19.6	15.1	8.8	5.6

Hardness (mg/L) – Receiving Water: N/A Effluent: 2135/2100/1790 Recon Water: 82

Alkalinity (mg/L) – Receiving Water: N/A Effluent: 452/470/398 Recon Water: 57

Chlorine (mg/L) – Effluent: 0.01/<0.01/<0.01 pH (initial/final) – Control: 7.8/7.8 100%: 6.6/7.8

Total Ammonia as NH₃ (mg/L) - Effluent: 0.97/1.04/1.86

Were all Test Conditions in Conformance with Division Guidelines? YES ☒ NO ☐

If **NO**, list deviations from test specifications:

Laboratory: SeaCrest Group

Comments:

Analyst's Name: Jacquelyn Weaver, Taylor Couillard-Rodak, and Daniel Hillenburg

Signature *Kara Olin*

Date 12/18/2018

WET TEST REPORT FORM – CHRONIC

Permittee: Elk Ridge Mining and Reclamation

Outfall: 013

Permit No.: CO-0000213

Test Type: Routine ☒ Accelerated ☐

Test Species: Fathead minnow

IWC: 100%

Test Start Time	Test Start Date	Test End Time	Test End Date
1610	11-27-2018	1600	12-04-2018

Test Results	Lethality	Growth
NOEC	80%	100%
	FAIL	PASS
IC ₂₅	>100%	>100%
	PASS	PASS

Dilution(s) - % Effluent

Measurements	Control (0%)	20%	40%	60%	80%	100%
% Survival for day 1	100	100	100	100	93	100
% Survival for day 2	100	100	100	100	90	100
% Survival for day 3	100	100	98	100	88	93
% Survival for day 4	100	100	98	98	85	90
% Survival for day 5	100	100	98	98	85	90
% Survival for day 6	100	100	98	98	85	85
% Survival for day 7	100	100	98	98	85	85
Mean Dry Wt. (mg)	0.331	0.344	0.333	0.368	0.339	0.340

Hardness (mg/L) – Receiving Water: N/A Effluent: 2135/2100/1790 Recon Water: 82
Alkalinity (mg/L) – Receiving Water: N/A Effluent: 452/470/398 Recon Water: 58
Chlorine (mg/L) – Effluent: pH (initial/final) – Control: 7.9/7.5 100%: 7.0/7.6
0.01/<0.01/<0.01

Total Ammonia as NH₃ (mg/L) – Effluent: 0.97/1.04/1.86

Were all Test Conditions in Conformance with Division Guidelines? YES ☒ NO ☐

If **NO**, list deviations from test specifications:

Laboratory: SeaCrest Group

Comments:

Analyst's Name: Nicole Denkinger, Taylor Couillard-Rodak, and Daniel Hillenburg

Signature *Kara Quinn*

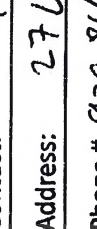
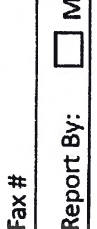
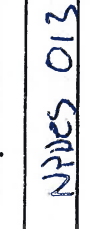
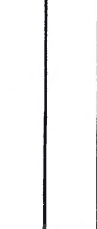
Date *12/18/2018*



500 S. Arthur Avenue, Unit 450 - Louisville, CO 80027
(303) 661.9324 - FAX (303) 661.9325

Client/Project Name: ERM		P. O./Project Number: New Horizon Mont		Contact: T. Fry		Address: 27646 W 5th Ave Nucha Co 81424		Phone # 970 864 1073		E-Mail: TRAY@TRI-STAT.NET, ORG		Fax #		Sampler: TRAY	
Report By: ☐ Mail ☒ PDF ☐ FAX		Sample Location or ID: NPHS 013		Date: 11.26.18		Time: 1130		Grab/Comp: G		Lab ID (LAB Use Only): 418812.0#1		WET: Acute (Indicate Below)		WET: Chronic (Indicate Below)	
WET: Accelerated (Indicate Below)		WET: PTI/TIE/TRE (Indicate Below)		Metals (List Below)		Solids (TS/TDS/TSS) (Circle)		Anions (List Below)		Chromium III/VI (Circle)		Oil and Grease		Coliform (Total/Fecal/E-Coli) (Circle)	
BOD/COD (Circle)		Other Analysis (List Below)		Number of Containers		Total Volume									

