Brice Engineering LLC
3800 Centerpoint Drive, Suite 417
Anchorage, Alaska 99503
907.275.2912 Phone/Fax

May 30, 2018

Mr. Douglas Simpleman
CENWO-PM-HB
United States Army Corps of Engineers
1616 Capitol Ave
Omaha, NE 68102

RE: Cornhusker Army Ammunition Plant OU1
Contract No.: W9128F-18-D-0020
February 2018 thru April 2018 Analytical Results Summary

Dear Mr. Simpleman:

Attached is a summary table of the quarterly sampling analytical results for the period of February 2018 through April 2018. The sampling was conducted to meet the requirements of the National Pollution Discharge Elimination System (NPDES) Permit, Permit Number NE0131725, and operations and maintenance procedures for the Cornhusker Army Ammunition Plant (CHAAP) Operating Unit 1 (OU1), located in Grand Island, Nebraska.

Brice Engineering collected samples for this quarterly sampling event on April 25, 2018. The results verify concentrations for all specified NPDES monitoring parameters are below the NPDES discharge standards and the Groundwater Treatment Facility (GWTF) is sufficiently treating contaminants of concern prior to discharge. The sampling conducted for this quarter reflect the latest NPDES requirements. We have included a copy of the Daily Chemical Quality Control Report (DCQCR) and the NPDES Discharge Monitoring Report (DMR) for the period February 2018 through April 2018 for your review.

Attached is a summary table showing the quarterly analytical results for sampling period January 2015 through April 2018 and two charts illustrating the historical analytical results from samples collected from Extraction Well EW-7.

Please sign the original NPDES forms attached and transmit to Nebraska Department of Environmental Quality (NDEQ).

If you have any questions, please feel free to contact myself or Scotty Mann or Anthony Farinacci, Project Managers.

Sincerely,

Gary Carson
Operation Manager - CHAAP Groundwater Treatment Facility
Phone: (308) 379-7542
Email: gcarson@briceeng.com

Attachments:
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (April 2018) (Tables)
DCQCR
NPDES DMR
CHAAP SAMPLING RESULTS SUMMARY (January 2015 – April 2018) (Tables)
Extraction Well EW#7 (Charts)

cc: Scotty Mann, Brice Engineering
Anthony Farinacci, Brice Engineering

SP-E1 [TOTAL EFFLUENT]
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (April 2018)

SAMPLE LOCATION SAMPLE DATE	Units	Anticipated	NPDES Permit	SP-E1 4/25/2018	
Explosives(method 8330A)					
HMX	(µg/L)	0.6	200	**J 0.077**	
RDX	(µg/L)	1	50	**J 0.12**	
Tetryl	(µg/L)	<0.5	Report	ND(0.11)	
TNT	(µg/L)	5.1	Report	ND(0.11)	
Combined Explosives (TNT+RDX+Tetryl)	(µg/L)	7.2	100	**0.12**	
VOC's(method 8260B)					
Trichloroethylene	(µg/L)	NN	5	ND(0.4)	
Trichlorotrifluoroethane	(µg/L)	0.9	500	ND(1.6)	
Metals(method 6020A)					
Selenium	(µg/L)	3	5	**J 1.4**	
				J 1.4	**QC**
pH(method 9040C)	(s.u.)	NN	6.5 - 9.0	**7.3**	

Notes:
Anticipated = The anticipated value was established when the Groundwater Treatment Facility (GWTF) went in to operation.
NPDES Permit = Permitted concentration on NPDES permit.
Report = Indicates concentrations are reported on NPDES Discharge Monitoring Report (DMR).
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX = hexahdyro-1,3,5-trinitro-1,3,5-triazine
TNT = 2,4,6-trinitrotoluene
pH = Field parameter with a holding time of 15 minutes.
Combined explosives for the effluent sample at SP-E1 are reported in the NPDES permit and are calculated as (TNT+RDX+Tetryl).
ND = Not Detected (values in parenthesis represent limits of detection (LOD)).
J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value.
J1 = Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
NN = Not Noted
M = Manual Integrated compound.
QC = Quality Control Sample
(µg/L) = micrograms per liter
(s.u.) = standard units

SP-S2 [TOTAL INFLUENT]
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (April 2018)

SAMPLE LOCATION SAMPLE DATE	Units	Max Expected	SP-S2 4/25/2018	QC SP-S22 4/25/2018
Explosives (method 8330A)				
HMX	(µg/L)	50	**0.54**	**0.51**
RDX	(µg/L)	100	**M 0.52**	**0.53**
Tetryl	(µg/L)	NN	**M** ND(0.11)	**M** ND(0.11)
TNT	(µg/L)	250	**6.4**	**6.5**
VOC's (method 8260B)				
Trichloroethylene	(µg/L)	NN	ND(0.4)	ND(0.4)
Trichlorotrifluoroethane	(µg/L)	NN	ND(1.6)	ND(1.6)
TSS (method 2540D)	(mg/L)	NN	J **1.2**	ND(2.8)
pH (method 9040C)	(s.u.)	NN	**7.3**	**7.4**

Notes:
Max Expected = The maximum expected values with one extraction well operating;
values established when went Groundwater Treatment Facility (GWTF) went in to operation.
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX = hexahdyro-1,3,5-trinitro-1,3,5-triazine
TNT = 2,4,6-trinitrotoluene
VOC's = Volatile Organic Compounds
TSS = total suspended solids
pH = Field parameter with a holding time of 15 minutes.
ND = Not Detected (values in parenthesis represent limits of detection (LOD)).
NN = Not Noted
M = Manual Integrated compound.
QC = Quality Control Sample
(µg/L) = micrograms per liter
(s.u.) = standard units
Sample ID: SP = Sampling Port, S=Source, n=port number
SP-S22 is duplicate sample
SP-S2 = Discharge of GAC Feed Tank

SP-S6 [LEAD GAC VESSEL]
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (April 2018)

SAMPLE LOCATION SAMPLE DATE	Units	SP-S6 4/25/2018
Explosives(method 8330A)		
HMX	(µg/L)	**0.2**
RDX	(µg/L)	**M 0.28**
Tetryl	(µg/L)	**M** ND(0.10)
TNT	(µg/L)	**0.63**

SP-S8 [LAG GAC VESSEL]
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (April 2018)

			E-1-QC
SAMPLE LOCATION **SAMPLE DATE**	**Units**	**SP-S8** **4/25/2018**	**SP-E1** **4/25/2018**
Explosives(method 8330A)			
HMX	(µg/L)	**J** ND(0.10)	**J 0.077**
RDX	(µg/L)	**JM 0.13**	**J 0.12**
Tetryl	(µg/L)	**M** ND(0.10)	ND(0.11)
TNT	(µg/L)	**M** ND(0.10)	**M** ND(0.11)

Notes:
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX = hexahdyro-1,3,5-trinitro-1,3,5-triazine
TNT = 2,4,6-trinitrotoluene
ND = Not Detected (values in parenthesis represent limits of detection (LOD)).
J = Result is less than the RL but greater than or equal to the limits of detection (LOD)and the concentration is an approximate value.
M = Manual Integrated compound.
E-1-QC = Quality Control Sample taken from the E-1 sample
(µg/L) = micrograms per liter
Sample ID: SP = Sampling Port, S=Source, n=port number
SP-S6 = Discharge of Lead GAC Unit
SP-S8 = Discharge of Lag GAC Unit

EXTRACTION WELL #7
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (April 2018)

SAMPLE LOCATION SAMPLE DATE	Units	Max Expected	EW#7 4/25/2018
Explosives (method 8330A)			
HMX	(µg/L)	50	**0.54**
RDX	(µg/L)	100	**M 0.52**
Tetryl	(µg/L)	NN	**M** ND(0.11)
TNT	(µg/L)	250	**6.4**
VOC's (method 8260B)			
Trichloroethylene	(µg/L)	NN	ND(0.4)
Trichlorotrifluoroethane	(µg/L)	NN	ND(1.6)

Notes:

Max Expected = The maximum expected values with one extraction well operating; values established when Groundwater Treatment Facility (GWTF) went in to operation.

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahdyro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

VOC's = Volatile Organic Compounds

ND = Not Detected (values in parenthesis represent limits of detection (LOD)).

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value.

NN = Not Noted

(µg/L) = micrograms per liter

Effective 3/31/2010, EW #7 samples were collected from inside the Groundwater Treatment Facility (GWTF); same as SP-S2.

EW #7 only well online.

Sample ID: EW=Extraction Well, n=Well Number

Brice Engineering Daily Chemical Quality Control Report

COE Project Manager Doug Simpleman **Date** April 25, 2018 Report No. **404**

Project CHAAP NPDES Sampling

Brice Eng. Project No. 1430057.0001.001

Contract No. W9128F-18-D-0020

Day	M	T	W	TH	F	S	SUN
			X				

On Site Hours	1
Travel Time	0
Office Time	1

Subcontractors on site: None

Equipment on site: None

Visitors on site: None

Personnel on site: Gary Carson

Weather	Bright Sun	Clear	Overcast	Rain	Snow
Temp	<32	32-50	50-70	70-85	85>
Wind	Still	Moderate	High		
Humidity	Dry	Moderate	Humid		

Field Work Performed (including sampling):
SP-S2 & SP-S22 = VOCs, pH, TSS & Explosives
SP-S6 = Explosives
SP-S8 = Explosives
SP-E1 = pH, Selenium, VOCs, & Explosives; SP-E11 = Selenium
SP-EW7 = VOCs & Explosives (Collected from inside GWTF; same as SP-S2)

Quality Control Activities (including field calibration):

Health and Safety Activities

Problems Encountered/Corrective Action Taken

Downtime/Standby:

Office Work Performed:
Sample labeling, Chain of Custody, DCQCR

By: Gary Carson Title: Plant Operator
Reviewed By: Scotty Mann Title: Project Manager

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS *(Include Facility Name/Location if Different)*

NAME: CORNHUSKER ARMY AMMUNITION PLT
ADDRESS: 102 N 60TH RD
GRAND ISLAND, NE 68803
FACILITY: CORNHUSKER ARMY AMMUNITION PLT
LOCATION: 102 N 60TH RD
GRAND ISLAND, NE 68803

NE0131725	002M
PERMIT NUMBER	**DISCHARGE NUMBER**

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	18	02	01	**TO**	18	04	30

DMR MAILING ZIP CODE: 68803
MINOR
(SUBR05)
TREATED GROUND WATER
External Outfall

No Discharge [X]

ATTN: Doug Simpleman, PROJECT MANAGER

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
pH	SAMPLE MEASUREMENT	******	******			******		(12)			
00400 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		6.5 MINIMUM	******	9 MAXIMUM	S		Semiannual	GRAB
Selenium, total (as Se)	SAMPLE MEASUREMENT	******	******		******			(19)			
01147 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	0.005 AVERAGE	0.02 MAXIMUM	mg/L		Semiannual	GRAB
Trichloroethylene	SAMPLE MEASUREMENT	******	******		******			(19)			
39180 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	Req. Mon. AVERAGE	0.005 MAXIMUM	mg/L		Semiannual	GRAB
Flow, in conduit or thru treatment plant	SAMPLE MEASUREMENT			(03)	******	******	******				
50050 1 0 Effluent Gross	PERMIT REQUIREMENT	Req. Mon. AVERAGE	Req. Mon. MAXIMUM	Mgal/d	******	******	******			Daily	CALCTD
Explosives, combined TNT + RDX + tetryl	SAMPLE MEASUREMENT	******	******		******			(19)			
78455 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	0.1 AVERAGE	0.2 MAXIMUM	mg/L		Semiannual	GRAB
TNT, total	SAMPLE MEASUREMENT	******	******		******			(19)			
81360 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	Req. Mon. AVERAGE	Req. Mon. MAXIMUM	mg/L		Semiannual	GRAB
RDX, total	SAMPLE MEASUREMENT	******	******		******			(19)			
81364 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	0.05 AVERAGE	0.1 MAXIMUM	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE		DATE		
Doug Simpleman, Project Manager	I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.		(402) 995-2753				
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA Code	NUMBER	YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

EPA Form 3320-1 (Rev.01/06) Previous editions may be used.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

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FACILITY: CORNHUSKER ARMY AMMUNITION PLT
LOCATION: 102 N 60TH RD
GRAND ISLAND, NE 68803

NE0131725	002M
PERMIT NUMBER	**DISCHARGE NUMBER**

	MONITORING PERIOD						
	YEAR	MO	DAY		YEAR	MO	DAY
FROM	18	02	01	TO	18	04	30

DMR MAILING ZIP CODE: 68803
MINOR
(SUBR05)
TREATED GROUND WATER
External Outfall

No Discharge [X]

ATTN: Doug Simpleman PROJECT MANAGER

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Trichlorotrifluoroethane	SAMPLE MEASUREMENT	******	******		******			(19)			
81611 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	Req. Mon. AVERAGE	0.02 MAXIMUM	mg/L		Semiannual	GRAB
HMX	SAMPLE MEASUREMENT	******	******		******			(19)			
82203 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	0.2 AVERAGE	0.4 MAXIMUM	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE		DATE		
Doug Simpleman, Project Manager	I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.		(402) 995-2753				
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA Code	NUMBER	YEAR	MO	DAY

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NE0131725	001M
PERMIT NUMBER	**DISCHARGE NUMBER**

MONITORING PERIOD							
	YEAR	MO	DAY		YEAR	MO	DAY
FROM	18	02	01	**TO**	18	04	30

DMR MAILING ZIP CODE: 68803
MINOR
(SUBR05)
TREATED GROUND WATER
External Outfall

No Discharge ☐

ATTN: Doug Simpleman, PROJECT MANAGER

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
pH	SAMPLE MEASUREMENT	******	******		7.3	******	7.3	(12)		1/90	Grab
00400 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		6.5 MINIMUM	******	9 MAXIMUM	SU		Semiannual	GRAB
Selenium, total (as Se)	SAMPLE MEASUREMENT	******	******		******	0.0014	0.0014	(19)		1/90	Grab
01147 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	0.005 AVERAGE	0.02 MAXIMUM	mg/L		Semiannual	GRAB
Trichloroethylene	SAMPLE MEASUREMENT	******	******		******	<0.0004	<0.0004	(19)		1/90	Grab
39180 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	Req. Mon. AVERAGE	0.005 MAXIMUM	mg/L		Semiannual	GRAB
Flow, in conduit or thru treatment plant	SAMPLE MEASUREMENT	0.402	0.449	(03)	******	******	******				
50050 1 0 Effluent Gross	PERMIT REQUIREMENT	Req. Mon. AVERAGE	Req. Mon. MAXIMUM	Mgal/d	******	******	******			Daily	CALCTD
Explosives, combined TNT + RDX + tetryl	SAMPLE MEASUREMENT	******	******		******	0.00012	0.00012	(19)		1/90	Grab
78455 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	0.1 AVERAGE	0.2 MAXIMUM	mg/L		Semiannual	GRAB
TNT, total	SAMPLE MEASUREMENT	******	******		******	<0.00011	<0.00011	(19)		1/90	Grab
81360 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	Req. Mon. AVERAGE	Req. Mon. MAXIMUM	mg/L		Semiannual	GRAB
RDX, total	SAMPLE MEASUREMENT	******	******		******	0.00012	0.00012	(19)		1/90	Grab
81364 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	0.05 AVERAGE	0.1 MAXIMUM	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE		DATE		
Doug Simpleman, Project Manager	I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.		(402)995-2753				
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA Code	NUMBER	YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

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LOCATION: 102 N 60TH RD
GRAND ISLAND, NE 68803

NE0131725	001M
PERMIT NUMBER	**DISCHARGE NUMBER**

	MONITORING PERIOD						
	YEAR	MO	DAY		YEAR	MO	DAY
FROM	18	02	01	TO	18	04	30

DMR MAILING ZIP CODE: 68803
MINOR
(SUBR05)
TREATED GROUND WATER
External Outfall

No Discharge ☐

ATTN: Doug Simpleman, PROJECT MANAGER

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Trichlorotrifluoroethane	SAMPLE MEASUREMENT	******	******		******	<0.0016	<0.0016	(19)		1/90	Grab
81611 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	Req. Mon. AVERAGE	0.02 MAXIMUM	mg/L		Semiannual	GRAB
HMX	SAMPLE MEASUREMENT	******	******		******	0.000077	0.000077	(19)		1/90	Grab
82203 1 0 Effluent Gross	PERMIT REQUIREMENT	******	******		******	0.2 AVERAGE	0.4 MAXIMUM	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE		DATE		
Doug Simpleman, Project Manager	I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.		(402) 995-2753				
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA Code	NUMBER	YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

SP-E1 (TOTAL EFFLUENT)
CHAAP SAMPLING RESULTS SUMMARY (January 2015 - April 2018)

	Explosives						VOC's		Metals		pH
	HMX	RDX	Tetryl	TNT	Combined Explosives	Total Explosives	Trichloro-ethylene	Trichloro-trifluoroethane	Selenium		
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)		(s.u.)
Anticipated	0.6	1	<0.5	5.1	7.2	NN	--	0.9	3		NN
Permit	200	50	Report	Report	100	NN	5 µg/L	500	5		6.5 - 9.0
SAMPLE DATE											
1/28/2015	ND(0.15)	ND(0.15)	ND(0.15)	ND(0.15)	ND	ND	ND(0.2)	**3.4**	**J 5.2**		**7.82**
1/28/2015									ND(12)	QC	
4/29/2015	ND(0.20)	**J 0.14**	ND(0.20)	ND(0.20)	**0.14**	**0.14**	ND(0.4)	**J 2.8**	ND(19)		**7.28**
4/29/2015									**J 5.8**	QC	
7/29/2015	ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	ND	ND	ND(0.4)	ND(1.6)	ND(19)		**7.11**
7/29/2015									ND(19)	QC	
10/28/2015	ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	ND	ND	ND(0.4)	**J 1**	**J 13**		**7.10**
10/28/2015									**J 9.9**	QC	
1/27/2016	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	ND	ND	ND(0.4)	**J 1.2**	**J 9.9**		**7.30**
1/27/2016									ND(19)	QC	
4/27/2016	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	ND	ND	ND(0.4)	**J 1.1**	ND(19)		**7.23**
4/27/2016									ND(19)	QC	
7/27/2016	ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	ND	ND	ND(0.4)	**J 1.6**	ND(19)		**7.10**
7/27/2016									ND(19)	QC	
10/26/2016	ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	ND	ND	ND(0.4)	**J 1.4**	ND(19)		**7.2**
10/26/2016									ND(19)	QC	
1/25/2017	ND(0.21)	**J 0.18**	**J 0.18**	ND(0.21)	**0.36**	**0.36**	ND(0.4)	**J 1.2**	ND(19)		**7.5**
1/25/2017									ND(19)	QC	
4/26/2017	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	ND	ND	ND(0.4)	**J 1.1**	ND(19)		**7.5**
4/26/2017									ND(19)	QC	
7/26/2017	**UJ** ND(0.23)	**UJ** ND(0.14)	**UJ** ND(0.23)	**UJ** ND(0.23)	ND	ND	ND(0.4)	**JQ 1.2**	ND(19)		**7.4**
7/26/2017									ND(19)	QC	
10/25/2017	ND(0.21)	**J 0.16**	ND(0.21)	ND(0.21)	**0.16**	**0.16**	ND(0.4)	**J 1.3**	ND(19)		**7.3**
10/25/2017									ND(19)	QC	
1/31/2018	**JJ1 0.045**	**J 0.14**	ND(0.10)	ND(0.10)	**0.14**	**0.19**	ND(0.4)	ND (1.6)	**J 1.7**		**7.5**
1/31/2018									**J 1.9**	QC	
4/25/2018	**J 0.077**	**J 0.12**	ND(0.11)	**M** ND(0.11)	**0.12**	**0.20**	ND(0.4)	ND (1.6)	**J 1.4**		**7.3**
4/25/2018									**J 1.4**	QC	

Notes:

Anticipated = The anticipated value was established when the Groundwater Treatment Facility (GWTF) went in to operation.

Permit = Permitted concentration on NPDES permit.

Report = Indicates concentrations only need reported on NPDES Discharge Monitoring Report (DMR).

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahdyro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

pH = Field parameter with a holding time of 15 minutes.

Combined explosives for the effluent sample at SP-E1 are reported in the NPDES permit and are calculated as (TNT+RDX+Tetryl)

Total explosives are calculated for operation evaluations as (TNT+RDX+Tetryl+HMX)

Blank cell indicates not analyzed

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value.

J1 = Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

M = Manual Integrated compound.

ND = Not Detected (values in parenthesis represent limits of detection (LOD))

NN = Not Noted

Q = One or more quality control criteria failed.

U = Undected at limit of detection

UJ = Estimated Non-detect

QC = Quality Control Sample

(µg/L) = micrograms per liter

(s.u.) = standard units

Method 8330A used for explosives

Method 8260B used for VOCs

Method 6020A for metals since 1/31/2018. Method 7740 used for metals prior to 1/31/2018.

Method 9040C used for pH since 1/31/2018. Method 150.1 used for pH prior to 1/31/2018.

Sample ID: SP = Sampling Port, E=Effluent, n=port number

SP-E1 = Bottom of Effluent Tank

SP-S2 (TOTAL INFLUENT)
CHAAP SAMPLING RESULTS SUMMARY (January 2015 - April 2018)

		Explosives				VOC's		TSS	pH
		HMX	RDX	Tetryl	TNT	Trichloro-ethylene	Trichloro-trifluoroethane		
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(s.u.)
Max Expected		50	100	NN	250	NN	NN	NN	NN
SAMPLE DATE									
1/28/2015		**J 0.37**	**1.1**	ND(0.16)	**10**	ND(0.2)	**4.6**	ND(2.8)	**7.5**
1/28/2015	QC	**J 0.42**	**1.2**	ND(0.16)	**10**	ND(0.2)	**4.2**	ND(2.8)	**7.47**
4/29/2015		**J 0.43**	**1.1**	ND(0.21)	**9.8**	ND(0.4)	**3.6**	ND(2.8)	**7.39**
4/29/2015	QC	**J 0.41**	**1.0**	ND(0.21)	**10**	ND(0.4)	**3.6**	ND(2.8)	**7.47**
7/29/2015		**J 0.47**	**0.92**	ND(0.20)	**9.4**	ND(0.4)	**J 2.7**	**J 3.2**	**7.11**
7/29/2015	QC	**JB 1.50**	**0.91**	ND(0.20)	**9.4**	ND(0.4)	**J 2.5**	**J 2.4**	**7.12**
10/28/2015		**J 0.37**	**0.92**	ND(0.20)	**11**	ND(0.4)	**J 2.3**	ND(2.8)	**7.1**
10/28/2015	QC	**J 0.38**	**0.89**	ND(0.20)	**11**	ND(0.4)	**J 2.3**	ND(2.8)	**7.1**
1/27/2016		ND(0.21)	**0.72**	ND(0.21)	**11**	ND(0.4)	**J 2.1**	**J 1.2**	**7.09**
1/27/2016	QC	ND(0.21)	**0.74**	ND(0.21)	**11**	ND(0.4)	**J 2.2**	ND(2.8)	**7.08**
4/27/2016		**0.66**	**B 0.97**	ND(0.21)	**7.5**	ND(0.4)	**J 1.7**	**J 1.2**	**7.13**
4/27/2016	QC	**0.73**	**B 1.0**	ND(0.21)	**7.7**	ND(0.4)	**J 1.6**	ND(2.8)	**7.23**
7/27/2016		**J 0.81**	**J 0.83**	ND(0.22)	**9.0**	ND(0.4)	**J 1.6**	ND(2.8)	**7.13**
7/27/2016	QC	**0.81**	**0.74**	ND(0.22)	**9.1**	ND(0.4)	**J**	ND(2.8)	**7.09**
10/26/2016		**1.0**	**0.96**	ND(0.23)	**9.2**	ND(0.4)	**J 1.4**	ND(2.8)	**7.4**
10/26/2016	QC	**0.91**	**0.78**	ND(0.23)	**9.3**	ND(0.4)	**J 1.5**	**J 1.2**	**7.4**
1/25/2017		**J 0.68**	**Q 0.70**	ND(0.21)	**Q 8.7**	ND(0.4)	**J 1.5**	ND(2.8)	**7.7**
1/25/2017	QC	**J 0.62**	**Q 0.71**	ND(0.21)	**Q 8.8**	ND(0.4)	**J 1.3**	ND(2.8)	**7.8**
4/26/2017		**J 0.36**	**0.33**	ND(0.21)	**7.5**	ND(0.4)	**J 1.1**	ND(2.8)	**7.7**
4/26/2017	QC	**J 0.34**	**0.32**	ND(0.21)	**7.4**	ND(0.4)	**J 1.1**	ND(2.8)	**7.7**
7/26/2017		**0.48**	**0.64**	ND(0.21)	**6.3**	ND(0.4)	**JQ 1.1**	ND(2.8)	**7.7**
7/26/2017	QC	**J 0.5**	**0.57**	ND(0.21)	**6.6**	ND(0.4)	**1.1**	ND(2.8)	**7.7**
10/25/2017		**J 0.34**	**0.66**	ND(0.23)	**5.9**	ND(0.4)	**J 1.3**	**J 1.6**	**7.7**
10/25/2017	QC	**0.59**	**0.67**	ND(0.21)	**6.5**	ND(0.4)	**J 1.2**	**J 1.6**	**7.6**
1/31/2018		**0.54**	**0.56**	ND(0.10)	**7.0**	ND(0.4)	ND(1.6)	ND(3.5)	**7.7**
1/31/2018	QC	**0.56**	**0.62**	ND(0.10)	**7.0**	ND(0.4)	ND(1.6)	ND(3.5)	**7.8**
4/25/2018		**0.54**	**M 0.52**	**M** ND(0.11)	**6.4**	ND(0.4)	ND(1.6)	**J 1.2**	**7.3**
4/25/2018	QC	**0.51**	**0.53**	**M** ND(0.11)	**6.5**	ND(0.4)	ND(1.6)	ND(2.8)	**7.4**

Notes:
Max Expected = The maximum expected values with one extraction well operating; values established when the Groundwater Treatment Facility (GWTF) went in to operation.
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX = hexahdyro-1,3,5-trinitro-1,3,5-triazine
TNT = 2,4,6-trinitrotoluene
VOC's = Volatile Organic Compounds
TSS = Total Suspended Solids
pH = Field parameter with a holding time of 15 minutes
GAC = Granulated Activated Carbon
Blank cell indicates not analyzed
ND = Not Detected (values in parenthesis represent limits of detection (LOD)).
J = Result is less than the RL but greater than or equal to the limits of detection (LOD)and the concentration is an approximate value.
B = Compound was found in the blank and sample.
NN = Not Noted
M = Manual Integrated compound
Q = One or more quality control criteria failed
QC = Quality Control Sample
(µg/L) = micrograms per liter
(mg/L) = milligrams per liter
(s.u.) = standard units
Method 8330A used for explosives
Method 8260B used for VOCs
Method 2540D used for TSS since 1/31/2018. Method 160.2 used for TSS prior to 1/31/2018.
Method 9040C used for pH since 1/31/2018. Method 150.1 used for pH prior to 1/31/2018.
Sample ID: SP = Sampling Port, S=Source, n=port number
SP-S2 = Discharge of GAC Feed Tank

SP-S6 & SP-S8
CHAAP SAMPLING RESULTS SUMMARY (January 2015 - April 2018)

	SP-S6 Lead GAC Unit				SP-S8 Lag GAC Unit				
	Explosives				Explosives				
	HMX	RDX	Tetryl	TNT	HMX	RDX	Tetryl	TNT	
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	
SAMPLE DATE									
1/28/2015	ND(0.15)	**0.48**	ND(0.15)	**1.4**	ND(0.15)	ND(0.15)	ND(0.15)	ND(0.15)	
1/28/2015					ND(0.15)	ND(0.15)	ND(0.15)	ND(0.15)	E-1-QC
4/29/2015	**J 0.22**	**0.54**	ND(0.20)	**1.5**	ND(0.20)	**J 0.13**	ND(0.20)	ND(0.20)	
4/29/2015					ND(0.20)	**J 0.14**	ND(0.20)	ND(0.20)	E-1-QC
7/29/2015	ND(0.20)	**J 0.17**	ND(0.20)	**J 0.24**	ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	
7/29/2015					ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	E-1-QC
10/28/2015	ND(0.20)	**J 0.17**	ND(0.20)	**J 0.24**	ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	
10/28/2015					ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	E-1-QC
1/27/2016	ND(0.21)	**J 0.20**	ND(0.21)	**0.61**	ND(0.21)	ND(0.12)	ND(0.21)	ND(0.21)	
1/27/2016					ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	E-1-QC
4/27/2016	ND(0.21)	**B 0.46**	ND(0.21)	**0.62**	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	
4/27/2016					ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	E-1-QC
7/27/2016	ND(0.22)	**0.30**	ND(0.22)	**0.51**	ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	
7/27/2016					ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	E-1-QC
10/26/2016	ND(0.22)	**0.39**	ND(0.22)	**0.89**	ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	
10/26/2016					ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	E-1-QC
1/25/2017	ND(0.21)	ND(0.12)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.12)	ND(0.21)	ND(0.21)	
1/25/2017					ND(0.21)	**J 0.18**	**J 0.18**	ND(0.21)	E-1-QC
4/26/2017	**J 0.21**	**0.27**	ND(0.21)	**1.1**	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	
4/26/2017					ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	E-1-QC
7/26/2017	**J 0.13**	**0.36**	ND(0.21)	**1.1**	ND(0.21)	**J 0.11**	ND(0.21)	ND(0.21)	
7/26/2017					**UJ** ND(0.23)	**UJ** ND(0.14)	**UJ** ND(0.23)	**UJ** ND(0.23)	E-1-QC
10/25/2017	ND(0.23)	**0.34**	ND(0.23)	**1.1**	ND(0.21)	**J 0.14**	ND(0.21)	ND(0.21)	
10/25/2017					ND(0.21)	**J 0.16**	**UJ** ND(0.21)	**UJ** ND(0.21)	E-1-QC
1/31/2018	**0.21**	**0.33**	ND(0.10)	**0.78**	**J 0.048**	**J 0.13**	ND(0.10)	ND(0.10)	
1/31/2018					**J 0.045**	**J 0.14**	ND(0.10)	ND(0.10)	E-1-QC
4/25/2018	**0.20**	**M 0.28**	**M** ND(0.10)	**0.63**	**J** ND(0.10)	**JM 0.13**	**M** ND(0.10)	**M** ND(0.10)	
4/25/2018					**J 0.077**	**J 0.12**	ND(0.11)	**M** ND(0.11)	E-1-QC

Notes:

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahdyro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

GAC = Granulated Activated Carbon

Blank cell indicates not analyzed

E-1-QC = Quality Control Sample taken from the E-1 sample

ND = Not Detected (values in parenthesis represent limits of detection (LOD)).

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value.

B = Compound was found in the blank and sample.

UJ = Estimated Non-detect

M = Manual Integrated compound.

(µg/L) = micrograms per liter

Method 8330A used for explosives

Sample ID: SP = Sampling Port, S=Source, n=port number

SP-S6 = Discharge of Lead GAC Unit

SP-S8 = Discharge of Lag GAC Unit

CY06 Carbon Changes: March 15, 2006; July 18, 2006; December 7, 2006

CY07 Carbon Changes: April 5, 2007; August 21, 2007, December 10, 2007

CY08 Carbon Changes: September 30, 2008

CY09 Carbon Changes: July 23, 2009

CY10 Carbon Changes: November 30, 2010

CY12 Carbon Changes: February 8, 2012

CY13 Carbon Changes: October 9, 2013

CY15 Carbon Changes: May 11, 2015

EXTRACTION WELL EW#7
CHAAP SAMPLING RESULTS SUMMARY (January 2015 - April 2018)

		Explosives						VOC's	
		HMX	RDX	Tetryl	TNT	Total Explosives		Trichloro-ethylene	Trichloro-trifluoroethane
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)		(µg/L)	(µg/L)
Well ID	**Max Expected**	50	100	NN	250	NN		NN	NN
	Sample Date								
EW#7	**1/28/2015**	**J 0.37**	**1.1**	ND(0.16)	**10**	**11**		ND(0.2)	**4.6**
EW#7	**4/29/2015**	**J 0.43**	**1.1**	ND(0.21)	**9.8**	**11**		ND(0.4)	**3.6**
EW#7	**7/29/2015**	**J 0.47**	**0.92**	ND(0.20)	**9.4**	**11**		ND(0.4)	**J 2.7**
EW#7	**10/28/2015**	**J 0.37**	**0.92**	ND(0.20)	**11**	**12**		ND(0.4)	**J 2.3**
EW#7	**1/27/2016**	ND(0.21)	**0.72**	ND(0.21)	**11**	**12**		ND(0.4)	**J 2.1**
EW#7	**4/27/2016**	**B 0.66**	**0.97**	ND(0.21)	**7.5**	**9**		ND(0.4)	**J 1.7**
EW#7	**7/27/2016**	**J 0.81**	**J 0.83**	ND(0.22)	**9.0**	**11**		ND(0.4)	**J 1.6**
EW#7	**10/26/2016**	**1.0**	**0.96**	ND(0.23)	**9.2**	**11**		ND(0.4)	**J 1.4**
EW#7	**1/25/2017**	**J 0.68**	**Q 0.70**	ND(0.21)	**Q 8.7**	**10**		ND(0.4)	**J 1.5**
EW#7	**4/26/2017**	**J 0.36**	**0.33**	ND(0.21)	**7.5**	**8**		ND(0.4)	**J 1.1**
EW#7	**7/26/2017**	**0.48**	**0.64**	ND(0.21)	**6.3**	**7**		ND(0.4)	**J 1.1**
EW#7	**10/25/2017**	**J 0.34**	**0.66**	ND(0.23)	**5.9**	**7**		ND(0.4)	**J 1.3**
EW#7	**1/31/2018**	**0.54**	**0.56**	ND(0.10)	**7.0**	**8**		ND(0.4)	ND(1.6)
EW#7	**4/25/2018**	**0.54**	**M 0.52**	**M** ND(0.11)	**6.4**	**7**		ND(0.4)	ND(1.6)

Notes:

Max Expected = The maximum expected values with one extraction well operating; values established when the Groundwater Treatment Facility (GWTF) went in to operation.

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahdyro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

Total explosives are calculated for operation evaluations as (TNT+RDX+Tetryl+HMX)

VOC's = Volatile Organic Compounds

ND = Not Detected (values in parenthesis represent limits of detection (LOD)).

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) ānd the concentration is an approximate value.

B = Compound was found in the blank and sample.

Q = One or more quality control criteria failed.

NN = Not Noted

N/A = Not Applicable

(µg/L) = micrograms per liter

Method 8330A used for explosives.

Method 8260B used for VOCs.

Sample ID: EW=Extraction Well, n=Well Number

Effective 3/31/2010, EW #7 samples were collected from inside the Groundwater Treatment Facility (GWTF); same as SP-S2.

EW #7 only well online.

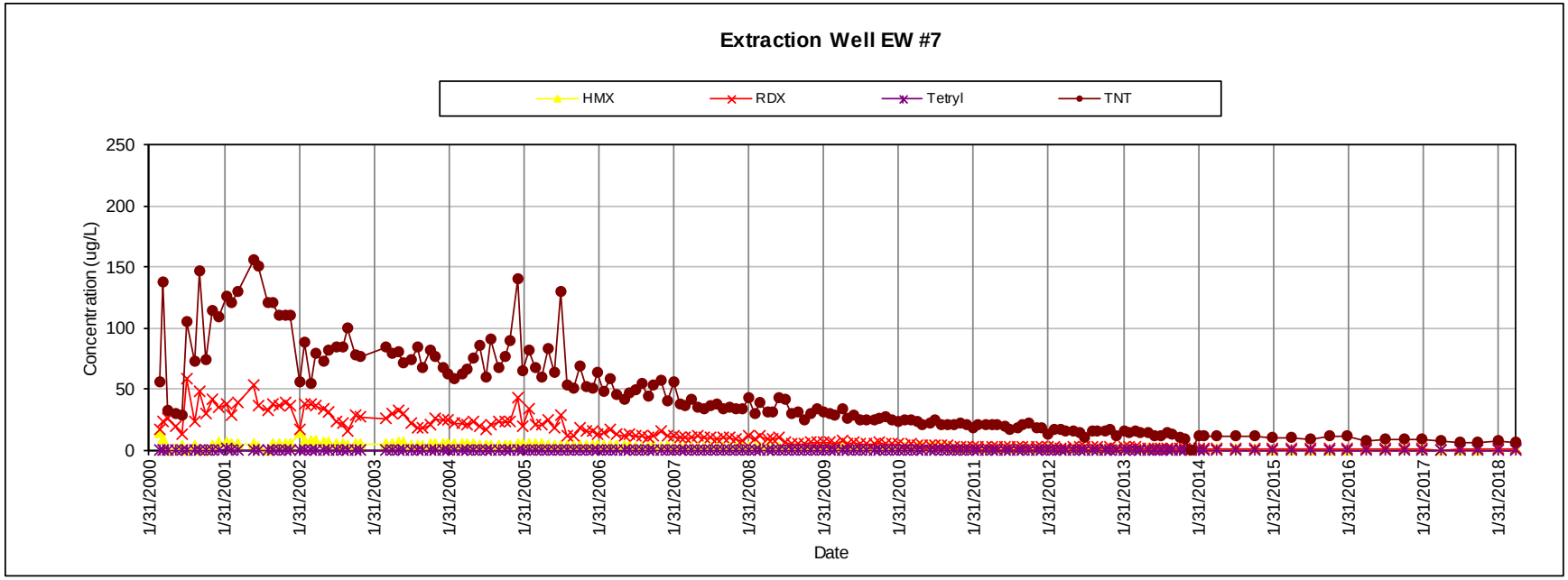

Figure 1 Extraction Well #7 - HMX, RDX, Tetryl and TNT Concentrations vs. Time

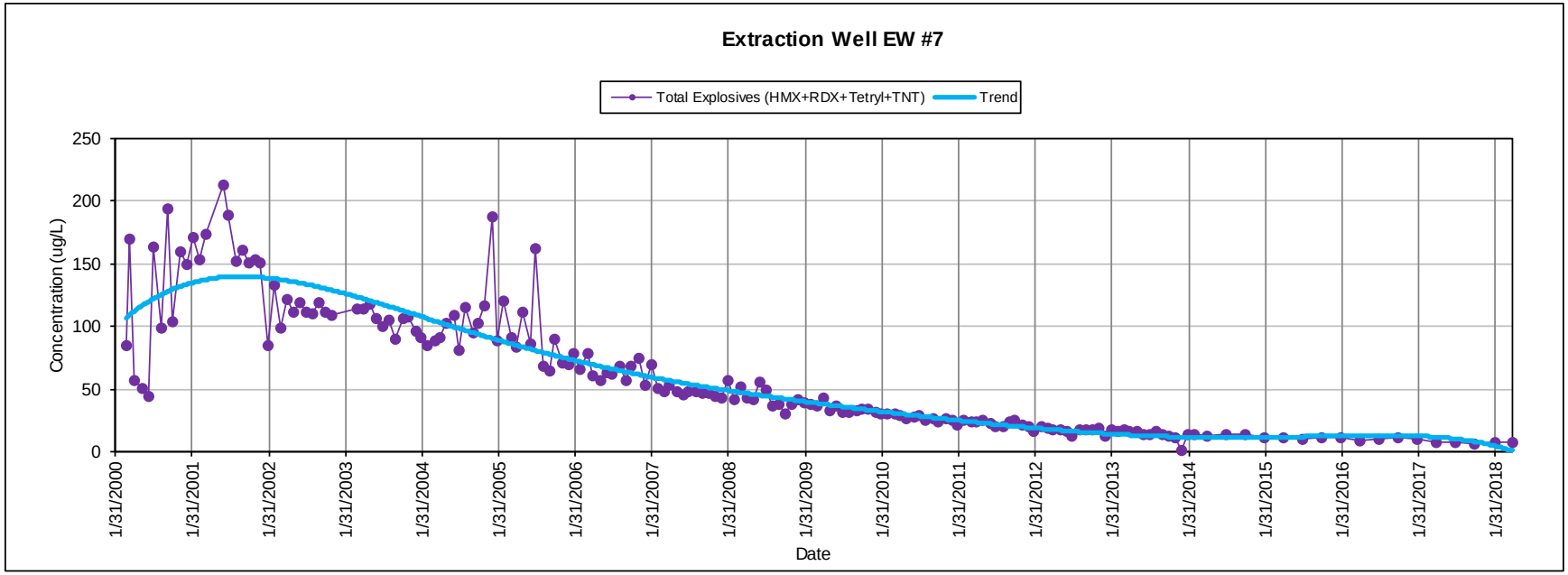

Figure 2 Extraction Well # 7 - Total Explosives (TNT+RDX+Tetryl+HMX) with Trend vs. Time. Note: Total Explosives are calculated for operational evaluations.