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

March 29, 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
November 2017 thru January 2018 Analytical Results Summary

Dear Mr. Simpleman:

Attached is a summary table of the quarterly sampling analytical results for the period of November 2017 through January 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 January 31, 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 November 2017 through January 2018 for your review.

Attached is a summary table showing the quarterly analytical results for sampling period January 2015 through January 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, Project Manager.

Sincerely,

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

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

cc: Scotty Mann, Brice Engineering

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

SAMPLE LOCATION SAMPLE DATE	Units	Anticipated	NPDES Permit	SP-E1 1/31/2018	
Explosives (method 8330A)					
HMX	(µg/L)	0.6	200	**JJ1 0.045**	
RDX	(µg/L)	1	50	**J 0.14**	
Tetryl	(µg/L)	<0.5	Report	ND(0.10)	
TNT	(µg/L)	5.1	Report	ND(0.10)	
Combined Explosives (TNT+RDX+Tetryl)	(µg/L)	7.2	100	**0.14**	
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 1.7**	
				J 1.9	**QC**
pH (method 9040C)	(s.u.)	NN	6.5 - 9.0	**7.5**	

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 calcu
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
QC = Quality Control Sample
(µg/L) = micrograms per liter
(s.u.) = standard units
Sample ID: SP = Sampling Port, E=Effluent, n=port number
SP-E1 = Bottom of Effluent Tank

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

SAMPLE LOCATION SAMPLE DATE	Units	Max Expected	SP-S2 1/31/2018	QC SP-S22 1/31/2018
Explosives (method 8330A)				
HMX	(µg/L)	50	**0.54**	**0.56**
RDX	(µg/L)	100	**0.56**	**0.62**
Tetryl	(µg/L)	NN	ND(0.10)	ND(0.10)
TNT	(µg/L)	250	**7.0**	**7.0**
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	ND(3.5)	ND(3.5)
pH (method 9040C)	(s.u.)	NN	**7.7**	**7.8**

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
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 (January 2018)

SAMPLE LOCATION SAMPLE DATE	Units	SP-S6 1/31/2018
Explosives(method 8330A)		
HMX	(µg/L)	**0.21**
RDX	(µg/L)	**0.33**
Tetryl	(µg/L)	ND(0.10)
TNT	(µg/L)	**0.78**

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

SAMPLE LOCATION SAMPLE DATE	Units	SP-S8 1/31/2018	E-1-QC SP-E1 1/31/2018
Explosives(method 8330A)			
HMX	(µg/L)	**J 0.048**	**J 0.045**
RDX	(µg/L)	**J 0.13**	**J 0.14**
Tetryl	(µg/L)	ND(0.10)	ND(0.10)
TNT	(µg/L)	ND(0.10)	ND(0.10)

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.
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 (January 2018)

SAMPLE LOCATION SAMPLE DATE	Units	Max Expected	EW#7 1/31/2018
Explosives(method 8330A)			
HMX	(µg/L)	50	**0.54**
RDX	(µg/L)	100	**0.56**
Tetryl	(µg/L)	NN	ND(0.10)
TNT	(µg/L)	250	**7.0**
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 January 31, 2018 Report No. **403**

Project CHAAP NPDES Sampling

Day

M	T	W	TH	F	S	SUN
		X				

Brice Eng. Project No. 1430057.0001.001

Contract No. W9128F-18-D-0020

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, DQCR

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

ATTN: Doug Simpleman, PROJECT MANAGER

NE0131725	002M
PERMIT NUMBER	**DISCHARGE NUMBER**

MONITORING PERIOD						
	YEAR	MO	DAY		YEAR	MO	DAY
FROM	17	11	01	TO	18	01	31

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

No Discharge X

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)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

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GRAND ISLAND, NE 68803

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

ATTN: Doug Simpleman PROJECT MANAGER

NE0131725	002M
PERMIT NUMBER	**DISCHARGE NUMBER**

	MONITORING PERIOD						
	YEAR	MO	DAY		YEAR	MO	DAY
FROM	17	11	01	TO	18	01	31

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

No Discharge [X]

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

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

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GRAND ISLAND, NE 68803

ATTN: Doug Simpleman, PROJECT MANAGER

NE0131725	001M
PERMIT NUMBER	**DISCHARGE NUMBER**

MONITORING PERIOD						
	MO	DAY		YEAR	MO	DAY
FROM 17	11	01	TO	18	01	31

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

No Discharge ☐

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
pH	SAMPLE MEASUREMENT	******	******		7.5	******	7.5	(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	******	******		******	0.0019	0.0019	(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	0.412	0.532	(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	******	******		******	0.00014	0.00014	(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	******	******		******	<0.00010	<0.00010	(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	******	******		******	0.00014	0.00014	(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

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

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

ATTN: Doug Simpleman, PROJECT MANAGER

NE0131725	001M
PERMIT NUMBER	**DISCHARGE NUMBER**

MONITORING PERIOD							
	YEAR	MO	DAY		YEAR	MO	DAY
FROM	17	11	01	TO	18	01	31

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

No Discharge ☐

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	******	******		******	0.000045	0.000045	(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 - January 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	

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.
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 - January 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

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
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 - January 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

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
(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 - January 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)

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) and 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.

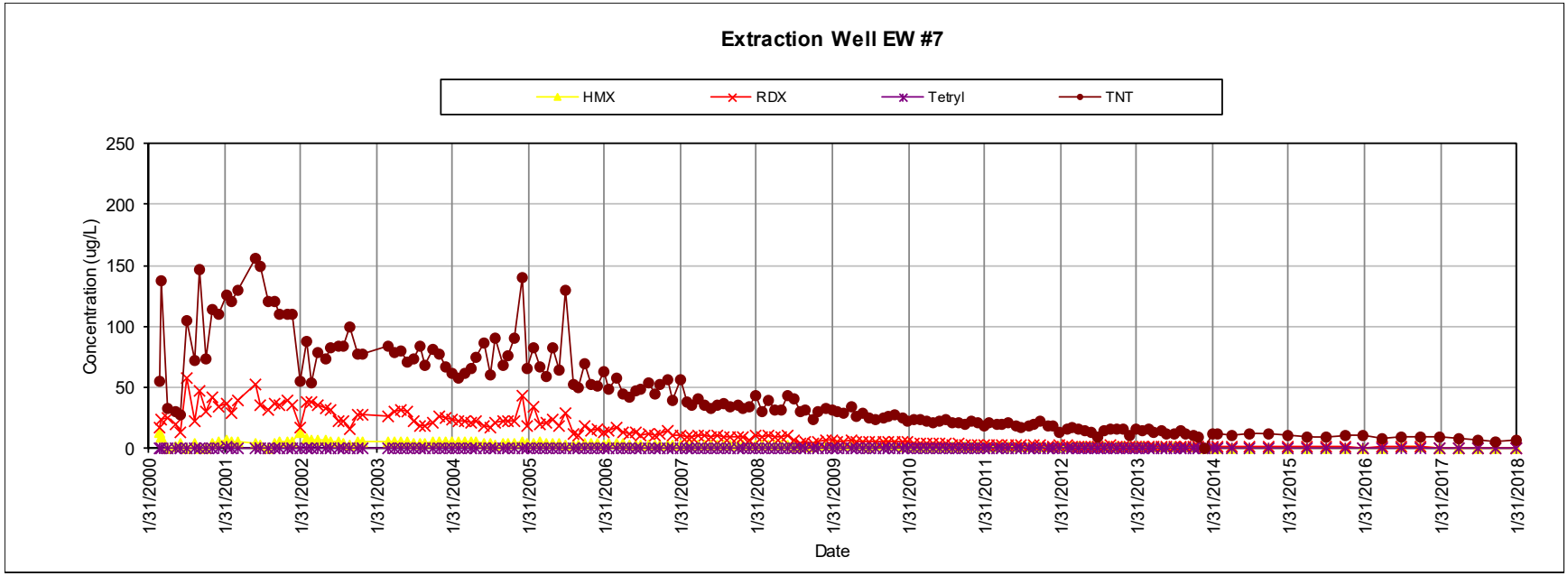

Figure 1 Extraction Well #7 - HMX, RDX, Tetryl and TNT Concentrations vs. Time

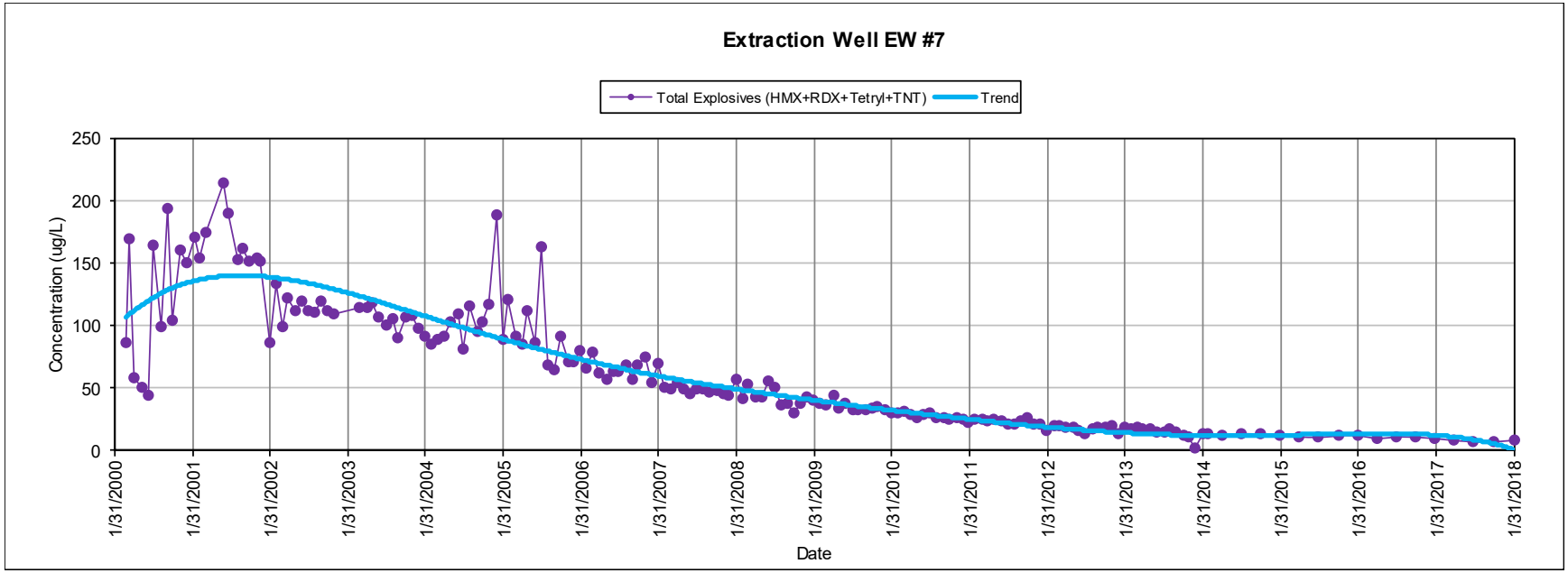

Figure 2 Extraction Well # 7 - Total Explosives (TNT+RDX+Tetryl+HMX) with Trend vs. Time. Note: Total Explosives are calculated for operational evaluations.