Turnaround Requirements (Analytical Testing Only)		Test Species: ☒ Fathead Minnow ☒ Cerio daphnia ☐ Daphnia magna ☐ Daphnia pulex ☐ Other (List Below)	
Standard (10 days)	6-9 Day	Special Instructions/Comments:	
3-5 Day	1-2 Day		

Requested Report Date:		Received By (1)		Relinquished By (2)		Received By (2)	
Signature: 	Date/Time: 11.26.18 1230	Signature: 	Date/Time: UPS	Signature: 	Date/Time: UPS	Signature: 	Date/Time: 11/27/18 1318



CHAIN OF CUSTODY

500 S. Arthur Avenue, Unit 450 - Louisville, CO 80027
(303) 661.9324 - FAX (303) 661.9325

Client/Project Name: ERM					
P.O./Project Number: New Horizon Menz					
Contact: 1 Fry					
Address: 27646 W 5th Ave Co 81424					
Phone # 970 844 1073	E-Mail: TRACY@INVESTIGATORS				
Fax #	Sampler: TF-14				
Report By: ☐ Mail ☒ PDF ☐ FAX					
Sample Location or ID	Date	Time	Grab/Comp	Lab ID (Lab Use Only)	
NPDES013	11.28.18	1155	G	48812.13#2	
Analysis (Check all applicable)					
WET: Acute (Indicate Below)					
WET: Chronic (Indicate Below)					
WET: Accelerated (Indicate Below)					
WET: PTI/TIE/TRE (Indicate Below)					
Metals (List Below)					
Solids (TS/TDS/TSS) (Circle)					
Anions (List Below)					
Chromium III/VI (Circle)					
Oil and Grease					
Coliform (Total/Fecal/E-Coli) (Circle)					
BOD/COD (Circle)					
Other Analysis (List Below)					
Number of Containers					
Total Volume					
Test Species: ☒ Earthhead Minnow ☐ Cerio daphnia ☐ Daphnia magna ☐ Other (List Below)					
Turnaround Requirements (Analytical Testing Only)					
Standard (10 days) <u>6-9 Day</u>					
3-5 Day <u>1-2 Day</u>					
Special Instructions/Comments:					
Requested Report Date:					
Relinquished By (1)		Received By (1)		Relinquished By (2)	
Signature	Date/Time	Signature	Date/Time	Signature	Date/Time
	11.28.18		12.20		11.28.18



CHAIN OF CUSTODY

500 S. Arthur Avenue, Unit 450 - Louisville, CO 80027
(303) 661.9324 - FAX (303) 661.9325

Client/Project Name: <u>ELK RIDGE MOUNTAIN RECLAMATION</u>			
P.O./Project Number: <u>NEW HORIZON MINE</u>			
Contact: <u>TRF</u>			
Address: <u>27646 W 5TH AVE CO 81424</u>			
Phone # <u>970 864 073</u>		E-Mail: <u>TRF@TRISTARCO</u>	
Fax #		Sampler: <u>TRF</u>	
Report By: ☐ Mail ☒ PDF ☐ FAX			
Sample Location or ID	Date	Time	Grab/Comp
<u>NPD28 013</u>	<u>11.30.08</u>	<u>1010</u>	<u>G</u>
Lab ID (Lab Use Only)		<u>418813.B#3</u>	
WET: Acute (Indicate Below)			
WET: Chronic (Indicate Below)			
WET: Accelerated (Indicate Below)			
WET: PTI/TIE/TRE (Indicate Below)			
Metals (List Below)			
Solids (TS/TDS/TSS) (Circle)			
Anions (List Below)			
Chromium III/VI (Circle)			
Oil and Grease			
Coliform (Total/Fecal/E-Coli) (Circle)			
BOD/COD (Circle)			
Other Analysis (List Below)			
Number of Containers			
Total Volume			

Turnaround Requirements (Analytical Testing Only)		Test Species: ☒ Fathead Minnow ☐ Cerio daphnia ☐ Daphnia magna ☐ Other (List Below)	
Standard (10 days)	6-9 Day		
3-5 Day	1-2 Day		
Requested Report Date:			
Relinquished By (1)		Received By (1)	
Signature <u>[Signature]</u>		Signature <u>[Signature]</u>	
Date/Time <u>11.30.08</u>		Date/Time <u>11.30.08</u>	
Relinquished By (2)		Received By (2)	
Signature <u>[Signature]</u>		Signature <u>[Signature]</u>	
Date/Time <u>11.30.08</u>		Date/Time <u>11.30.08</u>	

Special Instructions/Comments: